

Does Deafness Affect Resilience?

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Abstract

Background: Resilience is a positive psychological characteristic that contributes to mental health and adjustment under challenging conditions, such as deafness. Deafness is a traumatic experience and causes communication disorders; it may also affect resilience.

Objectives: We compared the resilience of deaf signers to that of a matched group of hearing individuals.

Materials and Methods: This comparative study was performed to assess self-evaluated resilience in 45 deaf signers and in 76 matched hearing subjects from Hamadan, Iran. Resilience scores were measured using a modified Connor-Davidson Resilience Scale.

Results: The average resilience score was 61.20 in deaf signers and 62.8 in hearing subjects; however, this difference was not statistically significant. The resilience score was different in female and male deaf participants. It was 65.22 for male deaf participants (SD = 10.4) and 55.17 for female deaf participants (SD = 16.1), and this difference was statistically significant ($P = 0.014$). The gender difference between the resilience scores of hearing participants (male, 66.24 [SD = 16.7] and female, 59.36 [SD = 13.9]) was not significant ($P = 0.057$).

Discussion: Similar resilience scores in deaf and hearing participants may be due to appropriate interaction of deaf signers with family members and society. Male deaf subjects were more resilient than female ones; studies should be done to examine the effects of cultural characteristics that may provide females with less communication opportunities than males.

Keywords: Resilience, Deafness, Mental Health

1. Background

Resilience, a key concept in positive psychology (1), is the process of negotiating, managing, and adapting to significant sources of stress or trauma (2). It is also defined as successful adaptation despite adversity, good outcomes despite high risk status, and sustained competence under threat (1, 3). This concept has been studied in diverse populations and groups because of its importance to psychological status (4-6). It is important to study resilience in the deaf because hearing impairment and environmental reactions to it put this population at high risk (7). Zakeri, Jowkar, and Razmjooe (2010) (1) claimed that facing situations repeatedly while being unable to influence one's environment, which can be caused by hearing impairment, may have the same effects as a traumatic experience (7). The concept of resilience has rarely been applied to the experiences of deaf children and families or to specific interventions in relation to this group (8).

Among the life stressors that deaf students reported in a study by Rogers et al. (2003), living with communication problems due to deafness in a hearing-oriented

world was highlighted (9). These problems were related to social isolation, being treated with disrespect by individuals and groups with misconceptions about deafness, and being raised by hearing parents who had to communicate without the advantage of Sign language (9). Grimard and Dubuisson (2004) noted some other life stressors that deaf individuals experience, including feeling helpless, fear of the gaze of others, and problems making friends (10). They also pointed out that deaf people must manage and tolerate feelings such as frustration, resentment, and bitterness (10). Many of the factors mentioned above may affect resilience, and this makes it worthwhile to study resilience in this group and attempt to decrease the negative psychological and communicative effects of deafness.

A limited number of studies have investigated resilience in congenitally deaf people. Rogers et al. (2003) surveyed resilience-fostering items in the deaf community (9). Charlson, Bird, and Strong (1999) investigated resilience in deaf signers by interviewing three subjects about how they be-

came resilient (11). Grimard and Dubuisson (2004) studied some deaf individuals in a qualitative study and discovered that some deaf individuals succeed in transcending traumatic social experiences and pursuing personal development (10). As mentioned above, most resilience studies in the deaf have used qualitative statistics and reported data gathered from resilient deaf people rather than comparing resilience in deaf and hearing individuals.

The resilience of deaf individuals had not previously been studied using the Connor-Davidson resilience scale (CD-RISC). However, there are various studies that have used CD-RISC to study resilience in different communities. Dahaki et al. (2014) compared the identity styles, resilience, and tolerance of ambiguity in adolescents with and without present fathers in 50 female high school students using the CD-RISC. They showed that female adolescents with present fathers had better resilience (12). Ebrahimi et al. (2012) (13) investigated the relationship between resilience, spiritual intelligence, and mental health among 100 male and female university students using the CD-RISC. The results indicated a positive meaningful relationship between resilience and mental health, but there was no meaningful difference in resilience between male and female students. Wasonga et al. (2003) evaluated 480 high school students in terms of protective factors predicting resilience and academic achievement using a questionnaire. Their study and others suggested that ethnicity, gender, coping strategies, personality traits, and age influenced protective factors predicting resilience (14-17).

Overall, deaf people seem to be at risk for psychological conditions due to the difficult situations they experience because of their impairment, and this must be addressed using quantitative tools such as the CD-RISC. Moreover, because resilience can be cultivated (18) and have positive effects on negative feelings such as anxiety (19), studying resilience in deaf individuals could guide us toward methods for preventing psychological harm and other negative consequences in this population. In this study, resilience was studied in Iranian deaf signers and in a group of hearing individuals matched for age, gender, and academic achievement. A Persian version of the CD-RISC was used; some of the items were modified to be comprehensible to deaf signers. We chose the CD-RISC because, as the Windle et al. study (2011) established, it is the best psychometric tool for measuring resilience (2).

2. Objectives

We investigated whether resilience is affected by deafness and whether it is related to gender.

3. Materials and Methods

In this study, we measured and compared the resilience scores of 45 Iranian deaf signers and a matched group of 76 hearing individuals using a modified Persian version of the CD-RISC. This comparative study, which was per-

formed using a descriptive analytical method, was carried out in Hamadan City in February, 2014.

3.1. Participants

The deaf group consisted of 27 males and 18 females ranging in age from 16 to 23 years. For each participant, a diagnosis of deafness had been reported in school health records based on an audiologist evaluation. For this study, the inclusion criterion was a hearing threshold above 90 dB. Participants had studied in deaf schools since the first grade. Their dominant mode of communication was Sign language, and they had completed at least one year of high school. Subjects with any other kind of disability, or being mentally retarded subjects were excluded from this study. Deaf people were selected by enumeration, and among them the subjects who had average successful educational achievement were selected to be compared with the matched hearing group. Successful average educational achievement was defined as acquiring average marks for the previous semester (an overall score of at least 15 out of 20). Average marks were extracted from school records. After checking the inclusion criteria and each individual's willingness to participate in the study, they were asked to fill out the CD-RISC questionnaire.

In order to adapt the CD-RISC for use by deaf individuals, an expert in Sign language was instructed in the items of the CD-RISC questionnaire. He signed the items, with three other experts in Sign language acting as judges. The three judging experts were asked to write down their perception of the performed sign, and inappropriate signs were replaced by their suggestions. Because the CD-RISC can be self-administered or administered in an interview, an expert in Sign language performed items of the CD-RISC in small groups of two or three deaf students. After the performance of each item, deaf individuals were asked to select their desired option. Among the 52 deaf participants that entered the study, five (two males and three females) were moderately hearing impaired and two (one female and one male) had difficulty understanding the questionnaire items, so these seven deaf individuals were excluded from the study.

The matched hearing group, consisting of 47 females and 29 males, was selected from the nearest normal high school and ranged in age from 15 to 24 years. Hearing and deaf subjects were matched by age, sex, and educational achievement. This project was approved by the Ethical Committee of the Hamadan University of Medical Science.

3.2. Materials and Procedures

The resilience score was considered as a representation of resilience, and it was calculated using a modified CD-RISC. The CD-RISC was chosen because it is among the scales that received the best psychometric ratings in the Windle, Bennett, and Noyes (2011) study (2). The CD-RISC has 25 items with five options for each item (always true, often true, sometimes true, rarely true, never true), and

it measures each item on a five-point Likert scale from zero to four; therefore, the final score is between 0 and 100, with higher scores indicating a greater degree of resilience (20). The questionnaire takes less than 20 minutes to complete. The Persian version of the CD-RISC was adjusted by Mohammadi (2005), who reported a Cronbach's alpha coefficient equal to 0.89 (21).

3.3. Validity and Reliability

In this study, some of the items of the questionnaire were modified in order to be comprehensible to deaf signers. The provisional version of the questionnaire was sent by email to a total of fifteen psychologists who had performed research on resilience scales and speech therapists who had worked with deaf signers; eleven of them returned the completed questionnaire.

To evaluate face validity, the experts were asked to rate the importance of each item using a five-point Likert scale (very important, important, moderately important, of little importance, unimportant), and the impact score was calculated to be higher than 1.5 for all items.

For content validity, the content validity rate (CVR) and content validity index (CVI) were investigated. To calculate CVR, the experts were asked to rate each item in terms of being "essential," "useful, but not essential" or "not necessary." To evaluate CVI, they were asked to rate each item in terms of clarity, simplicity, and relevance. Results showed a CVR of 0.803 and a CVI of 0.87. To investigate reliability, internal consistency was surveyed, and a Cronbach's alpha coefficient was calculated ($\alpha = 0.925$).

3.4. Statistical Analysis

As previously mentioned, we used enumeration for sampling of deaf individuals, and matched hearing subjects were selected from the nearest normal high school.

For the tool used to measuring resilience, internal consistency ($\alpha = 0.925$) was calculated for reliability. The CVR and CVI (CVR = 0.803, CVI = 0.87) were used to measure the content validity of the CD-RISC.

The CD-RISC mean score was reported using descriptive statistics. The Leven's test of equalizing variance and an independent t-test were used to compare the resilience scores of deaf and hearing male and female subjects using SPSS, version 21. Resilience was compared considering hearing status and gender using a two-factorial analysis of variance.

4. Results

Table 1 presents the demographic characteristics for the deaf and matched hearing groups of this study. The average age of deaf individuals was 19.3 years, and the average age was 17.8 for the matched hearing group. Of all subjects, 54% were female and 46% were male.

The mean resilience scores of male and female members of the deaf and matched hearing groups are presented in Table 2. The mean resilience score for female deaf signers was 55.17 (SD = 16.1) whereas the mean resilience score was 59.36 for hearing female matched individuals (SD = 13.9). The mean resilience score for male deaf signers was 65.22 (SD = 10.4), whereas it was 66.24 for hearing male matched cases (SD = 16.7). When deaf and hearing members of the same sex were compared, no significant difference was observed in either group. (Using an independent t-test for equality of means showed that differences between these two groups were not significant ($p = 0.59$) (Table 3)).

Table 1. Summary of Demographic Data for the Deaf and Matched Hearing Groups

Variable	Deaf (N = 45)	Hearing (N = 76)
Age, y		
16 - 23	19.33 ± 1.8	NA
15 - 24	NA	17.71 ± 2.3
Gender		
Male	27	29
Female	18	47
Educational achievement	16.64 ± 1.7	16.55 ± 1.6

Abbreviation: NA, not available.

Table 2. Age and Resilience Scores of Deaf Signers and the Matched Hearing Group

	Minimum	Maximum	Mean ^a
Hearing			
Female (n = 47)	24	85	59.36 ± 13.9
Male (n = 29)	34	96	66.24 ± 16.7
Deaf			
Female (n = 18)	17	81	55.17 ± 16.1
Male (n = 27)	17	87	65.22 ± 10.4

^aData are presented as mean ± SD.

Table 3. Resilience Differences Considering Hearing-Sex

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Hearing	183.2	1	183.2	0.8	.34
Gender	1933.2	1	1933.2	9.4	.00
Hearing vs. gender	67.9	1	67.9	0.3	.5
Error	24063.3	117	205.6	NA	NA
Total	486569.0	121	NA	NA	NA

Abbreviation: NA, not available.

Subjects were compared in two levels: hearing-deaf and male-female. In this analysis, female subjects (hearing-deaf) generally acquired a lower resilience score than male subjects (hearing-deaf). Resilience scores thus differed by gender ($P = 0.003$). The results of the independent t-test showed that the mean resilience score in male individuals was significantly higher than in female individuals ($P = 0.004$). A significant difference in resilience scores was not observed when gender and hearing status were considered simultaneously ($P = 0.566$).

A comparison of deaf females and deaf males showed that deaf males were more resilient, and this difference was statistically significant ($P = 0.014$). The same gender comparison was performed for hearing subjects, and the difference was not statistically significant ($P = 0.057$).

5. Discussion

This study surveyed the resilience scores of deaf signers versus those of a matched hearing group using the CD-RISC. Results showed that generally there is no statistically significant difference between deaf and hearing subjects in terms of resilience score. However, gender differences were revealed; male deaf individuals were generally more resilient than female deaf individuals. There was a statistically significant gender difference in deaf individuals ($P = 0.014$) but not in hearing ones ($P = 0.057$).

Because this study is the first one to use the CD-RISC to study resilience in deaf signers, there are no study results comparable to those of this study.

Our results showing that male and female hearing subjects have similar resilience scores is consistent with those of Ebrahimi et al. (2012), who showed that there are no meaningful differences in resilience among male and female university students (13).

Differences between gender in terms of resilience and coping strategies have been shown in different studies, but no previous studies have compared female and male deaf subjects.

The main question of this study was whether deaf people are as resilient as hearing individuals. In this respect, our findings are comparable with the studies of Rogers et al. (2003) (9), Charlson et al. (1999) (11) and Grimard and Dubuisson (2004) (10), in which resilient deaf subjects were investigated. The fact that the deaf subjects in our study showed approximately the same levels of resilience as the hearing subjects may mean that their ability to cope with their disability has improved their resilience, regardless of the negative experiences brought about by deafness. As Grimard and Dubuisson (2004) (10) noted, Cyrulnik (2002) believed that "The impacts of trauma may leave traces, but if the child or the teenager meets resilient tutors on his path, the development may proceed in spite of the effects of the trauma". They also noted that some characteristics of the person, mostly of the human environment, act as protective agents and improve resilience.

As Spencer mentioned Steinberg (2000) noted, "Individuals respond differently to the condition of being deaf. For some, audiologic deafness is simply a part of their identity. They do not experience it as a condition that places them at greater risk for undesirable outcomes in life or as something negative. For others, however, loss of hearing can be a major adversity involving 'the persistent void of shared communication' and not just a risk factor" (22).

According to the explanation offered by Grimard and Dubuisson (2004), the deaf subjects in this study who had similar resilience scores to hearing subjects may have grown up in stable, warm environments, and their parents may have invested a lot of energy and time in helping them learn to communicate, which would have helped them avoid the difficulties of isolation (10). They also noted that to those who say that early problems have lasting effects, Cyrulnik (2003) replied that "early problems provoke early responses that may be long lasting if the family and social environments maintain them as permanent stories" (10).

Another remarkable result of our study is the effect of gender on resilience score, and another remarkable result of our study is the effect of gender on resilience score, and this result was more significant in the deaf group. In other words, deaf males were shown to be more resilient than deaf female signers. One explanation of higher male resilience may be that cultural conventions provide fewer communication opportunities and social experiences for females. Culturally, the family monitors female children more closely than males, and this monitoring may increase when the child is facing limitations such as deafness. This should be evaluated in other studies to determine whether cultural characteristics affect resilience in deaf people.

Some limitations and weaknesses of this study include the following: deaf subjects sometimes requested extra explanations, which made data gathering time consuming. Deaf individuals had different histories of auditory and communicative rehabilitation, therefore they may have had different communicative experiences that would make the sample heterogeneous. It would be valuable to conduct similar research on a larger number of deaf signers or subjects with different communicative modes (Sign language, verbal, etc.) or hearing impaired subjects using hearing aids versus cochlear implants. Presenting the questionnaire as a pre-recorded video in sign language may have offered an improvement because some deaf subjects may have difficulty understanding the written form of the CD-RISC. Because this was the first time that the CD-RISC was used to evaluate deaf individuals, we should determine whether subjects with higher CD-RISC scores are actually successful and more resilient. Therefore, one could conduct interviews with deaf subjects to collect data on their experiences, attitudes and personal lives.

In conclusion, deaf signers in this study did not have

lower resilience scores than their hearing peers. This may be due to supportive environments (family and school) or appropriate rehabilitation and social services that helped them cope with deafness and its effects on communication, which are experienced differently by every deaf individual (10). Due to the limited number of subjects, the fact that subjects were all taken from one city and a limited age range, and due to the fact that deaf people constitute a heterogeneous group, the results of this study should be generalized only with caution.

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Footnotes

Authors' Contribution: Study concept and design: Nassim Ahmadi, Tahereh Afshari; acquisition of data: Nassim Ahmadi; analysis and interpretation of data: Nassim Ahmadi, Fatemeh Rajati, Mohammad Reza Nikoo, Bahram Tahmacbi; drafting of the manuscript: Nassim Ahmadi, Fatemeh Rajati, Mohammad Reza Nikoo; critical revision of the manuscript for important intellectual content: Nassim Ahmadi, Bahram Tahmacbi, Farhad Farahani; statistical analysis: Nassim Ahmadi, Fatemeh Rajati, Mohammad Kamali; administrative, technical, and material support: Nassim Ahmadi, Bahram Tahmacbi; study supervision: Farhad Farahani, Bahram Tahmacbi.

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