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Assessing Deaf Culture Awareness of Physician Assistant Students in the Midwest

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ASSESSING DEAF CULTURE AWARENESS OF PHYSICIAN ASSISTANT STUDENTS IN THE MIDWEST

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ABSTRACT

Currently, there has been insufficient research to support the need for implementation of deaf awareness training into physician assistant (PA) program curriculums. To address this gap in research, PA students in the Midwest United States were surveyed in order to assess student knowledge of Deaf culture and knowledge regarding appropriate management of patients who are deaf. Survey knowledge scores were compared to previously documented knowledge scores of medical students enrolled in the Medical Students, Cancer Control, and the Deaf Community Training (DCT) program at the University of California, San Diego (UCSD). PA student scores were also compared to scores of USCD medical students who did not participate in the DCT program. The results of the study revealed that PA students in the Midwest scored significantly lower than medical students who were enrolled in the DCT program. However, PA students scored significantly higher than medical students who did not participate in the DCT program. The results of this study suggest that incorporation of deaf awareness training into PA programs could be beneficial for PA students. Deaf awareness training can help prepare PA students for communication challenges faced by medical professionals who work with patients who are deaf. Successful communication promotes the formation of stronger patient-provider relationships, which can help address the healthcare disparity that exists for patients who are deaf.

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According to the United States census conducted in 2010, approximately 18.7% of the US population suffered from a disability and 12.6% suffered from a severe disability based on the *International Classification of Functioning, Disability, and Health* (ICF) scale (Brault, 2012). Of these individuals, 7.6 million people (3.1%) experienced a hearing difficulty with 1.1 million of these individuals being unable to hear a normal conversation (Brault, 2012). Communication with such individuals can be challenging and under the Americans with Disabilities Act (ADA), title II entities (state and local governments) and title III entities (businesses and nonprofit organizations) are required to ensure adequate communication with individuals who have disabilities due to hearing loss (United States Department of Justice Civil Rights Division, 2014). Included under title II and title III entities are hospitals and the disability discrimination legislation puts a duty on healthcare providers to facilitate access for patients who have a hearing disability (Reeves and Kokoruwe, 2005).

The deaf and hard of hearing population is a heterogenous group that is comprised of individuals who have varying degrees of hearing loss, who use multiple languages, and who belong to different cultures (Meador and Zazove, 2005). Persons who are Deaf (upper case D) consider themselves to be members of the Deaf community, which is a minority population that is characterized by unique cultural norms and the use of American Sign Language (ASL) (Hoang, LaHousse, Nakaji, & Sadler, 2011). The idioms and grammar of ASL differ from Standard English and as a result the Deaf community tends to have decreased English literacy (Meador and Zazove, 2005). In contrast, deaf

(lower case d) is a general descriptive term that refers to all individuals with any level of hearing disability (Steinberg, Barnett, Meador, Wiggins & Zazove, 2006). Individuals who are deaf may prefer English as their primary method of communication rather than utilizing ASL (Meador and Zazove, 2005). Due to cultural differences between deaf groups, solutions to providing health care to one group may not necessarily apply to others and deaf patients may vary greatly with respect to their individual hearing levels and communication preferences (Reeves & Kokoruwe, 2005).

In healthcare settings, many communication methods are available to help address these unique cultural needs. As outlined in the ADA requirements, possible options for communicating with individuals who are deaf include the use of written materials, lip-reading, real-time captioning, telecommunications relay service (TRS), video relay service (VRS), and the use of a qualified interpreter on-sight or via video remote interpreting (VRI) (United States Department of Justice Civil Rights Division, 2014). A qualified interpreter is defined as "someone who is able to interpret effectively, accurately, and impartially, both receptively and expressively using any necessary specialized vocabulary" (United States Department of Justice Civil Rights Division, 2014). Some of these methods are more preferred (such as interpreter use) than others, but ultimately it is up to the provider to select the best communication methods for each individual patient.

Unfortunately, most medical training programs do not adequately train their providers on how to effectively communicate with deaf patients, creating an atmosphere where it is difficult to form strong patient-provider relationships (Barnett, 2002).

According to Reeves and Kokoruwe, inadequate communication can result in a patient leaving an appointment, "still unsure of what was wrong, being unable to read a prescription or understand medication instructions, taking incorrect dosages, and [feeling] anxiety that the wrong drug may have been prescribed" (2005). In addition, patients may feel unheard or undervalued by their provider if adequate communication cannot be reached. Research conducted in England in 2005 found that 18% of the deaf population studied felt as though they were a waste of the physician's time all or most of the time, which is drastically increased from the average of 3% in non-deaf populations (Reeves & Kokoruwe, 2005). This study illustrates how critical patient-provider communication is to maintaining trusting and positive relationships within a patient care setting. Without proper training and exposure, physicians and other healthcare providers will continue to report discomfort when working with Deaf patients and will continue to report unfamiliarity with available communication methods leading to barriers to care (Iezzoni, O'Day, Killeen, & Harker, 2004).

Problem Statement

Currently, deaf persons are the non-English-speaking minority at greatest risk for poor patient provider-communication and this may be attributed to a lack of education among healthcare professionals (Meador & Zazove, 2005). Several communication methods are available to improve patient satisfaction with these interactions, but oftentimes these methods are not used effectively by the provider due to limited training and experience in working with patients who are deaf.

Purpose

The purpose of this study is to assess deaf culture awareness and knowledge of physician assistant students in the Midwest. Midwest is defined as the North Central Region of the United States that includes nine states which are Illinois, Indiana, Iowa, Michigan, Minnesota, North Dakota, Ohio, South Dakota and Wisconsin. This study will compare deaf culture competency scores of Physician Assistant (PA) students to documented scores collected from medical students.

Significance of the Study

Communicating effectively with patients is very important to ensure patients adequately understand their medical problems, are compliant with their medication regimens, and schedule appropriate follow-up appointments based on provider instructions. Effective communication should also improve patient satisfaction with received care. By surveying a population of Physician Assistant students attending three schools located in the Midwest United States and comparing the results to documented scores collected from medical students attending the University of California, San Diego (UCSD) School of Medicine the study will evaluate the adequacy of deaf culture training in PA programs as compared to medical schools. The study chooses medical students at UCSD as the comparison group as it is the only data available for comparison. The study will evaluate deaf cultural competency scores of PA student as compared to medical students and may reveal areas for deaf culture training improvement in PA program curriculums.

Research Questions

How do Deaf cultural competency scores of PA students attending three schools in the Midwest United States compare to those of traditional medical students enrolled in the University of California, San Diego (UCSD) School of Medicine? How do Deaf cultural competency scores of PA students in the Midwest compare to those of medical students participating in the University of California, San Diego (UCSD) School of Medicine's *Medical Students, Cancer Control, and Deaf Community Training Program*?

Research Definitions

deaf: Individuals who are deaf do not hear well enough to rely on their hearing to process speech and language.

Midwest United States: Defined as the North Central Region that includes nine states which are: Illinois, Indiana, Iowa, Michigan, Minnesota, North Dakota, Ohio, South Dakota and Wisconsin.

Physician Assistant Student: Eligible PA students are enrolled in an Accredited (or Provisionally Accredited) PA program in the Midwest United States.

Non-Traditional Medical Student: Eligible students were enrolled in the University of California, San Diego (UCSD) School of Medicine and the UCSD *Medical Students, Cancer Control, and Deaf Community Training Program.*

Traditional Medical Student: Eligible students were enrolled in the University of California, San Diego (UCSD) School of Medicine. They were not enrolled in the *Medical Students, Cancer Control, and Deaf Community Training Program.*

Chapter Two: Literature Review

Under the Americans with Disabilities Act (ADA), hospitals must provide effective means of communication for patients and hospital visitors who are deaf or hard of hearing (United States Department of Justice Civil Rights Division, 2014). There are currently 8.8 million deaf North Americans and hearing loss is the second most common disability in the US (Hoang, LaHousse, Nakaji, & Sadler, 2011) (Meador & Zazove, 2005) . It is estimated that 10% of the current U.S. population suffers from some degree of hearing loss, and this percentage is expected to rise as the population ages (Scheier, 2009). With the implementation of the ADA and increasing numbers of hearing impaired patients, it has become vitally necessary for all healthcare providers to be familiar with the Deaf community and its preferred communication methods.

Of the 8.8 million deaf individuals in North America, approximately a million belong to the Deaf community (upper case D) (Hoang, et al., 2011). These individuals are set apart from other cultural groups based on their preference for the use of American Sign Language (ASL) as their primary communication method (Hoang, et al., 2011). In addition, these individuals do not perceive their deafness as a medical disability and instead see themselves as part of a unique cultural and linguistic group (Middleton, Turner, Bitner-Glindzicz, Lewis, Richards, Clarke, & Stephens, 2010). The wider 'deaf community' (lower case d), is a general descriptive term that refers to all individuals with any level of hearing loss (Steinberg, Barnett, Meador, Wiggins & Zazove, 2006). Perception of deafness from a medical model or from a cultural linguistic model varies across deaf culture groups (Middleton, et al., 2010). Many hearing physicians follow a

medical model approach to their perception of deafness and therefore perceive deafness as a pathological disease that needs to be cured rather than viewing it as a distinct and proud culture group (Hoang, et al., 2011) (Scheier, 2009). This medical model conflicts with the cultural linguistic model of the Deaf population and may result in patient-provider misunderstandings as American Sign Language (ASL) is currently the third most commonly spoken language in the nation and many Deaf people have no desire hear (Berry & Stewart, 2009) (Scheier, 2009).

An individual's perception of their deafness (from a medical model or a linguistic model) often depends greatly on the circumstances under which the deafness was acquired (Scheier, 2009). Factors contributing to this perception include whether the individual is prelingually or postlingually deaf, the age at onset of the deafness, and the level of hearing loss (Scheier, 2009). For postlingually deafened individuals, their first language still has both a written and spoken component. As a result, postlingually deafened individuals may prefer English as their primary communication method (Meador and Zazove, 2005). In contrast, prelingually deafened individuals tend to use ASL (with no written or spoken words) as their first language and may have difficulty fully comprehending written or spoken English (Reeves & Kokoruwe, 2005). Ultimately, deaf patients vary greatly with respect to their individual hearing levels and perhaps their communication preferences based on how and when the deafness was acquired (Reeves & Kokoruwe, 2005). It is therefore important that future and current healthcare providers be educated regarding the various methods available for communicating with patients

who are deaf. Increasing education in this area may help promote patient satisfaction with received care and may help breach barriers to health literacy.

The Americans with Disabilities Act

Due to the variety in communication preferences between deaf and hearing individuals, it is necessary for providers to be attentive to unique patient needs and decisive when selecting the best methods to use in their practice. While many methods have been used to communicate with deaf individuals historically, in the United States the Americans with Disabilities Act (ADA) implemented in 1992 describes legally appropriate ways for this communication to take place.

The methods described in the ADA Business Brief of 2003 and the ADA Requirement brief containing the 2010 standards for accessible design include lip-reading, passing written notes between patient and provider, the use of telecommunication services, and the use of qualified interpreters (2014). These methods are the primary modes of communication available in healthcare settings and it is vitally important that medical providers be educated regarding their use and efficacy with certain deaf population groups. Exposure to these methods during medical training may help prepare future providers for interactions with members of the deaf community.

Use of Written Notes

One of the most common methods for communicating with deaf patients in the clinic or hospital is the passing of written notes (hand-written or on a screen with real time captioning) between the patient and provider. Real-time captioning (also known as computer assisted real time transcription or CART) is a service in which a transcriber

types what is being said at a meeting or event into a computer that projects the words onto a screen for the deaf individual to read (United States Department of Justice Civil Rights Division, 2014). According to the ADA Business Brief, exchanging written notes in any form is an effective means of communication for brief and relatively simple face-to-face conversations such as visitor inquiries about patient room numbers or filling out admission forms/medical history inquiries (2003). However, for more extensive communication such as obtaining a history of the present illness (HPI) or providing patient education on examination procedures, diagnosis, or treatment options written communication is not an effective method (United States Department of Justice Civil Rights Division, 2003). In cases that require more complicated and interactive communication, it is very time consuming for the medical professional to write out the information in a format that is understandable for the patient (Smeijers, Ens-Dokkum, van den Bogaerde, & Oudesluys-Murphy, 2011). Oftentimes, poor communication stems from providers who are either unable or unwilling to spending extra time with the individual who is deaf (Iezzoni, et al., 2004). These providers attempt to avoid lengthened consultation times by giving less information in writing than they would in a spoken language format (Smeijers, et al., 2011).

In addition to the time consuming nature of written notes, there are many other variables that can impact patient comprehension of the material. Patients who developed deafness prelingually may have difficulty understanding a language that has both spoken and written components as American Sign Language (ASL) is likely their first language (Reeves & Kokorwe, 2005). This difficulty has become apparent in studies revealing that

the average prelingually Deaf American has a reading age between 9-10 years of age, which is far lower than expected by most healthcare providers who choose to communicate using a written language method (Reeves & Kokorwe, 2005) (Berry & Stewart, 2009). Additionally, poor handwriting and incomplete words or sentences on the part of the provider can further decrease comprehension of the material (Reeves & Kokoruwe, 2005) (Iezzoni, et al., 2004). A final consideration when using a written format in medical settings is that many patients (hearing and deafened) are unfamiliar with medical terms so care must be taken to use words that the patient can understand (Pereira & De Carvalho Fortes, 2010).

Health literacy is a very real concern for both deaf patients and hearing patients alike. However, the use of written communication can be especially challenging for patients who are deaf as described in the above paragraphs. It is important that healthcare providers have an understanding that many members of the deaf community have decreased reading comprehension levels and may be unfamiliar with medical terms. Awareness of the limitations of written communication, particularly when working with a deaf patient, may allow providers to be more decisive when choosing to use written communication as their chosen method. Incorporated of limitations of written communication into medical training programs may help increase this awareness.

Use of Telephone Communication

In addition to written notes, telephone communication needed for scheduling appointments and contacting the clinician is often written communication using telecommunication relay services (TRS) or video relay services (VRS) for deaf patients

(Berry & Stewart, 2009). TRS is a free nationwide service that can be accessed by dialing 7-1-1. This service uses communication assistants (also known as relay operators) who serve as intermediaries for hearing impaired individuals who use a text telephone (TTY) and individuals who use voice telephones (United States Department of Justice Civil Rights Division, 2014). A TTY translates spoken words from the hearing individual into written words for the deaf caller and vice versa. VRS is also a free service that utilizes a relay operator but it is subscriber-based and requires the use of a videophone (smartphone) or computer with video capabilities. The deaf individual signs the outgoing message and the VRS relay interpreter converts American Sign Language into spoken English for the voice phone user (United States Department of Justice Civil Rights Division, 2014). The VRS interpreter is also able to sign the spoken response on the screen for the deaf caller.

Both TRS and VRS rely on a relay operator in between the two callers to facilitate the interaction and as a result, the challenges presented with normal written notes (reading level comprehension and difficulty with medical "jargon") extend to TTYs in many instances and both TRS and VRS may encounter problems associated with conversion between spoken and written words (Steinberg, et al., 2006). If the VRS relay operator is not trained as a medically certified interpreter it may be difficult to accurately relay medical terms and information. For most deaf patients in the hospital, the best communication in clinics or hospitals occurs when working with medically certified interpreters (Steinberg, et al., 2006). Additional problems with TRS and VRS can be seen with systems such as voicemail that require pushing a number on the keypad. These can

cause significant problems for TTY relay service agents because typically the voicemail system does not wait long enough for the relay operator to type the information to the deaf caller and wait for the typed response (Steinberg, et al., 2006).

There is also a lack of familiarity with TTY operation among healthcare professionals leading to difficulties for the deaf patient attempting to ask questions, schedule an appointment, or arrange necessary communication resources such as interpreters (Steinberg, et al., 2006) (Berry & Stewart, 2009). As a result, many patients opt to go directly to the emergency room rather than go through the hassle of scheduling an appointment (Steinberg, et al., 2006). A lack of knowledge and adequate training regarding the use of TRS and VRS can therefore have negative impacts on patient care. Increasing awareness among health professionals may require incorporation TRS and VRS basic operations and functions into training provided by medical and other healthcare related schools.

Use of Lip Reading

In addition to written notes, many providers choose to employ lip-reading methods as well. According to a study conducted by Pereira and De Carvalho Fortes in 2010, patients who are deaf revealed that oftentimes the provider would attempt speech-reading (lip-reading) as the first communication method during the visit. This method was overwhelmingly unsuccessful and the deaf patient would have to initiate a process of speaking and making faces while trying to express discomfort with the communication style (Pereira & De Carvalho Fortes, 2010). The interviewees would “ask, insist, and even beg” for the provider to put the information in writing (Pereira & De Carvalho

Fortes, 2010). The results of this study are not surprising given that only 30-40% of spoken English is visible on the lips, and many phonemes look identical on the lips like f and v, t and v, and k and g (Steinberg, et al., 2006) (McAleer, 2006). Additionally, lip reading comprehension is further reduced in a room with low lighting, when words are mouthed poorly, or when the provider looks away from the patient while talking (Reeves & Kokoruwe, 2005). Ultimately, a patient can miss 55-70% of what is being said during the medical interview and is forced to infer the rest of the information (Berry & Stewart, 2009).

However, some individuals who have a hearing disability are specifically trained in speech reading and may not be trained in sign language. To aid these specific individuals a healthcare provider may employ the use of oral interpreters or cued speech interpreters. Oral interpreters are specially trained to articulate speech silently and clearly and they may rephrase words or statements to ensure the highest visibility on the lips, thus helping to promote comprehension (United States Department of Justice Civil Rights Division, 2014). Gestures and specific body language may also be used by the oral interpreter (United States Department of Justice Civil Rights Division, 2014). Cued speech interpreters function similarly to an oral interpreter except that the individual will employ the use of hand codes or cues to represent each speech sound (United States Department of Justice Civil Rights Division, 2014).

There are many limitations to the use of lip-reading as a communication method as described above and despite this often lip-reading is the first attempted method by healthcare providers (Pereira & De Carvalho Fortes, 2010). Education regarding the

many limitations of lip-reading should be incorporated into medical training programs for the purpose of raising awareness of this issue. Providers may opt to employ a different communication method if they are aware of lip-reading's limitations and are aware of the benefits that other communication methods may offer.

Use of Qualified Interpreter

According to the United States Department of Justice, when faced with situation requiring extensive communication, the use of a qualified interpreter was highly recommended for the purpose of providing quality care (2003). A 'qualified interpreter' is defined as an interpreter who can competently, accurately, and impartially communicate information (United States Department of Justice, 2014). In a medical setting, they must also be able to interpret medical terms and concepts appropriately. Studies indicate that, for most deaf patients, the best communication in clinics or hospitals occurred when working with medically certified interpreters (Steinberg, et al., 2006). Indeed, the communication with a signer causes such drastic improvement that a study conducted in 2010 revealed 50% of the sign language users stated that they prefer consultation via a sign language interpreter and 43% would prefer to only have consultation with a signing health professional (Spicer, Schmidt, Ward, & Pinnington, 2005).

Sign language interpretation can come in various different forms depending on individual preference. American Sign Language (ASL) is the most common form of sign language used in the United States among the Deaf population (Berry and Stewart, 2009). ASL features entirely different grammar, vocabulary, and structure when compared to

standard spoken English and it involves the use of hands, arms, head, facial expressions, and body language for communication (Hunter, 2012). Signing Exact English (SEE) directly converts an exact English translation into sign language (Hunter, 2012). Sentences are literally signed word for word (including ending such as "ing" and "ed) (Hunter, 2012). Pidgen Signed English (PSE) combines aspects of both spoken English and ASL. The PSE signer communicates using English word order and substitutes ASL for various idiomatic expressions (Simon, 1993). For example, if the English speaker states that someone is "nutty as a fruitcake" the PSE interpreter would substitute the signed word for "crazy" (Simon, 1993). Also, the interpreter may substitute ASL signs to communicate the English word "fine" in different contexts (i.e. "fine" as in good or "fine" as in penalty) (Simon, 1993). The last common form of sign language takes the form of cued speech (as discussed in the "lip-reading" section). Cued speech is a communication system used among deaf persons that is phonemic-based and makes traditional spoken languages more accessible through the use of hand shapes that represent consonants near the mouth to show vowels (Hunter, 2012). This form of sign language is primarily used as a supplement for lip-reading. The main factor that may influence the selection of a particular sign language is the environment in which the deaf individual grew up. More than 90% of deaf children are born to hearing parents (Mitchell and Karchmer, 2004). Therefore, these deaf children are often unable to communicate with their families and do not learn language from their parents like most hearing children. If a deaf child is born to deaf parents, the child's first language may very well be American Sign Language, rather than spoken English (Harris, 1978).

While most doctors are aware of the benefits that sign language interpreters provide and most (63%) admit that using an interpreter should be the initial method of communication with deaf patients, frequently physicians opt to use other communication methods instead (Ebert & Heckerling, 1995). Ebert and Heckerling discovered that only 22% of physicians use sign language interpreters more often than other communication methods (1995). Potentially reasons for this include the cost of interpreter use and poor education regarding the effectiveness of lip-reading methods (Steinberg, et al., 2006) (Ebert & Heckerling, 1995). According to the ADA, it is the facility's responsibility to provide interpreters and the patient cannot be charged for interpreter services (United States Department of Justice Civil Rights Division, 2014). It is also the provider's responsibility to ensure that communication is successful and that quality care is being provided (United States Department of Justice Civil Rights Division, 2014).

It is also plausible that a shortage of available interpreters in some areas may prevent physicians from using them in their practice. To address this need, many companies offer video software that depicts an ASL interpreter in real time that can ask the patient questions and translate the information for the provider (Translation Technology Fills Important Niche, 2007). This fee-based interpreter service is known as Video Remote Interpreting (VRI). The new ADA regulation permit covered entities such as hospitals the right to choose between VRI and on-site interpreters in situations where either would be effective (United States Department of Justice Civil Rights Division, 2014). However, factors limiting the effectiveness of VRI must be considered before VRI is chosen as the communication method. If the patient who requires the interpreter is

unable to see the screen due to vision loss, injury, or an inability to be positioned effectively an on-site interpreter may be needed (United States Department of Justice Civil Rights Division, 2014). In addition, smaller healthcare facilities may not choose to employ the use of VRI as the service is fee based and can be costly (Translation Technology Fills Important Niche, 2007).

Aside from the cost and perceived inconvenience of hiring an interpreter, there are a few other variables that may impact the effectiveness or desirability of interpreter use by healthcare providers. Some deaf patient may be reluctant to use an interpreter, especially if the patient is well known and respected in the community, because they may feel anxious about a potential breach in provider-patient confidentiality (McAleer, 2006). Problems can also arise when the provider inappropriately maintains eye contact with the signer when speaking rather than the patient (Iezzoni, et al., 2004). However, despite the perceived problems encountered with interpreter use, the literature overwhelmingly supports the use of interpreters in healthcare settings (Steinberg, et al., 2006).

While the use of interpreters is strongly supported, only qualified interpreters should be used. The ADA does not recommend using family members as interpreters except in emergency situations where an interpreter cannot be contacted in time to save a patient's life (United States Department of Justice Civil Rights Division, 2014). Studies show that untrained family interpreters leave out or misinterpret up to half of the questions asked by the physician during the consultation (Smeijers, et al., 2011). In addition, sensitive or embarrassing information may not be communicated to the provider due to family interpreter bias (Smeijers, et al., 2011). Untrained interpreters may also

make the mistake of allowing the speaker to finish talking before signing, causing them to only translate what they can remember the speaker saying (McAleer, 2006)). Untrained interpreters, both family and unrelated, should ultimately be avoided for these reasons (McAleer, 2006). Circumstances may also arise where a health professional may have limited familiarity with sign language and attempt to communicate with the patient without a qualified signer present. According to the ADA, these situations should be avoided unless there is an emergency situation in which communication is vital for life-saving care (United States Department of Justice Civil Rights Division, 2003). Qualified interpreters should always be sought because studies show that while communication with untrained providers is "better than nothing" the communication is still poor (Steinberg, et al., 2006).

Qualified interpreters who are also health care providers are few and far between; approximately 5.8% of deaf or hard of hearing persons work in a healthcare profession (McKee, Smith, Barnett, & Pearson, 2013). Of these professionals, 4% are physicians and deaf patients along with their families appreciate having a deaf or hard-of hearing physician (McKee, Smith, Barnett, & Pearson, 2013). While it is unknown how many physicians (hearing and non-hearing) are fluent in ASL, according to a study conducted in 2006 it is clear that communication in these rare instances is very satisfying for the patient (Steinberg, et al., 2006). One interviewee reported that, "I was able to explain deeply what was going on with me… They asked me questions and I was able to sign back. Having a doctor that signs is a wonderful experience" (Steinberg, et al., 2006). Also, it has been observed that when the physician can sign, deaf patients report higher

compliance rates with recommended maintenance behaviors, they visit their physicians more regularly, and they report an overall greater satisfaction with their clinical experience (Hoang, et al., 2011). Based on these results, some Medical schools have designed fellowship programs (such as the San Diego School of Medicine's "Medical Student, Cancer Control, and the Deaf Community" program) for the purposes of training medical students in ASL and deaf culture (Hoang, et al., 2011). The importance of employing either a signing physician or a medically certified interpreter cannot be ignored when it comes to communication with patients who are deaf. The benefits of choosing this communication method over several others have been documented extensively in the literature and it is reasonable to suggest that incorporation of interpreter benefits into more medical training programs has the potential to increase health literacy and satisfaction with received care.

Patient Satisfaction with Received Care

After reviewing the methods for communication between deaf and hearing individuals as cited in the ADA, it is clear that some methods are more appropriate and effective than others in certain health care settings. Unfortunately, most medical training programs do not adequately educate their providers on how to effectively communicate with deaf patients creating an atmosphere where it is difficult to form strong patient provider relationships (Hoang, et al., 2011). According to Reeves and Kokorwe, inadequate communication can result in a patient leaving an appointment, "still unsure of what was wrong, being unable to read a prescription or understand medication instructions, taking incorrect dosages, and [feeling] anxiety that the wrong drug may have

been prescribed" (2005). In addition, patients may feel unheard or undervalued by their provider if adequate communication cannot be reached. Research conducted in England in 2005 found that 18% of the deaf population studied felt as though they were a waste of the physician's time all or most of the time, which is drastically increased from the average of 3% in non-deaf populations (Reeves & Kokorwe, 2005). These studies illustrate how critical patient-provider communication is to maintaining patient compliance and positive relationships within a patient care setting.

Barriers to communication in healthcare can ultimately have much more serious consequences than barriers in other professional areas (Reeves & Kokoruwe, 2005). If communication is not adequate between patient and provider, the patient may be unable to convey the history of their condition, their symptoms, and other relevant information such as drug allergies or their current medication regimens (Reeves & Kokoruwe, 2005). The patient may also have a difficult time comprehending the diagnosis and verifying instructions on how to manage the condition (Reeves & Kokoruwe, 2005). In a study conducted by Reeves and Kokoruwe it was revealed that up to 15% of deaf patients reported that they had "received a drug prescription without being adequately informed about the purpose of the medication or of potential side-effects" (Reeves & Kokoruwe, 2005). One interviewee stated that, "Doctor doesn't speak to me at all; just writes prescription; I am depressed about this" while another said "doctor rushed it through… no advice, just prescription; that's all. Doctor doesn't explain enough cause of the illness" (Reeves & Kokoruwe, 2005). In addition, Moola discovered that 17 out 20 patients

collecting acute medications and 15 out of 20 patients collecting chronic medications reported problems communicating with their healthcare professional (2010).

Studies indicate that most providers believe that they communicate effectively with their deaf patients when in reality 70% of their deaf patients revealed that they did not completely understand what was happening to them (Berry & Stewart, 2009). Of the patients surveyed, 59% reported that they understood their provider "sometimes" or "not at all" (Berry & Stewart, 2009). Currently, deaf persons are the non-English-speaking minority at greatest risk for poor patient provider-communication and this may be attributed to a lack of education among healthcare professionals (Meador & Zazove, 2005). Providers often report discomfort when working with deaf patients due to a limited understanding of deaf culture and the belief that deaf patients do not trust them (Hoang, et al., 2011). In addition, physicians may mistakenly assume that their deaf patient is unintelligent due to their use of faulty English or the fact that they cannot understand more complicated word phrasing when in reality English may be a second language for the deaf individual (Iezzoni, et al., 2004). Observations of deaf patients recorded in a study conducted in 2010 support the notion that providers are uncomfortable caring for the deaf (Pereira & De Carvalho Fortes, 2010). During the study, interviewees stated that the providers "run away from you", "they don't know what to do", and "they have no patience" (Pereira & De Carvalho Fortes, 2010).

In order to combat the miscommunication resulting from inadequate education, it has been suggested that health care professions are not only informed about Deaf culture, but that they spend more time with each patient and provide visual aids and interpreters

when necessary (Steinberg, et al., 2006). It was also suggested that providers have patients repeat instructions back to them to ensure adequate understanding and that providers speak slowly to allow for lip-reading if desired (Translation Technology Fills Important Niche, 2007)(Berry & Stewart, 2009). Providers should not shout at the patient and the exam room should be well lit (Berry & Stewart, 2009). In addition, all reception staff members should be trained on how to use TTY machines and simple written instructions and forms should be provided at a fourth grade reading level or lower (Berry & Stewart, 2009). Deaf patients should also be provided with a number or pager system to notify them when it is their appointment turn (Berry & Stewart, 2009).

Ultimately, all healthcare professionals who interact with the patient should be attentive to their needs and provide accommodations as necessary. However, inadequate education acts as a barrier to this goal as providers simply are not aware of all the methods available for communication and the efficacy of each method. Further training in deaf awareness may therefore help overcome these barriers and allow for greater patient satisfaction with received care. Further deaf awareness training incorporated in medical related programs may also help increase patient compliance and may aid in patient understanding when it comes to diagnosis and treatment plans.

Healthcare Providers and Deaf Culture Training

Due to the lack of Deaf culture training in the United States, the University of California, San Diego (UCSD) School of Medicine created the National Cancer Institute (NCI) funded fellowship program *Medical Students, Cancer Control, and Deaf Community Training Program* (Hoang, et al., 2011). This program was designed to train

a small group of medical students in ASL and Deaf culture. The program is two years in length and includes ASL classes and Deaf cultural competency training (Hoang, et al., 2011). In addition, students also complete a mandatory research study on the Deaf community (Hoang, et al., 2011). Students in the program receive an $8,000/year stipend for the "extra burden the program placed on the fellows during their medical studies and as mode of retention" (Hoang, et al., 2011).

Hoang, LaHousse, Nakaji, and Sadler published a study in 2011 comparing Deaf cultural competency of students in the Deaf community training program at UCSD to medical students at UCSD not in the program as well as faculty at UCSD. The results of this survey demonstrated that students enrolled in the Deaf community training program had significantly higher overall knowledge scores than faculty and medical students not enrolled in the Deaf community training program (Hoang, et al., 2011). On average, students enrolled in the Deaf community training program obtained a score of approximately 69% accuracy when responding to questions regarding Deaf culture (Hoang, et al., 2011). Faculty not involved in the program scored with approximately 44% accuracy, and students not enrolled in the program scored with only 35% accuracy (Hoang, et al., 2011).

In light of these results, healthcare training schools (both medical schools and PA programs) could potentially benefit from offering Deaf community training programs or including self-paced learning modules that can promote Deaf cultural competency (Hoang, et al., 2011). Idealistically, participants of these programs would "become the medical partners of Deaf community leaders who were advocating for improved access to

health information and care" (Hoang, et al., 2011). By promoting Deaf culture awareness during healthcare provider training, licensed medical providers are likely to have a greater understanding of the unique needs of patients who are deaf. In addition, these providers will likely have experience working with various communication methods and will have more confidence in their ability to treat and manage conditions afflicting patients who are deaf. This should in turn lead to the formation of stronger patient-provider relationships and a greater level of patient satisfaction with care.

Conclusions

The American's with Disabilities Act (ADA) dictates that all hospitals must provide effective means for communicating with deaf patients (United States Department of Justice Civil Rights Division, 2014). The suggested means of communication are lip-reading, passing written notes between patient and provider, the use of telecommunication, and the use of qualified interpreters (United States Department of Justice Civil Rights Division, 2003). The strengths and limitations of these methods were discussed in the previous paragraphs and it was concluded that each method has its own unique place in the scope of health care practice. Providers must be informed about available methods and they must understand their responsibility to ensure effective communication with deaf or hearing impaired patients. The UCSD deaf awareness project is an example of a program designed to instruct healthcare providers on communication techniques and inform students of both their ethical and legal responsibilities when working with patients who are deaf (Hoang, et al., 2011).

The results of the UCSD deaf awareness project are encouraging as they depict an increase in deaf awareness and competency of medical students when it comes to questions related to the management of patients who are deaf. However, to date there has been no similar study done evaluating deaf awareness of physician assistants who share many of the same responsibilities as medical students and medical doctors respectfully. If there is a lack of knowledge regarding deaf culture present among physician assistants as well then it is reasonable to suggest the implementation of more deaf awareness programs in various healthcare education settings may contribute to increased patient satisfaction with received care and may reduce healthcare disparities among the deaf population.

Chapter Three: Methodology

Effective communication between hearing and deaf individuals in clinical settings is necessary to enhance patient comprehension of their diagnosis and to enhance treatment compliance. In order to properly prepare healthcare providers for such interactions, the University of California, San Diego (UCSD) School of Medicine created the National Cancer Institute (NCI) funded fellowship program *Medical Students, Cancer Control, and Deaf Community Training Program* (Hoang, et al., 2011). This program was designed to train a small group of medical students in ASL and Deaf culture. A study published in 2011 confirmed that the UCSD Deaf culture training program successfully increased Deaf awareness among medical students (Hoang *et al*). To date, no similar Deaf awareness programs have been implemented into physician assistant (PA) curriculums. In order to determine the need for such a program in the Midwest, physician assistant students attending three accredited or provisionally accredited PA schools in the Midwest United States were asked to complete a survey designed to assess their cultural awareness and knowledge regarding appropriate management of patients who are deaf. The results of this study could inform the need for increased deaf awareness preparation for PA students.

Description of Participants

The sample population was comprised of approximately 213 physician assistant students attending an accredited or provisionally accredited PA program in the Midwest. Students may be in any semester of their PA education in order to participate in the survey.

Materials Used

The instruments of the study included a deaf awareness survey (see Appendix A), Qualtrics online survey distribution program, SPSS, and Microsoft Excel. Survey questions were derived exclusively from Hoang, LaHousse, Nakaji, and Sadler's published study *Assessing deaf cultural competency of physicians and medical students* (Journal of Cancer Education in 2011) (see Appendix C). The exact survey questions formulated for Hoang, LaHousse, Nakaji, and Sadler's study were replicated word for word to comprise the survey used in this study. Six multiple choice style questions were used as well as twenty-eight true/false style questions. Five deaf culture exposure screening questions were also included. These questions investigate exposure to deaf and hard of hearing individuals in social circles along with awareness of the existence of the Deaf culture and exposure to ASL. Three of these screening questions were derived from Hoang, LaHousse, Nakaji, and Sadler's study. The other two questions were formulated specifically for this study by the researchers. One qualitative question from the original study asking participants to list five problems they could foresee a deaf patient encountering when being hospitalized was omitted from the survey used in this study. This question was omitted as the researchers in this study desired to use only quantitative data.

Study Design and Duration

In order to assess physician assistant students' awareness of Deaf culture and their knowledge regarding appropriate management of patients who are deaf, a quantitative study containing within group comparisons was done using a survey format. The survey

addressed common cultural barriers and general facts concerning the deaf population. The independent variable of this study is physician assistant students' pre-existing level of deaf awareness. The dependent variable is students' recorded accuracy scores on survey questions regarding deaf awareness. Data was collected over a six week period. Physician assistant student scores were compared to medical student scores documented in Hoang, LaHousse, Nakaji, and Sadler's published study *Assessing deaf cultural competency of physicians and medical students* (2011).

Specific Procedures

Consent was obtained from three PA program directors in the Midwest United States granting the researchers permission to survey PA students (see Appendix E). The survey was distributed to the sample population of students via an email link through their respective PA program directors. The directors received an email containing both a link to the survey and general information about the survey (see Appendix G) approximately three days before the surveys were to be dispersed. The directors also received an additional email containing instructions (see Appendix F) three days before the surveys were to be dispersed. The instruction email stated that the program directors should forward the email containing the survey link to every student enrolled in their respective PA programs on the date specified. Allowing the PA program directors to disperse the surveys ensured participant confidentiality as the researchers did not have access to participants' names or email addresses.

Participants who elected to participate in the study clicked on the survey link. After clicking the link, a consent page appeared per IRB requirements detailing the risks

of taking the survey and informing the participant that he or she could discontinue the survey at any time by exiting the webpage (see Appendix B). On this page, participants were also encouraged to contact researchers with questions or concerns. Before moving past the consent page, participants were asked to check a box next a statement that read "I have read the above information and I consent to participation in this study" or to check a box next to a statement that read "I have read the above information and I do not consent to participation in this study." If the participant did not consent to the study, he or she bypassed all survey questions and were taken immediately to the end of the survey. If the participant consented to participation, they were prompted to complete the survey.

As a part of the screening questions, participants were asked to identify the PA school that they were currently enrolled in from a list of school choices in the Midwest. If they were not currently enrolled in one of the schools being studied, the individual bypassed all other survey questions and was taken immediately to the end of the survey. In order to protect school identities, during data analysis schools were randomly assigned a letter (A, B, or C). Individual school scores were not documented and will not be published. Only an average of all scores collected is available in this thesis.

Once the survey was completed by the participant, the online survey distribution agency (Qualtrics) automatically recorded participant responses and added them to a database. The researchers accessed this database after survey completion to view responses. From the survey distribution date, the email link remained active for six weeks. After six weeks, any additional surveys completed were omitted from data analysis. Please note that three weeks after the surveys were distributed, the PA program

directors received a reminder email and an email containing instructions stating to forward the reminder email to every student enrolled in their PA program (see Appendices H and I). Participants did not receive compensation for survey completion.

Data contained online in the Qualtrics program was secured and protected via the use of personal passwords to access the Qualtrics account and passwords to access the researchers' individual computers. All other confidential and identifying information was removed or destroyed, allowing researchers to add raw data and PA program director communication information to the appendices of the completed thesis. A copy of the completed thesis will be kept in the Bethel PA program director's office (the office of Dr. Wallace Boeve, located at 2 Pine Tree Drive, Arden Hills MN 55112).

Statistical Methods

The survey was distributed to approximately 213 physician assistant students with 58 viable responses recorded. A binary coding system (1=correct, 0=incorrect) was used to organize data and perform necessary quantitative calculations (Hoang, et al., 2011). Please note that if participants responded to a question by selecting the "do not know" option for analysis purposes it was considered as an incorrect answer and was coded with a 0. Chi squared analysis was used to compare individual question responses between physician assistant students, traditional medical students, and nontraditional medical students. An ANOVA with post hoc analysis was used to evaluate total survey scores between physician assistant students, traditional medical students, and nontraditional medical students. A combination of SPSS and Microsoft Excel was used to complete the analysis.

Please note that despite that the survey used in this study was slightly modified from the original Hoang, LaHousse, Nakaji, and Sadler study (the qualitative question was omitted), the documented scores of traditional and non-traditional medical students remain valid and pertinent to this study's statistical analysis. The researchers in the original study performed individual statistics for the multiple choice questions and the true/false questions. As these statistics were individual to the sections, the documented scores of traditional and nontraditional medical students calculated in the true/false section and multiple choice section can be compared to scores collected from the physician assistant students who complete the modified survey.

Validity and Reliability

The validity of the survey questions and the study design is supported by the previous use of the survey format in the published Hoang, LaHousse, Nakaji, and Sadler study (2011). In this particular study, medical students who underwent deaf awareness training scored significantly higher on the survey tool than medical students and faculty who did no undergo deaf awareness training. This was expected and therefore the validity of the survey tool is supported by these results. This particular tool and the methods have also been peer review and approved for use. However, it is important to note that Hoang, LaHousse, Nakaji, and Sadler's original study did not explicitly address validity in the published article (2011).

The reliability of the study cannot be definitively confirmed because reliability relies on the truthfulness of the participants. In addition, Hoang, LaHousse, Nakaji, and Sadler did not mention reliability in the original study. To combat this, Cronbach's alpha

will be calculated for the results of this study to support the reliability of the data collected for PA students. Cronbach's alpha value will be listed in the results section.

Limitations

Limitations to the reliability of the study primarily stem from the survey method chosen. By choosing to use an email format and funnel the emails through PA program directors researchers were unable to confirm that the surveys were completed in a controlled environment. It is possible that students could research answers to individual questions while completing the survey in order to obtain a higher, non-representative score. To combat this, a timer was placed on the survey so researchers were able to identify surveys that took significantly more time to complete. These surveys were removed during data analysis. Another limitation related to funneling surveys through the PA program directors is surveys may not have been distributed to all students on time or surveys may not have been distributed at all. Directors were instructed to email researchers confirming survey distribution but it is possible that some emails may not have made it to the participants. In addition, the emails chosen by the PA program directors to reach their students may not have been active or in working order.

Other limitations to this study revolve around the forwarding nature of the surveys. Students and PA program directors alike could have emailed the survey link to individuals outside of the desired sample population. Problems related to this limitation were addressed by asking participants to identify which school they attended. Individuals who did not attend a school in the study sample immediately bypassed all survey questions and were taken to the end of the survey. A final limitation of the study lies in

the small modification researchers made to the original Hoang, LaHousse, Nakaji, and Sadler study. The qualitative question was omitted from the original study template, thus altering the research tool slightly. As the survey was modified, the validity of the tool may be decreased.

Chapter Four: Data Analysis and Results

This chapter will discuss the methods of data analysis by presenting the collected data in the Deaf Culture Awareness survey as well as demographic information. Data will include deaf culture competency scores of PA students in the Midwest calculated from results of the Deaf Culture Awareness survey. For the data analysis, culture competency scores of PA students are compared to traditional (non-DCT) medical students as well as medical students enrolled in a deaf cultural training (DCT) program at the University of California, San Diego (UCSD). In addition, demographic information collected in the Deaf Culture Awareness survey will be displayed in pie charts and deaf cultural competency scores for varying demographic information will be displayed in bar graphs for comparison. All original data is included in the Appendix sections K-V.

Techniques of Data Analysis

The response rate for the survey was 30%. Fifty-eight surveys were completed and available for analysis in Qualtrics. However, two surveys were removed from the data analysis due to excessive time required for the participant to complete the survey. These responses were suspicious for assistance with answering questions and were thus removed from the analysis. Of the remaining survey responses, the number of correct, incorrect, and total responses were recorded in a spreadsheet using Microsoft Excel. In addition, the correct, incorrect, and total responses for Deaf Culture Training (DCT) and non-DCT medical students based on information provided by Hoang, LaHousse, Nakaji, and Sadler were transferred to a spreadsheet for data analysis (2011). Each true/false question as well as each correct answer to multiple choice questions were analyzed

separately. A total score (0-39) was calculated. Greater scores indicate more knowledge. A binary coding system (1=correct, 0=incorrect) was used for all items. The knowledge sum score was calculated by adding up the total number of correct responses per survey. Chi-square tests were then used to compare responses to individual question items among the three groups (PA students, DCT medical students and non-DCT medical students). A significant difference is described as a *p* value greater than 0.05. Demographic question responses were converted to percentages. Total scores for demographic questions were calculated via SPSS along with significant differences via t-tests. A significant difference once again was described as a *p* value greater than 0.05 for this analysis.

Reliability

Reliability analysis was done on the 27 true/false survey items. Cronbach's alpha for these particular items was calculated to be 0.75, which is above the minimum standard of 0.70. Please see Appendix V for details regarding the calculation.

Total Knowledge Sum Score Analysis

To analyze the research questions, total knowledge sum scores of the Deaf Culture Awareness survey was calculated via a binary coding system (0-incorrect, 1=correct). The number of correct responses to each question was automatically calculated by Qualtrics. The total knowledge sum score of the surveys was then divided by the number of responses to calculate an average total knowledge score sum for PA students in the Midwest. For comparison, the total knowledge sum scores of traditional (non-DCT) medical students as well as medical students who were enrolled in a deaf culture training program (DCT) were added to the bar graph below.

Figure 1: Knowledge sum score for PA students, DCT medical students and non-DCT medical students

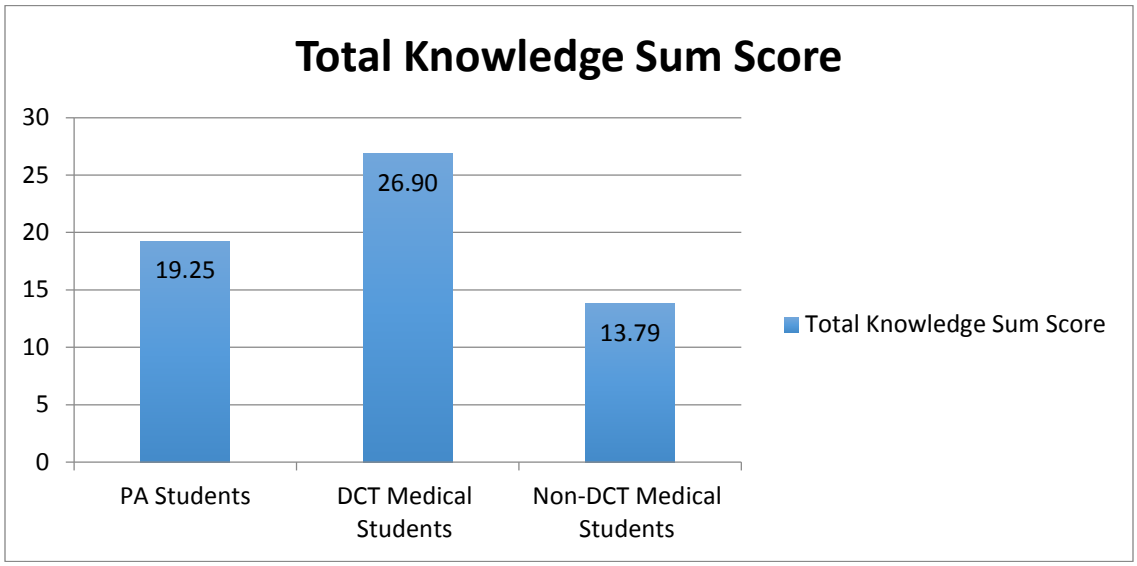

Figure 1 is a bar graph displaying the total knowledge sum score of PA students surveyed in the deaf culture awareness study. For comparison, the total knowledge sum scores of DCT medical students and non-DCT medical students at the University of California, San Diego Medical School are also displayed (Hoang, et al., 2011). The total score ranged from 0-39. On average, PA students scored 19.25, DCT medical students scored 26.90 and non-DCT medical students scored 13.79. As the chart displays, PA students in the Midwest scored higher than non-DCT medical students at UCSD, but DCT medical students at UCSD scored higher than PA students in the Midwest.

In order to determine if there was a significant difference in the total knowledge scores of PA students in the Midwest, non-DCT medical students at UCSD and DCT medical students at UCSD, an ANOVA with post hoc analysis was used. A p value less than 0.05 was determined to be significant. The ANOVA results displayed $F(2,396) = 56.43$, $p < .001$. Therefore, a statistically significant difference was present between the

total knowledge scores of PA students in the Midwest, non-DCT medical students, and DCT medical students as measured by the ANOVA. The results of the post-hoc analysis are shown below.

Table 1: *T*-scores and significance between PA students, DCT medical students and non-DCT medical students

Comparison	Significant? (*P* <0.05?)	*t*
1: PA vs DCT	Yes ($p<0.01$)	5.041
2: PA vs non-DCT	Yes ($p<0.01$)	5.987

The above table displays the calculated t-scores and *p* value significance comparing PA students' total knowledge score to DCT medical students' total knowledge score in the first line. The second line displays the calculated t-score and *p* value significance comparing total knowledge score of PA students to non-DCT medical students. As displayed in the chart, the *p* values were <0.05 for both comparisons which is statistically significant. Therefore, the scores of all three groups were significantly different from each other. DCT medical students had the highest average total knowledge score. PA students in the Midwest had the second highest total knowledge score and non-DCT medical students had the lowest total knowledge score. For a breakdown of the percent correct scores for individual questions please refer to Appendix K.

Demographics Analysis

In addition to knowledge questions, the survey also asked several demographic questions which included phase of education, history of ASL training, previous exposure to an ASL interpreter, having a deaf or hard-of-hearing person in one's social circle, and previous awareness of the Deaf culture. To report the demographic information, pie charts will be used to display the percentage of PA students who answered each response.

Following the pie chart, a bar graph will display the total knowledge sum scores of PA students who answered each demographic item for comparison to determine if the demographic information correlated with total knowledge sum scores. T-tests were used to calculate a *p* value to determine significance. A *p* score <0.05 is significant.

The first demographic item addressed for analysis purposes was the percentage of participants in the didactic and clinical phases of their education. Total knowledge scores of participants in each group were compared for statistical significance.

Figure 2: Phase of education for PA students

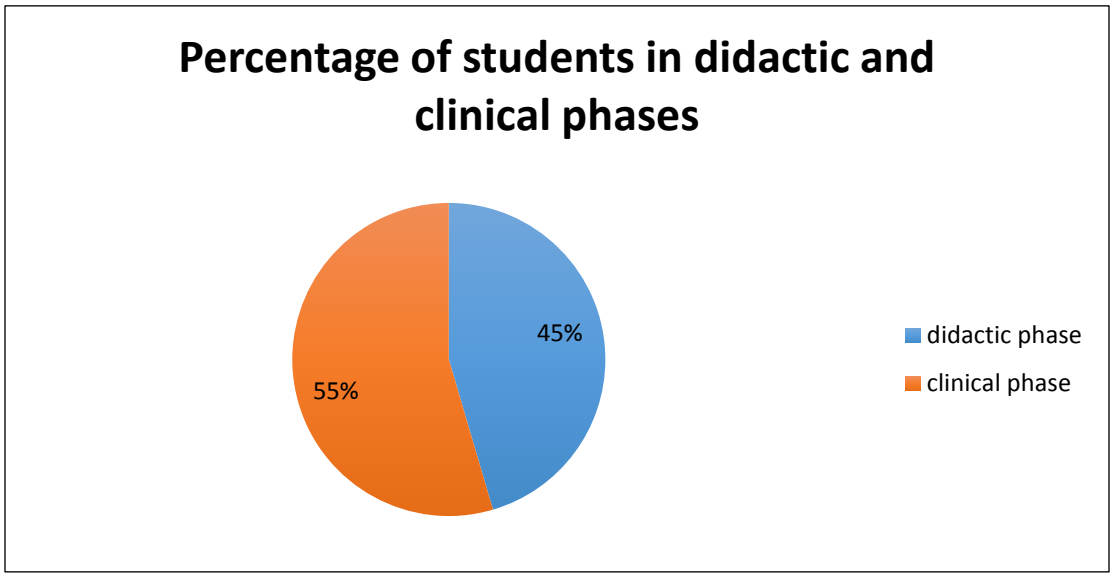

Figure 2 is a pie chart displaying the percentage of students in the didactic and clinical phases respectfully. Despite that each PA program in the Midwest has a slightly different curriculum, the didactic phase of PA education generally involves classroom learning. Classes include anatomy, physiology, clinical medicine, exam and procedure skills, pathophysiology and pharmacology. The clinical phase follows the didactic phase and consists primarily of clinic and hospital education and exposure. As displayed in the

pie chart, 54.5% of PA students surveyed in this study reported they were in the clinical phase of their education. The other 45.5% of respondents reported they were in the didactic phase of their PA education. The comparison between total knowledge scores for each respective group are depicted in the following bar graph.

Figure 3: Total knowledge score of PA students in didactic phase compared to total knowledge score of PA students in clinical phase

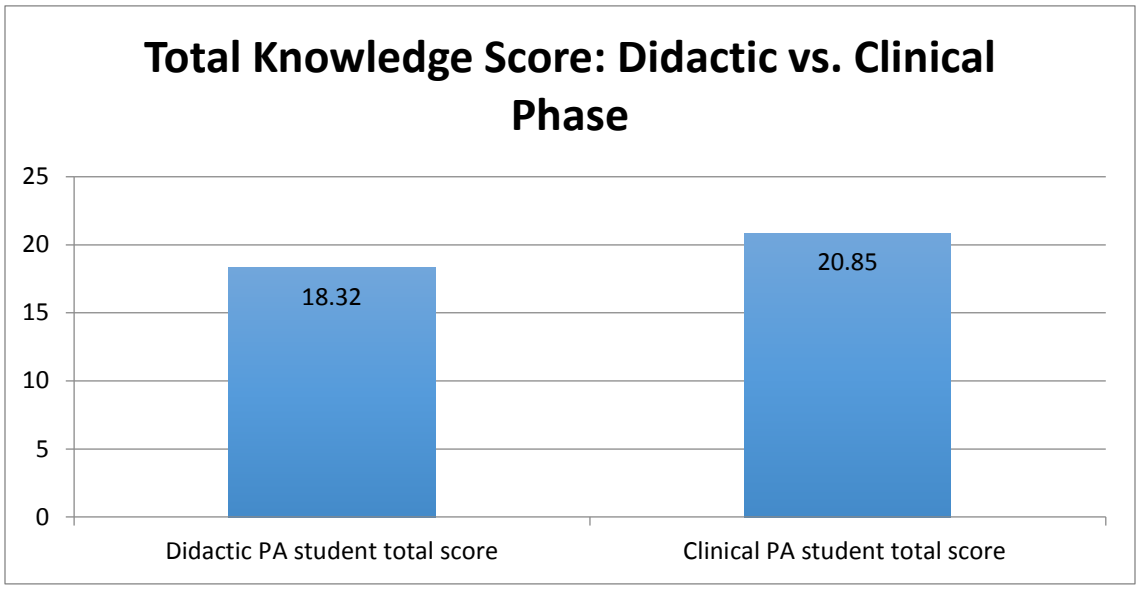

Figure 3 is a bar graph that depicts the total knowledge score of PA students in the didactic phase as well as the total knowledge score of PA students in the clinical phase. As displayed in the graph, the total knowledge score was found to be 18.32 for PA students in the didactic phase and 20.85 for PA students in the clinical phase. Scores had the potential range of 0-39 with 39 representing a perfect score. To determine if the differences between total knowledge scores of PA students in the didactic and clinical phases were significant, a *t*-test was used to analyze the data.

Table 2: *T*-scores and significance between PA students in the didactic and clinical phase of education

Comparison	**Significant? (*p*<0.05?)**	***T***
Didactic versus Clinical Phase	Yes (*p*=0.023)	-2.35

Table 2 is a table that displays the calculated *t* and *p* values comparing knowledge scores of PA students in the didactic phase to PA students in the clinical phase. The *p* value was calculated to be 0.023, which is less than 0.05. Therefore, the evidence suggests there is a significant difference between the knowledge scores of PA students in the didactic versus the clinical phases of PA education.

The second demographic item addressed for analysis purposes was the percentage of participants who had and had not taken an American Sign Language (ASL). Total knowledge scores of participants in each group were compared for statistical significance.

Figure 4: Percentage of PA students who have and have not taken an American Sign Language class

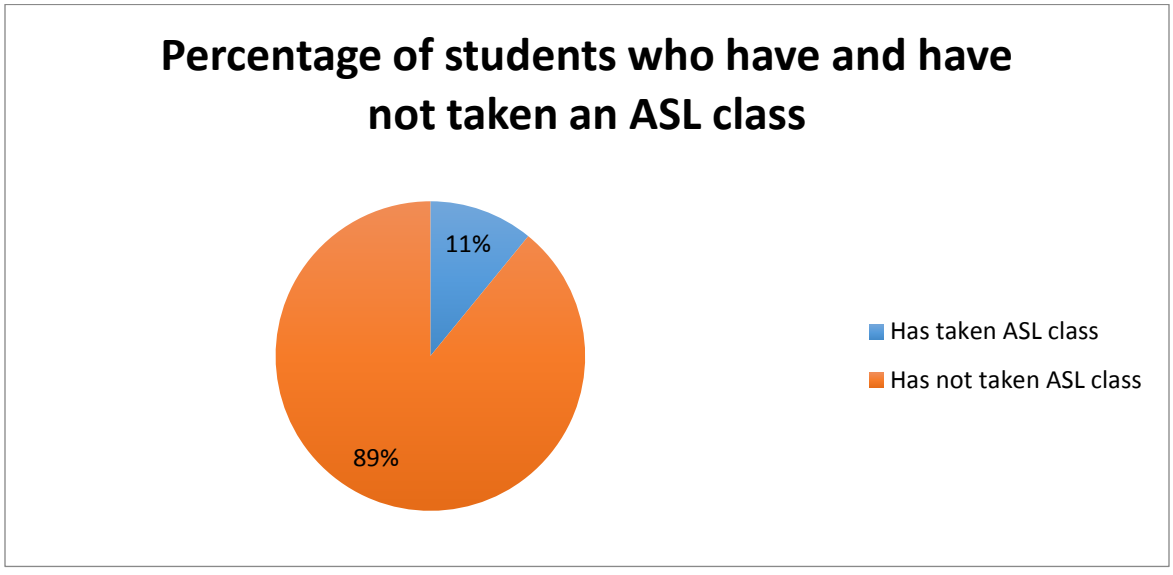

Figure 4 is a pie chart that represents the percentage of PA students surveyed who have and have not taken an ASL class. According to the results, 89.1 % of PA students reported never taking an ASL class while 10.9 % of PA students surveyed reported taking an ASL class in the past. The comparison between total knowledge scores for each respective group are depicted in the following bar graph.

Figure 5: Total knowledge score of PA students who have taken an ASL class compared to total knowledge score of PA students who have not taken an ASL class

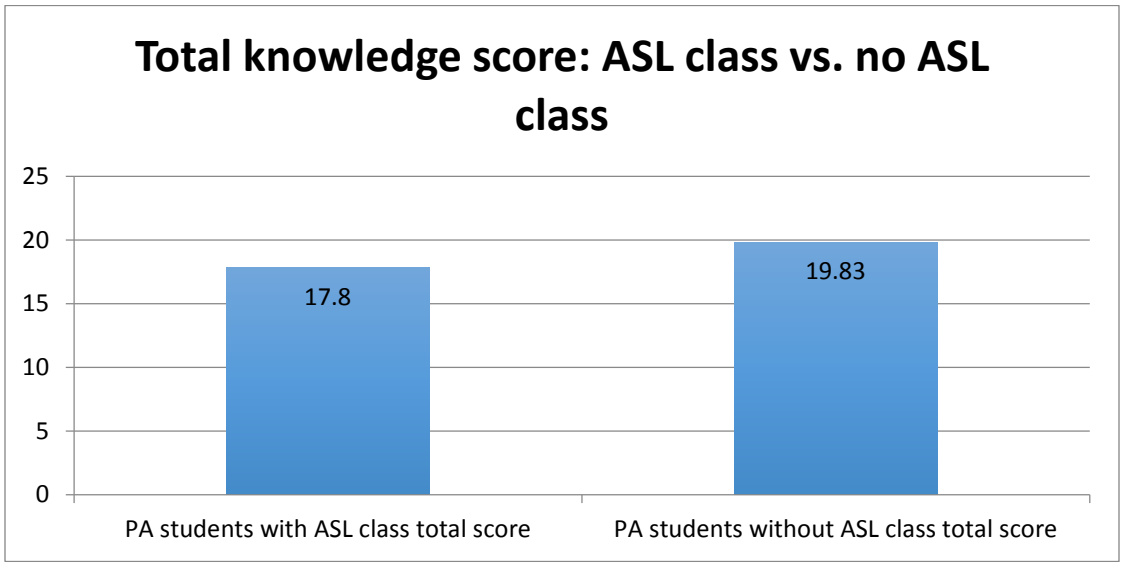

Figure 5 is a bar graph that displays the total knowledge score of PA students who have taken an ASL class to be 17.8. The total knowledge score for PA students who have not taken an ASL class was slightly higher at 19.83. To determine if the differences between total knowledge scores of PA students who have and have not taken an ASL class were significant, a *t*-test was used to analyze the data.

Table 3: *T*-scores and significance between PA students who have and who have not taken an ASL class

Comparison	**Significant? (*p*<0.05?)**	***T***
PA students with and without previous ASL class experience	No (*p*=0.29)	-1.07

Table 3 displays the calculate *t* and *p* values comparing total knowledge scores of PA students who have taken an ASL class in the past to PA students who have not taken an ASL class in the past. The *p* value was found to be 0.66 which is greater than 0.05 and therefore not significant. This indicates that previous exposure to an ASL class does not correlate with an increase in total knowledge sum scores.

The third demographic item addressed for analysis purposes was the percentage of participants who had and had not worked with an American Sign Language (ASL) interpreter in the past. Total knowledge scores of participants in each group were compared for statistical significance.

Figure 6: Percentage of PA students who have and have not worked with ASL interpreter

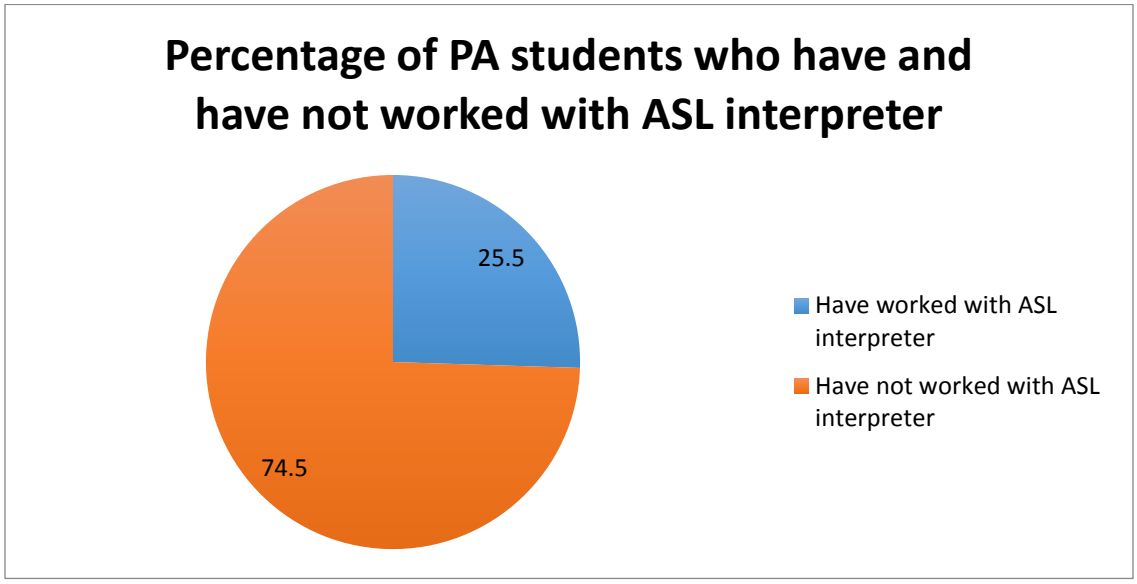

Figure 6 is a pie chart that displays the percentage of PA students who participated in the study who have and have not worked with an ASL interpreter in the past. According to the results, 25.5% of PA students surveyed stated they had worked with ASL interpreter whereas 74.5% of PA students surveyed stated they had not worked with ASL interpreter in the past. The comparison between total knowledge scores for each respective group are depicted in the following bar graph.

Figure 7: Total knowledge score of PA students who have worked with ASL interpreters compared to PA student score of those who have not worked with ASL interpreters

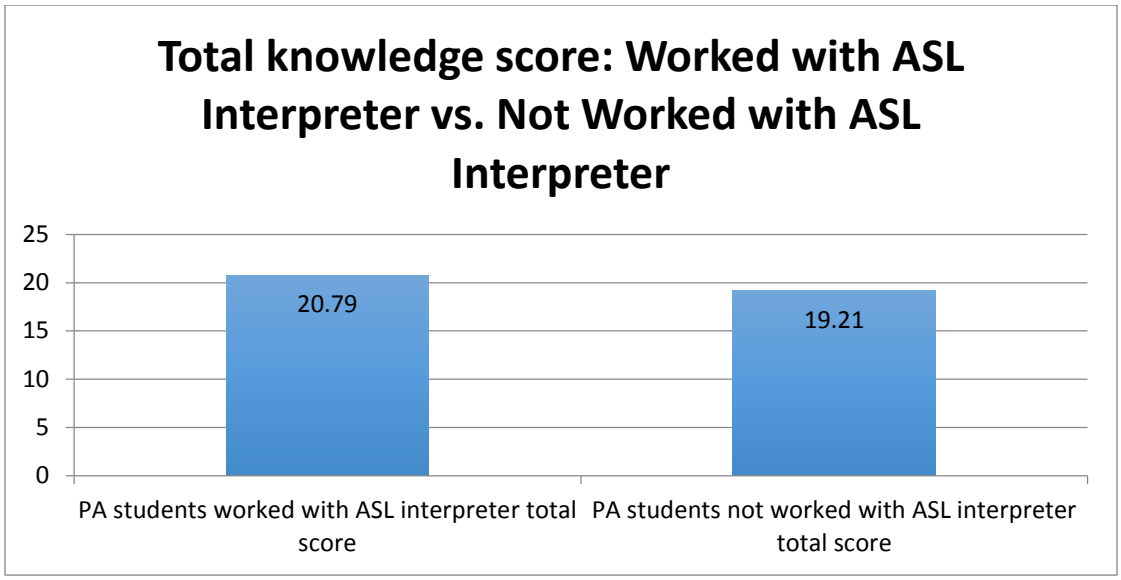

Figure 7 is a bar graph that displays the total knowledge score of PA students who have worked with interpreters to be 20.79 whereas the total knowledge score of PA students who have not worked with interpreters was slightly slower at 19.21. To determine if the differences between total knowledge scores of PA students who have and have not worked with an ASL interpreter were significant, a t-test was used to analyze the data.

Table 4: *T*-scores and significance between PA students who have and who have not worked with an ASL interpreter

Comparison	**Significant? ($p<0.05$)**	***T***
PA students who have worked with an ASL interpreter and not worked with an ASL interpreter	No ($p=0.22$)	1.25

Table 4 displays the calculated *t* and *p* values comparing the total knowledge scores of PA students who have worked with an ASL interpreter and PA students who have not worked with an ASL interpreter in the past. The *p* value was found to be 0.09 which is greater than 0.05 and therefore is not statistically significant. This indicates that previous exposure to an ASL interpreter does not correlate with an increase in total knowledge sum scores.

The fourth demographic item addressed for analysis purposes was the percentage of PA students with and without a deaf or hard-of-hearing (HOH) person in their social circle. Total knowledge scores of participants in each group were compared for statistical significance.

Figure 8: Percentage of PA students with and without a deaf or hard-of-hearing (HOH) person in their social circle

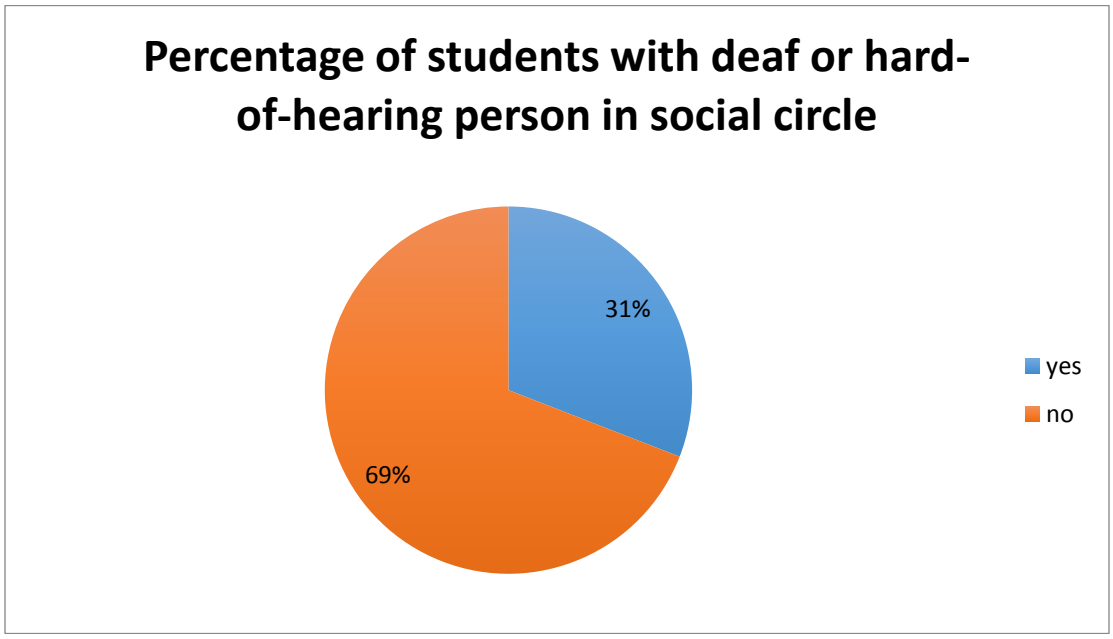

Figure 8 is a pie chart that displays the percentage of PA students with and without a deaf or hard-of-hearing (HOH) person in their social circle. According to the results, 31% of the PA students surveyed reported having a deaf or hard-of-hearing person in their social circle whereas 69% reported that they have never had a deaf or hard-of-hearing person in their social circle. The comparison between total knowledge scores for each respective group are depicted in the following bar graph.

Figure 9: Total knowledge score of PA students who have a deaf or HOH person in their social circle compared to PA student score of those who do not have a deaf or HOH person in their social circle

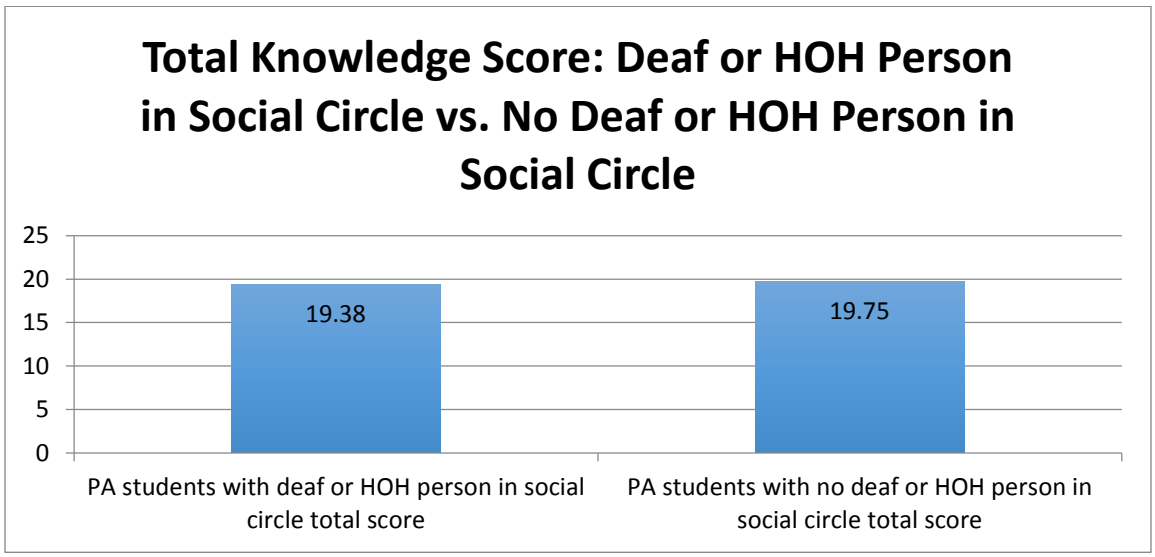

Figure 9 is a bar graph that displays the total knowledge score of PA students who have a deaf or HOH person in their social circle and the total knowledge score of PA students who do not have a deaf or HOH person in their social circle. The total knowledge score for PA students with a deaf or HOH person in their social circle was 19.38. PA students who did not have a deaf or HOH person in their social circle scored slightly higher with a total knowledge score of 19.75. To determine if the difference between the total knowledge scores was significant, a t-test was used to analyze the data.

Table 5: *T*-scores and significance between PA students who do and do not have a deaf or HOH person in their social circle

Comparison	**Significant? ($p<0.05$?)**	***t***
PA students with and without a deaf or HOH person in their social circle	No (p=0.76)	-0.31

Table 5 displays the calculated *t* and *p* values comparing total knowledge scores of PA students who have a deaf or HOH person in their social circle and PA students who

do not have a deaf or HOH person in their social circle. The *p* value was found to be 0.42, which is greater than 0.05 and therefore not significant. This indicates that having a deaf or HOH individual in one's social circle does not correlate with an increase in total knowledge sum score.

The fifth demographic item addressed for analysis purposes was percentage of PA students aware and not aware of the existence of the Deaf culture. Total knowledge scores of participants in each group were compared for statistical significance.

Figure 10: Percentage of PA students aware and not aware of a Deaf Culture

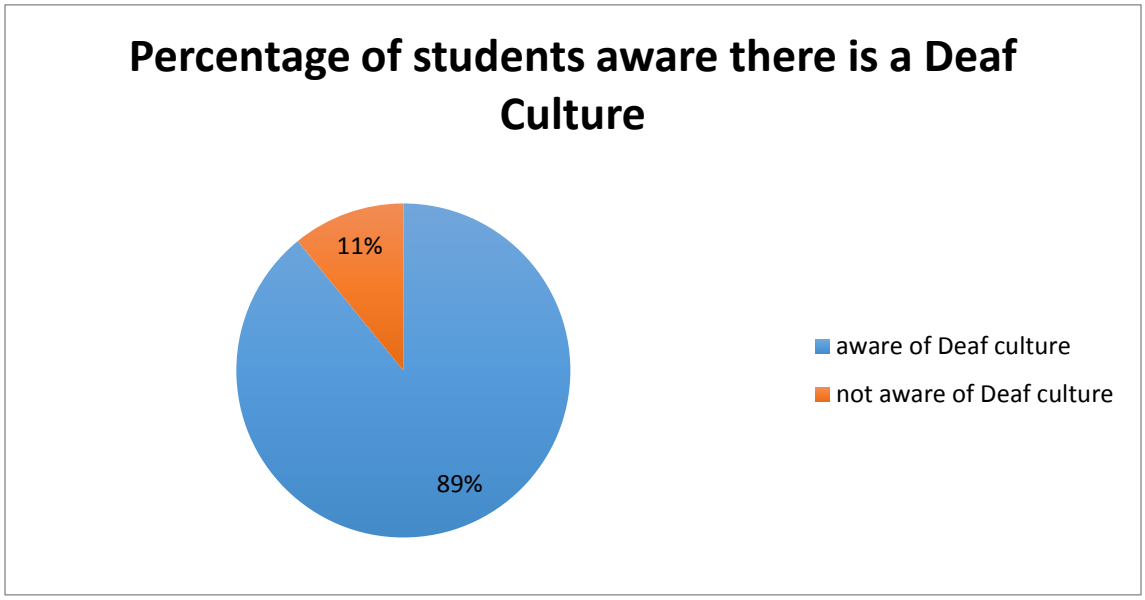

Figure 10 is a pie chart that displays the percentage of PA students who were aware and not aware of the existence of the Deaf culture. According to the results, 89% of the PA students surveyed reported they were aware of the existence of the Deaf culture whereas 11% reported they were not aware of the Deaf culture. The comparison between total knowledge scores for each respective group are depicted in the following bar graph.

Figure 11: Total knowledge score of PA students who are aware there is a Deaf culture compared to PA student knowledge score of those who are not aware there is a Deaf culture

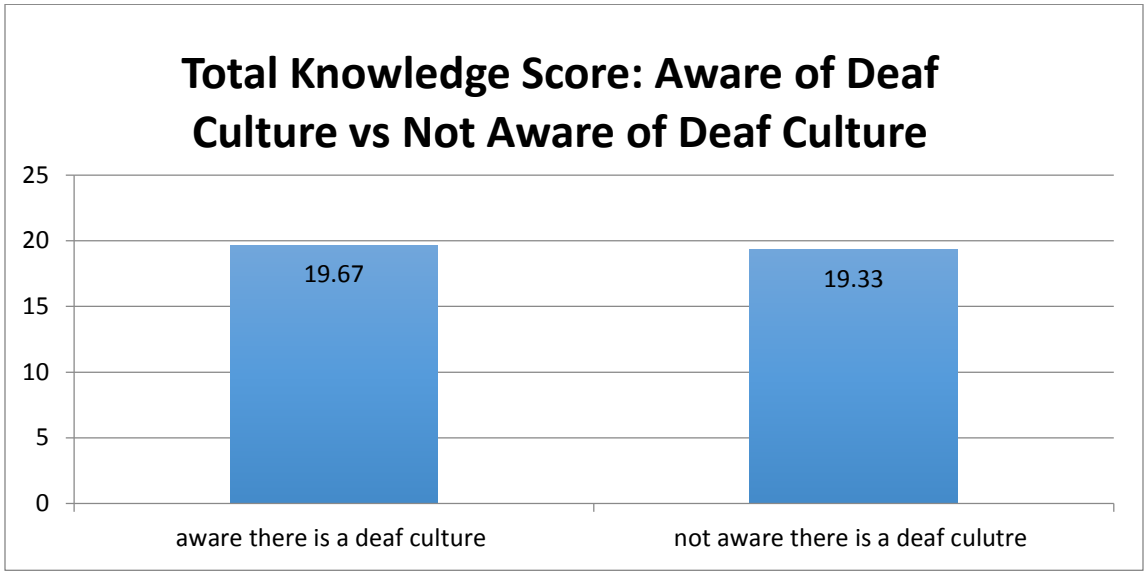

Figure 11 is a bar graph that displays the total knowledge score of PA students who are aware there is a Deaf culture compared to PA students who are not aware of the existence of the Deaf culture. According to the results, the total knowledge score for PA students who were aware of the existence of the Deaf culture was 19.67. The total knowledge score for PA students not aware of the existence of the Deaf culture was 19.33. To determine if the difference between the total knowledge scores was significant, a t-test was used to analyze the data.

Table 6: *T*-scores and significance between PA students who are aware of a Deaf culture vs PA students who are not aware of a Deaf culture total scores.

Comparison	**Significant? ($p<0.05$?)**	***t***
PA students aware of Deaf Culture vs not aware of Deaf Culture	No ($p=0.85$)	0.19

Table 6 displays the calculated *t* and *p* values for comparison between the total knowledge scores of PA students who were aware of the Deaf culture and PA students who were not aware of the Deaf culture. The *p* value was found to be 0.64, which is greater than 0.05 and therefore does indicate a significant difference between total knowledge scores.

In order to do a brief comparison between the percentages of PA students and non-DCT medical students who answered yes to the shared Hoang, LaHousse, Nakaji, and Sadler demographic questions the following table was created.

Table 7: Percentage of PA students and non-DCT medical students who answered positively to shared demographic questions

Demographic Question	Percentage of PA students who answered yes	Percentage of non-DCT medical students who answered yes
Has there ever been a deaf or hard of hearing person in your social group?	30.77	14.54
Have you ever taken an American Sign Language class?	9.62	15.67
Are you aware that there is a Deaf culture?	88.46	14.23

Table 7 displays the percentage of PA students and non-DCT medical students who answered positively to demographic questions shared by Hoang, LaHousse, Nakaji, and Sadler. This table reveals that 30.77% of PA students who participated in the study stated they have had a deaf or hard of hearing person in their social circle while only 14.54% of non-DCT medical students stated they have. According to the results, 9.62% of PA students surveyed have taken an ASL class while 15.67% of non-DCT medical students stated they had taken an ASL class in the past. According to the results, 88.46%

of PA students surveyed were aware of the existence of the Deaf culture while only 14.23% of non-DCT medical students were aware of the existence of the Deaf culture.

Overview of Collected Data

On reviewing the data, the total knowledge score of PA students in the Midwest was found to be significantly different from the total knowledge scores of both the non-DCT medical students and DCT medical students at the University of California, San Diego (UCSD). PA students total knowledge score was significantly higher than non-DCT medical students and DCT medical students score was significantly higher than the scores of PA students in the Midwest. The collected demographic information including phase of PA education, previous ASL class exposure, previous use of an ASL interpreter, having a deaf or hard-of-hearing individual in one's social circle, and awareness of the existence of the Deaf culture only revealed a statistically significant difference or correlation in total knowledge score with phase of PA education. PA students in their clinical phase did score significantly higher than those in their didactic phase, which was expected as students in the clinical phase are more experienced and are further along in their PA education. Clinical students learning at hospitals and clinics may have more exposure to patients who are deaf and sign language interpreters, thus increasing their Deaf culture awareness.

Investigation of shared demographic questions revealed that on average 16.23% more PA students responded yes to having a deaf or hard of hearing person in their social circle than non-DCT medical students. On average 6.05% more non-DCT medical students answered yes to taking an American Sign Language (ASL) class in the past as

compared to PA students. On average, 74.23% more PA students stated they were aware of the existence of the Deaf culture as compared to non-DCT medical students. The following chapter will discuss the significance of the results as well as provide limitations, implications to practice, and suggestions for further research.

Chapter Five: Discussion and Conclusions

The purpose of this study was to assess deaf culture awareness of physician assistant students in the Midwest. This study compared deaf culture competency scores of physician assistant (PA) students to documented scores collected from medical students who had and had not completed a deaf culture training program. The following research questions were address in this study:

1. How do deaf culture competency scores of PA students in the Midwest compare to those of traditional medical students enrolled in the University of California, San Diego (UCSD) School of Medicine?
2. How do deaf culture competency scores of PA students in the Midwest compare to those of medical students participating in the University of California, San Diego (UCSD) School of Medicine's *Medical Students, Cancer Control, and Deaf Community Training Program*?

This study compared the level of deaf culture awareness of PA students in the Midwest to medical students at the University of California, San Diego (UCSD) who enrolled in a deaf culture training program as well as medical students at UCSD who did not enroll in a deaf culture training program. Demographic information was also obtained in the deaf culture awareness survey and the total knowledge scores of different demographics was analyzed as well. The results and limitations of this study as well as suggestions for further research on this topic are discussed in the following sections.

Discussion of Findings: Research Question Analysis

In order to address the original research questions, a deaf culture awareness survey was adapted from Hoang, LaHousse, Nakaji, and Sadler's published study "Assessing deaf cultural competency of physicians and medical students" and was administered to PA students in the Midwest (2011). The data collected from PA students was then compared to existing medical student data collected by Hoang, LaHousse, Nakaji, and Sadler (2011). Existing medical student data was collected from traditional medical students attending the University of California, San Diego (UCSD) School of Medicine and medical students who participated in a deaf culture training (DCT) program from UCSD. The data analysis was performed using Chi-square tests to compare responses to individual survey items among the three groups (PA students, DCT medical students and non-DCT medical students). Total knowledge scores were calculated for each group and an ANOVA with post hoc analysis was used to assess significance. Total knowledge scores were calculated for the various demographic questions as well and t-tests were used to assess for significance. A significant difference was described as a p value greater than 0.05. The following paragraphs will address the findings for individual research questions.

The first research question to be addressed is how do Deaf culture competency scores of PA students in the Midwest compare to those of traditional medical students enrolled in the University of California, San Diego (UCSD) School of Medicine? According to collected data, Deaf culture competency scores of PA students in the Midwest were found to be significantly higher than the scores of traditional medical

students enrolled in the University of California, San Diego (UCSD) School of Medicine. The average total knowledge score for PA students was 19.25 or 49.4% correct. Traditional medical students' average total knowledge score was 13.79 or 35.4% correct. Therefore, PA students in the Midwest on average scored 14% higher than traditional medical students at UCSD. Based on demographic analysis questions, on average 16.23% more PA students responded yes to having a deaf or hard of hearing person in their social circle than non-DCT medical students. On average 6.05% more non-DCT medical students answered yes to taking an American Sign Language (ASL) class in the past as compared to PA students, and on average, 74.23% more PA students stated they were aware of the existence of the Deaf culture as compared to non-DCT medical students.

While it is largely unknown why PA students scored higher than traditional medical students on the deaf awareness survey some plausible explanations can be seen in the demographic analysis. More PA students on average were aware of the existence of the Deaf culture than traditional medical students. It is possible that these students also had some knowledge regarding Deaf culture beliefs and practices. However, this also begs the question of why more PA students were aware of the Deaf culture. This question may represent an area for further study. Another plausible explanation that could help explain PA students' increased score revolves around deaf population exposure. According to shared demographic data, slightly more PA students answered yes to having a deaf or hard of hearing person in their social circle. This may help explain why some students had greater knowledge as they had greater exposure to the deaf population.

The second research question to be addressed is how do Deaf cultural competency scores of PA students in the Midwest compare to those of medical students participating in the University of California, San Diego (UCSD) School of Medicine's Medical Students, Cancer Control, and Deaf Community Training Program? According to collected data, Deaf culture competency scores of PA students in the Midwest were found to be significantly lower than the deaf culture training (DCT) medical students at UCSD. DCT medical students scored on average 26.90 or 69.0% correct on the test overall. PA students scored 19.25 or 49.4% correct on the test overall. This could suggest that deaf culture education and exposure to the deaf community can increase deaf cultural competency as assessed by Hoang, LaHousse, Nakaji, and Sadler in 2011. According to the shared demographic information, PA students on average had greater exposure to the deaf community as more PA students were aware of the Deaf culture and more had a deaf or hard of hearing person in their social circle. It is unclear if these demographic differences contributed significantly to PA students' increased score as compared to non-DCT medical students but it is a possible explanation that is supported by Hoang, LaHousse, Nakaji, and Sadler's findings.

Currently, deaf persons are the non-English-speaking minority at greatest risk for poor patient provider-communication and this may be attributed to a lack of education among healthcare professionals (Meador & Zazove, 2005). If PA students' prior exposure to the deaf community truly was the factor influencing their increased knowledge score, this suggests that incorporation of deaf culture training into PA programs may

significantly increase PA deaf cultural competency levels. This has the potential to help address disparities in healthcare as it relates to the deaf population.

Discussion of Findings: Demographic Analysis

In order to assess the effects of various deaf culture related exposures on total knowledge scores of PA students, several demographic questions were analyzed via *t*-tests to assess for significance. Based on the results of the survey, the only significant difference observed between total knowledge scores of PA students was the phase of education. PA students in their clinical phase scored significantly higher than those in their didactic phase. This result was expected as PA students in their clinical phase generally have more experience and are farther along in their training. Other demographic information included previous ASL class exposure, previous work with an ASL interpreter, awareness of the existence of the Deaf culture and having a deaf or hard-of-hearing individual in one's social circle.

These results are interesting as they suggest that prior exposure to the deaf culture based on these specific questions cannot fully explain the increase in total knowledge score of PA students as compared to non-DCT medical students. While it is true that PA students in the clinical phase scored higher than PA students in the didactic phase the demographic data cannot solely account for the significant increase in PA student total knowledge score. Researchers expected to see a significant increase in total knowledge scores of PA students who answered yes to most if not all the demographic questions as compared to PA students who answered no. However, the results did not indicate this. Therefore, further study is warranted to evaluate other factors contributing to an increase

in deaf awareness. In particular, it would be interesting to assess how many PA students worked with patients who are deaf while acquiring patient contact hours. Most PA programs require students to complete a certain number of direct patient contact hours prior to applying and being accepted into the program. Therefore, many students work or volunteer as a health professional of some kind prior to attending PA school. Possible means of acquiring patient contact hours include shadowing experience and practicing as a nursing assistant, EMT/Paramedic, Medical Scribe, Nurse, Radiology Technician, or other healthcare provider.

Implications to Practice

As stated previously, most medical training programs do not adequately educate their providers on how to effectively communicate with deaf patients (Hoang, et al., 2011). This inadequate communication represents a disparity in healthcare as it can result in ineffective and unsatisfactory patient care. If adequate communication cannot be reached, a patient may leave an appointment feeling unsure about their diagnosis, treatment plan, and how to take their prescribed medication properly (Reeves & Kokorwe, 2005). In addition, patients may also feel unheard or undervalued by their providers, which can seriously impact the development of patient-provider trust.

Currently, deaf persons are the non-English-speaking minority at greatest risk for poor patient provider-communication and this may be attributed to a lack of education among healthcare professionals (Meador & Zazove, 2005). Therefore, the implementation of deaf awareness training into PA programs could significantly improve provider knowledge regarding deaf culture and practices. By increasing deaf awareness

and competency, the likelihood of reaching adequate communication between providers and deaf patients is likely to increase, thus increasing overall patient satisfaction with received care.

Limitations

Limitations to the applicability and generalizability of published results are reduced based on the sample size and selection of participants. The sample population was comprised exclusively of PA students attending an accredited or provisionally accredited PA program in the Midwest United States. The Midwest was defined as the North Central Region including Illinois, Indiana, Iowa, Michigan, Minnesota, North Dakota, Ohio, South Dakota and Wisconsin. It is possible that this sample population is not representative of the PA student population as a whole. Therefore, results can only be reliably generalized to PA students in the Midwest. Additionally, PA student scores were only compared to results collected from medical students enrolled at the University of California, San Diego (UCSD) School of Medicine. This population of medical students studied may not represent the population of medical students as a whole. Therefore, it is only acceptable to reliably generalize the information to medical students attending this institution.

Sample size also represents a limitation of this study. The sample population of PA students was small with only 58 viable survey responses. The population of non-DCT medical students surveyed was 211 and the population of DCT medical students was only 22. In the future, it would be desirable to repeat the study with larger sample sizes of each group and expand collection to multiple different PA programs and medical schools

across the nation. This would help obtain a more representative sample and more generalizable data. It may also be desirable to administer surveys to prospective and newly graduated PA and medical students to access student progress over the course of their education with regards to deaf culture awareness.

Limitations to the reliability of the study primarily stem from the survey method chosen. By choosing to use an email format and funneling emails through PA program directors, the researchers were unable to confirm that the surveys were completed in a controlled environment. It is possible that students could research answers to individual questions while completing the survey in order to obtain a higher, non-representative score. To combat this, a timer was placed on the survey so researchers were able to identify surveys that took significantly more time to complete. These surveys were removed during data analysis. Another limitation related to funneling surveys through PA program directors is surveys may not have been distributed to all students on time or surveys may not have been distributed at all. Directors were instructed to email researchers confirming survey distribution, but it is possible that some emails may not have made it to the participants. In addition, the emails chosen by the PA program directors to reach their students may not have been active or in working order.

Other limitations to this study revolve around the forwarding nature of the surveys. Students and PA program directors alike could have emailed the survey link to individuals outside of the desired sample population. Problems related to this limitation were addressed by asking participants to identify which school they attended. Individuals who did not attend a school in the study sample immediately bypassed all survey

questions and were taken to the end of the survey. A final limitation of the study lies in the small modification researchers made to the original Hoang, LaHousse, Nakaji, and Sadler study. A qualitative question was omitted from the original study template, thus altering the research tool slightly. As the survey was modified, the validity of the tool may be decreased.

Suggestions for Further Research

According to the results of Hoang, LaHousse, Nakaji, and Sadler's published study *Assessing deaf cultural competency of physicians and medical students*, implementation of deaf awareness training into healthcare related curriculums increases deaf cultural competency of medical students (2011). Their research found that medical students enrolled in a deaf culture training program (DCT medical students) had significantly more knowledge regarding deaf culture and appropriate management of patients who are deaf than medical students who were not enrolled in a deaf training program. Comparison analysis between Hoang, LaHousse, Nakaji, and Sadler's data and the data collected during the course of this study indicated that DCT medical students had significantly more knowledge regarding deaf culture and appropriate management of patients who are deaf than PA students who were not enrolled in a deaf culture training program.

In order to address limitations to the applicability and generalizability of the two studies as stated above, it is desirable that the studies be replicated with an increase in sample size and region scope. In the future, it would be preferable to repeat the study with larger sample sizes of each group (medical students and PA students) and to expand

data collection to multiple different PA programs and medical schools across the nation. This would help obtain a more representative sample and more generalizable data. It may also be desirable to administer surveys to prospective and newly graduated PA and medical students to access student progress over the course of their education with regards to deaf culture awareness. These suggestions would help support reliability and consistency of the described findings which would further support the belief that incorporation of deaf culture training programs can increase deaf culture awareness.

To further evaluate the impact of deaf culture training in PA programs, a study could also be conducted in which PA students were asked to complete a pre-test assessing their deaf culture awareness and knowledge. A presentation to promote deaf culture awareness could then be given and a post-test could be administered to measure the knowledge gained. The presentation on deaf culture and appropriate management of patients who are deaf has the potential to not only assess effectiveness of the education program but it may also help increase deaf culture awareness of medical professionals. This is extremely important as patients who are deaf are at great risk for experiencing inadequate interpersonal communication between themselves and a hearing healthcare professional. Increasing deaf culture awareness is therefore critical to promote quality patient care.

Summary and Conclusions

The total knowledge score of PA students in the Midwest was significantly higher than traditional medical students at the University of California, San Diego (UCSD). However, the total knowledge score of PA students in the Midwest was significantly

lower than medical students enrolled in the deaf culture training program at the UCSD. This suggests a deaf culture training program improves deaf culture knowledge as assessed by the deaf culture awareness survey created by Hoang, LaHousse, Nakaji, and Sadler (2011).

Therefore, the results of the study suggest that incorporation of deaf awareness training into PA programs could be beneficial for PA students. By increasing deaf awareness, students will be better equipped to successfully manage communication challenges faced by health practitioners who work with patients who are deaf. If adequate communication can be successfully reached, deaf patient satisfaction with received care should increase along with compliance. Ultimately, the goal of all practitioners should be to maximize care satisfaction and understanding for all patients who are deaf. This goal may become more attainable with additional deaf awareness training incorporation into both new and established programs.

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Appendices

Appendix A: Survey Questions

What PA school do you currently attend?

- ○
- ○
- ○
- ○ None of the above

Please read the following statements and determine whether the statement is true or false.

Only 30% of the English language can be accurately lip read.

- ○ True
- ○ False
- ○ I don't know

You are running considerably behind schedule. Your deaf patient is waiting with his/her interpreter. The interpreter is ethically bound to wait with the patient until you are ready to see them.

- ○ True
- ○ False
- ○ I don't know

ASL is a pictorial language that produces a word-for-word translation of what is being said in English.

- ○ True
- ○ False
- ○ I don't know

The majority of hearing parents with deaf children never learn to sign.

- ○ True
- ○ False

- I don't know

When communicating with a deaf patient through an interpreter, you should face the interpreter and explain to the interpreter what the patient needs to know.

- True
- False
- I don't know

Trying to help cure your patient's deafness should be your top priority.

- True
- False
- I don't know

Because deaf people rely upon printed forms of information, their literacy is equal to or better than the general public.

- True
- False
- I don't know

A good interpreter will be able to step out of his/her interpreting role in order to explain to the provider what the patient is really trying to say.

- True
- False
- I don't know

When there is a dominant source of light, such as a window, your deaf patient should be seated with his/her back to the light source and you should be seated facing the light source.

- True
- False
- I don't know

For an infant, there is very little that can be done to improve an infant's hearing due to its age.

- ○ True
- ○ False
- ○ I don't know

When speaking to a deaf patient through an interpreter you should speak each word very slowly, to allow the interpreter time to sign or fingerspell your words.

- ○ True
- ○ False
- ○ I don't know

For most members of the deaf community, English is their primary language.

- ○ True
- ○ False
- ○ I don't know

When a deaf patient is hospitalized, the entire staff should be notified that the patient is deaf.

- ○ True
- ○ False
- ○ I don't know

When hiring an interpreter, the minimum time per session is two hours.

- ○ True
- ○ False
- ○ I don't know

At the end of the health care visit, the interpreter should again review the information with the patient.

- ○ True
- ○ False
- ○ I don't know

Early in the conversation, your patient mentions to you that he has Usher's syndrome. This information will influence how you communicate with him.

- ○ True
- ○ False
- ○ I don't know

Deaf patients generally do not participate in support groups such as those that help patients cope with disease or death. The main reason for this is due to the language barrier.

- ○ True
- ○ False
- ○ I don't know

On average, deaf patients report that they are unable to convey adequate information to their doctors.

- ○ True
- ○ False
- ○ I don't know

Less than 50% of physicians who have deaf patients use a certified interpreter.

- ○ True
- ○ False
- ○ I don't know

Working with other minority and/or disabled population will adequately prepare a physician to work with the deaf.

- ○ True
- ○ False
- ○ I don't know

Ninety percent of deaf people have hearing parents.

- ○ True

- ○ False
- ○ I don't know

If a child is found to have a hearing loss, you should also refer the child to an optometrist.

- ○ True
- ○ False
- ○ I don't know

It is the patients' responsibility to schedule the interpreter if they think one will be needed.

- ○ True
- ○ False
- ○ I don't know

You have complicated surgical information to communicate to a deaf patient, so it would be wise to tell the patient to bring along a friend or family member to assist with the interpretation.

- ○ True
- ○ False
- ○ I don't know

If the patient requests an interpreter for a visit with their health care provider, it is the patients' responsibility to pay for the interpreter.

- ○ True
- ○ False
- ○ I don't know

If a deaf patient requests an interpreter, you may ask your nurse, who has taken several semesters of ASL classes, to interpret for the consultation.

- ○ True
- ○ False
- ○ I don't know

If you suspect hearing loss in an infant, you should make a note to recheck the infant's hearing on the next visit.

- ○ True
- ○ False
- ○ I don't know

The American Disabilities Act requires an interpreter to be present whether the patient wants one or not.

- ○ True
- ○ False
- ○ I don't know

Multiple choice questions: Please select correct answer (s). Note some questions will have more than one correct answer.

A cochlear implant

- ☐ Will allow a deaf adult to immediately begin hearing and understanding oral conversations
- ☐ Destroys any residual hearing in the ear that the patient may have had
- ☐ Corrects for any type of hearing loss
- ☐ Is desired by at least 90% of deaf people
- ☐ Do not know

In a medical setting, it is the right of the deaf patient

- ☐ To express a preference for a particular interpreter
- ☐ To be provided with an interpreter by the practitioner
- ☐ To determine how much personal information he/she wants to disclose in an interpreted situation
- ☐ Do not know

The hospital has arranged for you to give a presentation on an important health topic with the assistance of an ASL interpreter. The audience, which consists mainly of deaf patients, are all socializing prior to the presentation. You are ready to begin your presentation. You should:

- ☐ Stand on the stage and wait patiently for the audience to settle down
- ☐ Flick the lights on and off several times in order to get the audience's attention
- ☐ Clap loudly
- ☐ Ask the interpreter to sign that you are ready to begin
- ☐ Do not know

In a consultation room, where would you suggest the patient and interpreter sit?

- ☐ Place the interpreter besides the patient. The patient and the interpreter are facing the provider.
- ☐ Place the interpreter besides the provider. The provider and the interpreter are facing the patient.
- ☐ Place the interpreter at an equal distance between the provider and the patient.
- ☐ Do not know

You have a deaf couple who refuse to have their newborn baby's hearing tested. You should:

- ☐ Tell them this is required by law, and that it has to be done for their baby's benefit.
- ☐ Tell them it is their decision, but explain that this lack of knowledge will put their baby at risk.
- ☐ Accept their decision.
- ☐ Do not know

You are in the Emergency Department (ED) and you call for a patient several times. Others in the ED point to a person reading a magazine and say "She's deaf". You should

- ☐ Approach the patient and gently tap her on the shoulder.
- ☐ Approach the patient and call their name louder.
- ☐ Approach the patient, making small gestures in her field of vision to try to get her attention.
- ☐ Do not know

Are you currently in the didactic or clinical phase of your PA education?

- ○ didactic
- ○ clinical

Have you ever taken an American Sign Language (ASL) class?

- ○ Yes
- ○ No

Have you ever worked with or used an American Sign Language (ASL) Interpreter?

- ○ Yes
- ○ No

Has there ever been a deaf or hard-of-hearing person in your social circle?

- ○ Yes
- ○ No

Are you aware that there is a deaf culture?

- ○ Yes
- ○ No

Appendix B: Consent Form

Assessing Deaf Culture Awareness of Physician Assistant Students in the Midwest
Sheryl Delude and Morgan Foizie, Masters of Science in Physician Assistant

INTRODUCTION:
The purpose of this document is to invite your participation in a research study developed by Sheryl Delude and Morgan Foizie and to inform you of the possible benefits and risks that may be associated with your experience if you decide to participate. Please read this form carefully and ask any questions that you may have before agreeing to participate.

PURPOSE AND DESCRIPTION OF THIS RESEARCH:

The purpose of this study is to explore healthcare providers' knowledge and beliefs regarding deaf patients. This study will compare deaf culture knowledge scores of physician assistant (PA) students to documented scores collected from medical students.

This will be accomplished by asking PA students in the Midwest to complete a survey. No demographic or identifying information will be collected in this survey. You will be asked to respond to four questions regarding prior exposure to the deaf community as well as 28 true-false questions and 6 multiple choice questions regarding your knowledge of the deaf culture.

This is a student research project that is being done for academic purposes. The results of this study will be reported in a thesis paper which will be presented at Bethel University.

BENEFITS AND RISKS:

There are no direct benefits to you for participating in this research. The results of this study may help identify the need for implementing deaf awareness training in physician assistant programs. This could be beneficial to future physician assistant students.

The risks associated with this study may include public knowledge of the average physician assistant student score of deaf awareness in the Midwest. Individual student scores will not be published in the study.

The researchers, Sheryl Delude and Morgan Foizie, Masters of Physician Assistant students, are available by phone (218-340-4534) or email (sed98898@bethel.edu) to answer any questions or discuss any concerns you have about this study. The research supervisor, Dr. Diane Dahl, RN is also available (651-638-6327).

CONFIDENTIALITY:

By completing this online survey, you agree to participate in this research study.

The information collected will be analyzed and the results will be presented to Bethel University in August 2015. A thesis paper will be written regarding these results and will be available upon request following the presentation.

The information collected will be kept in a secure and confidential location by the researchers located at Bethel University Graduate School (2 Pine Tree Drive, Arden Hills, MN 55112) in Dr. Wallace Boeve's office. The privacy of your information will be carefully guarded and no information that can identify you will be released or published. The Institutional Review Board (the committee that oversees the rights of people in research studies) will inspect the research records to ensure the study is being conducted appropriately.

COMPENSATION/COST:
There is no cost to you to participate in this study. You will not be paid to participate in this study.

NEW INFORMATION:
Any new information that is learned while this study is in progress that may influence your willingness to continue to participate will be provided to you.

CONTACT PERSONS:
The persons conducting the study, Sheryl Delude and Morgan Foizie, can answer any questions you might have and can be contacted at (218)-340-4534. You may also contact Dr. Diane Dahl, research supervisor from Bethel University at 651-638-6327 with any questions about the study.

VOLUNTARY PARTICIPATION:
Participation in this study is entirely voluntary. You may choose not to participate or you may participate and then decide to stop at any time. Your refusal to participate in this study will not impact your PA education in any way or your relationship with Bethel University.

GENERAL SURVEY INFORMATION:

Attached is a survey to gather necessary information to complete the data collection of this research. The survey will take approximately 10-15 minutes to complete.

Your participation is vital to the success of this research and the information you provide is essential to the validity of the study. We understand that you have an extremely busy schedule and that your time is limited so thank you for considering our study. If you wish to participate, please complete the survey by October 27th.

Thank you in advance for your prompt response.

Sincerely,

Sheryl Delude and Morgan Foizie

- ○ I have read the above information and I consent to participation in this study
- ○ I have read the above information and I do not consent to participation in this study

Appendix C: ***Assessing deaf cultural competency of physicians and medical students (2011)***

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Assessing Deaf Cultural Competency of Physicians and Medical Students

Lisa Hoang · Sheila F. LaHousse · Melanie C. Nakaji · Georgia Robins Sadler

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Abstract The Medical Students, Cancer Control, and the Deaf Community Training program (DCT) intended to create physicians who were culturally competent to care for deaf patients were evaluated. DCT medical students (n=22), UCSD medical faculty (n=131), and non-DCT medical students (n=211) were anonymously surveyed about their perceptions related to deaf patients, deaf cultural competency, and interpreter use. The faculty and non-DCT medical students displayed less knowledge than the DCT students. These findings suggest that training medical students in deaf cultural competency can significantly increase their capacity to care for community members and reduce the health disparities experienced by this community.

Keywords Deaf cultural competency · Physicians · Medical students

Introduction

Of the 8.8 million North Americans who are deaf [1], nearly a million belong to the Deaf community [2]. The Deaf community is distinguished by its preference for using American Sign Language (ASL) and its distinct culture.

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There are many studies showing that members of the Deaf community experience health disparities due to language barriers, which contribute to lower health literacy [1, 3]. The problem is exacerbated by the fact that most physicians are not adequately prepared to provide linguistically and culturally competent care for deaf patients [4]. Many lack knowledge about deaf culture and deaf patients' rights [5–7]. Healthcare providers report discomfort with deaf patients, limited understanding of deaf culture, and a belief that deaf patients do not trust them [8–10].

Many physicians do not realize how few words can be lip-read (30%) [2, 8, 10, 11]. Failure to communicate effectively can lead to mistakes and this contributes to deaf patients' preference to avoid physicians [8, 10, 12] and an increasing number of lawsuits [1]. While many physicians believe interpreters should be used when interacting with a deaf patient, few actually schedule them [2, 11, 13], while others are unaware of their legal obligation to provide interpreters [6]. Compounding the problem, many deaf people themselves do not understand their rights to interpreting services [2].

Further contributing to the distrust of physicians has been the medical community's view of deafness solely as a pathophysiological disease that needs to be "cured," rather than a unique culture and language that warrants respect [2, 14]. Other deaf patients perceive that physicians act in a paternalistic manner that effectively reduces their autonomy [1, 2] and associate their healthcare experiences with stress and strong negative emotions [2, 15].

Since many healthcare barriers stem from health care providers' lack of community-specific cultural and linguistic competency when working with members of underserved groups, training providers to be culturally and linguistically competent should help reduce those barriers [16–18]. For example, when physicians can sign, deaf patients report that

they were more likely to follow recommended health maintenance behaviors, visit their physicians regularly [5], and feel greater satisfaction with the clinical experience [2].

Given the lack of training in deaf culture and the limited number of providers who sign, the University of California, San Diego (UCSD) School of Medicine created the NCI-funded fellowship program, *Medical Students, Cancer Control, and the Deaf Community Training program* (*DCT*). The fellowship was created to train a small cohort of its medical students in ASL and deaf culture within the context of a cancer control curriculum. The goal was to have them ultimately become the medical partners of Deaf community leaders who were advocating for improved access to health information and care.

Methods

Hypothesis

The DCT medical students will demonstrate greater knowledge of deaf culture and deaf patients than UCSD's non-DCT medical students and faculty.

Intervention

As the first part of this 2-year training program, fellows participated in a deaf culture training program. They were asked to master a curriculum of self-paced reading materials that would provide a sound understanding of deaf culture. Over the first 2 years of school, they completed six quarters of ASL classes and one summer at Gallaudet University's residential ASL/deaf culture immersion program. Throughout this time, the previously mastered cultural concepts were reinforced. While in school, students practiced their ASL and cultural competency by interacting with the community and by providing the Deaf community with workshops about health promotion. Students complete their mandatory research projects on a topic related to the Deaf community and take fourth year rotations where they interact with the Deaf community [19]. Fellows received an $8,000/year stipend as compensation for the extra burden the program's placed on the fellows during their medical studies and as a mode of retention.

Study Design

DCT students, non-DCT students, and faculty were invited to take part in an institutional review board (IRB)-approved, anonymous survey with six multiple choice and 28 true-false questions plus an "I don't know" option. To maintain participant anonymity, IRB had approved an implied consenting process, which placed the consent statement at the top of the survey page and considered return of the survey as sufficient evidence of implied consent. To keep the survey brief, the only socio-demographic data gathered was whether they were faculty, DCT, or non-DCT.

The survey questions were created based on a review of the literature [2, 5–11, 13], the project team members' prior knowledge, and guidance from the project's Deaf community advisory group. Questions were related to: (1) commonly held misperceptions of deafness and deaf culture, (2) common difficulties experienced by deaf patients in the clinical settings, (3) errors commonly made when providers work interpreters in the clinical setting, and (4) the participants' prior exposure to the Deaf community. The survey also asked respondents to list up to five problems they thought deaf patients may face when hospitalized (Table 1). The survey was extensively pilot tested prior to dissemination.

Recruitment of Participants

From April 2007 to May 2008, 780 medical school faculty and 640 non-DCT students and 25 DCT students from the graduating classes of 2007-2011 were sent the survey via list-serve and Survey Monkey [20], making anonymous responses possible. Although participants were reached in various ways, they were instructed to complete and return only one survey. While it was not possible to separate the medical school faculty with MD degrees (N=525) from those with other terminal degrees, the survey instruction declared that the survey was directed only to faculty with direct patient care responsibilities.

Data Analysis

All data were entered and analyzed using SPSS version 14.0 [21]. Responses were summed to create an overall, continuous sum score, where greater scores indicated more knowledge. A binary coding system (1=correct, 0=incorrect) was used for all items. The Knowledge sum score was analyzed using analysis of variance and t tests [22, 23]. Chi-square tests were used to compare responses to individual items among the three study groups. A significant difference is described as a p value greater than 0.05.

Description of the Sample

Of the 372 surveys returned, nine were omitted because respondents reported that they were non-clinical faculty, not medical students, or did not self-identify. Participation was 25% (n=130/525) for faculty, 33% (n=211/640) for non-

Table 1 DCT medical students, faculty and non-DCT medical students group comparisons on knowledge multiple choice items

Assessing knowledge of deaf cultural competency in a medical setting	DCT medical students	School of medicine faculty	Non-DCT medical students
	Percent correct% (*n*)		
Item 1: a cochlear implant			
A. Will allow a deaf adult to immediately begin hearing and understanding oral conversations (incorrect)	–	–	–
B. Destroys any residual hearing in the ear that the patient may have had (correct)	66.7 (14)**, ****	25.8 (31)	18.8 (38)
C. Corrects for any type of hearing loss (incorrect)	–	–	–
D. Is desired by at least 90% of deaf people (incorrect)	–	–	–
E. Do not know (incorrect)	–	–	–
Item 2: in a medical setting, it is the right of the deaf patient			
A. To express a preference for a particular interpreter (correct)	36.4 (8)	50.0 (61)******	32.2 (65)
B. To be provided with an interpreter by the practitioner (correct)	100.0 (22)**, ****	70.2 (85)	64.9 (131)
C. To determine how much personal information he/she wants to disclose in an interpreted situation (correct)	50.0 (11)	62.8 (76)******	43.1 (87)
D. Do not know (incorrect)	–	–	–
Item 3: the hospital has arranged for you to give a presentation on an important health topic with the assistance of an ASL interpreter. The audience, which consists mainly of deaf patients, are all socializing prior to the presentation. You are ready to begin your presentation. You should:			
A. Stand on stage and wait patiently for the audience to settle down (correct)	4.5 (1)	11.5 (14)	9.0 (18)
B. Flick the lights on and off several times in order to get the audience's attention (correct)	95.5 (21)**, ****	26.2 (32)*****	16.1 (32)
C. Clap loudly (incorrect)	–	–	–
D. Ask the interpreter to sign that you are ready to begin (correct)	22.7 (5)**, ****	78.5 (95)******	56.8 (113)
E. Do not know (incorrect)	–	–	–
Item 4: in a consultation room, where would you suggest the patient and interpreter to sit?			
A. Place the interpreter beside the patient. The patient and the interpreter are facing the provider (incorrect)	–	–	–
B. Place the interpreter beside the provider. The provider and the interpreter are facing the patient (correct)	90.9 (20)**, ****	38.5 (47)	42.1 (85)
C. Place the interpreter at an equal distance between the provider and the patient (incorrect)	–	–	–
D. Do not know (incorrect)	–	–	–
Item 5: You have a deaf couple who refuse to have their newborn baby's hearing tested. You should:			
A. Tell them this is required by law, and that it has to be done for their baby's benefit (incorrect)	–	–	–
B. Tell them it is their decision, but explain that this lack of knowledge will put their baby at risk (incorrect)	–	–	–
C. Accept their decision (correct)	31.8 (7)*, ****	14.0 (17)	7.4 (15)
D. Do not know (incorrect)	–	–	–
Item 6: you are in the Emergency Department (ED) and you call for a patient several times. Others in the ED point to a person reading a magazine and say "She's deaf." You should			
A. Approach the patient and gently tap her on the shoulder (correct)	81.8 (18)**, ****	46.7 (57)	51 (103)
B. Approach the patient and call their name louder (incorrect)	–	–	–
C. Approach the patient, making small gestures in her field of vision to try to get her attention (correct)	22.7 (5)**	53.3 (65)******	28.2 (57)
D. Do not know (incorrect)	–	–	–
Question (correct answer)	Percent correct% (*n*)		
1. Only 30% of the English language can be accurately lip read (true)	86.4 (19)**, ****	17.1 (20)	13.5 (26)
2. You are running considerably behind schedule. Your deaf patient is waiting with his/her interpreter. The interpreter is ethically bound to wait with the patient until you are ready to see them (false)	31.8 (7)	16.2 (19)	18.7 (36)

Table 1 (continued)

Assessing knowledge of deaf cultural competency in a medical setting	DCT medical students	School of medicine faculty	Non-DCT medical students
	Percent correct% (*n*)		
3. ASL is a pictorial language that produces a word-for-word translation of what is being said in English (false)	100.0 (22)**, ****	69.2 (81)	71.0 (137)
4. The majority of hearing parents with deaf children never learn to sign (true)	90.9 (20)**, ****	13.7 (16)	9.9 (19)
5. When communicating with a deaf patient through an interpreter, you should face the interpreter and explain to the interpreter what the patient needs to know (false)	90.9 (20)	75.0 (87)	80.8 (156)
6. Trying to help cure your patient's deafness should be your top priority (false)	100.0 (22)*	83.8 (98)	88.0 (169)
7. Because deaf people rely upon printed forms of information, their literacy is equal to or better than the general public (false)	95.5 (21)**, ****	34.5 (40)*****	23.3 (45)
8. A good interpreter will be able to step out of his/her interpreting role in order to explain to the provider what the patient is really trying to say (false)	72.7 (16)*, ****	46.6 (54)*****	34.2 (66)
9. When there is a dominant source of light, such as a window, your deaf patient should be seated with his/her back to the light source and you should be seated facing the light source (true)	77.3 (17)****	56.0 (65)******	38.3 (74)
10. For an infant, there is very little that can be done to improve an infant's hearing due to its age (false)	72.7 (16)	69.2 (81)******	54.4 (105)
11. When speaking to a deaf patient through an interpreter you should speak each word very slowly, to allow the interpreter time to sign or fingerspell your words (false)	86.4 (19)**, ****	55.6 (65)******	39.9 (77)
12. For most members of the deaf community, English is their primary language (false)	90.9 (20)**, ****	38.3 (44)	29.0 (56)
13. When a deaf patient is hospitalized, the entire staff should be notified that the patient is deaf (true)	77.3 (17)	74.1 (86)******	57.8 (111)
14. When hiring an interpreter, the minimum time per session is two hours (true)	27.3 (6)**, ****	5.1 (6)	2.6 (5)
15. At the end of the health care visit, the interpreter should again review the information with the patient (false)	31.8 (7)**, ****	6 (7)	6.3 (12)
16. Early in the conversation, your patient mentions to you that he has Usher's syndrome. This information will influence how you communicate with him (true)	45.5 (10)****	33.3 (39)******	14.2 (27)
17. Deaf patients generally do not participate in support groups such as those that help patients cope with disease or death. The main reason for this is due to the language barrier (true)	68.2 (15)**, ****	18.8 (22)	18.0 (34)
18. On average, deaf patients report that they are unable to convey adequate information to their doctors (true)	81.8 (18)**, ***	49.6 (58)	56.8 (108)
19. Less than 50% of physicians who have deaf patients use a certified interpreter (true)	81.8 (18)**, ****	41.9 (49)	40.0 (76)
20. Working with other minority and/or disabled population will adequately prepare a physician to work with the deaf (false)	95.5 (21)****	82.9 (97)******	65.3 (124)
21. Ninety percent of deaf people have hearing parents (true)	77.3 (17)**, ****	44.4 (52)	36.8 (70)
22. If a child is found to have a hearing loss, you should also refer the child to an optometrist (true)	63.6 (14)****	43.5 (50)*****	30.0 (57)
23. It is the patients' responsibility to schedule the interpreter if they think one will be needed (false)	81.8 (18)**, ****	39.7 (46)	41.9 (80)
24. You have complicated surgical information to communicate to a deaf patient, so it would be wise to tell the patient to bring along a friend or family member to assist with the interpretation (false)	95.5 (21)**, ****	44.4 (52)	38.9 (74)
25. If the patient requests an interpreter for a visit with their health care provider, it is the patients' responsibility to pay for the interpreter (false)	90.9 (20)**, ****	40.2 (47)	45.3 (86)
26. If a deaf patient requests an interpreter, you may ask your nurse, who has taken several semesters of ASL classes, to interpret for the consultation (false)	95.5 (21)**, ****	45.3 (53)	39.5 (75)
27. If you suspect hearing loss in an infant, you should make a note to recheck the infant's hearing on the next visit (false)	13.6 (3)	22.2 (26)*****	12.8 (24)

Table 1 (continued)

Assessing knowledge of deaf cultural competency in a medical setting	DCT medical students	School of medicine faculty	Non-DCT medical students
	Percent correct% (*n*)		
28. American Disabilities Act requires an interpreter be present whether the patient wants one or not (false)	68.2 (15)**, ****	23.1 (27)	19.1 (36)
	M (SD)	M (SD)	M (SD)
Total summary score (TF+MC)[a]	26.90 (5.34) **, **** *n*=21	17.07 (5.81)****** *n*=105	13.79 (6.39) *n*=179

[a] Total score was created by summing all possible correct answers across the 34 items. This score ranges from 0 to 39, greater scores indicate more knowledge

*$p \leq 0.05$, chi-square difference between DCT medical students and faculty are significant

**$p \leq 0.01$, chi-square difference between DCT medical students and faculty are significant

***$p \leq 0.05$, chi-square difference between DCT medical students and non-DCT medical students are significant

****$p \leq 0.01$, chi-square difference between DCT medical students and non-DCT medical students are significant

*****$p \leq 0.05$, chi-square difference between faculty and *non*-DCT medical students are significant

******$p \leq 0.01$, chi-square difference between faculty and *non*-DCT medical students are significant

DCT medical students, and 88% (n=22/25) for DCT students.

Results

The hypothesis was supported. The DCT students had a significantly higher overall knowledge score (M=26.9) than the faculty (M=17.07) and the non-DCT students (M=13.79; $p \leq 0.01$; Table 1). For example, DCT students were significantly more likely to know that most deaf children are born to hearing parents, deaf patients seldom use support groups, and the different modes of communications and difficulties associated with each mode. Table 1 shows the cumulative scores as well as the scores for each of the three groups broken down by individual questions.

We anticipated that for the faculty, DCT, and non-DCT students, having prior exposure to the Deaf community would predict higher cultural knowledge scores. The linear regression analysis showed that this prediction held true only for the faculty (B=3.839, SE=1.751, $p<0.05$). However, faculty with prior experience still scored far below the DCT students, but significantly higher (M=17.51) than non-DCT students with prior exposure (M=13.92; Table 2).

Further analyses were conducted to compare the total knowledge scores between faculty and non-DCT students based on whether they reported having a deaf or hard-of-hearing person in their immediate social circle. For those who reported not having a deaf or hard-of-hearing person in their social circle, faculty had significantly higher average knowledge scores (M=17.73) than the non-DCT students (M=13.66). There was no difference in knowledge scores between faculty and non-DCT students who reported having a deaf or hard-of-hearing person in their social circle (Table 2).

Among those who reported awareness of deaf culture, the faculty (M=18.09) had greater knowledge scores than the non-DCT students (M=14.23). All faculty (who did, M=17.82; and did not, M=13.44 report wanting to take an ASL class in the past) had higher knowledge scores compared to non-DCT students in the corresponding categories (M=16.70, M=14.28, respectively). Faculty who reported never taking an ASL class had significantly higher knowledge scores (M=17.01) than non-DCT students in the same category (Table 2).

Participants were asked to list up to five problems they felt a deaf person would have when hospitalized, other than the obvious difficulties of communicating with their health-care provider or the inability to use the room's telephone. Responses to this open-ended question were qualitatively analyzed. Those responses that were too ambiguous or not specific to difficulties experienced by deaf patients were omitted from analysis. Response were clustered by the primary author and two independent researchers (85% inter-rater agreement) [24, 25], culminating into 15 themes. For those responses in which there was a disagreement, a consensus among the three researchers was reached. Results from this qualitative thematic analysis [25] are outlined in Table 3.

Table 2 Comparison of faculty and non-DCT medical student

Percentage that responded "yes" to questions regarding past exposure to deaf and hard-of-hearing persons		Faculty% (*n*)	Non-DCT student% (*n*)
Have you ever had exposure to deaf or hard-of-hearing people?		87.5 (112)***	44.2 (92)
Has there ever been a deaf or hard-of-hearing person in your social circle?		46.1 (59)***	14.9 (31)
Are you aware that there is a deaf culture?		82.8 (106)	84.1 (175)
Have you ever taken an American Sign Language (ASL) class?		4.7 (6)	2.9 (6)
Have you ever wanted to take an ASL class?		31.3 (40)***	58.2 (121)
Comparison of knowledge scores based on exposure of participant to deaf or hard-of-hearing persons		Faculty M (SD)	Non-DCT student M (SD)
Has prior exposure to deaf or hard-of-hearing persons?			
Yes	Average total score	15.51 (5.40)*, *** n=93	13.92 (6.01) n=78
No	Average total score	13.67 (7.83) n=12	13.68 (6.70) n=101
Has deaf or hard-of-hearing person in social circle?			
Yes	Average total score	16.34 (5.45) n=50	14.54 (5.57) n=26
No	Average total score	17.73 (6.10)*** n=55	13.66 (6.53) n=153
Are you aware that there is a deaf culture?			
Yes	Average total score	18.09 (4.95)*** n=88	14.23 (6.27) n=152
No	Average total score	11.76 (7.13) n=17	11.30 (6.65) n=27
Have you ever taken an American Sign Language (ASL) class?			
Yes	Average total score	18.20 (4.39) n=5	15.67 (8.08) n=3
No	Average total score	17.01 (5.89)*** n=100	13.76 (6.39) n=176
Ever wanted to take an ASL class in the past?			
Yes	Average total score	17.82 (6.06)*** n=34	13.44 (6.33) n=105
No	Average total score	16.70 (5.70)** n=71	14.28 (6.49) n=74

*$p \leq 0.05$, within group mean difference between faculty with without exposure was significant

**$p \leq 0.05$, mean difference between faculty and non-DCT medical students are significant

^^ Mean difference between faculty and non-DCT medical students are significant ($p \leq 0.01$)

The frequency with which the three groups endorsed each theme is reported in Table 3. Each group endorsed the 15 difficulties in unique ways. DCT students listed "understanding terms and medical language" as the number one difficulty experienced by deaf patients when hospitalized, while faculty and non-DCT students listed "communication with persons other than healthcare providers, (i.e., janitor or dietician)." The DCT students also were more likely to list maltreatment or mistreatment as a difficulty.

Discussion

Literature has shown that the Deaf community experiences barriers to the acquisition of health information and care [1, 2, 4, 5, 8, 9, 11, 14, 16, 26–28], which may be improved by increasing clinicians' cultural competency [8–10, 12, 14, 15, 17, 19, 29, 30]. The DCT program was designed to address this issue. The data presented in this paper demonstrate that the DCT students scored significantly higher than faculty and non-DCT students on knowledge related to cultural competency within the Deaf community.

Overall, the faculty performed significantly better than non-DCT medical students, especially on questions related to interactions with deaf patients (e.g., how to approach a deaf patient or what to do with children who have hearing loss; Tables 1 and 2). This observation may be the culmination of faculty's clinical work with deaf or hard-of-hearing persons. Exposure proves to be a differentiating factor even amongst the faculty because faculty without exposure scored the same as non-DCT students in general. However, having a deaf or hard-of-hearing person in one's social circle did not translate into a better understanding of their difficulties in healthcare. These results suggest that exposure to members of the Deaf community in a clinical setting may be most beneficial in increasing physicians' cultural competency when a program such as the DCT is not available. Medical schools can benefit from this finding by offering classes or self-paced learning modules that can create deaf cultural competency of medical students, faculty, and attendings.

Table 3 Cumulative ranking of most frequently listed perceived problems that hospitalized deaf patients may encounter in a hospital setting

1. Communication with personnel other than provider (e.g., dietician, janitor, etc.)		
2. Emergency or warnings		
3. Emotions (fear/confusion)		
4. Understanding terms and medical knowledge		
5. Knowledge of rights and interpreter services		
6. Awareness of activities in hospitals heard in announcements		
7. Maltreatment or mistreatment by medical staff		
8. Privacy issues		
9. Circumstances that inhibit communication (e.g., vision impairments or immobility of hands)		
10. Difficulty with the radio or television		
11. Limited medical knowledge/lack of health literacy		
12. Contacting family and friends		
13. Social support		
14. Distrust of providers		
15. Decreased awareness of surroundings (e.g. People in the room, coming up from behind)		
Top three reported problems by group		
DCT-medical students	Medical school faculty	Non-DCT medical students
1.Understanding medical language (19%)	1.Communication (33%)	1.Communication (22%)
2.Communication (17%)	2.Emergency or warnings (19%)	2.Emergency or warnings (24%)
3.Maltreatment or mistreatment by medical staff (17%)	3.Emotions such as fear or confusion (15%)	3.Emotions such as fear or confusion (12%)

By evaluating the open-ended responses from the DCT and non-DCT students, it became clear that the DCT students were focusing on problems that extended beyond the Deaf community's physiologic differences (i.e., inability to hear). The issues listed by the DCT students including difficulty with understanding medical terms, as well as fearing or experiencing mistreatment or maltreatment is a point that would be considered only if one is knowledgeable of deaf culture and deaf history (Table 4).

Recruitment efforts were made to maximize sample sizes, but the number of DCT students was limited in comparison to the other study arms. The DCT student group was self-selected and given a funded fellowship as compensation for the program's extra burden, and thus does not necessarily represent the interest of all medical students. Thus, study results should be generalized with caution to other medical schools. There was also the potential for variation in the interpretation of a few survey questions that may have limited the interpretation of the results. For example, while it can be inferred that the faculty's exposure to deaf and hard-of-hearing people is equated with advancing years of clinical experience, the term "exposure" as used in the questionnaire did not specify the qualities of the exposure. Future studies may help to clarify this point. Future studies should also examine whether receiving only the deaf culture training educational materials without the more expansive training program (ASL coursework, ASL immersion, and ongoing ASL and deaf culture training throughout medical school), could produce the same desired level of cultural competency.

Conclusion

Deaf people face challenges in accessing health care which may be ameliorated by providing healthcare providers with cultural competency training. Understanding that the Deaf community is a linguistic and socio-cultural minority will help clinicians more effectively respond to issues of human diversity in the healthcare setting.

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Portions of the data included in this paper were presented as a poster at the October 2009 American Association for Cancer Education's Annual Conference, where it won the award for First Place.

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The Deaf Community is denoted by a capital "D" not be confused with the audiological term "deaf."

Appendix D: Email Communication with Dr. Georgia Sadler

Email sent to Dr. Georgia Robins Sadler at 11:53am March 12, 2014

Morgan Foizie mkf25752@bethel.edu 11:53 AM (0 minutes ago)

to gsadler@ucsd.edu, jmdiamond@ucsd.edu

Dr. Georgia Sadler,

Our names are Sheryl and Morgan and we are graduate students in the physician assistant (PA) program at Bethel University in Minnesota. For our community research capstone project (thesis), we are very interested in exploring deaf cultural competency of practicing PAs and PA students. While investigating this topic, we came across your published article "*Assessing Deaf Cultural Competency of Physicians and Medical Students*." If possible, we would like to use some of your survey questions to assess PAs and PA student's knowledge of deaf culture. We would also like to run statistical analysis using your results in order to compare deaf cultural knowledge of PAs and PA students to those of physicians and medical students. The results of our study may suggest that a Deaf Cultural Competency program similar to USCD's may be beneficial to implement in PA programs or our study may indicate that PA programs need to include more deaf cultural training as a part of their general curriculum.

We chose to contact you because your email was included on the published study. Your study states that for copy-right purposes it is open access (it permits "any noncommercial use, distribution, and reproduction in any medium, provided the original authors are credited"), but before using your study we wanted to contact you to ensure you and your fellow authors find our use of the study acceptable. We will clearly and explicitly credit all authors with any and all information we use from the study. We would also be happy to send you a copy of our proposal (and eventually our completed thesis) if desired.

If you find our use of your study acceptable, we would like to know if there is any specific way you would like us to credit you besides including a citation in our literature cited section. We could add you and your fellow authors to our "acknowledgments" and "special thanks" sections if desired.

Thank you very much.

Sincerely,

Morgan Foizie
Sheryl Delude
Contact Information: mkf25752@bethel.edu

Appendix E: Official Consent to Survey Physician Assistant Students

Official Consent for School A

PA Director Number 1 Jul 12 (8 days ago)

Dear Morgan and Sheryl,
I apologize for the delay as I was on vacation this past week.
You have my permission to include my PA students in your study.
Please forward any information to me as we can pass it along to the students.
Please let me know if you have any questions.

PA Program director

Official Consent for School B

PA Program Director Number 2

Sheryl;

Please let this email to you confirm that you are welcome to survey the PA students regarding their understanding of working with patients who are hearing impaired.

I agree, emailing the survey link to the program directors would be the best method for them then to forward it on to the students. That said, if you send any follow up email reminders, you may want to do some form of tracking by number to assure that you don't get a student who responds more than once. Qualtrics might be able to do that for you, not allowing someone to respond more than once.

Let me know if you have any further questions.

Thanks

Program Director

Physician Assistant Program

Official Consent for School C

PA Program Director Number 3

Hello Sheryl and Morgan,

We are happy to participate, please forward the link to me for distribution.

This email may serve as official permission that you may survey my PA students as part of your research regarding Deaf Culture Awareness.

I'm sorry for the delay in my response to you.

Sincerely,

Appendix F: Thesis Survey Instructions for PA Program Directors

Greetings PA program directors,

You will receive an email within the next 24 hours that contains the survey link and instructions for survey completion. The email will also contain general information about the study purpose. Please forward the email containing the survey link to all of your students on September 15, 2014 (students must be currently enrolled in your PA program to participate).

Please do not forward the email to faculty or alumni and do not personally complete the survey or click on the survey link. If you would like to view the survey or have any questions about survey distribution, please contact Morgan Foizie (763-229-9287) or Sheryl Delude (218-340-4534).

Once you have forwarded the email, please send a reply to Sheryl Delude (sed98898@bethel.edu) confirming that the survey link has been successfully distributed.

Thank you for your cooperation and assistance with this research project.

Sincerely,

Morgan Foizie and Sheryl Delude

Appendix G: Thesis Survey Instructions for PA Students

Greetings PA students,

Attached to this email you will find a link to a research study that will prompt you to complete a short survey. The purpose of the study is to assess deaf culture awareness of physician assistant students in the Midwest. This study will compare deaf cultural competency scores of PA students to documented scores collected from traditional medical students and medical students enrolled in a 2 year deaf training program. This is a student research project that is being done for academic purposes, and the results of this study may identify a need for implementation of deaf awareness training into future PA programs.
Your participation is vital to the success of this research and the information you provide is critical to the validity of the study. We understand that you have extremely busy schedules and that your time is limited so thank you for considering our study. If you wish to participate, please complete the survey by October 27, 2014.

Please follow the link below to complete the deaf awareness survey. The survey is open **Monday September 15 through October 27. No identifying or personal information will be collected and individual student survey scores will be kept confidential**. Participation in this study is entirely voluntary. You may choose not to participate or you may participate and then decide to stop at any time. If you wish to stop the survey, close the survey browser window by clicking the "x" in the upper right-hand corner of your screen.

Thank you for your time and support of this study.

Sincerely,
Morgan Foizie, PA-S
Sheryl Delude, PA-S

Physician Assistant Program
Bethel University, CAPS/GS
2 Pine Tree Drive, Arden Hills
MN 55112

Follow this link to the Survey:
Take the Survey

Or copy and paste the URL below into your internet browser:

Appendix H: Thesis Survey Reminder Instructions for Program Directors

Greetings PA program directors,

Three weeks ago you dispersed a survey link via email to all of your currently enrolled PA students. In order to maximize participant response, you will receive a reminder email containing the survey link within the next 24 hours. Please forward the reminder email containing the survey link to all of your students on October 6, 2014 (students must be currently enrolled in your PA program to participate).

Please do not forward the email to faculty or alumni and do not personally complete the survey or click on the survey link. If you would like to view the survey or have any questions about survey distribution, please contact Morgan Foizie (763-229-9287) or Sheryl Delude (218-340-4534).

Once you have forwarded the reminder email, please send a reply to Sheryl Delude (sed98898@bethel.edu) confirming that the survey link has been successfully distributed.

Thank you for your cooperation and assistance with this research project.

Sincerely,

Morgan Foizie and Sheryl Delude

Appendix I: Thesis Survey Reminder Email for Students

Greetings PA students,

One week ago you received an email containing a link to a deaf awareness survey. If you have already completed the survey, thank you very much and please disregard this email. If you have not completed the survey, we encourage you to do so as the results of the survey may identify a need for the implementation of deaf awareness training into future PA programs.

Your participation is vital to the success of this research and the information you provide is critical to the validity of the study. We understand that you have extremely busy schedules and that your time is limited so thank you for considering our study. If you wish to participate, please complete the survey by October 27, 2014.

Please follow the link below to complete the deaf awareness survey. The survey is open **Monday September 15 through October 27. No identifying or personal information will be collected and individual student survey scores will be kept confidential**. Participation in this study is entirely voluntary. You may choose not to participate or you may participate and then decide to stop at any time. If you wish to stop the survey, close the survey browser window by clicking the "x" in the upper right-hand corner of your screen.

Thank you for your time and support of this study.

Sincerely,
Morgan Foizie, PA-S
Sheryl Delude, PA-S

Physician Assistant Program
Bethel University, CAPS/GS
2 Pine Tree Drive, Arden Hills
MN 55112

Follow this link to the Survey:
Take the Survey

Or copy and paste the URL below into your internet browser:

Appendix J: IRB Approval

Wallace Boeve 9:55 AM (12 hours ago)

to Sheryl, me, Diane, Peter

Sheryl & Morgan;

I have reviewed and approve of the attached Level 3 research project as delegated to the PA program from the Bethel University Human Subjects committee for the period of one year from today's date. If the project is not completed in one year from today's date, you must submit a letter of update to renew this project for another year. If any significant changes occur in the methodology, you must also notify me. Also, please notify the PA program of final project and defense completion with a bound copy of your thesis project. Best wishes in your research pursuits.

Sincerely;

Wallace Boeve, EdD, PA-C
Program Director
Physician Assistant Program
Bethel University
w-boeve@bethel.edu
651 308-1398 cell
651 635-1013 office
651 635-8039 fax
http://gs.bethel.edu/academics/masters/physician-assistant

Appendix K: Breakdown of Percentage Correct Answers to Individual Survey Items

Table 8: Breakdown of percent correct answers to individual survey items for PA students, DCT medical students, and Non-DCT medical students

Assessing Knowledge of deaf cultural competency in a medical setting	PA students- Percent correct % (n)	DCT medical students	Non-DCT medical students
Item 1: a cochlear implant			
A. Will allow a deaf adult to immediately begin hearing and understanding oral conversations (incorrect)			
B. Destroys any residual hearing in the ear that the patient may have had (correct)	18 (9)	66.7 (14)	18.8 (38)
C. Corrects for any type of hearing loss (incorrect)			
D. Is desired by at least 90% of deaf people (incorrect)			
E. Do not know (incorrect)			
Item 2: In a medical setting, it is the right of the deaf patient			
A. To express a preference for a particular interpreter (correct)	54 (28)	36.4 (14)	32.2 (65)
B. To be provided with an interpreter by the practitioner (correct)	73 (38)	100.0 (22)	64.9 (131)
C. To determine how much personal information he/she wants to disclose in an interpreted situation (correct)	67 (35)	50.0 (11)	43.1 (87)
D. Do not know (incorrect)			
Item 3: the hospital has arranged for you to give a presentation on an important health topic with the assistance of ASL interpreter. The audience, which consists mainly of deaf patients, are all socializing prior to the presentation. You are ready to begin your presentation.			
A. Stand on stage and wait patiently for the audience to settle down (correct)	15 (8)	4.5 (1)	9.0 (18)
B. Flick the lights on and off several times in order to get the audience's attention	15 (8)	95.5 (21)	16.1 (32)

(correct)			
C. Clap loudly (incorrect)			
D. Ask the interpreter to sign that you are ready to begin (correct)	88 (46)	22.7 (5)	56.8 (113)
E. Do not know (incorrect)			
Item 4: In a consultation room, where would you suggest the patient and interpreter sit?			
A. Place the interpreter besides the patient. The patient and the interpreter are facing the provider (incorrect)			
B. Place the interpreter besides the provider. The provider and the interpreter are facing the patient (correct)	48 (25)	90.9 (20)	42.1 (85)
C. Place the interpreter at an equal distance between the provider and the patient (incorrect)			
D. Do not know (incorrect)			
Item 5: You have a deaf couple who refuse to have their newborn baby's hearing tested. You should:			
A. Tell them this is required by law, and that it has to be done for their bay's benefit. (incorrect)			
B. Tell them it is their decision, but explain that this lack of knowledge will put their baby at risk. (incorrect)			
C. Accept their decision (correct)	13 (7)	31.8 (7)	7.4 (15)
D. Do not know (incorrect)			
Item 6: You are in the Emergency Department (ED) and you call for a patient several times. Others in the ED point to a person reading a magazine and say "She's deaf". You should			
A. Approach the patient and gently tap her on the shoulder. (correct)	60 (31)	81.8 (18)	51 (103)
B. Approach the patient and call their name louder. (incorrect)			
C. Approach the patient, making small gestures in her field of vision to try and get her attention. (correct)	46 (24)	22.5 (5)	28.2 (57)
D. Do not know (incorrect)			

Question (correct answer)			
1. Only 30% of the English language can be accurately lip read (true)	45 (25)	86.4 (19)	13.5 (26)
2. You are running considerably behing schedule. Your deaf patient is waiting with his/her interpreter. The interpreter is ethically bound to wait with the patient until you are ready to see them (false)	39 (22)	31. 8 (7)	18.7 (36)
3. ASL is a pictorial language that produces a word-for-word translation of what is being said in English. (false)	66 (37)	100.0 (22)	71.0 (137)
4. The majority of hearing parents with deaf children never learn to sign. (true)	29 (16)	90.9 (20)	9.9 (19)
5. When communicating with a deaf patient through an interpreter, you should face the interpreter and explain to the interpreter what the patient needs to know. (false)	95 (53)	90.9 (20)	80.8 (56)
6. Trying to help cure your patient's deafness should be your top priority. (false)	96 (53)	100.0 (22)	88.0 (156)
7. Because deaf people rely upon printed forms of information, their literacy is equal to or better than the general public. (false)	54 (30)	95.5 (21)	23.3 (45)
8. A good interpreter will be able to step out of his/her interpreting role in order to explain to the provider what the patient is really trying to say. (false)	54 (30)	72.7 (16)	34.2 (66)
9. When there is a dominant source of light, such as a window, your deaf patient should be seated with his/her back to the light source. (true)	56 (31)	77.3 (17)	38.3 (74)
10. For an infant, there is very little than can be done to improve an infant's hearing due to its age. (false)	91 (51)	72.7 (16)	54.4 (105)
11. When speaking to a deaf patient through an interpreter you should speak each word very slowly, to allow the interpreter time to sign or fingerspell your words. (false)	65 (36)	86.4 (19)	39.9 (77)
12. For most members of the deaf community, English is their primary language. (false)	35 (19)	90.9 (20)	29.0 (56)

13. When a deaf patient is hospitalized, the entire staff should be notified that the patient is deaf (true)	76 (42)	77.3 (17)	57.8 (111)
14. When hiring an interpreter, the minimum time per session is two hours. (true)	13 (7)	27.3 (6)	2.6 (5)
15. At the end of the health care visit, the interpreter should again review the information with the patient. (false)	27 (15)	31.8 (7)	6.3 (12)
16. Early in the conversation, your patient mentions to you that he has Usher's syndrome. This information will influence how you communicate with him. (true)	32 (18)	45.5 (10)	14.2 (27)
17. Deaf patients generally do not participate in support groups such as those that help patients cope with disease or death. The main reason for this is due to the language barrier. (true)	41 (23)	68.2 (15)	18.0 (34)
18. On average, deaf patients report that they are unable to convey adequate information to their doctors. (true)	71 (40)	81.8 (18)	56.8 (108)
19. Less than 50% of physicians who have deaf patients use a certified interpreter. (true)	73 (40)	81.8 (18)	40.0 (76)
20. Working with other minority and/or disabled population will adequately prepare a physician to work with the deaf. (false)	88 (49)	95.5 (21)	65.3 (124)
21. Ninety percent of deaf people have hearing parents. (true)	71 (40)	77.3 (17)	36.8 (70)
22. If a child is found to have hearing loss, you should also refer the child to an optometrist. (true)	63 (34)	63.6 (14)	30.0 (57)
23. It is the patients' responsibility to schedule the interpreter if they think one will be needed. (false)	66 (37)	81.8 (18)	41.9 (80)
24. You have complicated surgical information to communicate to a deaf patient, so it would be wise to tell the patient to bring along a friend or family member to assist with the interpretation. (false)	49 (27)	95.5 (21)	38.9 (74)
25. If the patient requests an interpreter for a visit with their health care provider, it is the patients' responsibility to pay for the	62 (34)	90.9 (20)	45.3 (86)

interpreter. (false)			
26. If a deaf patient requests an interpreter, you may ask your nurse, who has taken several semesters of ASL classes, to interpret for the consultation. (false)	86 (48)	95.5 (21)	39.5 (75)
27. If you suspect hearing loss in an infant, you should make a note to recheck the infant's hearing on the next visit. (false)	14 (8)	13.6 (3)	12.8 (24)
28. American's Disabilities Act requires an interpreter be present whether the patient wants one or note. (false)	36 (20)	68.2 (15)	19.1 (36)

Appendix L: Correct, Incorrect and Response Rate for Individual Survey Items

Table 9: Correct, incorrect, and total response rate for deaf culture awareness survey items

Item Number	Correct Responses	Incorrect Responses	Total Responses
Multiple Choice			
1	9	42	51
2	a. 28 b. 38 c. 35	a. 24 b. 14 c. 17	52
3	a. 8 b. 8 c. 46	a. 44 b. 44 c. 6	52
4	b. 25	b. 27	52
5	c. 7	c. 45	52
6	a. 31 b. 24	a. 21 b. 28	52
True/False			
1	25	31	56
2	22	34	56
3	37	19	56
4	16	39	55
5	53	3	56
6	53	3	55
7	30	26	56
8	30	26	56
9	31	24	55
10	51	5	56
11	36	19	55
12	19	36	55
13	42	13	55
14	7	48	55
15	15	41	56
16	18	38	56
17	23	33	56
18	40	16	56
19	40	15	55
20	49	7	56
21	40	16	56
22	34	20	54
23	37	19	56
24	27	28	55

25	34	21	55
26	48	8	56
27	8	48	56
28	20	36	56

Appendix M: Basic Statistics for PA Student Knowledge Scores

Table 10: Basic statistics for PA student knowledge scores

Statistics

		GTOTALSCORE
N	Valid	55
	Missing	6
Mean		19.2545
Median		20.0000
Mode		20.00
Std. Deviation		4.25666
Variance		18.119
Minimum		11.00
Maximum		28.00

Appendix N: Frequency and Total Score Percentages for PA Student Total Knowledge Scores

Table 11: Frequency and Total Score Percentages

TOTALSCORE

	Frequency	Percent	Valid Percent	Cumulative Percent
11.00	3	4.9	5.5	5.5
12.00	1	1.6	1.8	7.3
13.00	3	4.9	5.5	12.7
14.00	2	3.3	3.6	16.4
15.00	3	4.9	5.5	21.8
16.00	2	3.3	3.6	25.5
17.00	3	4.9	5.5	30.9
18.00	6	9.8	10.9	41.8
19.00	2	3.3	3.6	45.5
20.00	8	13.1	14.5	60.0
21.00	4	6.6	7.3	67.3
22.00	5	8.2	9.1	76.4
23.00	5	8.2	9.1	85.5
24.00	1	1.6	1.8	87.3
25.00	5	8.2	9.1	96.4
27.00	1	1.6	1.8	98.2
28.00	1	1.6	1.8	100.0
Total	55	90.2	100.0	
System	6	9.8		
Total	61	100.0		

Appendix O: Chi-Squared Analysis for Individual Items

Chi-Squared for individual survey items comparing PA students, non-DCT medical students, and DCT medical student scores.

MC Question 1.

	PA	DCT	Non-DCT	***Row Totals***
Correct	9 (11.35) [0.49]	14 (4.68) [18.60]	38 (44.97) [1.08]	61
Incorrect	42 (39.65) [0.14]	7 (16.32) [5.33]	164 (157.03) [0.31]	213
Column Totals	51	21	202	**274 (Grand Total)**

The chi-square statistic is 25.9429. The P-Value is < 0.00001. The result is significant at $p < 0.05$.

MC Question 2A.

	PA	DCT	Non-DCT	***Row Totals***
Correct	28 (19.10) [4.15]	8 (7.71) [0.01]	65 (74.19) [1.14]	101
Incorrect	24 (32.90) [2.41]	13 (13.29) [0.01]	137 (127.81) [0.66]	174
Column Totals	52	21	202	**275 (Grand Total)**

The chi-square statistic is 8.3734. The P-Value is 0.015196. The result is significant at $p < 0.05$.

Question 2B.

	PA	DCT	Non-DCT	***Row Totals***

Correct	38 (35.99) [0.11]	22 (15.22) [3.02]	131 (139.79) [0.55]	191
Incorrect	14 (16.01) [0.25]	0 (6.78) [6.78]	71 (62.21) [1.24]	85
Column Totals	52	22	202	**276 (Grand Total)**

The chi-square statistic is 11.9514. The P-Value is 0.00254. The result is significant at $p < 0.05$.

MC Question 2C.

	PA	DCT	Non-DCT	***Row Totals***
Correct	35 (25.06) [3.94]	11 (10.60) [0.01]	87 (97.34) [1.10]	133
Incorrect	17 (26.94) [3.67]	11 (11.40) [0.01]	115 (104.66) [1.02]	143
Column Totals	52	22	202	**276 (Grand Total)**

The chi-square statistic is 9.7625. The P-Value is 0.007588. The result is significant at $p < 0.05$.

MC Question 3A.

	PA	DCT	Non-DCT	***Row Totals***
Correct	8 (5.12) [1.61]	1 (2.17) [0.63]	18 (19.71) [0.15]	27
Incorrect	44 (46.88) [0.18]	21 (19.83) [0.07]	182 (180.29) [0.02]	247

Column Totals	52	22	200	**274 (Grand Total)**

The chi-square statistic is 2.6527. The P-Value is 0.265444. The result is *not* significant at $p < 0.05$.

MC Question 3B.

	PA	DCT	Non-DCT	***Row Totals***
Correct	8 (11.62) [1.13]	21 (4.92) [52.63]	32 (44.47) [3.49]	61
Incorrect	44 (40.38) [0.32]	1 (17.08) [15.14]	167 (154.53) [1.01]	212
Column Totals	52	22	199	**273 (Grand Total)**

The chi-square statistic is 73.7217. The P-Value is < 0.00001. The result is significant at $p < 0.05$.

MC Question 3D.

	PA	DCT	Non-DCT	***Row Totals***
Correct	46 (31.24) [6.98]	5 (13.22) [5.11]	113 (119.55) [0.36]	164
Incorrect	6 (20.76) [10.50]	17 (8.78) [7.69]	86 (79.45) [0.54]	109
Column Totals	52	22	199	**273 (Grand Total)**

The chi-square statistic is 31.1622. The P-Value is < 0.00001. The result is significant at $p < 0.05$.

MC Question 4B.

	PA	DCT	Non-DCT	***Row Totals***
Correct	25 (24.49) [0.01]	20 (10.36) [8.96]	85 (95.14) [1.08]	130
Incorrect	27 (27.51) [0.01]	2 (11.64) [7.98]	117 (106.86) [0.96]	146
Column Totals	52	22	202	**276 (Grand Total)**

The chi-square statistic is 19.0099. The P-Value is 7.4E-05. The result is significant at p < 0.05.

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MC Question 5C.

	PA	DCT	Non-DCT	***Row Totals***
Correct	7 (5.44) [0.44]	7 (2.30) [9.58]	15 (21.25) [1.84]	29
Incorrect	45 (46.56) [0.05]	15 (19.70) [1.12]	188 (181.75) [0.22]	248
Column Totals	52	22	203	**277 (Grand Total)**

The chi-square statistic is 13.2489. The P-Value is 0.001328. The result is significant at p < 0.05.

MC Question 6A.

	PA	DCT	Non-DCT	***Row Totals***
Correct	31 (28.64) [0.19]	18 (12.12) [2.86]	103 (111.25) [0.61]	152
Incorrect	21 (23.36) [0.24]	4 (9.88) [3.50]	99 (90.75) [0.75]	124

Column Totals	52	22	202	**276 (Grand Total)**

The chi-square statistic is 8.1547. The P-Value is 0.016952. The result is significant at $p < 0.05$.

MC Question 6B.

	PA	DCT	Non-DCT	***Row Totals***
Correct	24 (16.20) [3.75]	5 (6.86) [0.50]	57 (62.94) [0.56]	86
Incorrect	28 (35.80) [1.70]	17 (15.14) [0.23]	145 (139.06) [0.25]	190
Column Totals	52	22	202	**276 (Grand Total)**

The chi-square statistic is 6.9945. The P-Value is 0.03028. The result is significant at $p < 0.05$.

T/F Question 1.

	PA	DCT	Non-DCT	***Row Totals***
Correct	25 (14.46) [7.67]	19 (5.68) [31.21]	26 (49.85) [11.41]	70
Incorrect	31 (41.54) [2.67]	3 (16.32) [10.87]	167 (143.15) [3.97]	201
Column Totals	56	22	193	**271 (Grand Total)**

The chi-square statistic is 67.8101. The P-Value is < 0.00001. The result is significant at p < 0.05.

T/F Question 2.

	PA	DCT	Non-DCT	***Row Totals***
Correct	22 (13.43) [5.47]	7 (5.28) [0.56]	36 (46.29) [2.29]	65
Incorrect	34 (42.57) [1.72]	15 (16.72) [0.18]	157 (146.71) [0.72]	206
Column Totals	56	22	193	**271 (Grand Total)**

The chi-square statistic is 10.9407. The P-Value is 0.00421. The result is significant at p < 0.05.

T/F Question 3.

The Chi-square statistic, P value and statement of significance appear beneath the table. Blue means you're dealing with dependent variables; red, independent.

	PA	DCT	Non-DCT	***Row Totals***
Correct	37 (40.50) [0.30]	22 (15.91) [2.33]	137 (139.59) [0.05]	196
Incorrect	19 (15.50) [0.79]	0 (6.09) [6.09]	56 (53.41) [0.13]	75
Column Totals	56	22	193	**271 (Grand Total)**

The chi-square statistic is 9.6856. The P-Value is 0.007885. The result is significant at p < 0.05.

T/F Question 4.

	PA	DCT	Non-DCT	***Row Totals***
Correct	16 (11.41) [1.85]	20 (4.48) [53.74]	19 (39.11) [10.34]	55
Incorrect	40 (44.59) [0.47]	2 (17.52) [13.75]	173 (152.89) [2.65]	215
Column Totals	56	22	192	**270 (Grand Total)**

The chi-square statistic is 82.7931. The P-Value is < 0.00001. The result is significant at $p < 0.05$.

T/F Question 5.

	PA	DCT	Non-DCT	***Row Totals***
Correct	53 (26.66) [26.03]	20 (10.47) [8.67]	56 (91.87) [14.01]	129
Incorrect	3 (29.34) [23.65]	2 (11.53) [7.87]	137 (101.13) [12.72]	142
Column Totals	56	22	193	**271 (Grand Total)**

The chi-square statistic is 92.9552. The P-Value is < 0.00001. The result is significant at $p < 0.05$.

T/F Question 6.

	PA	DCT	Non-DCT	***Row Totals***
Correct	53 (47.23) [0.70]	22 (18.89) [0.51]	156 (164.88) [0.48]	231
Incorrect	2 (7.77) [4.28]	0 (3.11) [3.11]	36 (27.12) [2.91]	38

Column Totals	55	22	192	**269 (Grand Total)**

The chi-square statistic is 11.9917. The P-Value is 0.002489. The result is significant at $p < 0.05$.

T/F Question 7.

	PA	DCT	Non-DCT	***Row Totals***
Correct	30 (19.84) [5.21]	21 (7.79) [22.38]	45 (68.37) [7.99]	96
Incorrect	26 (36.16) [2.86]	1 (14.21) [12.28]	148 (124.63) [4.38]	175
Column Totals	56	22	193	**271 (Grand Total)**

The chi-square statistic is 55.0883. The P-Value is < 0.00001. The result is significant at $p < 0.05$.

T/F Question 8.

	PA	DCT	Non-DCT	***Row Totals***
Correct	30 (21.08) [3.78]	16 (8.28) [7.20]	56 (72.64) [3.81]	102
Incorrect	26 (34.92) [2.28]	6 (13.72) [4.34]	137 (120.36) [2.30]	169
Column Totals	56	22	193	**271 (Grand Total)**

The chi-square statistic is 23.7107. The P-Value is < 0.00001. The result is significant at $p < 0.05$.

T/F Question 9.

	PA	DCT	Non-DCT	***Row Totals***
Correct	31 (24.85) [1.52]	17 (9.94) [5.01]	74 (87.21) [2.00]	122
Incorrect	24 (30.15) [1.25]	5 (12.06) [4.13]	119 (105.79) [1.65]	148
Column Totals	55	22	193	**270 (Grand Total)**

The chi-square statistic is 15.5693. The P-Value is 0.000416. The result is significant at $p < 0.05$.

T/F Question 10.

	PA	DCT	Non-DCT	***Row Totals***
Correct	51 (35.04) [7.27]	16 (14.01) [0.28]	105 (122.95) [2.62]	172
Incorrect	4 (19.96) [12.76]	6 (7.99) [0.49]	88 (70.05) [4.60]	98
Column Totals	55	22	193	**270 (Grand Total)**

The chi-square statistic is 28.0306. The P-Value is < 0.00001. The result is significant at $p < 0.05$.

T/F Question 11.

	PA	DCT	Non-DCT	***Row Totals***
Correct	36 (26.89) [3.09]	19 (10.76) [6.32]	77 (94.36) [3.19]	132
Incorrect	19 (28.11) [2.95]	3 (11.24) [6.04]	116 (98.64) [3.05]	138

Column Totals	55	22	193	**270 (Grand Total)**

The chi-square statistic is 24.6506. The P-Value is < 0.00001. The result is significant at p < 0.05.

T/F Question 12.

	PA	DCT	Non-DCT	***Row Totals***
Correct	19 (19.35) [0.01]	20 (7.74) [19.42]	56 (67.91) [2.09]	95
Incorrect	36 (35.65) [0.00]	2 (14.26) [10.54]	137 (125.09) [1.13]	175
Column Totals	55	22	193	**270 (Grand Total)**

The chi-square statistic is 33.1864. The P-Value is < 0.00001. The result is significant at p < 0.05.

T/F Question 13.

	PA	DCT	Non-DCT	***Row Totals***
Correct	42 (34.76) [1.51]	17 (13.90) [0.69]	111 (121.34) [0.88]	170
Incorrect	13 (20.24) [2.59]	5 (8.10) [1.18]	81 (70.66) [1.51]	99
Column Totals	55	22	192	**269 (Grand Total)**

The chi-square statistic is 8.367. The P-Value is 0.015245. The result is significant at p < 0.05.

T/F Question 14.

	PA	DCT	Non-DCT	***Row Totals***
Correct	7 (3.68) [2.99]	6 (1.47) [13.93]	5 (12.85) [4.79]	18
Incorrect	48 (51.32) [0.21]	16 (20.53) [1.00]	187 (179.15) [0.34]	251
Column Totals	55	22	192	**269 (Grand Total)**

The chi-square statistic is 23.2718. The P-Value is < 0.00001. The result is significant at $p < 0.05$.

T/F Question 15.

	PA	DCT	Non-DCT	***Row Totals***
Correct	15 (7.10) [8.77]	7 (2.79) [6.35]	12 (24.10) [6.08]	34
Incorrect	41 (48.90) [1.27]	15 (19.21) [0.92]	178 (165.90) [0.88]	234
Column Totals	56	22	190	**268 (Grand Total)**

The chi-square statistic is 24.2807. The P-Value is < 0.00001. The result is significant at $p < 0.05$.

16.

	PA	DCT	Non-DCT	***Row Totals***
Correct	18 (11.49) [3.68]	10 (4.51) [6.66]	27 (38.99) [3.69]	55
Incorrect	38 (44.51) [0.95]	12 (17.49) [1.72]	163 (151.01) [0.95]	213

Column Totals	56	22	190	**268 (Grand Total)**

The chi-square statistic is 17.6614. The P-Value is 0.000146. The result is significant at $p < 0.05$.

T/F Question 17.

	PA	DCT	Non-DCT	***Row Totals***
Correct	23 (15.10) [4.13]	15 (5.93) [13.86]	34 (50.97) [5.65]	72
Incorrect	33 (40.90) [1.53]	7 (16.07) [5.12]	155 (138.03) [2.09]	195
Column Totals	56	22	189	**267 (Grand Total)**

The chi-square statistic is 32.3663. The P-Value is < 0.00001. The result is significant at $p < 0.05$.

T/F Question 18.

	PA	DCT	Non-DCT	***Row Totals***
Correct	40 (34.69) [0.81]	18 (13.63) [1.40]	108 (117.69) [0.80]	166
Incorrect	16 (21.31) [1.32]	4 (8.37) [2.28]	82 (72.31) [1.30]	102
Column Totals	56	22	190	**268 (Grand Total)**

The chi-square statistic is 7.9208. The P-Value is 0.019055. The result is significant at $p < 0.05$.

T/F Question 19.

	PA	DCT	Non-DCT	***Row Totals***
Correct	40 (27.60) [5.57]	18 (11.04) [4.39]	76 (95.36) [3.93]	134
Incorrect	15 (27.40) [5.61]	4 (10.96) [4.42]	114 (94.64) [3.96]	133
Column Totals	55	22	190	**267 (Grand Total)**

The chi-square statistic is 27.8694. The P-Value is < 0.00001. The result is significant at $p < 0.05$.

T/F Question 20.

	PA	DCT	Non-DCT	***Row Totals***
Correct	49 (40.54) [1.77]	21 (15.93) [1.62]	124 (137.54) [1.33]	194
Incorrect	7 (15.46) [4.63]	1 (6.07) [4.24]	66 (52.46) [3.49]	74
Column Totals	56	22	190	**268 (Grand Total)**

The chi-square statistic is 17.0801. The P-Value is 0.000195. The result is significant at $p < 0.05$.

T/F Question 21.

	PA	DCT	Non-DCT	***Row Totals***

Correct	40 (26.54) [6.83]	17 (10.43) [4.15]	70 (90.04) [4.46]	127
Incorrect	16 (29.46) [6.15]	5 (11.57) [3.73]	120 (99.96) [4.02]	141
Column Totals	56	22	190	**268 (Grand Total)**

The chi-square statistic is 29.3378. The P-Value is < 0.00001. The result is significant at $p < 0.05$.

T/F Question 22.

	PA	DCT	Non-DCT	***Row Totals***
Correct	34 (21.32) [7.55]	14 (8.68) [3.25]	57 (75.00) [4.32]	105
Incorrect	20 (32.68) [4.92]	8 (13.32) [2.12]	133 (115.00) [2.82]	161
Column Totals	54	22	190	**266 (Grand Total)**

The chi-square statistic is 24.9838. The P-Value is < 0.00001. The result is significant at $p < 0.05$.

T/F Question 23.

	PA	DCT	Non-DCT	***Row Totals***
Correct	37 (28.10) [2.82]	18 (11.04) [4.39]	80 (95.86) [2.62]	135
Incorrect	19 (27.90) [2.84]	4 (10.96) [4.42]	111 (95.14) [2.64]	134
Column	56	22	191	**269 (Grand**

Totals				**Total)**

The chi-square statistic is 19.7228. The P-Value is 5.2E-05. The result is significant at p < 0.05.

T/F Question 24.

	PA	DCT	Non-DCT	***Row Totals***
Correct	27 (25.13) [0.14]	21 (10.05) [11.92]	74 (86.82) [1.89]	122
Incorrect	28 (29.87) [0.12]	1 (11.95) [10.03]	116 (103.18) [1.59]	145
Column Totals	55	22	190	**267 (Grand Total)**

The chi-square statistic is 25.6936. The P-Value is < 0.00001. The result is significant at p < 0.05.

T/F Question 25.

	PA	DCT	Non-DCT	***Row Totals***
Correct	34 (28.84) [0.92]	20 (11.54) [6.21]	86 (99.63) [1.86]	140
Incorrect	21 (26.16) [1.02]	2 (10.46) [6.85]	104 (90.37) [2.05]	127
Column Totals	55	22	190	**267 (Grand Total)**

The chi-square statistic is 18.9171. The P-Value is 7.8E-05. The result is significant at p < 0.05.

T/F Question 26.

	PA	DCT	Non-DCT	***Row Totals***
Correct	48 (30.09) [10.66]	21 (11.82) [7.13]	75 (102.09) [7.19]	144
Incorrect	8 (25.91) [12.38]	1 (10.18) [8.28]	115 (87.91) [8.35]	124
Column Totals	56	22	190	**268 (Grand Total)**

The chi-square statistic is 53.9824. The P-Value is < 0.00001. The result is significant at $p < 0.05$.

T/F Question 27.

	PA	DCT	Non-DCT	***Row Totals***
Correct	8 (7.37) [0.05]	3 (2.89) [0.00]	24 (24.74) [0.02]	35
Incorrect	48 (48.63) [0.01]	19 (19.11) [0.00]	164 (163.26) [0.00]	231
Column Totals	56	22	188	**266 (Grand Total)**

The chi-square statistic is 0.092. The P-Value is 0.955033. The result is *not* significant at $p < 0.05$.

T/F Question 28.

	PA	DCT	Non-DCT	***Row Totals***
Correct	20 (14.95) [1.71]	15 (5.87) [14.19]	36 (50.18) [4.01]	71
Incorrect	36 (41.05) [0.62]	7 (16.13) [5.17]	152 (137.82) [1.46]	195

Column Totals	56	22	188	**266 (Grand Total)**

The chi-square statistic is 27.1506. The P-Value is < 0.00001. The result is significant at $p < 0.05$.

Appendix P: Demographic Raw Data: Frequency, Percent, Valid Percent, and Cumulative Percent of All Demographic Items

Demographic Raw Data: Frequency, Percent, Valid Percent, and Cumulative Percent

Are you currently in the didactic or clinical phase of your PA education?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	didactic	25	41.0	45.5	45.5
	clinical	30	49.2	54.5	100.0
	Total	55	90.2	100.0	
Missing	System	6	9.8		
Total		61	100.0		

Have you ever taken an American Sign Language (ASL) class?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	6	9.8	10.9	10.9
	No	49	80.3	89.1	100.0
	Total	55	90.2	100.0	
Missing	System	6	9.8		
Total		61	100.0		

Have you ever worked with or used an American Sign Language (ASL) Interpreter?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	14	23.0	25.5	25.5
	No	41	67.2	74.5	100.0
	Total	55	90.2	100.0	
Missing	System	6	9.8		
Total		61	100.0		

Has there ever been a deaf or hard-of-hearing person in your social circle?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	17	27.9	30.9	30.9
	No	38	62.3	69.1	100.0
	Total	55	90.2	100.0	
Missing	System	6	9.8		
Total		61	100.0		

Are you aware that there is a deaf culture?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	49	80.3	89.1	89.1
	No	6	9.8	10.9	100.0
	Total	55	90.2	100.0	
Missing	System	6	9.8		
Total		61	100.0		

Appendix Q: Demographic Raw Data: Clinical phase versus Didactic phase

Demographic Raw Data: Clinical phase versus Didactic phase group statistics and independent tests

Group Statistics

	Are you currently in the didactic or clinical phase of your PA education?	N	Mean	Std. Deviation	Std. Error Mean
TOTALSCORE	didactic	25	18.3200	4.17053	.83411
	clinical	27	20.8519	3.59170	.69122

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
TOTALSCORE	Equal variances assumed	.543	.465	-2.351	50	.023	-2.53185
	Equal variances not assumed			-2.337	47.572	.024	-2.53185

Independent Samples Test

	t-test for Equality of Means		
	Std. Error Difference	95% Confidence Interval of the Difference	
		Lower	Upper

TOTALSCORE	Equal variances assumed	1.07701	-4.69508	-.36862
	Equal variances not assumed	1.08329	-4.71046	-.35324

Appendix R: Demographic Raw Data: ASL Class Exposure Item

Demographic Raw Data: ASL class exposure group statistics and independent tests

Group Statistics

	Have you ever taken an American Sign Language (ASL) class?	N	Mean	Std. Deviation	Std. Error Mean
TOTALSCORE	Yes	5	17.8000	4.14729	1.85472
	No	47	19.8298	4.03420	.58845

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
TOTALSCORE	Equal variances assumed	.197	.659	-1.067	50	.291	-2.02979
	Equal variances not assumed			-1.043	4.842	.346	-2.02979

Independent Samples Test

		t-test for Equality of Means		
		Std. Error Difference	95% Confidence Interval of the Difference	
			Lower	Upper
TOTALSCORE	Equal variances assumed	1.90200	-5.85006	1.79049
	Equal variances not assumed	1.94583	-7.08136	3.02178

Appendix S: Demographic Raw Data: ASL Interpreter Exposure Item

Demographic Raw Data: ASL interpreter exposure group statistics and independent tests

Group Statistics

	Have you ever worked with or used an American Sign Language (ASL) Interpreter?	N	Mean	Std. Deviation	Std. Error Mean
TOTALSCORE	Yes	14	20.7857	2.77845	.74257
	No	38	19.2105	4.38152	.71078

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
TOTALSCORE	Equal variances assumed	2.919	.094	1.251	50	.217	1.57519
	Equal variances not assumed			1.532	36.862	.134	1.57519

Independent Samples Test

		t-test for Equality of Means		
		Std. Error Difference	95% Confidence Interval of the Difference	
			Lower	Upper
TOTALSCORE	Equal variances assumed	1.25888	-.95334	4.10372
	Equal variances not assumed	1.02792	-.50784	3.65821

Appendix T: Demographic Raw Data: Deaf and HOH Person in Social Circle Item

Demographic Raw Data: Deaf and HOH person in social circle group statistics and independent tests

Group Statistics

	Has there ever been a deaf or hard-of-hearing person in your social circle?	N	Mean	Std. Deviation	Std. Error Mean
TOTALSCORE	Yes	16	19.3750	3.79254	.94813
	No	36	19.7500	4.20459	.70076

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
TOTALSCORE	Equal variances assumed	.645	.426	-.306	50	.761	-.37500
	Equal variances not assumed			-.318	31.798	.753	-.37500

Independent Samples Test

		t-test for Equality of Means		
		Std. Error Difference	95% Confidence Interval of the Difference	
			Lower	Upper
TOTALSCORE	Equal variances assumed	1.22749	-2.84049	2.09049
	Equal variances not assumed	1.17900	-2.77713	2.02713

Appendix U: Demographic Raw Data: Deaf Culture Awareness Item

Demographic Raw Data: Deaf culture awareness group statistics and independent tests

Group Statistics

	Are you aware that there is a deaf culture?	N	Mean	Std. Deviation	Std. Error Mean
TOTALSCORE	Yes	46	19.6739	3.97243	.58570
	No	6	19.3333	5.00666	2.04396

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
TOTALSCORE	Equal variances assumed	.227	.636	.192	50	.849	.34058
	Equal variances not assumed			.160	5.850	.878	.34058

Independent Samples Test

		t-test for Equality of Means		
		Std. Error Difference	95% Confidence Interval of the Difference	
			Lower	Upper
TOTALSCORE	Equal variances assumed	1.77427	-3.22315	3.90431
	Equal variances not assumed	2.12622	-4.89451	5.57567

Appendix V: Raw Data: Reliability

Reliability Raw Data: Raw data analysis for calculating reliability via Cronbach's Alpha

Scale: Deaf Culture t-f

Case Processing Summary

		N	%
Cases	Valid	55	90.2
	Excluded[a]	6	9.8
	Total	61	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.746	27

Item Statistics

	Mean	Std. Deviation	N
You are running considerably behind schedule. Your deaf patient is waiting with his/her interpret...	1.91	.776	55
ASL is a pictorial language that produces a word-for-word translation of what is being said in En...	1.89	.567	55
The majority of hearing parents with deaf children never learn to sign.	1.91	.646	55

When communicating with a deaf patient through an interpreter, you should face the interpreter an...	1.96	.189	55
Trying to help cure your patient's deafness should be your top priority.	2.00	.192	55
Because deaf people rely upon printed forms of information, their literacy is equal to or better...	1.91	.674	55
A good interpreter will be able to step out of his/her interpreting role in order to explain to t...	1.80	.678	55
When there is a dominant source of light, such as a window, your deaf patient should be seated wi...	1.78	.917	55
For an infant, there is very little that can be done to improve an infant's hearing due to its age.	2.11	.315	55
When speaking to a deaf patient through an interpreter you should speak each word very slowly, to...	1.84	.536	55
For most members of the deaf community, English is their primary language.	2.15	.803	55
When a deaf patient is hospitalized, the entire staff should be notified that the patient is deaf.	1.35	.673	55
When hiring an interpreter, the minimum time per session is two hours.	2.53	.690	55

At the end of the health care visit, the interpreter should again review the information with the...	1.65	.775	55
Early in the conversation, your patient mentions to you that he has Usher's syndrome. This inform...	2.20	.951	55
Deaf patients generally do not participate in support groups such as those that help patients cop...	1.75	.726	55
On average, deaf patients report that they are unable to convey adequate information to their doc...	1.49	.767	55
Less than 50% of physicians who have deaf patients use a certified interpreter.	1.56	.877	55
Working with other minority and/or disabled population will adequately prepare a physician to wor...	1.98	.304	55
Ninety percent of deaf people have hearing parents.	1.60	.915	55
If a child is found to have a hearing loss, you should also refer the child to an optometrist.	1.56	.788	55
It is the patients' responsibility to schedule the interpreter if they think one will be needed.	2.07	.573	55
You have complicated surgical information to communicate to a deaf patient, so it would be wise t...	1.71	.629	55

If the patient requests an interpreter for a visit with their health care provider, it is the pat...	2.18	.580	55
If a deaf patient requests an interpreter, you may ask your nurse, who has taken several semester...	2.07	.378	55
If you suspect hearing loss in an infant, you should make a note to recheck the infant's hearing...	1.29	.599	55
The American Disabilities Act requires an interpreter to be present whether the patient wants one...	2.09	.800	55

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
You are running considerably behind schedule. Your deaf patient is waiting with his/her interpret...	48.44	37.732	.548	.718
ASL is a pictorial language that produces a word-for-word translation of what is being said in En...	48.45	42.438	.109	.747
The majority of hearing parents with deaf children never learn to sign.	48.44	40.028	.381	.732
When communicating with a deaf patient through an interpreter, you should face the interpreter an...	48.38	43.166	.146	.745

Trying to help cure your patient's deafness should be your top priority.	48.35	43.490	.015	.748
Because deaf people rely upon printed forms of information, their literacy is equal to or better...	48.44	39.658	.406	.730
A good interpreter will be able to step out of his/her interpreting role in order to explain to t...	48.55	41.104	.230	.741
When there is a dominant source of light, such as a window, your deaf patient should be seated wi...	48.56	40.917	.154	.750
For an infant, there is very little that can be done to improve an infant's hearing due to its age.	48.24	41.888	.387	.738
When speaking to a deaf patient through an interpreter you should speak each word very slowly, to...	48.51	42.106	.168	.744
For most members of the deaf community, English is their primary language.	48.20	39.126	.377	.731
When a deaf patient is hospitalized, the entire staff should be notified that the patient is deaf.	49.00	41.074	.236	.741
When hiring an interpreter, the minimum time per session is two hours.	47.82	39.966	.358	.733
At the end of the health care visit, the interpreter should again review the information with the...	48.69	41.366	.160	.747

Early in the conversation, your patient mentions to you that he has Usher's syndrome. This inform...	48.15	41.090	.129	.752
Deaf patients generally do not participate in support groups such as those that help patients cop...	48.60	39.800	.354	.733
On average, deaf patients report that they are unable to convey adequate information to their doc...	48.85	40.275	.278	.738
Less than 50% of physicians who have deaf patients use a certified interpreter.	48.78	38.396	.405	.729
Working with other minority and/or disabled population will adequately prepare a physician to wor...	48.36	42.939	.134	.745
Ninety percent of deaf people have hearing parents.	48.75	37.193	.496	.720
If a child is found to have a hearing loss, you should also refer the child to an optometrist.	48.78	38.840	.418	.728
It is the patients' responsibility to schedule the interpreter if they think one will be needed.	48.27	41.721	.205	.742
You have complicated surgical information to communicate to a deaf patient, so it would be wise t...	48.64	42.051	.137	.746
If the patient requests an interpreter for a visit with their health care provider, it is the pat...	48.16	40.288	.399	.732

If a deaf patient requests an interpreter, you may ask your nurse, who has taken several semester...	48.27	42.461	.195	.743
If you suspect hearing loss in an infant, you should make a note to recheck the infant's hearing...	49.05	42.978	.029	.752
The American Disabilities Act requires an interpreter to be present whether the patient wants one...	48.25	39.267	.365	.732

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
50.35	43.564	6.600	27