Assessing Medical Students' Knowledge of the Deaf Culture and Community in Puerto Rico: A Descriptive Study

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ABSTRACT

BACKGROUND: Effective communication between health care professionals and Deaf and Hard of Hearing (D&HH) patients remains a challenge. Literature regarding health professionals' knowledge of the D&HH community and their barriers toward health care access is limited in Puerto Rico and suggests a need for research. Therefore, this descriptive study aims to evaluate future physician's knowledge about the Deaf culture and community in a student cohort at San Juan Bautista School of Medicine (SJBSM), with the objective of guiding our results toward improving our curriculum.

METHODS: Medical students answered a survey to evaluate their knowledge of D&HH patients. The survey consisted of 3 parts testing awareness, exposure, and knowledge of the Deaf community. Responses from the Knowledge section were graded using an answer key, and correct answers were added to create an overall continuous sum score per participant, with higher scores meaning higher knowledge. Participants were also asked to write in possible issues deaf patients may face when hospitalized, apart from communication problems. All data were recorded and used for descriptive analysis.

RESULTS: 158 (68%) medical students participated. 63% reported exposure to D&HH people, and 80% were aware of the Deaf culture. 21% of students answered to have attended an American Sign Language (ASL) class, and 86% expressed interest in taking an ASL class. The overall percentage of correct answers from all the medical groups evaluated was 39%, with increasing percent knowledge as medical student year increased. The most frequently listed problem by respondents that deaf patients may face when hospitalized was dealing with an emergency in the hospital, such as the fire alarm.

CONCLUSION: Students from clinical years (MSIII & MSIV) showed a better understanding of the Deaf culture than students in pre-clinical years (MSI & MSII). Nevertheless, the knowledge was limited in all groups. The information generated is not only valuable for our school but the healthcare community as well. The literature related to Deaf culture, particularly in the medical setting in Puerto Rico, is limited. Therefore, there exists a need to continue investigating ways to improve medical students' education of the Deaf culture and community.

KEYWORDS: Deaf community, medical students, medical education, deafness, deaf and hard of hearing

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Background

Hearing impairment is a growing disability in the world that comes with its own set of challenges and changes. According to the World Health Organization, an estimate of 466 million persons in the world live with hearing disabilities, a number that is expected to increase over the years.[1] In Puerto Rico, 4.3% of the population suffer from a hearing disability and face challenges with daily activities and access to healthcare services.[2] Moreover, a 2020 CDC update reported that 7% of the population in Puerto Rico was suffering from deafness or serious difficulty in hearing compared to 5.6% of the population in the USA.[3] Individuals with a Puerto Rican background were associated with the highest prevalence of hearing difficulty when compared to other Latino groups in the USA.[4] According to the authors, the participants of Puerto Rican background had high-risk factors such as diabetes, prediabetes, exposure to loud noise, lower education, and low income, and these were associated with increased hearing difficulties. However, they could not prove cause and effect and recommended that longitudinal studies be performed to address this association.[4] Access to health care for Deaf and Hard of Hearing (D&HH) patients has proven to be a global challenge.[5-8] One study found that D&HH individuals were afraid of miscommunication with their physician and preferred the use of an interpreter.[9] Moreover, hospitals and health care systems in 30 countries had access to a qualified sign language interpreter; however, the availability of those interpreter services was still limited.[6,8,10] Here in Puerto Rico, limited interpreter access also exists, with interpreters having not received adequate training to be certified sign language interpreters.[11] As a response, many countries have started increasing access to more sign language interpreters via online or remote services. France, the USA, the UK, Spain,

and Japan have reported ease of communication with D&HH patients with these online and remote services, leading to improved patient-physician satisfaction and increased preventive care outcomes.[8] Still, the use of these technologies comes with challenges such as lack of personal interaction as well as misinterpretation of the patient's concerns or responsiveness during an emergency.[12] These communication difficulties may cause delays in healthcare for Deaf patients and they might wait until their condition worsens to utilize emergency services or see a specialist.[13] The delay in seeking medical care places deaf individuals at higher risk factors for cardiovascular disease, hypertension, diabetes, and depression.[7]

A successful therapeutic doctor-patient relationship is achieved when effective communication allows the physician to obtain the appropriate information to arrive at an accurate diagnosis and treatment plan.[14] D&HH patients rely on sign language to communicate. Still, most health care providers do not know sign language, which can result in increased language difficulties and jeopardize adequate access to health care for these individuals.[15-17] This, in turn, may pose an issue toward effective communication between health care providers and D&HH patients and may be a violation of their rights per the Americans with Disabilities Act.[18]

Both the National Academy of Medicine and the American Medical Association have recognized the need for awareness and understanding of the cultural differences that influence the quality of health care provided for D&HH patients.[19,20] Although medical students are taught the importance of effective communication with patients from the beginning of their training many students do not have the basic skills to communicate with D&HH patients.[21,22] Incorporating awareness of communication with the D&HH patients in medical education can help to meet the specials needs of this community.[10]

Some US medical schools have made efforts to increase cultural competency of the D&HH community in the medical school curriculum.[21] Students from Kirksville College of Osteopathic Medicine were provided with a 4-hour deaf culture competency and ASL workshop which showed increased knowledge and reported confidence in interacting with the Deaf community.[23] In a UK study, medical students who completed a deaf awareness and basic sign language module showed improved attitudes toward deaf individuals and higher knowledge scores than the control group.[24] This proved to be an effective mechanism for improving attitudes toward deaf individuals and improving student's knowledge; also, this indicated the value of dedicated deaf awareness training. First and second year medical students at Dalhousie University in Canada had workshops on deafness and hearing impairments along with group discussions.[22] These workshops were conducted in an effort to increase awareness among medical educators about the needs of teaching future physicians and the Deaf. Therefore, education of Deaf culture within medical school curricula has been found in the literature;[21,24,25-29] however, none have been specifically reported in Puerto Rico.

San Juan Bautista School of Medicine (SJBSM) is one of four LCME accredited medical schools in Puerto Rico with a majority Hispanic population. The school distinguishes itself by providing a strong education focused on developing and integrating students' skills and competencies in community-based practice. Students, faculty, and staff are engaged in community activities that promote the well-being of underserved populations such as women, the elderly, the homeless, and children. We, therefore, serve several vulnerable populations in our community and recognize that our encounter with the D&HH community can be strenghthen. With an estimated 150,000 to over 200,000 hearing-impaired individuals on the island,[3,30,31] knowledge and effective communication with the D&HH community is important for future health professionals and poses a need to be addressed. As such, our aim in this preliminary study was to assess medical students' knowledge and awareness of Deaf culture and community at our School of Medicine, with the objective of guiding our results toward improving the curriculum.

Methods

Study design

A descriptive study using a questionnaire-based survey was given to medical students from San Juan Bautista School of Medicine, Caguas, Puerto Rico. The survey from "Assessing Deaf Cultural Competency of Physicians and Medical Students"[27] was selected after our literature search because it resembled the primary aim of our study. Permission was obtained from the authors and the survey was only modified to add in a demographics section. The survey is composed of 3 sections: (1) demographic information in relation to our study population such as age, gender, and year of study; (2) 5 yes-or-no questions assessing user experience; (3) knowledge questions with 6 multiple-choice questions and 28 true-false questions, each with a "don't know" option. Questions included commonly held misperceptions of deafness and Deaf culture, common difficulties experienced by deaf patients in the clinical settings, errors commonly made by providers working with interpreters in the clinical setting, and the participants' prior exposure to the Deaf community. The survey also had a free-response question asking participants to list 5 problems that they consider hospitalized deaf patients might face. This section specified to include answers other than issues communicating with the physician or answering the phone. The study was approved by the San Juan Bautista School of Medicine Institutional Review Board (EMSJB-5-2018).

Recruitment and survey implementation

SJBSM medical students from all 4 years (MSI, MSII, MSIII, MSIV) were invited to complete a confidential and anonymous questionnaire from April 19, 2018 through June 22, 2018. Study participation was completely voluntary, and no compensation was offered to those who completed the survey. Students from the first, second, and third years were asked to

Table 1. Demographics of SJBSM medical student participants.

	MSI % (N)	MSII % (N)	MSIII % (N)	MSIV % (N)	TOTAL % (N)
Sex					
Male	52 (25)	37 (20)	57 (26)	45 (5)	48 (76)
Female	48 (23)	63 (34)	43 (19)	55 (6)	52 (82)
Age					
18-22	19 (9)	-	-	-	6 (9)
23-27	79 (38)	91 (49)	78 (35)	45 (5)	80 (127)
28+	2 (1)	9 (5)	22 (10)	55 (6)	14 (22)
Total Participants	48	54	45	11	158

Table 2. SJBSM medical students' experience with deaf culture.

	MSI % (N)	MSII % (N)	MSIII % (N)	MSIV % (N)	TOTAL % (N)
1. Have you ever had exposure to deaf or hard-of-hearing people?	58 (28)	61 (33)	69 (31)	73 (8)	63 (100)
2. Has there ever been a deaf or hard-of-hearing person in your social circle?	21 (10)	33 (18)	16 (7)	27 (3)	24 (38)
3. Are you aware that there is a Deaf culture?	83 (40)	72 (39)	82 (37)	91 (10)	80 (126)
4. Have you ever taken an American Sign Language (ASL) class?	23 (11)	11 (6)	29 (13)	27 (3)	21 (33)
5. Have you ever wanted to take an ASL class?	92 (44)	83 (45)	84 (38)	82 (9)	86 (136)

fill out a paper questionnaire on 3 designated dates following their end-of-block exam. A block represents a specific section of a course or rotation. The block exams in the first and second years are after each organ system is covered and in the third year, the exams are at the end of a clinical rotation. These dates were chosen to allow for a higher participation rate as all students had to take their end-of-block exam on those given dates, thus increasing the likelihood of targeting all students for participation in the study. Given the likelihood of external rotations in the fourth year, MSIV students were recruited via email with a link to the electronic-version of the questionnaire (Google Forms). All willing participants provided their signed consent prior to the start of the survey, and returned surveys were de-identified by using only a number for record tracking and data collection purposes. All documents were retained by a single investigator (SC) and only available for investigators to view on campus.

Data collection and analysis

All responses were stratified by class and recorded using Microsoft Excel 2012. The Knowledge section was graded and measured in a manner similar to Hoang et al.[27] Each participant's responses were graded using an answer key provided with the original questionnaire. We added the responses to create an overall continuous sum score per participant, meaning higher scores indicated greater knowledge. A binary coding system (1 = correct, 0 = incorrect) was used to record results and percent correct was calculated for each question set and by medical student year. Results were measured using univariate descriptive statistics (frequencies, percent distributions, mean, median, mode, and standard deviation). Each of the free-response answers was individually recorded and later grouped based on commonalities in the answers' general themes (Table 3). For example, responses such as anger, sadness, frustration, etc., were grouped as emotion. The data was analyzed based on frequency of responses.

Results

A total of 158 (69%) SJBSM medical students participated in the survey (Table 1). The second section of the questionnaire comprises yes/no answers related to their experience with the Deaf culture (Table 2). The results presented in this table are those students that answered yes to the questions. When asked about student experience with Deaf culture, 63% of all participants reported having exposure to D&HH people and 24% reported having a D&HH person in their social circle (Table 2). 80% of respondents were aware of a Deaf culture, with MSIV students having the highest percentage awareness. Collectively, 21% of the medical students had taken an ASL class, and 86% expressed wanting to take an ASL class.

Table 3. Issues hospitalized deaf patients may experience.

- Emergency (fire alarms, codes, announcements)*
- Emotions (anxiety, depression, isolation, fear, confusion, frustration)**
- Lack of interpreter***
- Privacy issues
- Discrimination by health providers and patients
- Communication problems
- Issues with non-trained ASL health care professionals
- Information loss upon an exchange with medical staff
- Lack of understanding of medical condition therapy
- Disorientation to time
- Problem communicating need
- Autonomy not respected

*Most common response.
**Second most common response.
***Third most common response.

For the knowledge sections, (6 multiple-choice questions and 28 true-false questions), the overall percentage of correct answers in our total study population was 39% (see supplementary material). In the overall score, SJBSM students showed an increase in the percent correct score with each academic year, such that MSI students scored lowest and MSIV students scored highest. MSI students scored 34% in the knowledge of Deaf culture, while MSII, MSIII, and MSIV students scored 38%, 43%, and 46%, respectively. For the correct responses to the 6 multiple-choice questions. The medical students answered correctly, with a more than 75% rate in 3 of the 6 knowledge areas. In comparison, in the other 3, they scored less than 40% correct, with cochlear implant the lowest score of correct (8%) and 14% for what to do if they had a deaf couple who refuse to have their newborn baby's hearing tested.

The responses obtained from the 28 true-false questions showed that 19 areas of knowledge of deaf culture were below 50% accurate. Lastly, students had the opportunity to write in five (5) problems a deaf person may have when hospitalized. Table 3 presents the most frequently reported answers regarding possible issues hospitalized deaf patients may experience in addition to communication problems with health professionals.

Discussion

Overall, we found that most medical students in our study had an awareness of the existence of the Deaf culture and community. Still, only 63% had previous exposure to this community. Students in the clinical years (MSIII and MSIV) reported more exposure to D&HH people over students in the pre-clinical years (MSI and MSII). This difference in exposure is likely due to the greater exposure to patients in clinical rotations during MSIII and MSIV at our institution. Although only 21% of participants from all 4 classes reported taking a sign language class in the past, a large portion of the student community expressed an interest in taking an ASL class. These results provided useful information to our medical school to support additional learning opportunities in our current curriculum so that our medical graduates may acquire the knowledge and skills to better address the health needs of D&HH populations.

With the overall knowledge section scores less than the 50th percentile, our medical students showed limited knowledge of the Deaf community and their health needs, similar to findings reported by Hoang et al.[27] Although the MSIV showed a higher percentage of knowledge compared to their peers, the sample size was far less than other classes. It is also possible that these respondents had more awareness and exposure to the Deaf community because they had more clinical experience. Previous studies have reported an increase in knowledge scores for those who have completed sign language courses or education about the deaf community.[22,23,27] Gilmore et al. reported that medical students who completed sign language courses had a higher knowledge score in the questionnaire assessment and a more positive attitude toward the Deaf culture community. Lapinski et al found increased scores from pretest to posttest after attending a 4-hour workshop, as well as increased confidence when interacting with the Deaf patients. In our preliminary study, our students scored less than 50% correct in the knowledge section, showing that our students could benefit from more exposure to Deaf culture, especially since hearing impairment is a growing disability in the world.

Through the evaluation of the open-ended responses, it became clear that despite a minimum exposure to this community, students could point out a variety of problems that a deaf patient might encounter in the healthcare setting. The third most common response was the lack of interpreters, a very valid concern in our daily life in Puerto Rico. According to Rivera, K.Y., the majority of interpreters work primarily in educational and video relay services, which makes their availability for medical healthcare centers limited.[11] This shortcoming raises the concern if it is necessary to add American Sign Language (ASL) classes to the curriculum of medical schools, which we believe it would be in the best interest and beneficial to the D&HH community.

Even though our study focused on providing initial descriptive data to understand our medical students' knowledge and awareness of the Deaf culture community, we propose to expand this preliminary study to include the other 3 medical schools in Puerto Rico to advance the knowledge and future practice of medical graduates. Our current results have helped guide considerations of incorporating Deaf culture into the curriculum to diversify our students' medical education. As such, SJBSM is committed to initiating strategies to improve competencies by offering a workshop on basic sign language communication and knowledge of the D&HH culture to students of all programs of our institution; Medicine, Nursing, Public Health, and Physician Assistant. A pre/post assessment accompanying this workshop will be offered to expand on the outcomes of work posted in this article.

Further analysis is necessary to identify when would be the most compelling moment in which to include D&HH topics in the curriculum to improve medical students' knowledge. As of this time, deaf awareness training is available in many countries but differs among medical schools. Despite these resources

being available at many medical schools worldwide, none have been standardized and permanently established in the medical curriculum. Given that communication with healthcare providers is challenging for D&HH patients, it would be prudent to provide deaf awareness/communication training as part of the standard medical curriculum. It is well known that without proper training, medical students lack the knowledge and competency related to Deaf culture needed to provide adequate healthcare to this patient population.[22,27]

Conclusion

This study describes the future physician's knowledge and awareness of Deaf culture and community in a student cohort at SJBSM in Puerto Rico. Our findings support the need to identify strategies and create opportunities in the medical curriculum to improve students' knowledge of Deaf culture. We believe that by understanding that the deaf community has unique social, linguistic, and cultural needs, this will help physicians to better target diversity issues in the health care environment.

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Authors' Contributions

YH conceived the project topic. MK, AL, LR, VC, and YH were aided by YD in designing the study and in analysis of data and interpretation. SC supervised and approved project design, the main conceptual ideas, and proof outline. MK, AL, LR, VC, and YH were highly active in data gathering and wrote the paper with input from all authors. All authors read and approved the final manuscript.

Ethics Approval and Consent to Participate

This study was reviewed by the San Juan Bautista School of Medicine Institutional Review Board (SJBSM IRB) and approved for investigation, IRB# EMSJB-5-2018. Consent was obtained prior to study and all ethical standards and considerations were followed.

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Supplemental material

Supplemental material for this article is available online.

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