

Emergency situations and deaf people in Israel: Communication obstacles and recommendations

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Abbreviations: TV, television; SMS, short message service; SD, standard deviation

The absence of the ability to hear sounds in deaf people is an obstacle to optimal communication in a predominantly hearing world. Emergency situations harbor sufficient challenge for the hearing person and pose even greater barriers for the deaf and hard of hearing. During disasters and emergency situations, deaf people have great difficulty in obtaining and sharing information, increasing their dependence on others. This article focuses on the experience of deaf people during a period of security threat, when missiles from the Gaza strip were aimed at the civilian population in Southern Israel, in 2009. The aim of this article is to illustrate the complexities that deaf citizens experienced, and describe their coping mechanisms. A qualitative study including 15 heterogeneous-background Deaf participants interviewed by a researcher that belongs to the deaf community using a multiple-method facilitated questionnaire. Data was analyzed using grounded theory methodology principles. Main categories that arose from data analysis were communication problems during emergencies, the pager as a questionable warning device about emergencies (due to timing and content/context issues of its use), and the implications of the location of deaf people at time of emergency. Various channels for conveying information should be examined and created in order to maximize the heterogeneous deaf community's ability to receive vital information during an emergency. Professional sign language interpreters are necessary during emergencies, helping to reduce both dependence on informal sources (such as family members, including minors, friends, neighbors, by-standers) and risk. The development of new technologies may bear potential help for deaf persons during emergencies. Being a socio-linguistic minority, it is recommended to ensure these technologies will be accessible to the whole deaf community.

Introduction

During an emergency situation, hearing is an essential ability. The capacity to hear sounds of pending hazard, receive messages, instructions and information, as well as the ability to maintain outgoing communication is vital to an individual's ability to respond in situations of danger.¹ Most of the information in times of emergency is transmitted by sound in the form of verbal commands and sirens, report of hazard, damage and harm. The fact that such measures are futile for deaf people, endangers this population and puts it at greater risk. The question of how deaf individuals are expected to cope in emergency situations is not frequently dealt with in emergency plans.

Methods of communication between deaf and hearing people include sign language, lip reading, correspondence, use of interpreters, and speech.²⁻⁵ The optimal solution suggested in the literature to communication barriers for deaf

people is professional interpreters. However, in times of acute emergency, interpreters are scarce, and usually not available for the majority deaf and hard of hearing persons in the immediate phase. In such situations, deaf people will most likely revert to using their hearing family members in order to communicate.⁶⁻⁸ The use of family members as interpreters is problematic on many levels – it hinders the deaf person's privacy, it may create conflicts of interest, result in inaccurate transfer of information, and increase the dependence of the deaf person on his or her relatives.^{2,4,5,9,10}

Understanding this and other limitations in the various forms of communication with deaf people is important for the identification of effective communication channels and plan specialized programs for deaf people in emergency situations. In general, it is important to include treatment and care for vulnerable groups in any design of policy responses for events of emergency.¹¹

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Deaf People in Israel

The estimated Israeli deaf population comprises 7,000 deaf people and 500,000 hearing impaired (approximately 8% of the citizens of Israel).¹² In Israel, most deaf people use and understand sign language, whereas deaf adults have a more positive attitude toward sign language than younger deaf individuals.¹³

International literature perceives social activities within the deaf community as a necessity.¹⁴⁻¹⁶ With many social structures that are available for hearing people lacking, the deaf community fulfills these needs and is thus an integral part of the lives of deaf people.⁶⁻⁸ The deaf community in Israel was established by deaf people in order to provide support for their social and emotional needs.¹⁷ Several organizations for the deaf exist in Israel and most of the deaf people in Israel are members of at least one of the organizations which cater to various subgroups such as deaf children, youth, adults, religious sectors, and Arabs. These organizations promote the improvement of the quality of life for deaf people by providing information, promoting relevant legislation, creating connections with hearing-aid banks, audiology therapists, advanced diagnostics, rehabilitation, social activities, and support. In 1992, a study of deaf people in Israel showed that half of those interviewed visited deaf clubs and one-third regularly sought assistance.¹³ One of the significant resources for this population is thus the deaf community,¹⁷ yet in emergency situations the community life is stalled, creating a gap and increasing the sense and reality of isolation.

Communications Support for Deaf People

In the State of Israel, the Equal Rights for People with Disabilities Act (1998) states that “a person with a disability is entitled access to all services available to the public. . . including means of shelter and evacuation, information regarding the state of emergency. . . including access to special means of protection adapted to people with disabilities by disability type. . .”¹⁸

Communication aid facilities and device for the deaf are subsidized by the Ministry of Social Affairs¹⁹ including tax refunds for the purchase of devices to assist communication, translation to sign language or written translation.²⁰ In addition, the Ministry of Health financially supports Cochlear implantation for eligible persons.^{19,21} Furthermore, the Law requires one quarter of television programs on particular channels to be broadcasted with subtitles and in sign language. In emergency situations, the Homefront Command instructs the TV channels which information to convey with subtitles and translation.²¹

During times of emergency in Israel, warning sirens sound and ‘color red’ (code for attack) in the media warn inhabitants to seek immediate shelter. The time to safely enter a shelter varies by distance from the border, but in the South it ranges from 15 to 45 seconds from the time of alert. After the “falling” of the missile is heard, citizens are required to remain in the shelter for another 10 minutes, and are then “released,” unless otherwise instructed by mass media.²² Stress and post-traumatic stress symptoms were widespread among the population,²³ and the

effect of the early warning on the population needs to be further studied.

The deaf population requires additional support in receiving alerts, information, and communicating with authorities. People with hearing disabilities are entitled to pagers, provided by the ministry of Social affairs and the Homefront Command. These pagers provide alerts in written form during emergencies.²⁴ The first time pagers were distributed among deaf civilians as an emergency alert was during the Gulf War in 1991. Despite significant advancement in technology in the past 2 decades, the State continues to distribute these pagers rather than utilizing more modern technologies available today.

It is thus plausible that during disasters and emergency situations, deaf people have increased anxiety as well as more reliance on others due to barriers to obtaining and sharing information.

This article describes the experience of deaf people in Southern Israel during a period of security threat in 2009. The aim of this paper is to illustrate the complexities that deaf citizens experienced, and describe their coping mechanisms. The goal is that the portrayal of difficulties experienced by a deaf person can help guide hearing people to contribute to the facilitation of greater independence and reduced risk for the deaf. This can be achieved through more effective receiving and conveying of vital information in disaster and emergency situations.

Methods

A qualitative study was conducted using standardized open-ended interviews by a researcher who, being a daughter of 2 deaf parents, is identified as belonging to the deaf community, and is familiar with Israeli sign language. As stated in the previous section, due to the significance of the deaf community for its members, the identification of the researcher as a community member was not only instrumental for the interviews, but also served as a major enabling factor for undertaking the research. The “insider” outlook that envisioned and facilitated this research was easily grasped by study participants.

Open-ended questions were asked to members of the deaf community using Israeli sign language, speech for lip reading, reading (a print of the study questionnaire was offered to the participants), correspondence, or a combination thereof, and depending on the deaf person’s choice. When interviewing participants of Russian origin, an interpreter helped in the translation from Israeli to Russian sign languages when needed. Additional information was obtained by standardized observation about the interactions of study participants with family members (mainly spouses and children, deaf and/or hearing), friends (when interviews took place in the deaf clubs), dwellings of study participants, and participants’ body language and appearance.

It is important to note that there were modifications to “standard” qualitative interview methodologies as recording the interviews was impossible, filming interviews was found to be intimidating for most subjects, and the researcher needed her hands for using sign language, rather than for writing. These

barriers were overcome by very quick notes during the interview that were elaborated immediately upon its completion to minimize omission of information. The full “reconstruction” of the interviews was possible due to the concise mode of sign language.

The interviewees were people who categorize themselves as deaf, are community participants and reside in emergency zones in the Southern region of Israel. The region was divided into 3 areas where warning times varied: a warning time of 15 to 20 seconds, 20 to 30 seconds and more than 30 seconds to reach the shelter. The study included 15 people aged 18 to 77, participants’ mean age 39.1 (s.d. 16.5) years, women (n = 5) and men (n = 10), Jews (n = 14) and Bedouins (n = 1). They were recruited in Deaf Clubs and organizations, and also using snowball sampling, so as to reach members more and less active within the community. Characteristics of the study participants are described in **Table 1**.

The interviews were conducted from January to September of 2011 until reaching theoretical saturation, i.e. no new information emerged from the interviews. As per participants’ request, most of the interviews took place in their homes; 3 interviews took place in the deaf club. The interviews lasted between one hour and one hour and a half, and included 4 questions about the background of the interviewee and his/her residence in Southern Israel, a description of the interviewee daily routine, a description of the daily routine during the last emergency, and the interviewee suggestion(s) about what to do for the deaf community during emergencies.

Data was analyzed, simultaneously with its collection, following the principles of grounded theory,^{25,26} first splitting the interviews transcriptions into meaning units, followed by their grouping by open coding (using the constant comparison method) and axial coding. Peer debriefing sessions were held

after each interview and its initial analysis to review the appropriate categorization of the meaning units and the emergent coding categories.

Results

All of the study participants underwent several emergency situations in recent years and they willingly shared their encounters of difficulty and distress during emergencies. The main categories that emerged from the analysis of the interviews are presented in this section.

Communication problems during emergencies

The interviews confirmed that the deaf population in the South of Israel experienced gaps in communication, compromising their safety and sense of security. Many even exhibited intense emotional responses during the interview.

The interviewees’ native language was mostly referred to as sign language and not Hebrew, Arabic or Russian. This fact contributed to deficient processing of information that is essential to understanding.

As mentioned above, the law requires the transmission of sign language and subtext in a predefined portion of the broadcasts in times of emergency. Nevertheless, a large proportion of participants reported that they only partially follow the sign language translations that appear on television - “I don’t understand, it is a small bubble and distant.” (Interview No. 5), “I don’t read well the subtitles (on TV) and the (translation into sign language) bubble is small.” (Interview No. 3), “We did not understand some of the signs.” (Interview No. 5). In addition, some of the participants who are able to read the subtitles on television, raise other issues of content such as: “the subtitles summarize rather than convey what is actually being said.” (Interview No. 4), “(information on) news is not sufficient, subtitles short (summarise), the next day (get the full information) in the newspaper or online.” (Interview No. 16). “(hearing people) know what is happening (because they can listen to the) information on the radio (we get) the information late, not at 100%.” (Interview No. 4). “I have a TV but I do not understand, I turn the TV on for the child (child hears)” (Interview No. 6).

The younger participants stated that they prefer to receive information via the Internet - “I only receive information from Internet, (I) read English and Hebrew.” (Interview No. 10), “I’m interested in economics so I went to check on the Internet. I also know English.” (Interview No. 12).

The pager for deaf warning about emergencies – a solution

One of the solutions offered by the authorities to the means for warning deaf people is the pager, intended to provide warning by vibration and text. 2 main categories were relevant regarding this solution: “Timing issues about the pager” and “Content/Context issues” about it.

Timing issues about the pager: The deaf people in this study described that during emergency situations they often receive delayed alert messages about missiles: “Sometimes the pager does

Table 1. Characteristics of the study population (N=15)

Characteristic	Percent	Number
Gender		
Female	33	
Male	67	10
Nationality		
Jews	93	14
Arab/Bedouin	7	1
Marital Status		
Married (deaf spouse)	60	9
Single	33	5
Divorced	7	1
Employment		
Employed	27	4
Student/soldier	13	2
Non-employed / pensioner	60	9
Hearing aids		
Without hearing devices	87	13
Hearing device	7	1
Cochlear implant	7	1
Parenting		
Parents to deaf children	20	3
Parents to hearing children	47	7
Parents to hearing and deaf children	0	0
No children	33	5

not work. My son or daughter can hear the siren . . . the pager did not work, just after a minute (we are notified) and the missile already fell.” (Interview No. 5). Delay in receiving notice of the proximal landing missiles, led to feelings of mistrust of interviewees concerning this technology, “Messages (came) later, I see on TV (have an alarm) and pager don’t (no message). You do not trust, and then you do not use it” (Interview No. 10). Moreover, these feelings led some of interviewees to cease using the pager: “I do not use it (pager), I do not trust it. This is my life; you cannot be dependent on something that doesn’t work. Messages arrive late! If the military received messages late, what would they do? An investigation.” (Interview No. 14). This statement clearly shows that in such instances, delayed alerts and messages occur regularly, and may not be tolerated.

Another problematic aspect of the timing that was repeatedly mentioned about the pager revolved around nighttime alerts. “That night, I slept with the pager, the next day my mother writes me a SMS [short message text sent via mobile phones] that there was an alarm during the night” (Interview No. 8). Due to the fact that some deaf people fail to sense the pager’s vibration while sleeping, they have decided not to use it at night: “I slept, it was night, without a pager, was on the table. I don’t sleep with it. It does not wake me. . . Was a boom, (then) I woke up.” (Interview No. 13). In such cases, individuals who are deaf are not protected in emergencies that occur during the night.

Content/Context issues about the pager: A number of interviewees indicated that even when they use the pager, they don’t receive messages informing of the threat’s termination. “The information (in the pager) is incomplete; we don’t know when to get out of the shelter.” (Interview No. 5). Therefore, the deaf person using the pager has a continued need for pertinent information.

Participants whose mother tongue was not Hebrew claimed difficulties in following the message – “There are deaf people who cannot read Hebrew, cannot read the message from the pager.” (Interview No. 4), “When the emergency period began, all the time I was with the pager and watching TV, but I couldn’t follow. . . so I dropped everything.” (Interview No. 10). “It does not work for me, is not good, I do not use it” (why?) “I do not understand, I do not know how to stop the vibration, I cannot read Hebrew. I cannot go with it, I have a problem walking, I need a cane in one hand to walk, and in the other hand cannot hold a pager” (Interview No. 15). Thus, it appears that in addition to the problems of understanding, physical difficulty may constitute a barrier to access and use the pager.

Several participants reported technical or bureaucratic problems such as: “Sometimes the battery is drained and I did not notice” (Interview No. 8), “To receive the first pager, I needed to meet a social worker. I had to sign a waiver of medical confidentiality, I was under the age of 18, I refused to sign” (Interview No. 12).

Place matters: deaf people and their location at time of emergency

One interesting observation is that marked differences existed between warnings received when the deaf person is in a public area versus while at home. In a public area the deaf person has a social environment to observe. Be it a neighborhood, work,

school etc., the deaf person can use his other senses (especially vision) to alert himself: “I watched all the time what was going on” (Interview No. 11), “I can see what people do, and I do the same” (interview No. 6), “I didn’t have a pager, I do not know why, I forgot, happens. I saw people running, cars standing on the side and I took action” (interview No. 5), “I lost the pager at school . . . and I was in the street and I saw an old woman scared, at first I did not understand, then I “woke” and ran to safety.” (Interview No. 10), “I work with hearing people . . . I see how they react and (I) do the same thing.” (Interview No. 13).

On the other hand, when a deaf person is in his home and the emergency alert is on, he depends on others (warning accessories and hearing people) to receive the alarm notice. In families where parents are deaf and have hearing children, the responsibility to inform the event of emergency often rests on the children, “My son or daughter hear the siren, the kids run to alert us” (Interview No. 4), “The children alert us, but it is hard for me” (interview 5). Parents are not always comfortable with the fact that this responsibility falls on their children, especially when the children are young. When the parents are hearing and children are deaf, the responsibility rests to the parents to inform “my parents told me to go to the shelter.” (Interview No. 11). This citation demonstrates the dependence between a deaf adult with hearing parents.

In cases when in a nuclear family there are no hearing people, the responsibility to report rests on a close hearing person, such as “the neighbors alarm me.” (Interview No. 1), “My mother in law sends me a text message by SMS and informs us. It is more secure, and arrives timely. The pager message comes later, much later.” (Interview No. 9), “co-workers inform me of an emergency” (Interview No. 13). The interviews show that often the responsibility to inform the deaf person in an emergency relies on someone in their vicinity that agreed in advance to take the responsibility to inform the deaf person in case of an emergency.

2 interviewees described a situation in which the deaf person did not know of an emergency event. Participants living alone or with deaf partners that had no one to inform them about the emergency are particularly vulnerable in emergency situations.

Discussion

In emergencies, access to information is crucial as receiving information from the authorities and the media is a significant factor in preserving life. Therefore, if the transmission is based on written information like subtitles on a TV or Internet newscast, even if deaf people watch it, as study participants stated, they may not comprehend all of the information, some of which may be crucial to their immediate survival. Consequently, other channels for conveying information should be examined and created in order to maximize the deaf person’s ability to receive vital information during an emergency.

A bubble with translation to sign language that appears on part of the screen during certain TV broadcasts, was thought to be a good solution. However this study reveals that deaf people do not perceive it as such due to the small bubble size, and the distance/size of the person signing in it which makes the hand

motions and face mimic almost impossible to decipher. Furthermore, differences in sign dialect used among people in varying geographic areas pose another barrier.

One of the solutions offered in the literature to transmit information to deaf people is employing the use of a professional translator. Testimonies from interviewees in this study indicated that since professional interpreters are not available to transmit the essential information during the unexpected emergency situations, their dependence on informal sources of information is strengthened. Similar to findings in the international literature, professional sign language interpreters are necessary during emergencies.^{2,4,5,9,27-29}

This manuscript provided evidence that pager alerts are not appropriate for some of the deaf population since the pager may not fulfill its original purpose. One of the reasons that many of the deaf people mentioned explaining their refusal to use the pagers had to do with their previous negative experiences of receiving delayed message alerts. However, technological progress has the potential to significantly improve communication for deaf people and indeed, much technological advancement is usable by the hearing impaired.³⁰⁻³² Such are communication by video call using computers and mobile devices, cell phone (vibration) alerts (where the cell phone can act in place of the pagers), and instant messaging programs that enable correspondence even with multiple people in parallel.

The video conference call, a visual communications method for deaf persons, allows receiving information in sign language. This tool has the potential of greater accessibility for the deaf person.³³ In Germany, there is a learning system for the deaf based on video calls.³⁴ In the area of preventive medicine, instruction to deaf patients is already available by video conference.³⁵⁻³⁸ We believe that as technology continues to advance, more combined solutions will be available to provide the requisite information to deaf people, and they will have a choice of method for receiving emergency related information. A pilot study conducted in the US reported that participants used their cell phones, felt the vibration and therefore received the alerts in real time.³² In Israel, there are similar plans by the Homefront Command to utilize mobile phones for alerts to targeted regions, but this is yet to occur. These emerging solutions may improve the way deaf people cope with challenges they face and provide a variety of communication channels. This is important for the deaf person's quality of life and social needs but it is particularly crucial when it comes to emergency preparedness and emergency situations.

In many aspects, deaf people are similar to socio-linguistic minorities, and can be compared to immigrants such as Spanish-speakers in the US, French-speaking citizens in the English speaking parts of Canada, and refugees in various countries. Characteristic of all these minorities is the need to overcome communication barriers.^{5,28,29,39} while the means to do so are

also similar and take the form of written materials, translators who speak both languages.

In the current study most of the participants interviewed experienced difficulty reading the questions, similar to other studies performed in the United States.^{3,5,28,29}

Conducting a study within the deaf community is not straight forward due to the low level of reading comprehension among the deaf,^{3,5,28,40} communication problems,^{2,5,9,10,28,41,42} and the potential alienation of deaf people from hearing persons that inquire about their world.

Qualitative interviews may be structured for the deaf, especially where researchers are familiar and sensitive to the emotional needs of the participants. Qualitative studies allow the researcher to conduct the interview and help the participants answer the questionnaire in a tolerant, open and empathetic environment.⁴³ Nevertheless a study of deaf subjects poses many technical challenges beyond the fact that the researcher needs to be familiar with the sign language and the deaf culture. A worth mentioning limitation of this study is the potential bias of writing relatively short notes (as opposed to taping or video-recording, preferred data collection practices in qualitative research) during the interview. The concise fashion of sign language, coupled with the immediacy of the transcription reproduction, and the participants' vivid accounts of their experiences during emergencies, facilitated the reproduction of the whole interviews.

Conclusion and Recommendations

Deriving from the interviews are several conclusions and recommendations.

- The transmission of information should use multiple channels to be accessible to a larger proportion of the deaf population.
- New technology, such as cellular phones, can be used to communicate risk and to receive and give information. It is important that new technology includes light and vibration.
- The translation to sign language on TV and Internet broadcasts should be enlarged, be presented in slow and simple language, and be present on all transmissions during emergency situations.
- Civil servants and persons who have direct contact with deaf people in emergency situations should be familiar with the basic aspects of deaf culture, and means of communication with deaf people.

Disclosure of Potential Conflicts of Interest

No potential conflicts of interest were disclosed.

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