RESEARCH ARTICLE

The cyberspace usage in students with hearing impairment and their motivations and their feeling of loneliness

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Abstract

Background and Aim: Social networking sites (SNSs), known in terms of cyberspace, are a very popular and accepted aspect of technology. Internet is more useful for hearing-impaired children and adolescents than the other users because of the type of communication and its possibility of hiding their disabilities. This study aimed to determine the relationship between using cyberspace and the motivation of hearing impaired adolescents and their feeling of loneliness.

Methods: Eighty five hearing impaired students with age range of 12-23 and mean age of 16.28 ± 2.35 years took part in this study. All students were selected from special schools in Tehran city. Dehshiri loneliness scale and the questionnaire of characteristics of hearing impaired users of Social Networking Sites were used to collect data.

Results: The results showed that despite inferquent use of cyberspace for learning among hearing-impaired students, there was no relationship between motivation of using cyberspace and feeling of loneliness. Also, no correlation was found between feeling of loneliness and their activities in cyberspace except for chatting with other hearing impaired individuals ($p>0.05$). In other words, chatting with hearing impaired individuals had a positive significant correlation with feeling of loneliness ($p=0.020$).

Conclusion: Based on the obtained results, hearing-impaired individuals normally chat with their hearing-impaired peers when they feel lonely. Also, it was found that the use of cyberspace for learning is rare in hearing-impaired students. Thus, it is necessary for teachers and experts to provide appropriate facilities and useful internet use for these students.

Keywords: Loneliness; hearing impairment; cyberspace; internet

Introduction

Hearing is one of the most important sensory abilities, absence of which disrupts the process of their social adjustment. A person who is not able to hear as well as someone with normal hearing – hearing thresholds of 25 dB or better in both ears – is said to have hearing loss [1]. Individuals with Disabilities Education Act (IDEA) in 2004, defined deafness as a hearing impairment that is so severe that the child is impaired in processing linguistic information

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through hearing, with or without amplification that adversely affects a child's educational performance [2]. The incidence rate of congenital hearing loss is about one to six individuals per 1000 live births [3]. According to the Ministry of Health of Iran, annually approximately one thousand children are born with hearing loss [4].

One of the prominent characteristics of these people is the inability to establish effective and satisfactory relationship with other people in the community [5]. In fact, lack of ability to appropriately communicate with other people leads individuals with hearing loss toward loneliness and isolation from the society. Dunn et al. expressed that the feeling of loneliness is one of the most common problems during adolescence, which could result in unbalanced social relationships and emotional and psychosocial difficulties [6].

This feeling of loneliness is mostly observed in adolescents and young adults with hearing loss. Several definitions have been proposed for the feeling of loneliness; in this regard, Asher and Paquette defined loneliness as the cognitive awareness of weaknesses in individual and social relations, which will lead to sadness, emptyness, sorrow, and regret [7].

In a study by Parkhurst and Asher, loneliness was described as discomfort caused by isolation [8]. Rostami et al. [9] has also stated that hearing loss significantly affects the quality of life, resulting in social isolation and depression, Knutson and Lansing, Murphy and Newlon [10,11]. Also reported that while one of the consequences of hearing loss is recognized as the feeling of loneliness and isolation, Booth identified loneliness as one of the products of internet use [12]. Although the internet is used to interact with other people, feeling of loneliness has a significant association with the extensive use of the internet [13].

Today, use of cyberspace has remarkably increased to communicate with others. While these networks have many advantages, they are associated with several disadvantages. However, the increased use of these networks is a sign of positive experiences of individuals [14]. internet

technology has enhanced our daily life due to its sustained progress. Meanwhile, our lifestyles have inevitably changed due to heavy reliance on the internet [15].

Unfortunately, focus on deficiencies and differences of people with hearing loss has prohibited further attention to the fact that these people have some abilities like other people and can achieve happiness and success by focusing on those skills. Several studies have been conducted on people with hearing loss during the past few decades, which highlighted the competence of these individuals to live their life independently rather than considering them as an at-risk group [16].

On the other hand, cyberspace can provide special opportunities for people with disabilities due to its specific features. On the internet, people with any height, weight, and physical defect, with stuttering, or without hair, hand, or leg can feel like a normal person. Since in the cyberspace people use writing and pictures to communicate, many advantages can be provided for the individuals with hearing loss, who experience difficulty in making direct interacttion with other people [17].

Few studies have been conducted on the incentives for the use of cyberspace by people with hearing loss and feeling of loneliness. In this regard, Kozuh et al. proposed a model in a study, which could be applied for educational purposes and helps those with hearing loss make better interactions with others [18].

Barak and Sadovsky, also demonstrated that people with hearing loss have greater incentive to use the internet [17]. Moreover, Blom et al. indicated that excessive use of online relationships affects the quality of friendships [19]. In another study by Mashayekh and Borjali a significant relationship was noted between the feeling of loneliness in young females and chatting [20].

Ever-acceleration of technology in 21th century and use of the internet by people with hearing loss, which can empower them and decrease their behavioural, emotional, and communication problems, is of paramount importance. Since the feeling of loneliness is an emotional

problem and can be one of the consequences of communication problems in people with hearing loss and given the lack of sufficient studies in this regard or presence of conflicting results, this study was conducted to evaluate the relationship between incentives to use the cyberspace and the feeling of loneliness in students with hearing loss.

Methods

A correlational, cross-sectional study was conducted on all adolescent students with hearing loss at a special school for hearing-impaired individuals in Tehran, Iran. With the introduction and cooperation of the Ministry of Education, 85 students were selected from this school through convenience sampling. In total, 24 (28.2%) of the cases were male and 61 (71.8%) were female, all of whom were within the age range of 12-23 years (mean age: 16.28±2.35 years). In addition, educational level of these students ranged from the fifth grade of elementary school to the third grade of junior high school.

Unfortunately, none of the students had information about their hearing loss even though they were studying in a special school for such individuals. This was confirmed when all of them chose the "I don't know" option when were asked: what is your degree of hearing loss (mild, moderate, severe, profound, or I don't know)? Therefore, the degree of their hearing loss was determined with the aid of the school audiologist and available audiograms in the medical records of the students. It was found that 71.7% of the students had severe to profound hearing loss, 6% moderate to severe, 14.1% had mild and moderate hearing loss, and no information could be obtained for the remainning 8.2% students (no audiogram in their medical records). In this study, the inclusion criteria were the age range of 12-23 years, as well as having hearing loss (hearing level below 25 dB) and no other impairments.

The Dehshiri Loneliness Scale [21] and self-report questionnaire on the characteristics of cyberspace users with hearing loss [18] were used to collect the data.

Items of the Dehshiri Loneliness Scale are about the extent and method of communication and social interaction with parents, family members, friends, and about emotional characteristics caused by these relationships.

Items were rated based on a 5-point Likert scale (1: very low to 5: very high); to elaborate, subjects were required to determine how accurately each item describes the subject's feelings, behaviors and way of thinking from very high to very low. The scale was scored within the range of 0-4 in some items, the scoring was reversed. Dehshiri et al. has demonstrated the reliability of this scale to be 0.91 and confirmed appropriate convergent and divergent validity of the scale [21]. In the present study, Cronbach's alpha reliability was 0.85.

Hearing-impaired/deaf cyberspace users contains a self-report criterion and offline and online contents. In the first section of the offline content, information such as gender, age, educational level, degree of hearing loss, and hearing condition of parents was collected. The second section of the offline content included items on data about communication between individuals with hearing loss and family members during childhood, interaction during the process of education, and preferred type of communication by these people. In the third section, the subjects answered some questions about their skill in using technology and its availability for these people. The subjects were required to describe their ability for using a computer, tablet, and smart phone and specify the type of technology they use to have access to cyberspace.

On the other hand, the online content was about causes and goals of using the cyberspace, the frequency of its use, the type of activities performed while using the internet, online communication status, the subjects' opinions on usefulness of the internet. In order to determine the causes of using the cyberspace, the participants were asked to talk about their incentives (e.g. pleasure, usefulness, or learning) for using this technology. The participants determined if factors, such as recreation, work or school, had drawn them toward the cyberspace. The

Table 1. Distribution of media use

Media	Number	Percent
Mobile networks	65	76.5
Others	6	7.1
None	14	16.5
Total	85	100

participants were asked to choose from one (rarely-once a month or less) to four (quite often-once a day or more) to determine the frequency of cyberspace use.

Downloading photos, sending photos or videos, writing comments, or even liking a post. This was carried out through choosing from one (never) to five (most of the times). Kožuh et al. determined the Cronbach's alpha reliability of this questionnaire in their study at 0.84 [18], which was 0.75 in the present study.

Difficulties people with hearing loss are faced for understanding some common terms, questionnaires were completed in small groups. In addition, verbal, sign, and other languages were used to facilitate this process. Data analysis was performed in SPSS 23 descriptive statistics and Spearman's correlation coefficient.

Results
In this study, mean score of feeling loneliness in students with hearing loss was 51.60±1.47 (Table 1). These data were obtained after the evaluation of the questionnaire of characteristics of deaf/hearing-impaired cyberspace users, which demonstrated the distribution of incentives of people with hearing loss to us the cyberspace. In total, 67.1% of the students agreed on easy access to the cyberspace and only 25.9% of the participants agreed on using the internet for educational purposes (Table 2). According to the results provided in Table 3, no significant relationship was observed between the feeling of loneliness and incentives of students with hearing loss to use the cyberspace (p>0.05).
There was no association between the feeling of

loneliness in adolescents with hearing loss and their motivation for use of the cyberspace (e.g. recreation, learning, and education). According to the results, no significant relationship was observed between different activities on the cyberspace (e.g. updating profiles, sending photos and videos, liking a post, writing a comment, and chatting with deaf and hearing people) and feeling of loneliness (p<0.05).
However, the correlation between chatting with other people with hearing impairment and feeling of loneliness was (+0.25), which was indicative of a positive significant relationship between chatting with people with hearing problems and feeling of loneliness in students with hearing loss (p=0.20).

Discussion
According to the results of this study, no significant link was noted between the feeling of loneliness and motives of adolescents with hearing loss for using the internet. In fact, whether these individuals experience feeling of lonelyness or not, they use the Interment only for its pleasure and user-friendliness. Other incentives for using the internet, such as learning and education, ranked after pleasure.
In general, 78.7% of the students with hearing loss agreed on using the internet only for fun by completing the questionnaire of characterristics of cyberspace users with hearing loss, and just 36.5% of the participants used the cyberspace for educational purposes. In this regard, Kožuh et al. stated that their proposed model could be used to facilitate the educational goals and communication abilities of individuals with hearing loss [18].
Of their hearing peers, who were residents of Israel, within two age groups of 12-15 and 16-19 years old. Results of their study indicated that the hearing-impaired subjects had more incentives to use the internet. While the feeling of loneliness and low self-confidence are more frequent in individuals with hearing loss, those who used the internet had characteristics closely similar to those of hearing individuals [17].
On this topic, Blom et al. expressed that Dutch students with hearing impairment had more

Table 2. Distribution of motivations of hearing impaired people to use cyberspace

Motivation for use	Number (%)					
	Fun	School	Useful	Learn something	Easy use	Adapted to my needs related to hearing loss
Strongly disagree	2 (2.4)	9 (10.6)	4 (4.7)	2 (2.4)	1 (1.2)	4 (4.7)
Disagree	4 (4.7)	25 (29.4)	2 (2.4)	2 (2.4)	3 (3.5)	6 (7.1)
Undecided	13 (15.3)	20 (23.5)	16 (18.8)	19 (22.4)	12 (14.1)	17 (20)
Agree	53 (62.4)	22 (25.9)	52 (61.2)	49 (57.6)	57 (67.1)	50 (58.8)
Strongly agree	13 (15.3)	9 (10.6)	11 (12.9)	13 (15.3)	12 (14.1)	8 (9.4)
Total	85 (100)	85 (100)	85 (100)	85 (100)	85 (100)	85 (100)

incentives to use the internet for communicating with their relatives and family members, which was not observed in Dutch students with normal hearing ability [19].

Morahan-Martin and Schumacher demonstrated that lonely people were more eager to use email and the internet, and their strongest incentive to use the internet was emotional support [13]. Morahan-Martin also stated in another study that the internet is something that can be used both for fun and communication. In addition, the internet can create a safe and happy social life for those who deny their real life due to deficiencies and impairments [22].

As previously mentioned, our findings are not in congruence with the results of previous studies. This could be due to the fact that Iran is one of the developing countries and it has been just a few years that people have access to the internet and cyberspace. Scarcity of studies on deaf/hearing-impaired children evaluating the attitude and incentives of these individuals toward cyberspace. Below are some of the possible explanations for the results based on previous studies, which were based out of Iran.

While the use of cyberspace for learning and education [18] is beneficial for individuals with hearing impairment, this is rarely observed among the mentioned population. People with hearing impairment can perceive many objective and abstract concepts that they do not normally grasp in their surrounding environment. This lack of perception could lead to isolation from the society, which could be facilitated through writing and displaying pictures and videos on the internet. However, use of smart phones in schools is extremely prohibited and computers of special centers and schools for hearing-impaired are not properly used, which is one of the most important barriers in this regard.

According to the results of the current study, adolescents with hearing loss perform several activities in the cyberspace such as updating their profiles, sending photos and videos, writing comments, liking a post, and chatting with other individuals with hearing loss or normal hearing.

However, a significant correlation was found

Table 3. Correlation between loneliness and motivations of cyberspace use

Variale		Learning	Useful	School	Fun
Loneliness	Correlation factor	0.07	0.18	0.11	0.08
	Significance level	0.44	0.29	0.10	0.52

between the feeling of loneliness and interacting with other people with hearing loss. This means that increased feeling of loneliness could be associated with more communication with other individuals with hearing loss.

This finding is in line with the previous results. Mashayekh and Borjali demonstrated a significant relationship between a great feeling of loneliness in female adolescents and chatting, whereas no such association was observed in the male students for educational purposes [20].

Alavi et al. claimed that most internet users were adolescents and young adults, 35% of whom used the internet for chatting, 28% for online games, 30% for checking their emails, and 25% for searching on the global networks [23]. The following items are provided to describe the final results:

1) The majority of adolescents with hearing loss use the internet for non-educational purposes, while it could provide a more appropriate situation for learning and training [18]. Some of the factors for inappropriate use of the internet by students are lack of consensus between the policy-makers of our country regarding traditional education and not completely accepting the cyberspace as a proper tool for education in this system. The internet by parents due to the uncertainty toward this means as a communication tool. Parents are not eager to teach the appropriate method of internet use to their children.

2) Hearing-impaired individuals can use other features of the cyberspace, including sending photos and videos and communication through writing in order to make new friends [19]. However, most of these individuals only used this written communication with their peers at the time of loneliness in the present study. It might be due to the fact that interacting with those who have the same experiences is easier and more pleasant, even on the internet. In fact, adolescents preferred to talk to people similar to themselves when feeling alone.

Conclusion

According to the results of the present study, it seems that the use of cyberspace is essential for students with hearing loss. Several previous studies, which were conducted on individuals with no impairment, have shown that use of the internet could create a feeling of loneliness for users or make them addicted to the internet. However, no significant relationship was observed between the feeling of loneliness and use of the internet by people with hearing loss in the current study. In fact, it was concluded that application of the internet could be beneficial for this group of people.

Given the decrease of the feeling of loneliness in the subjects through chatting with those who had similar conditions, it could be concluded that people with hearing loss are more eager to communicate with their peers at the time of their loneliness. Our findings were also indicative of little use of the internet for educational purposes in Iran. Review of studies from other countries revealed that the respective authorities must provide a proper situation in this regard.

One of the most important drawbacks of the present study is lack of randomized sampling and use of the convenience sampling method, which limited the generalization of the results. Small sample size was another limitation of the present study. It is recommended that further studies with randomized sampling method be conducted on rehabilitated individuals with hearing loss. In addition, it is suggested that researchers adhere to gender balance, age limitation, and large sample size to obtain more accurate results.

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