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ORIGINAL RESEARCH

Promoting Arabic Sign Language Skills Among Dental Students

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Purpose: While the services available to deaf people in the Middle East have yet to be documented, they need improvement in several countries. The aim of this article was to reduce miscommunication between dentists and deaf patients through the introduction of an optional sign language course for pre-doctoral students and faculty of dentistry at King Abdulaziz University (KAUFD).

Patients and Methods: All fourth-year pre-doctoral students were invited to participate in an Arabic sign language course. A survey with 11 multiple choice and 38 true/false questions with an "I don't know" option was distributed, both before and two weeks after the course. This survey was extensively validated and pilot-tested before distribution.

Results: The response rate was 141 students (84.9%), 49 of which were males (34.8%) and 92 of which were females (65.2%). The pre-doctoral students had a higher overall knowledge score (mean 22.9±14.8) and sign language skills (11.1±1.7) after the course compared to before the course (9.8±7.1, and 3.7±3.3, respectively) (all P-value <0.001). All the pre-course individual questions had lower scores compared to the post-course questions (P-value <0.05).

Conclusion: Deaf people might face difficulties communicating at dental health care clinics, which may be improved by equipping dentistry providers with cultural competency training, like this course.

Keywords: Deaf, sign language, Arabic, dental students

Introduction

Out of the 350 million people in the Middle East, more than 11 million have a disabling hearing loss.[1] This number is comparable to other regions, such as North America, which has approximately 8.8 million.[2] However, while the services available to deaf people in the Middle East have yet to be documented, improvement is needed in several countries. For example, in California (United States), there is one sign language interpreter for every 46 hearing-impaired individuals; meanwhile, in Saudi Arabia, there is one interpreter for approximately every 93,000 hearing-impaired individuals.[1]

The problem is that most of the physicians and dentists are not adequately prepared to deal with deaf patients.[3] In fact, the majority lack the knowledge and skills required in dealing with the deaf community and understanding their rights,[4–6] despite it being documented that sign language can improve deaf patients oral hygiene and overall health.[7]

An inability to communicate effectively with deaf patients can lead to misdiagnosis and neglect,[8–10] as well as potential lawsuits.[11] As a consequence, primary medical and dental care for deaf patients was significantly reduced compared with regular patients.[12] For these reasons, several efforts (eg, the Brazilian sign language booklet and the Disability Equality Training [DET]) have been conducted to facilitate the communication between dentists and deaf patients.[13] However, it was also recommended that a sign language course be included as a way to improve such programs as DET at the University of Malaya.[14] The only currently available program of note was conducted at the University of the West Indies (UWI) in Mona, Jamaica, and it received positive feedback due to its uniqueness.[9]

While efforts to increase deaf sign language training in the Middle East still need to be improved, several have been conducted. For example, Saudi Arabia recently produced the first-ever Saudi Sign Language Dictionary.[1] In this article, the authors are presenting another effort to improve dentists' knowledge by introducing an optional sign language course for the

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pre-doctoral students and faculty of dentistry at King Abdulaziz University (KAUFD). The course's goal is to reduce the miscommunication between dentists and deaf patients, resulting in better dental care, and to produce dentists equipped with the information and skills required to deal with deaf patients. The aims of this article were to evaluate and improve dental students' knowledge about deaf patients, as well as to provide a new short dental course on sign language.

Materials and Methods

Hypothesis

After taking the course, the dental students will have a higher understanding and a more knowledgeable attitude toward deaf culture and deaf patients when compared to before the course.

Intervention

KAUFD developed the Arabic sign language course to help students know and manage the oral health care of deaf patients. The students spent a total of four hours during one-week period in the beginning of the fall semester in the course, which was optional and conducted entirely at the dental school. The students were asked to attend a didactic component in class about the rights of deaf patients and Arabic sign language, which consisted of lectures (one hour), discussion of deaf patient rights cases (one hour), and interaction with the dentist who taught them the sign language (one hour), followed by the mastering of self-paced reading materials that provided more details about deaf rights and sign language (one hour). The total course was four hours. The teacher was a dentist who was certified in sign language and had a booklet about Arabic sign language in the dental clinic. The pre-doctoral program at KAUFD is six-years in total—this course was established for fourth-year students (the year in which students start their clinical practice).

Study Design

This study is a quasi-experiment and all fourth-year pre-doctoral students were invited to participate. The course was approved as a pilot course by the vice dean of development. It was a convenience sample and it was approved by the ethical committee at KAUFD (# 294-10-21). A survey with 11 multiple choice and 38 true/false questions with an "I don't know" option was distributed, both before and two weeks after the course. The consent form was placed at the beginning of the electronic survey page and, combined with the returned surveys, served as sufficient evidence of participant approval. The link between the two surveys was the student ID number. To keep the survey short, the only demographic information obtained was gender. The survey questions were formed based on a published survey of a deaf training program,[15] which was established based on the literature review[3–5,8–10] and the investigator's prior knowledge. This survey was extensively validated and pilot-tested before distribution. The original English questionnaires were validated. It was translated and cultural adapted to Arabic using forward translation by official paid transitional office, checking discrepancies, then back translation by another official paid transitional office and reviewed by the investigator, then was pre tested on 5 fifth year students for their feedback.

Questions were related to (1) the most common misperceptions of deaf culture, (2) the most common difficulties facing deaf patients in the dental clinic, (3) the most common errors when dentists work with an interpreter in the dental clinic, and (4) the most common sign language used in the dental clinic. All sections were evaluated using Cronbach's alpha and the values were ranged between 0.79 and 0.87.

Recruitment of Participants

In the second week of September, the survey was sent via Google Forms to 166 fourth-year pre-doctoral students from the class cycle of 2018–2023. They were instructed to complete and return one survey before the course, and then to complete and return another two weeks after completing the course. They understood that participation was voluntary and that the course was not graded.

Data Analysis

All data were analyzed using SPSS version 21. Responses of each question were summed to create an overall frequency and percentage. A binary coding system (1=correct, 0=incorrect) was used for all items. An answer of "I don't know" was considered an incorrect answer. The Knowledge Sum score was analyzed using a paired *t*-test after checking the normality distribution. Each question was analyzed using McNemar to compare knowledge before and after the course. A significant difference is described as a P-value less than 0.05.

Results

Description of the Sample

Of the 166 surveys returned, 25 were removed because respondents did not take the course. The response rate was 141 students (84.9%), 49 of which were males (34.8%) and 92 of which were females (65.2%).

Overall Knowledge Score

The pre-doctoral students displayed evidence of a higher overall knowledge score after the course (mean 22.9±14.8, range 12 to 51) compared to before the course (mean 9.8±7.1, range 0 to 29) (P-value <0.001) (Table 1). Table 1 shows the cumulative scores before and after the course, as well as the scores broken down by individual questions.

Table 1 Frequency and Percentage of Correct Answer of Awareness and Knowledge About Deaf Patients

Awareness and Knowledge About Deaf Patients	Before N=141	After N=141	*P* value^
Overall (mean ± SD)	9.8±7.1	22.9±14.8	<0.001*
Arabic language can be accurately lip read	28(19.9)	78(55.3)	<0.001*
The interpreter should wait with the patient until the dentist ready	5(3.5)	83(58.9)	<0.001*
Arabic Sign Language need word-for-word translation	28(19.9)	71(50.4)	<0.001*
Parents with deaf children never learn to sign	13(9.2)	60(42.6)	<0.001*
Dentist should face the interpreter and explain to the interpreter	40(28.4)	87(61.7)	<0.001*
Help cure patient's deafness should the top priority	44(31.2)	59(41.8)	0.029*
Deaf people literacy is equal to or better than the general public	11(7.8)	42(29.8)	<0.001*
A good interpreter will be able to step out of his/her interpreting role in order to explain	12(8.5)	43(30.5)	<0.001*
When there is a source of light, your patient should be seated with his back to the light source	16(11.3)	85(60.3)	<0.001*
There is very little that can be done to improve an infant's hearing due to its age	21(14.9)	53(37.6)	<0.001*
You should speak each word very slowly, to allow the interpreter to sign or fingerspell your words	20(14.2)	41(29.1)	0.001*
For most members of the deaf community, Arabic is their primary language	33(23.4)	77(54.6)	<0.001*
When a deaf patient is hospitalized, the entire staff should be notified that the patient is deaf	74(52.5)	122(86.5)	<0.001*
At the end of the dental visit, the interpreter should again review the information with the patient	61(43.3)	94(66.7)	<0.001*
Deaf patients generally do not participate in support groups. The main reason for this is due to the language barrier	26(18.4)	77(54.6)	<0.001*
On average, deaf patients report that they are unable to convey adequate information to their doctors	38(27.0)	106(75.2)	<0.001*
Most of the dentists who have deaf patients use a certified interpreter	29(20.6)	82(58.2)	<0.001*
Ninety percent of deaf people have hearing parents	17(12.1)	51(36.2)	<0.001*
If a child have a hearing loss, you should him to an optometrist	12(8.5)	69(48.9)	<0.001*
It is the patients' responsibility to schedule the interpreter if they think one will be needed	32(22.7)	46(32.6)	<0.001*
In complicated surgical information, it would be better to tell the patient to bring along someone to assist with the interpretation	30(21.3)	32(22.7)	0.003*
It is the patients' responsibility to pay for the interpreter if he need	14(9.9)	53(37.6)	<0.001*
If a deaf patient requests an interpreter, you may ask your nurse, who has taken several semesters of Arabic Sign Language classes, to interpret for the consultation	9(6.4)	25(17.7)	0.002*
If you suspect hearing loss in an infant, you should make a note to recheck the infant's hearing on the next visit	7(5.0)	19(13.5)	0.027*
American Disabilities Act requires an interpreter be present whether the patient wants one or not	5(3.5)	39(27.7)	<0.001*

Notes: ^*P* value were calculated using McNemar test; **P* value < 0.05.

Individual Question Score

All the pre-course questions had lower scores compared with the post-course questions (Tables 1–3). Specifically, students had very low scores (<10% correct answers) when it came to how to deal with the interpreter (3.6%), a parent with deaf children (9.2%), deaf literacy (7.9%), the role of the interpreter (9.2%), using a nurse as an interpreter (6.4%), re-evaluating an infant's hearing on the next visit (5.7%), and the American Disabilities Act (3.6%). All these questions were improved after the course was completed (all P-value <0.05).

Discussion

Published articles have shown that deaf patients experience difficulties when accessing medical care.[1,2,4,5,9,10,15,16] The challenges deaf patients face in dental clinics have yet to be fully investigated,[9] and the difficulties they experience regarding dental services in the Middle East are unknown. However, establishing programs and training courses may improve dentists' knowledge, awareness, and skills when dealing with this group of patients.[9–11,16] The KAUFD course

Table 2 Frequency and Percentage of Correct Answer of Clinical Scenario

Clinical Scenario	Before N=141	After N=141	*P* value^
Overall (mean ± SD)	2.0±2.9	8.9±3.2	<0.001*
In a medical setting, deaf patient can express a preference for a particular interpreter	30(21.3)	65(46.1)	<0.001*
In a medical setting, it is the right of the deaf patient to be provided with an interpreter by the practitioner	24(17.0)	61(43.3)	<0.001*
In a medical setting, it is the right of the deaf patient to determine how much personal information he/she wants to disclose in an interpreted situation	25(17.7)	63(44.7)	<0.001*
The dental clinic has arranged for you to give a presentation on a dental topic with the assistance of an Arabic Sign Language interpreter. The audience (deaf patients), are all socializing. You are ready to begin. You should stand on stage and wait patiently for the audience to settle down	19(13.5)	42(29.8)	<0.001*
The dental clinic has arranged for you to give a presentation on a dental topic with the assistance of an Arabic Sign Language interpreter. The audience (deaf patients), are all socializing. You are ready to begin. You should Use the lights on and off several times to get the audience's attention	14(9.9)	49(34.8)	<0.001*
The dental clinic has arranged for you to give a presentation on a dental topic with the assistance of an Arabic Sign Language interpreter. The audience (deaf patients), are all socializing. You are ready to begin. You should clap loudly	18(12.8)	51(36.2)	<0.001*
The dental clinic has arranged for you to give a presentation on a dental topic with the assistance of an Arabic Sign Language interpreter. The audience (deaf patients), are all socializing. You are ready to begin. You should ask the interpreter to sign that you are ready to begin	18(12.8)	54(38.3)	<0.001*
In a consultation room, where would you suggest the patient and interpreter to sit? Place the interpreter beside the patient. The patient and the interpreter are facing the provider	11(7.8)	39(27.7)	<0.001*
In a consultation room, where would you suggest the patient and interpreter to sit? Place the interpreter beside the provider. The provider and the interpreter are facing the patient	21(14.9)	53(37.6)	<0.001*
In a consultation room, where would you suggest the patient and interpreter to sit? Place the interpreter at an equal distance between the provider and the patient	9(6.4)	29(20.6)	<0.001*
You have an emergency patient and you call for a patient several times. Others in the room point to a person reading a magazine and say "She's deaf". You should approach the patient and gently tap her on the shoulder	20(14.2)	58(41.1)	<0.001*
You have an emergency patient and you call for a patient several times. Others in the room point to a person reading a magazine and say "She's deaf". You should approach the patient and call their name louder	15(10.6)	58(41.1)	<0.001*
You have an emergency patient and you call for a patient several times. Others in the room point to a person reading a magazine and say "She's deaf". You should approach the patient, making small gestures in her field of vision to try to get her attention	16(11.3)	59(42.8)	<0.001*

Notes: ^*P* value were calculated using McNemar test; **P* value < 0.05.

Table 3 Practical Sign Language Skills of Dental Related Vocabulary

Dental Related Vocabulary	Before N=141	After N=141	*P* value^
Overall (mean ± SD)	3.7±3.3	11.1±1.7	<0.001*
Welcome	63(44.7)	69(48.9)	<0.001*
Wait	19(13.5)	73(51.8)	<0.001*
Pain	47(33.3)	73(51.8)	<0.001*
Be calm	48(34.0)	74(52.5)	<0.001*
Main problem	27(19.1)	73(51.8)	<0.001*
Tooth	18(12.8)	87(62.1)	<0.001*
Gum	28(19.9)	70(49.6)	<0.001*
Taking medications	16(11.3)	55(39.0)	<0.001*
Prescription	31(22.0)	65(46.1)	<0.001*
Dentist	24(17.0)	71(50.4)	<0.001*
X ray	27(19.1)	72(51.1)	<0.001*

Notes: ^*P* value were calculated using McNemar test; **P* value < 0.05.

was designed to manage this issue. The results presented in this article show that after completing the course, students scored higher on knowledge related to deaf patients then they did prior to taking the course.

A previous study found no articles on mandatory sign language programs in dental schools in North America, Europe, or Australia. Moreover, in the examination of 97 dentistry programs in the United States, Canada, the United Kingdom, and Australia, only two programs in the United Kingdom[10,17] and one in the United States introduced a sign language course to pharmacy students. However, the data on dental students is unknown.[18] A program at UWI in Mona, Jamaica, is the first mandatory program worldwide that prepares dental students for dealing with deaf patients.[9]

Deaf programs/courses were introduced at other universities, such as at the School of Dental Medicine at Case Western Reserve University (United States) in the early 1980s.[9] However, it is not apparent if the course is still being offered in the present curriculum. Midwestern University's College of Dental Medicine (United States) is another university that offered the PPRAD 1318 course (Introduction to American Sign Language for Health Professionals) as a professional elective course in their Pharmacy Program.[18] In the United Kingdom, the University of Aberdeen School of Medicine and Dentistry has a course in British Sign Language.[17]

According to the World Health Organization, there are 360 million individuals with hearing loss worldwide, and 59 million of them are deaf.[18] These patients, like all other patients, have health needs in all medical fields. In dentistry, there is no clear direct association between deafness and oral health, nor is there a high prevalence of oral issues compared with the rest of the population.[18] However, studies[19] have shown that there are communication barriers between deaf patients and dentists. These patients will feel better when their dental providers can communicate with them directly via sign language; it will help alleviate several challenges associated with sign language interpenetrations,[18,19] such as the loss of information and the lack of sensitivity to the diversity in culture and language within the deaf community.[18] The rationale for the KAUFD course was to improve the direct communication between the deaf community and dentists, and the hope is that this course will encourage other universities to develop a similar course.

This study was limited to one arm group and the authors did not compare it with other arms who did not receive any training concerning the deaf community or other forms of deaf education. Thus, applying study results to other dental schools should be done with caution. There was also a short evaluation of this course and it may be beneficial to do another evaluation after one year, with a possible rehearsal course. Future studies should be conducted to evaluate student knowledge and skills after dental graduation and with actual interaction with deaf patients, and to assess the course outcome at a longer term.

Conclusion

Deaf individuals suffer from barriers in accessing medical care, including dental, which may be improved by providing dental health care providers with a training course. These skills can have a positive impact on patient treatment and can increase job opportunities due to the ability of these dentists to more effectively communicate with deaf patients in the health care setting.

This course can significantly enhance the dental team ability to communicate with patients who are deaf or hard of hearing by improve patient communication, enhance patient Care, build trust and comfort, compliance with accessibility Standards, broaden the scope of practice, and increase cultural sensitivity and Inclusivity toward this group.

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Disclosure

The author reports no conflicts of interest in this work.

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