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Inequalities in access to health services faced by the population with hearing loss in Greece: a cross-sectional study

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Abstract

Background, aims and objectives: The present study aimed to investigate the perceived barriers in access to healthcare among the population with hearing loss in Greece (deaf and hard of hearing).

Methods: The sample consisted of 86 deaf and 54 hard of hearing adults that live in Attica. Core demographic data and information regarding participants' access to health services was gathered using a self-completed structured questionnaire.

Results: The 93% of deaf and the 77.8% of hard of hearing struggled to navigate the healthcare system and reported barriers in access to health services and unmet needs ($p=0.009$). There were difficulties in booking an appointment ($p<0.001$), lack of appropriate administrative means (e.g., booking *via* email) so as to book a visit without the mediation of another person ($p<0.001$), long waiting time ($p=0.01$) and intention to manage very consciously the limited benefits (regarding the free interpretation hours) that are entitlements ($p<0.001$). Regarding engagement with healthcare providers, poor adherence to medical instructions was revealed, as the 41.2% of deaf and the 60% of the hard of hearing did not adhere to the recommended medication, making a self-assessment that they did not need to do so ($p=0.02$). This minority population faces disproportionate difficulties in access to healthcare and therefore significant interventions to tackle these barriers need to be considered in order to create the person-centeredness of their care.

Keywords

Access to health services, barriers, clinical communication, deaf, equity, Information and Communication Technology (ICT) apps, hard of hearing, health literacy, health policy, health services accessibility, hearing health inequalities, medical adherence, person-centered healthcare

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Introduction

Hearing loss is a major public health concern, as nearly half a billion people globally live with disabling hearing loss, which refers to a hearing threshold of 41 decibels or greater in the better hearing ear [1]. International studies have shown that people with hearing loss face multiple barriers to receiving adequate healthcare, have a deficiency in knowledge of health matters and use the health services in a different way when compared to hearing people [2,3]. The recent study by Kuenburg *et al.* [4] reviewed the literature from 2000 to 2015 regarding access to healthcare among the deaf, documenting significant challenges in their communication with health providers. Moreover, the deaf have serious health knowledge gaps which affect their health promotion and disease prevention.

In Greece, despite hearing loss being an important public health and societal concern, this specific population is literally absent from health policy measures that could minimize the barriers they face in accessing healthcare services [5,6]. It is noteworthy that since 2010 the financial crisis has seriously affected Greece's economy, which has lost more than the 25% of Gross Domestic Product (GDP). In addition, large-scale austerity measures have been adopted that have led to the significant reduction to public funding. That severity of the economic downturn leads to significant reductions in the government grant for payment of sign language interpretation. Thus, since 2011, sign language users in Greece are able to cover their communication needs making use of only 25 hours of free interpretation per year. After the consumption of these 25 free hours, they have to pay privately for the cost of

interpretation so as to cover their communication needs. Importantly, the price of an hour of interpretation is relatively higher when the topic is related to a health matter (e.g., 50€ as a standard payment plus 25€ per hour). That means that many people who communicate primarily in sign language face serious inequalities in their access to healthcare and their communication with health providers [7].

To date, these barriers have not been taken into account, mainly due to a knowledge gap regarding the multiple barriers that this population faces to health. The aim of this study is to explore the perceived barriers of deaf and hard of hearing people in Greece, as a crucial step to the person-centered health policy actions towards an adequate, appropriate and ethical healthcare of this minority population. Without such measures it will not be possible to increase the person-centeredness of the care to which the deaf and hard of hearing are fully entitled.

Methods

Participants

In order to examine different subgroups of population with hearing loss, as they differ substantially in their cultural and communicational characteristics [8], we examined cross-sectionally 86 d/Deaf and 54 hard of hearing adults, aged 18-65 years old. The distinction between the terms “deaf” and “hard of hearing” was based on the categorisation of the population with hearing loss of Tsimpida *et al.* [8], according the participant’s language preferences and cultural self-identification.

As there are not official records of this population and random sampling was not feasible, we used a convenience sampling technique for recruitment, by visiting the 5 Deaf Clubs of the Hellenic Federation of the Deaf, located in Attica region.

Materials

Data were collected using a questionnaire that was specially developed for this study and based on the relevant literature and a previous study concerning public health services knowledge and utilization which was conducted by the authors [9]. The first section of the questionnaire explained the purpose of the study, providing contact details for any queries. Next, core sociodemographic data was gathered, such as gender, age, marital status, number of household members and indicators of socioeconomic position (educational status, occupation and income). The third section consisted of questions on participants’ access to health services characteristics. We calculated Cronbach’s alpha equal to 0.92, which indicated excellent internal consistency of the questionnaire.

We carried out a pilot study with 6 participants which we considered as representative of the specific population, in terms of educational and other needs, so as to examine issues of comprehensibility, as the written form of spoken

language is considered as a second language for the deaf, according to Greek laws. The validity of the questionnaire was high and therefore no significant corrections were made by those that participated in the pilot study.

Procedure

The collection of the data was done in person, using a convenience sampling technique. Questionnaires were distributed and collected from April 2015 to June 2015. The previous engagement of the first author in the Deaf community, as she is certified in GSL, reinforced the feelings of trust and comfortability of the participants leading to a high response rate (91%).

All participants gave their consent and were informed about the aim and procedures of their participation in this study, which was voluntary and anonymous. Personal data of the participants were not registered at any stage of the study. Those that used to communicate in sign language were assisted by DT when necessary, so as to prevent potential difficulties they might face when completing a lengthy questionnaire.

All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study protocol and the questionnaire were approved by the Hellenic Federation of the Deaf, which is the official representative association of deaf and hard of hearing people in Greece, with the reference number 435/13-3-2015.

Statistical analysis

Continuous variables are presented as mean (standard deviation, SD), while categorical variables are presented as absolute and relative frequencies. The normality assumption was evaluated using Kolmogorov-Smirnov criterion ($p > 0.05$ for all variables), histograms and normal probability plots.

Associations between categorical variables were assessed with chi-square test, while between categorical and ordinal variables were analyzed with the chi-square trend test. The Mann-Whitney test was applied for the association between a quantitative variable and a dichotomous one when the quantitative variable did not follow normal distribution. In addition, we used Analysis of Variance (ANOVA) to assess the relationship between a quantitative variable and a categorical variable when the quantitative variable followed normal distribution and the Kruskal-Wallis test was employed when the quantitative one did not follow the normal distribution. Due to the small number of participants we did not perform multivariate analyses. The two-tailed significance level was set ≤ 0.05 . Data were analyzed using IBM SPSS 21.0 (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp).

Table 1 Sociodemographic data of the participants

Variable	Hard of Hearing	Deaf
Gender		
Women	32 (59.3)	46 (53.5)
Men	22 (40.7)	40 (46.5)
Age (years) ^a	41.4 (11.8)	38.1 (10.7)
Marital Status		
Unmarried	16 (29.6)	37 (43)
In cohabitation	14 (25.9)	11 (12.8)
Married	14 (25.9)	20 (23.3)
Divorced	7 (13)	13 (15.1)
Widowed	3 (5.6)	5 (5.8)
Number of household members ^b	2.7 (1.2)	2.6 (1.2)
Existence of hearing person in household	38 (70.4)	37 (43)
Educational attainment		
Junior High	4 (7.4)	11 (12.8)
High School	19 (35.2)	59 (68.6)
College	3 (5.6)	2 (2.3)
Technological Educational Institution	5 (9.3)	0 (0)
University	11 (20.4)	10 (11.6)
Master's/Doctorate degree	12 (22.2)	4 (4.7)
Work Status		
Unemployed	8 (14.8)	21 (24.4)
Household keeper	3 (5.6)	5 (5.8)
Income collection	0 (0)	1 (1.2)
Student	1 (1.9)	5 (5.8)
Unskilled worker	4 (7.4)	6 (7)
Private sector employee	10 (18.5)	30 (34.9)
Public sector employee	18 (33.3)	16 (18.6)
Entrepreneur	6 (11.1)	0 (0)
Retired	4 (7.4)	2 (2.3)
Family annual income (euro) ^b	15 (75)	15 (49)

Results

The participant's socio-demographic characteristics are presented in Table 1. Among the deaf participants, the 91.9% used to communicate in sign language. Among the hard of hearing, the 50% used to communicate *via* lip-reading, the 29.6% in Greek sign language, while the 20.4% responded that still used the oral method for their communication.

Participants' access to health services characteristics are presented in Table 2. In this study we found that people with hearing loss were struggling in their access to health services, as during the past 12 months the 48.8% of deaf and the 22.2% of hard of hearing did not visit a healthcare provider despite it being urgent because they did not know which service to choose ($p=0.002$). But even if they knew which service to choose, the level of difficulty for booking

a medical appointment for a health visit to a doctor or a hospital was extremely high for the 58.1% of deaf and the 22.2% of hard of hearing ($p<0.001$). The 53.5% of deaf and the 20.4% of hard of hearing did not visit a healthcare provider due to an inability to contact their own the healthcare service in order to book an appointment ($p<0.001$). It is striking that the 59.3% of the deaf did not visit a healthcare provider - despite it being urgent - because they preferred not to consume a portion of the 25 free hours of interpretation per year ($p<0.001$). In total, 86.7% of participants strongly agreed with the statement "the sign language interpretation cost has to be fully paid by the State" ($p=0.05$). Furthermore, the 54.7% of deaf and the 33.3% of hard of hearing did not visit a health service because of the long waiting time for booking an appointment ($p=0.01$). Finally, the 93% of deaf and the 77.8% of hard of hearing did not visit a health service each time they needed to ($p=0.009$).

Table 2 Participants' access to health services characteristics

Variable	Hard of Hearing	Deaf	P-value
Health insurance coverage booklet			0.99 ^a
Yes	54 (100)	86 (100)	
No	0 (0)	0 (0)	
Health insurance provider			0.5 ^a
IKA	19 (35.2)	51 (59.3)	
Public health insurance	23 (42.6)	25 (29.1)	
OAEE	9 (16.7)	9 (10.5)	
OGA	1 (1.9)	1 (1.2)	
Other	2 (3.7)	0 (0)	
Number of health visits to doctor or hospital during the past 12 months ^b	5 (5)	4 (10)	0.1 ^c
Number of non-visit to a doctor or hospital in spite of being a need during the past 12 months ^b	2 (3)	2 (6)	0.1 ^c
Reasons for avoiding medical care			
I made the self-assessment that the reason was not serious			0.99 ^a
No	27 (50)	43 (50)	
Yes	27 (50)	43 (50)	
I didn't know which service to choose			0.002^a
No	42 (77.8)	44 (51.2)	
Yes	12 (22.2)	42 (48.8)	
I couldn't book an appointment because I need assistance to do so			<0.001^a
No	43 (79.6)	40 (46.5)	
Yes	11 (20.4)	46 (53.5)	
Health insurance coverage had expired			0.3 ^a
No	54 (100)	83 (96.5)	
Yes	0 (0)	3 (3.5)	
Long waiting time to arrange an appointment			0.01^a
No	36 (66.7)	39 (45.3)	
Yes	18 (33.3)	47 (54.7)	
Long patient waiting room "wait"			0.1 ^a
No	40 (74.1)	52 (60.5)	
Yes	14 (25.9)	34 (39.5)	
High health visit cost			0.9 ^a
No	36 (66.7)	56 (65.1)	
Yes	18 (33.3)	30 (34.9)	
Lack of Sign Language interpreters availability			<0.001^a
No	54 (100)	62 (72.1)	
Yes	0 (0)	24 (27.9)	
I preferred not to consume from the 25 free hours of interpretation per year			<0.001^a
No	44 (81.5)	35 (40.7)	
Yes	10 (18.5)	51 (59.3)	
I visited a health service each time I needed to			0.009^a
No	42 (77.8)	80 (93)	

Yes	12 (22.2)	6 (7)	
Cases that you did not take medicines while you need it			<0.001^a
No	39 (72.2)	35 (40.7)	
Yes	15 (27.8)	51 (59.3)	
Most important reason for non-medical compliance			0.02^a
No medical prescription and inability of health cost coverage with private payment	3 (20)	22 (43.1)	
Inability of payment of health cost coverage percentage	1 (6.7)	8 (15.7)	
Self-assessment that the medication was not necessary	9 (60)	21 (41.2)	
Other reason	2 (13.3)	0 (0)	
Who undertakes to arrange a medical appointment for a health visit to a doctor or a hospital			0.05 ^a
A Sign Language interpreter	0 (0)	11 (12.8)	
The Hellenic Federation of the Deaf	0 (0)	6 (7)	
A hearing friend	12 (22.2)	18 (20.9)	
A hearing family member	30 (55.6)	44 (51.2)	
Me	12 (22.2)	7 (8.1)	
Level of difficulty for arranging a medical appointment for a health visit to a doctor or a hospital			<0.001^d
Not at all difficult	7 (13)	4 (4.7)	
Slightly difficult	7 (13)	4 (4.7)	
Somewhat difficult	10 (18.5)	18 (20.9)	
Moderately difficult	18 (33.3)	10 (11.6)	
Extremely difficult	12 (22.2)	50 (58.1)	
Direct booking of a medical appointment for a health visit to a doctor or a hospital (via sms, email, fax)			<0.001^a
Yes	11 (20.4)	2 (2.3)	
No	43 (79.6)	84 (97.7)	
Number of days that a Sign Language interpreter has to be booked before a medical appointment for a health visit to a doctor or a hospital ^b	4 (5)	4 (8)	0.3 ^c
Number in agreement with the statement "the Sign Language interpretation cost has to be fully paid by the State"			0.05^b
Strongly disagree	0 (0)	0 (0)	
Disagree	0 (0)	0 (0)	
Neither agree nor disagree	2 (13.3)	3 (4)	
Agree	4 (26.7)	7 (9.3)	
Strongly agree	9 (60)	65 (86.7)	
Number in agreement with the statement "I would visit more frequently a doctor or a health service if the communication was easiest"			<0.001^a
Strongly disagree	3 (5.6)	2 (2.3)	
Disagree	9 (16.7)	2 (2.3)	
Neither agree nor disagree	16 (29.6)	11 (12.8)	
Agree	17 (31.5)	19 (22.1)	
Strongly agree	9 (16.7)	52 (60.5)	

Values are expressed as n (%) unless otherwise is indicated. * $p < 0.05$. ^a χ^2 test; ^b Median (range); ^c Mann-Whitney test; ^d χ^2 test for trend

The fact that there was a difficulty for the participants in understanding medical advice (Table 2), possibly contributed to the poor adherence to medical treatment; the 41.2% of deaf and 60% of hard of hearing did not comply with the recommended medication, having decided that the medication was not necessary ($p=0.02$). Given the above, it is unsurprising that the 82.6% of deaf and the 48.2% of hard of hearing agreed or strongly agreed with the statement "I would visit more frequent a doctor or a health service if the communication was easiest" ($p<0.001$).

Discussion

Previous studies have documented that deaf sign language users are not well familiarized with access to health services [10,11] and also face major challenges and barriers when navigating the healthcare system [7,12,13]. High percentages of patients that did not visit a healthcare provider - despite it being urgent - because they did not know which service they had to choose, has been reported by Sheppard & Badger [14]. In that study it was quite common for the deaf participants, even if they had understood the urgency of a healthcare visit, to view contact with the health system as a source of fear, embarrassment, sadness and frustration.

In our study, even if the deaf participants knew which service to choose, the level of difficulty for arranging a medical appointment for a health visit to a doctor or a hospital was high for both deaf and hard of hearing participants. Frequently, they could not manage to book an appointment because they needed assistance to do so and this was an important reason for avoiding medical care, an observation also documented in the SignHealth study [15], at a percentage of 33% ($n=176$). That study also revealed that while many Deaf preferred to book a medical appointment in sign language, they could not do so and had to ask a friend or a hearing family member to book the appointment on their behalf. Difficulties, as has been shown also in other studies, are therefore related to access to healthcare services, where deaf people face serious obstacles such as, for example, the lack of adequate mediation to close an appointment [16-18]. In our study, the percentage of the deaf participants who could book a medical appointment for a health visit on their own was extremely low and it is worth mentioning that it was exactly the same percentage of the deaf participants for whom the Greek Sign language was not the preferred method of communication (8.1%). The majority of the participants asked from a hearing member of their family or a friend to act as mediator so as to arrange a medical appointment. However, over half of the deaf participants (57%) did not have a hearing member among their family to help them to arrange the appointment, which made the situation difficult for them.

In another study [19], deaf participants were not able to call health services in order to book an appointment, because the doctors did not have a telecommunications device for the deaf (TDD). Electronic devices for provision of email and/or text software are crucial for persons with

hearing or speech difficulties, otherwise deaf patients must go to the health service to book their appointment in person, which requires a substantial amount of time and effort. Without adequate provision of email and text software, deaf patients must spend a great deal of time and effort going to the clinic to book in person [20]. According to the SignHealth study [21], carried out at the University of Bristol, 45% ($n=135$) of Deaf people still had to walk into their surgery to make an appointment, because of the lack of other means to make an appointment. The report Action on Hearing Loss [22] that explored the experiences of patients with hearing loss accessing health services, revealed that there was a marked difference between how patients actually contact their surgery to book appointments in contrast to how they would prefer to. Approximately one in 10 respondents (9%, $n=55$) contacted their GP surgery by email, while around three in 10 (31%, $n=188$) identified that this would be their preferred method of contact. In our study, the direct booking of a medical appointment for a health visit to a doctor or a hospital (*via* SMS, email, fax) was feasible for only the 2.3% and the 20.4% of the deaf and hard of hearing, respectively ($p<0.001$). Communication difficulties become critical in emergency situations when a person with hearing loss has no way to communicate an acute need or to call an ambulance. In the Sheppard study [23], participants encountered difficulty in closing an appointment or calling an ambulance to an emergency. In addition, men were found to have an increased risk of injuries during emergencies. In medical emergency situations, the system's resources are not sufficient, leaving little room for attention to special populations [24].

More than one out of four deaf participants in our study reported that they do not make use of health services due to the lack of an interpreter to accompany them ($p<0.001$). Previous studies have shown that the lack of availability of sign language interpreters forces deaf users of health services to seek assistance from listening members of their family or hearing friends in interpreting medical advice, despite their lack of knowledge of medical terminology. Questions arise not only about impartiality and credibility - as there is a possibility of concealment or paraphrasing of the content provided by the physician or patient's information - but also about how autonomy and privacy for sign language users can be compromised [18,20,24,25]. The spoken language is a serious obstacle for those that communicate in sign language in their attempt to obtain health information, before, during and after a medical appointment [26-28]. This population is at even greater risk of poor communication when accessing health services compared to immigrants who do not speak the language in the country they live [29,30]. Thus, they face substantial barriers not only in their access to primary healthcare, but also at all stages of the healthcare process [7,11,16,17,22,25,31-33]. Furthermore, they have a serious risk of complications during a disease, as a function of limited access to information about the outcome of their illness, with it also not being always possible to rearrange clinic visits or contact a doctor to clarify health issues [11,34,35]. This observation may explain the high percentage of 50% of the participants in our study that

made self-assessments that a health issue was not so serious for using the health services and who then did not benefit from medical care. Moreover, previous studies have shown that sign language users face significant difficulties which is the main reason for their reduced use of healthcare services even when they need them [15,17,29,36-38].

It is a serious concern that more than half of deaf participants in our study mentioned that they tried to save some of the 25 free hours of interpretation per year, by not making use of health services when actually needed ($p < 0.001$). That explains why the majority of the participants strongly agreed that the sign language interpretation cost has to be fully paid by the State ($p = 0.05$). Smeijers and Pfau also reported this matter in their study [39], where the deaf avoided hiring interpreters for short consultations, given the limited funds made available by the government of the Netherlands. In order to achieve equity of access, it has been recommended in the literature that there should be a permanently available sign language interpreter in every hospital. This could lead to immediate and effective communication with sign language users who come with a serious illness or with injuries in the health unit [18,27]. However, Greek hospitals do not include sign language interpreters in their staff.

Another reason for the inequalities in access to health services that the deaf are facing [27], is the lack of deaf awareness from health professionals [39,40]. When the preferred communication method for a patient with hearing loss is sign language, the presence of the interpreter is also useful for the physician himself, as effective communication is crucial for the explanation of the treatment he recommends, following an adequate clinical assessment and diagnosis [21,41]. That could lead to an increased risk of medical errors and misunderstandings in the use of prescriptions [12,19]. It is also noteworthy that patients are not always allowed to discuss their concerns [7,42], which ultimately leads to a reduced understanding of therapeutic interventions and illnesses [43]. A previous study [44] revealed that almost one-third of deaf and hard of hearing sign language users in the UK do not know how often to take their medication. In another study [38], 77% of sign language users faced difficulties in communication with doctors during a hospital visit. After the consultation, 33% of them were not sure how to use the medical prescription and either took too much or too little. Phenomena such as these, recorded in the study of Kritzinger *et al.* [10], where the majority of the deaf participants often leave a medical appointment without even understanding the diagnosis or the reasons for the proposed medication, maintain the insecurity of deaf patients in contacting the health system and lead to them not using the health services that they actually need. Thus, the overall health status of deaf people, the adoption of a healthier lifestyle and, consequently, the improvement of the health outcomes of this under-served cultural and linguistic minority of the population, are seriously at risk [10,11,20,45]. This is confirmed also by the high percentage of the participants in our study that made a self-assessment that a proposed medication was not necessary, resulting in medicine non-adherence.

The communication between hard of hearing and health professionals is relatively easier and these phenomena happen rarely. They are usually more confident to ask what they do not understand by the process, the diagnosis or treatment in the public health system and thus show better knowledge of their medical history, their illnesses and the necessary clinical protocols [10]. That may explain why those participants with a lower grade of self-reported hearing loss had better medical compliance than their deaf counterparts.

Despite the existence of legislation in Greece mandating a higher priority within health services for hearing impaired people, this is not always applied in daily practice. This is confirmed by the fact that the 54.7% of deaf participants and the 33.3% of hard of hearing did not visit a doctor or a health service due to long waiting times for arranging an appointment ($p = 0.01$). In the SignHealth study [21], it was found that the waiting time for a health service was an important criterion for how people with hearing loss experiencing the access to a health service and also a rejection criterion for a service when they do not feel they are served with the priority that they are entitled to. This same study also discussed the "fatigue barrier" for the deaf, which refers to the fact that people who suffer from repeated negative experiences in accessing and communicating when navigating the health system, due to their low expectations and continuous frustrations, are subject to a reduced use of health services and maintain unmet needs. With reference to the above, it may easily be understood why the vast majority of the deaf participants in our study (82.6%) agreed or strongly agreed with the statement "I would visit more frequently a doctor or a health service if the communication was easiest" ($p < 0.001$).

The main limitation of our study was that it was not possible to take into account the language preferences of the participants in the analysis, due to the small number of participants in some categories of the initial classification ($n \leq 10$). Thus, we considered only two broader categories of the population with hearing loss, which was based on their self-classification as deaf or hard of hearing. However, the population with hearing loss consisted of subgroups with different characteristics [2] and the examination of a larger sample in future studies could make feasible the exploration of differences among subgroups. The place of residence plays a significant role in the characteristics of the deaf community and thus our observations which were collected only from Attica region may be biased. A sample taken from the whole country would offer a less biased investigation of the characteristics of the specific population and the exploration of several control factors.

Conclusion

This study contributes further evidence to the important area of hearing health inequalities which has recently gained a higher level of interest in health services research [2]. Tackling inequalities in access to health services is important for the rights of persons with disabilities, as

clearly stated by the UN Convention on the Rights of People with Disabilities. Nevertheless, our results underscore the fact that deaf and hard of hearing persons constitute a minority population that experiences major barriers in access to health services and considerable difficulties within the doctor-patient relationship. In light of these findings, a special effort must be made to ensure that deaf and hard of hearing individuals receive adequate, appropriate and ethical healthcare, in order to ensure an increase in the person-centeredness of care to which the deaf and hard of hearing are fully entitled.

Future research should focus on health communication between patients with hearing loss and health providers and interventions in cultural awareness trainings for health professionals, key components of the person-centered healthcare approach. In addition, research should explore the development and implementation of Information and Communications Technology (ICT) applications, supported health communication that could contribute to improved health communication in primary healthcare settings and solutions for minimizing the multiple barriers for booking appointments. Furthermore, programs and interventions aiming to increase the health information knowledge in Deaf Communities could help tackle these health inequalities, as the specific population faces many health literacy limitations.

Conflicts of Interest

The authors declare no conflicts of interest.

References

[1] World Health Organization. (2015). Fact sheet. Deafness and hearing loss. Available at: <http://www.who.int/mediacentre/factsheets/fs300/en>.

[2] Tsimpida, D., Kaitelidou, D. & Galanis, P. (2018). Determinants of health-related quality of life (HRQoL) among deaf and hard of hearing adults in Greece: a cross-sectional study. *Archives of Public Health* 76 (1) 55.

[3] Tsimpida, D., Kaitelidou, D. & Galanis, P. (2018). Barriers to the use of health services among deaf and hard of hearing adults in Greece: a Cross-Sectional Study. *European Journal for Person Centered Healthcare* 6 (4) 638-648.

[4] Kuenburg, A., Fellingner, P. & Fellingner, J. (2016). Health care access among deaf people. *Journal of Deaf Studies and Deaf Education* 21 (1) 1-10.

[5] Hearing loss: an important global health concern. (2016). *Lancet* 387 (10036) 2351.

[6] Emond, A., Ridd, M., Sutherland, H., Allsop, L., Alexander, A. & Kyle, J. (2015). The current health of the signing Deaf community in the UK compared with the general population: a cross-sectional study. *BMJ Open* 5 (1) e006668.

[7] Steinberg, A.G., Barnett, S., Meador, H.E., Wiggins, E.A. & Zazove, P. (2006). Health care system

accessibility. *Journal of General Internal Medicine* 21 (3) 260-266.

[8] Meador, H.E. & Zazove, P. (2005). Health care interactions with deaf culture. *Journal of the American Board of Family Practice* 18 (3) 218-222.

[9] Galanis, P., Sourtzi, P., Bellali, T., Theodorou, M., Karamitri, I., Siskou, O., Charalambous, G. & Kaitelidou, D. (2013). Public health services knowledge and utilization among immigrants in Greece: a cross-sectional study. *BMC Health Services Research* 13 (1) 350.

[10] Kritzinger, J., Schneider, M., Swartz, L. & Braathen, S.H. (2014). "I just answer 'yes' to everything they say": access to health care for deaf people in Worcester, South Africa and the politics of exclusion. *Patient Education and Counseling* 94 (3) 379-383.

[11] Zazove, P., Meador, H.E., Reed, B.D., Sen, A. & Gorenflo, D.W. (2009). Cancer prevention knowledge of people with profound hearing loss. *Journal of General Internal Medicine* 24 (3) 320-326.

[12] Scheier, D.B. (2009). Barriers to health care for people with hearing loss: a review of the literature. *Journal of the New York State Nurses Association* 40 (1) 4-10.

[13] McAleer, M. (2006). Communicating effectively with deaf patients. *Nursing Standard* 20 (19) 51-54.

[14] Sheppard, K. & Badger, T. (2010). The lived experience of depression among culturally Deaf adults. *Journal of Psychiatric and Mental Health Nursing* 17 (9) 783-789.

[15] SignHealth. (2013) Research into the health of deaf people. Available at: <http://www.signhealth.org.uk/deaf-health-report-stage-one/>

[16] Tannenbaum-Baruchi, C., Feder-Bubis, P., Adini-Weisel, B. & Aharonson-Daniel, L. (2014). How deaf people cope in routine and emergency situations-suggested paths for thought and action. *Harefuah* 153 (9) 532-536.

[17] Alexander, A., Ladd, P. & Powell, S. (2012). Deafness might damage your health. *Lancet* 379 (9820) 979-981.

[18] Cardoso, A.H.A., Rodrigues, K.G. & Bachion, M.M. (2006). Perception of persons with severe or profound deafness about the communication process during health care. *Revista Latino-americana de Enfermagem* 14 (4) 553-560.

[19] Iezzoni, L.I., O'Day, B.L., Killeen, M. & Harker, H. (2004). Communicating about health care: observations from persons who are deaf or hard of hearing. *Annals of Internal Medicine* 140 (5) 356-362.

[20] The health of deaf people: communication breakdown. (2012). *Lancet* 379 (9820) 977.

[21] SignHealth. (2014). A Report Into The Health Of Deaf People (detailed version of Sick Of It, for professionals). Available at: <http://www.signhealth.org.uk/sick-of-it-report-professionals/>

[22] Action on Hearing Loss (2012). A report into the experiences of people with hearing loss when accessing healthcare. Available at: <http://www.actiononhearingloss.org.uk/accessallareas.aspx>

[23] Sheppard, K. (2014). Deaf adults and health care: Giving voice to their stories. *Journal of the American Association of Nurse Practitioners* 26 (9) 504-510.

- [24] Aharonson-Daniel, L., Tannenbaum-Baruchi, C. & Feder-Bubis, P. (2012). The health of deaf people. *Lancet* 379 (9833) 2238-2239.
- [25] SignHealth. (2013) Research into the health of deaf people. Available at: <http://www.signhealth.org.uk/deaf-health-report-stage-one/> Accessed April 9, 2018.
- [26] Napier, J. & Kidd, M.R. (2013). English literacy as a barrier to health care information for deaf people who use Auslan. *Australian Family Physician* 42 (12) 896-899.
- [27] Ubido, J., Huntington, J. & Warburton, D. (2002). Inequalities in access to healthcare faced by women who are deaf. *Health & Social Care in the Community* 10 (4) 247-253.
- [28] MacKinney, T.G., Walters, D., Bird, G.L. & Nattinger, A.B. (1995). Improvements in preventive care and communication for deaf patients. *Journal of General Internal Medicine* 10 (3) 133-137.
- [29] Berman, B.A., Jo, A., Cumberland, W.G., Booth, H., Britt, J., Stern, C., Zazove, P., Kaufman, G., Sadler, G.R. & Bastani, R. (2013). Breast cancer knowledge and practices among D/deaf women. *Disability and Health Journal* 6 (4) 303-316.
- [30] Pollard Jr, R.Q. & Barnett, S. (2009). Health-related vocabulary knowledge among deaf adults. *Rehabilitation Psychology* 54 (2) 182-185.
- [31] McKee, M.M., Barnett, S.L., Block, R.C. & Pearson, T.A. (2011). Impact of communication on preventive services among deaf American Sign Language users. *American Journal of Preventive Medicine* 41 (1) 75-79.
- [32] Reeves, D., Kokoruwe, B., Dobbins, J. & Newton, V. (2004). Access to primary care and accident and emergency services for deaf people in the North West, Manchester. National Health Service Executive North West Research and Development Directorate.
- [33] Tamaskar, P., Malia, T., Stern, C., Gorenflo, D., Meador, H. & Zazove, P. (2000). Preventive attitudes and beliefs of deaf and hard-of-hearing individuals. *Archives of Family Medicine* 9 (6) 518-525.
- [34] Orsi, J.M., Margellos-Anast, H., Perlman, T.S., Giloth, B.E. & Whitman, S. (2007). Cancer screening knowledge, attitudes, and behaviors among culturally Deaf adults: Implications for informed decision making. *Cancer Detection and Prevention* 31 (6) 474-479.
- [35] Margellos-Anast, H., Estarzi, M. & Kaufman, G. (2006). Cardiovascular disease knowledge among culturally Deaf patients in Chicago. *Preventive Medicine* 42 (3) 235-239.
- [36] Woodcock, K. & Pole, J.D. (2007). Health profile of deaf Canadians: analysis of the Canada Community Health Survey. *Canadian Family Physician* 53 (12) 2140-2141.
- [37] Kyle, J., Reilly, A.M., Allsop, L., Clark, M. & Dury, A. (2005). Investigation of access to public services in Scotland using British Sign Language. Scottish Executive Social Research. Available at: <http://www.scotland.gov.uk/Resource/Doc/930/0012107.pdf>.
- [38] Royal National Institute for the Deaf (Great Britain). (2004). A simple cure: A national report into deaf and hard of hearing people's experiences of the National Health Service. London: RNID.
- [39] Smeijers, A.S. & Pfau, R. (2009). Towards a treatment for treatment: On communication between general practitioners and their deaf patients. *The Sign Language Translator and Interpreter* 3 (1) 1-14.
- [40] Middleton, A., Turner, G.H., Bitner-Glindzicz, M., Lewis, P., Richards, M., Clarke, A. & Stephens, D. (2010). Preferences for communication in clinic from deaf people: A cross-sectional study. *Journal of Evaluation in Clinical Practice* 16 (4) 811-817.
- [41] Chilton, E.E. (1995). Ensuring effective communication: the duty of health care providers to supply sign language interpreters for deaf patients. *Hastings Law Journal* 47 (3) 871-910.
- [42] Barnett, S. & Franks, P. (2002). Health care utilization and adults who are deaf: relationship with age at onset of deafness. *Health Services Research* 37 (1) 103-120.
- [43] Zazove, P., Meador, H.E., Reed, B.D., Sen, A. & Gorenflo, D.W. (2009). Cancer prevention knowledge of people with profound hearing loss. *Journal of General Internal Medicine* 24 (3) 320-326.
- [44] Shakespeare, T., Iezzoni, L.I. & Groce, N.E. (2009). Disability and the training of health professionals. *Lancet* 374 (9704) 1815-1816.
- [45] McAlinden, C. (2014). The importance of doctor-patient communication. *British Journal of Hospital Medicine*. 75 (2) 64-65.