

Psychological Achievements

(Psychol Achiev), 2022,
29(Special Issue), 27-36
Received: 04 Apr 2022
Accepted: 11 Jul 2022
Doi: 10.22055/psy.2022.40443.2828

ISSN (E): 2588-6649
<https://psychac.scu.ac.ir/>



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Research Article

Anxiety Disorders, Emotional Literacy, and Emotion Expression in Deaf, Hard-of-Hearing, and Hearing Students

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Keywords:

Anxiety,
Emotion Expression,
Emotional Literacy,
Hearing Loss

Citation: Etemadizadeh, H., & Amirimanesh, M., (2022). Anxiety disorders, emotional literacy, and emotion expression in deaf, hard-of-hearing, and hearing students *Psychological Achievements*, 29(Special Issue), 27-36..

Abstract

Aim: The present study was conducted to compare the symptoms of anxiety disorders, emotional literacy, and emotion expression in deaf, HH, and hearing students in four cities in Iran.

Methods: This causal-comparative study was conducted with the participation of deaf, Hard-of-Hearing (HH), and hearing students in Iran in 2019. A total of 72 (38 HH and 34 deaf) students with HL and 72 hearing students participated in the present research. The Screen for Child Anxiety-Related Emotional Disorders, The Emotional Literacy Assessment Instrument, and The Emotion Expression Scale for Children were used for data collection. The data were analyzed using MANOVA.

Results: The results showed a higher rate of anxiety disorders in deaf and HH students than in hearing students. Emotional literacy was lower in deaf and HH students than in the hearing students, and it was lower in deaf students than in the HH students. Also, disturbance in emotional expression (Poor Awareness Factor [PAF] and Expressive Reluctance Factor [ERF]) was higher in deaf and HH students than in hearing students, and PAF was lower in deaf students than in HH students.

Conclusion: The results support the existence of anxiety symptoms, low emotional literacy, and difficulties in expressing emotions in students with HL. Appropriate psychological and pedagogical strategies to reduce anxiety disorders and increase the level of emotion expression and emotional literacy in students with HL are recommended.



1. Introduction

Hearing Loss (HL) is classified into five categories: mild, moderate, moderately severe, severe, and profound. It can affect one or both ears and causes difficulty hearing a conversation or hearing intense sounds (Alshuaib et al., 2015). Hard-of-Hearing (HH) people usually communicate through spoken language and can use hearing aids such as cochlear implants. Deaf people have profound hearing loss or minimal hearing and often use sign language to communicate (World Health Organization, 2021).

Worldwide 466 million people have disabling HL, of whom 34 million are children (WHO, 2021). The prevalence of HL in a population-based study in Iran has been reported at 14.7 percent (Asghari et al., 2017). One study reported that conductive HL in students in Iran was 8.2% (Absalan et al., 2013).

Some studies have examined how HL may affect anxiety (Contrera et al., 2017). The primary anxiety disorders are selective mutism, social anxiety disorder, panic disorder, agoraphobia, generalized anxiety disorder, and separation anxiety disorder. (American Psychiatric Association, 2013). Deaf people are less interested in attending school than their hearing peers (Kushalnagar et al., 2019). In a review study, the lifetime prevalence of anxiety disorder in HL people was 11.1%, and 15.4–31.3% had clinically significant anxiety symptoms (Shoham et al., 2019). In a study in Iran, the symptoms of anxiety disorders in adolescents with hearing loss was 37.5% (60.9% in deaf vs. 21.2% in hard-of-hearing). Also, the social anxiety disorder, school avoidance, panic disorder, and anxiety disorders in deaf adolescents were higher than those in hard-of-hearing ones (Ariapooran & Khezeli, 2021).

Emotional literacy, first used by Claude Steiner (1997), is the ability to empathize with the emotions of others and to express emotions. Emotional literacy improves relationships, friendships, and feelings of togetherness (Ariapooran, 2021). Weakness in emotional literacy skills leads to problems in cognitive flexibility (Malkoç & Aydın Sunbul, 2020). Deaf adolescents have more problems with social skills (Sidera et al., 2020). Deaf and HL adolescents have low interest in communicating with their peers and involving in social interaction (Terlektsi et al., 2020) and also feel lonely in school, experience low levels of self-regulation, cognitive empathy, and pro-social motivation (Netten et al., 2015).

Emotion regulation, defined by Thompson (1994, cited in Ariapooran, 2021), is an internal and external process responsible for reviewing, evaluating, and modifying emotional reactions. According to the functionalism approach, the development of skills to regulate the experience of emotion and its expression has a significant role in psychological and social adjustment. A study showed that people with HL have low levels of emotion expression (Ghosh, 2016). Deaf children are sensitive to visual recognition of emotions and have no difficulty identifying basic emotions and opposite emotions such as sadness and happiness (Serra et al., 2017). On the other hand, people with HL had low emotional intelligence and regulation and emotional adaptability levels and delayed emotional recognition tasks (Freitas et al., 2022; Al-Khateeb et al., 2014).

As mentioned above some studies have shown that hearing impairment affects the experience of anxiety and emotional regulation, there is no comprehensive agreement in this area. Therefore, this study compares symptoms of anxiety disorders, emotional literacy, and expressing emotions in deaf and HH children and peers with normal hearing.

3. Method

3.1. Research Design

This causal-comparative study was conducted with the participation of deaf, hard-of-hearing, and hearing students in Iran in 2019. This study compares the symptoms of anxiety disorders, emotional literacy, and expressing emotions in deaf and HH students with those of hearing students. Accordingly, hearing loss is considered an independent variable, and symptoms of anxiety disorders, emotional literacy, and emotion expression as dependent variables.

3.2. Participants

The statistical population was comprised of Students aged 13 to 18 with hearing loss in sixth to eighth grades (deaf or HH ranged from mild to severe) in four adjacent cities of Iran: Borujerd (Lorestan province, 18 students); Malayer (Hamedan province, 14 students); Qom (Qom province, 21 students); and Arak (Arak province, 23 students). All students were attending exceptional schools for students with hearing impairment. Seventy-six students (39 HH and 37 deaf) participated in the study. When the students answered the questions, their special teacher was present in the classroom, and if the questions were ambiguous, he/she explained the issue to them. Four students (one HH and three deaf) were excluded from the final sample due to incomplete questionnaires, and the final sample was reduced to 72 students (38 HH and 34 deaf). All deaf children used sign language for communication, and HH children used speech with or without hearing aids.

Inclusion criteria were: having physical health, no history of hospitalization due to psychological and physical problems, medium and higher intelligence quotient based on the academic record, and not having other disabilities such as blindness. Exclusion criteria included not having the consent of the child and the parent to participate in the research, having infectious diseases such as Colds and Flu when answering the questionnaires, and failing to complete the questionnaire.

The hearing students group included 72 students selected among the hearing school students and matched with the HL group in terms of the city of residence, type of school, school grades, gender, and age. Among the hearing students (sixth to eighth grades), the matched students participating in the study were selected in equal numbers as the study group, and they completed the questionnaires. It should be noted that in seven hearing students, there was no match for age because the HL group had seven students of age more than that of the hearing group; therefore, these seven students were matched in terms of other variables.

3.3. Ethical Consideration

All parents of students signed an informed consent form to allow their children to participate in the research. It should be noted that exceptional school teachers confirmed the questionnaire items. Also, whenever the deaf and HH had ambiguity or questions about the questionnaire items, an exceptional school teacher helped them rate the items using sign language.

3.4. Instruments

3.4.1. Screen for Child Anxiety-Related Emotional Disorders (SCARED)

This questionnaire contains 41 items scored based on a 3-point Likert scale (Very True or Often True = 2, Somewhat True or Sometimes True = 1, and Not True or Hardly Ever True = 0), that examines various emotions and behaviors which are related to anxiety symptoms. The final score obtained ranges from 0 to 82. The questionnaire has five subscales: Panic

Disorder [PD] with 13 items, General Anxiety Disorder [GAD], with nine items, Separation Anxiety Disorder [SAD] with eight items, Social Anxiety Disorder [SoAD] with seven items, and Avoiding School [AS] with four items. The cut-off point for all anxiety disorders is a score of more than 25 on all items. Scores higher than seven in the PD subscale, scores higher than nine in the GAD subscale, scores higher than five in the SAD subscale, scores higher than eight in the SoAD subscale, and scores more than three in the SA subscale are considered a cut-off point for each of these symptoms. The validity data showed a sensitivity of .71 for the questionnaire; its internal consistency was reported to be between .78 and .87 (Birmaher et al., 1999). In Iran, Cronbach's alpha coefficients of .78, .71, .73, .76, and .61 for PD, GAD, SAD, SoAD, and SA, respectively and .98 were found for the whole scale (Jalali et al., 2018; cited in Ariapooran & Khezeli, 2021). Convergent validity of this scale showed that there is a significant positive correlation between the total score of this scale and the total score of overt anxiety in children [$r=0.48$](Jalali et al., 2018; cited in Ariapooran & Khezeli, 2021). Cronbach's alpha coefficients of the questionnaire in the present study were .84 and .72 in HL and hearing students, respectively.

3.4.2. The Emotional Literacy Assessment

This checklist was designed by Faupel (2003) and contained three checklists: pupil (25 items), teachers (20 items), and parents (25 items). Responses are scored based on a 4-point Likert scale from not at all true (given a score of 1) to very true (given a score of 4). The final score of the scale ranges from 25 to 100. The scale has five subscales (each subscale has five items), including self-awareness, empathy, motivation, self-regulation, and social skills. A study reported Cronbach's alpha coefficient of 0.63 for the child version of Emotional Literacy Assessment and Intervention (Knowler & Frederickson, 2013). Ariapooran (2016) translated the items into Persian through the forward/backward translation method, and the Cronbach's alpha coefficient of the questionnaire was reported as 0.72 in Iran; its divergent validity has also been confirmed by the correlation of each dimension with the whole scale (from $r=0.65$ to $r=0.82$). Cronbach's alpha coefficients in the present study were 0.77 and 0.71 for the Persian version of the scale in HL and hearing students, respectively.

3.4.3. The Emotion Expression Scale for Children (EESC)

EESC was designed by Penza-Cliyve and Zeman (2002) and contained 16 items scored on a 5-point Likert-type scale from 1 (not at all true) to 5 (extremely accurate). The final score ranges from 16 to 80. The scale has two subscales: Poor Awareness Factor (PAF) with eight items, and Expressive Reluctance Factor (ERF) with nine items. High scores on the scale show a low level of emotion expression. The Cronbach's alpha coefficients of .83 and .81 were reported for the subscales of PAF and ERF, respectively (Penza-Cliyve & Zeman, 2002). The scale items have been translated into Persian through the forward/backward translation method, and Cronbach's alpha coefficient was .77 and .79 for the subscales of PAF and ERF, respectively; its divergent validity has also been confirmed by the correlation (from $r=0.77$ to $r=0.86$) of each dimension with the whole scale. (Ariapooran, 2016). Cronbach's alpha in the present study was .75 and .69 for the Persian version of the full scale in HL and hearing students, respectively.

4. Results

The mean ages of the deaf, HH, and hearing participants were 14.47 ± 0.825 , 14.60 ± 0.718 , and 14.87 ± 0.837 , respectively. Of the HL sample, 29 (40.3%) were in the sixth grade, 24

(33.3%) were in the seventh grade, and 19 (26.4%) were in the eighth grade; 23 students were females (12 HH and 11 deaf), and 49 were males (26 HH and 23 deaf). Of the deaf children, 31 were Prelingually deaf, and three were Postlingually deaf. Of the HH children, 29 used hearing aids.

Table 1. Anxiety disorders, emotional literacy, and emotion expression in the deaf, hard-of-hearing, and hearing students

Variable	Deaf Students		Hard-of-Hearing Students		Hearing Students		
	M	SD	M	SD	M	SD	
Anxiety disorders	PD	5.07	1.94	4.87	2.15	4.54	1.99
	GAD	3.79	1.74	4.42	1.92	2.96	1.89
	SAD	4.33	1.51	3.89	1.91	4.14	2.14
	SoAD	5.40	1.79	4.78	2.01	3.61	2.06
	SA	2.29	1.50	2.48	1.28	1.99	1.61
	Anxiety disorders	20.89	6.29	20.44	6.35	17.25	7.51
Emotional Literacy	Empathy	15.23	1.52	15.47	1.83	15.31	1.89
	Motivation	15.82	1.42	15.69	1.51	15.49	2.79
	Self-Awareness	17.68	2.07	17.79	2.33	19.46	3.25
	Self-Regulation	14.91	1.11	15.37	1.08	16.25	2.45
	Social Skills	14.34	2.09	14.43	1.47	16.32	2.94
	Emotion Literacy	77.98	5.47	78.77	5.05	82.84	6.17
emotion expression	Poor Awareness	17.32	1.80	16.42	1.99	14.43	2.49
	Expressive Reluctance	16.08	2.41	16.19	2.51	14.83	2.28
	Disturbance in Emotion Expression	33.41	3.58	32.62	3.58	29.27	4.49

Note: PS=Panic Symptoms; GAD= General Anxiety disorder; SAD=Separation Anxiety Disorder; SoAD=Social Anxiety Disorder, SA=School Avoidance

Table 1 presents the mean and standard deviation of anxiety disorders, emotional literacy, and emotion expression in deaf, HH, and hearing students. Before performing the MANOVA, the BOX test was carried out to assess the homogeneity of the variance-covariance matrices, and the results showed homogeneous matrices ($F_{\text{Box}} = 1.003$; $P < .171$). The equality of error variances was also assessed using Levene's test for anxiety disorders symptoms ($P < .947$), emotional literacy ($P < .092$), and emotion expression problems ($P < .463$).

Table 2. Results of MANOVA for comparing the anxiety disorder symptoms, emotional literacy, and emotion expression problem among deaf, hard-of-hearing, and hearing students

Source	Dependent Variable	SS	df	MS	F	Sig.	Effect Size
Group	Anxiety disorders	447.124	2	223.562	5.030	0.008	0.067
	Emotional literacy	720.906	2	360.453	5.537	0.005	0.073
	Disturbance in emotional expression	511.055	2	255.527	15.495	0.000	0.180

Note. SS = Sum of Squares; MS = Mean Square.

As shown in Table 2, the results of the MANOVA suggest a significant difference between the deaf, HH, and hearing students in anxiety disorders symptoms, emotional literacy, and disturbance in emotional expression (Wilks' Lambda=8.351; $P < 0.01$). After performing the MANOVA, Fisher's Least Significant Difference (LSD) post hoc test was used to examine the mean of the variables in the deaf, HH, and hearing groups. The results of Fisher's LSD post hoc test showed that anxiety disorder symptoms were higher in the deaf and HH students than in the hearing students ($P < .01$). Moreover, emotional literacy was lower in deaf and HH students than in hearing students ($P < .01$). However, disturbance in emotional expression was higher in deaf and HH students than in hearing students ($P < .01$). According to the effect sizes, 6.7% of

the variance in the anxiety disorders, 7.3% of the variance in the emotional literacy, and 18% of the variance in the disturbance in emotional expression were related to the HL. On the other hand, the effect sizes for anxiety disorders and emotional literacy were medium, and for the disturbance in emotional expression, they were large.

Table 3. Results of MANOVA for comparing the dimension of anxiety disorder symptoms, emotional literacy dimension, and emotion expression among deaf, hard-of-hearing, and hearing students

Source	Dependent Variable	SS	df	MS	F	Sig.	Effect Size (Partial Eta ²)	
Group	Anxiety Disorders	PS	7.253	2	3.627	0.887	0.414	0.012
		GAD	49.341	2	24.671	8.303	0.000	0.105
		SAD	3.596	2	1.798	0.477	0.622	0.007
		SoAD	83.773	2	41.887	10.609	0.000	0.131
		SA	6.362	2	3.181	1.405	0.249	0.020
	Emotional Literacy	Empathy	1.109	2	0.555	0.173	0.842	0.002
		Motivation	2.864	2	1.432	0.286	0.752	0.004
		Self-Awareness	107.029	2	53.514	6.898	0.001	0.089
		Self-regulation	47.114	2	23.557	6.478	0.002	0.084
		Social skills	135.422	2	67.711	11.276	0.000	0.138
	Emotion	Poor Awareness Factor	224.141	2	112.070	22.778	0.000	0.244
	Expression	Expressive Reluctance Factor	62.343	2	31.171	5.546	0.005	0.073

Note. SS = Sum of Squares; MS = Mean Square.

According to [Table 3](#), the results of the MANOVA indicate significant differences between symptoms of GAD, SoAD, self-awareness, self-regulation, social skills, PAF, and ERF in the deaf, HH, and hearing students (Wilks' Lambda = 5.311; $P < 0.01$). According to the results of Fisher's LSD post hoc test, GAD and SoAD symptoms were higher in deaf and HH students than in hearing students ($P < 0.01$); self-awareness, self-regulation, and social skills were lower in deaf and HH students than in hearing students ($P < 0.01$). Moreover, PAF ($P < 0.01$) and ERF ($P < 0.05$) were higher in the deaf and HH students than in the hearing students. There was no significant difference between GAD, SoAD, self-awareness, self-regulation, social skills, PAF, and ERF in the deaf and HH students, and there was no significant difference between PS, SDA, SA, empathy, and motivation among the three groups. According to the effect sizes, 10.5% of the variance in the GAD, 13% in the SoAD, 8.9% in self-awareness, 8.4% in self-regulation, 13.8% in social skills, 24.4% in PAF, and 7.3% in ERF are related to HL. Also, the effect sizes for GAD, SoAD, self-awareness, self-regulation, and social skills are medium, and for PAF, they are large.

5. Discussion

The present study was conducted to compare the symptoms of anxiety disorders, emotional literacy, and emotion expression in deaf, HH, and hearing students in four cities in Iran. This study indicated that the anxiety disorder symptoms GAD and SoAD in the deaf and HH students were higher than in their hearing peers and the effect size for anxiety disorders was medium. These results are consistent with other studies and showed that social anxiety disorder (Azab et al., 2015), types of anxieties and specific phobias (Li & Prevatt, 2010), and General Anxiety Disorder (Azab et al., 2015) in HL children are higher than hearing children. Also, there was no significant difference between PD, SAD, and SA in deaf/HH and hearing students; these results are similar to the results of previous studies (Kushalnagar, 2019; Azab et al., 2015).

Deaf and HH people cannot determine as quickly as hearing people what people say in their verbal speech, and because of their linguistic problems, it is difficult for them to understand others' feelings and thoughts. They often focus on lip movements in conversation with others and have to use lip reading to understand the speech of others. Therefore, this slow down, or perhaps the failure to understand the speech of others, may lead to worry and symptoms of anxiety. Research has shown that younger children with HL are more likely to face problems in social competence and neglect by peers (Elwey et al., 2021). Therefore, difficulties in expressive language and feelings of rejection by others can cause them to feel more worried or generally experience more symptoms of social anxiety than their hearing peers.

Concerning the lack of a significant difference in the mean of PD, SAD, and SA between students with HL and those who cannot hear, this can be attributed to the developmental similarities of these children, which have also been mentioned in the previous research (Kushalnagar, 2019). Additionally, it can be noted that students with HL are studying in exceptional schools. Therefore, the type of school, the interaction with similar HL students, and the presence of special teachers can cause students to experience less anxiety of separation and avoidance and give them more incentive to attend school.

In our study, deaf and HH students have lower emotional literacy (and self-awareness, self-regulation, and social skills dimensions) than the hearing students, but there was no significant difference between empathy and motivation in the three groups. Some studies have reported difficulties in communication and social interaction, isolation, and loneliness, social problems, and low self-regulation in people with HL (Sidera et al., 2020; Kluwin et al., 2002; Di Bacco, 2017).

The problem of verbal communication in students with HL, especially deaf students, is likely to lead to weakness in the transmission of spoken messages and low speech comprehension concerning their peers. Students with HL reported many social-emotional problems, such as finding friends, classroom learning, and the ability to be alone with people (Mekonnen et al., 2015). Concerning the lack of difference in empathy and motivation, in both dimensions of emotional literacy among the deaf, HH, and hearing students, as previous research suggests, students with HL, like the hearing students, may understand the feelings and emotions both positive and negative of others. They may be motivated to express their emotions but have difficulty regulating and managing them (Freitas et al., 2022).

Our findings indicate that disturbance in emotion expression (PAF and ERF) in deaf and HH students is higher than in hearing students, and emotional awareness in deaf students is lower than in hearing peers. The effect size for disturbance in emotion expression was large. These results are consistent with other studies; indicating difficulties in expressing emotions (Ghosh, 2016), perception of emotions (Wiefferink et al., 2013), emotion regulation (Freitas et al., 2022), and adapting to emotions (Akram & Hameed, 2014) among students with hearing loss. Students with hearing loss often experience many linguistic problems when communicating with others. It may be one possible reason for their PAF and ERF, as it has been revealed that strength and clarity in speech are related to the appropriate expressive emotion (Lindquist et al., 2015).

The effect size for anxiety disorders and emotional literacy by hearing loss was medium in our study; hearing loss (deaf and HH) alone will not lead to anxiety disorders and emotional problems. It may return to other problems in school and family. For example,

Bigdeli & Salahi (2011) indicated that 52.2% of teachers of hearing loss students in Iran stated that there were no appropriate communication devices (including Teletext and Chat) in exceptional schools, and the quality of libraries in these schools was not appropriate.

6. Limitation and Recommendation

Using a self-report questionnaire was one of the limitations of this study, and this limitation may affect the generalizability of the results. Because answering the questionnaire questions may be biased. We suggest that interviews be used to gather information in future research. Another limitation was the lack of participation of students with mild hearing loss who attended ordinary schools. These students were not included in the research because their exact statistics were unavailable. Future studies are recommended to address these limitations to improve the generalizability of the study. Despite these limitations, the results support the existence of anxiety symptoms (general anxiety and social anxiety), low emotional literacy (self-awareness, self-regulation, and low social skills), and difficulties in expressing emotions in students with hearing loss compared to their hearing peers. Therefore, the use of appropriate psychological and pedagogical strategies to reduce the symptoms of anxiety disorders and increase the level of emotion expression and emotional literacy in students with hearing loss is recommended, including social skills training and emotional literacy, student participation in group activities, and interactions with ordinary students. It may help modify these problems and positively affect these students' mental and emotional health.

7. Conclusion

Considering the lack of agreement in this field in previous studies, our research showed a high rate of anxiety disorders, emotional literacy and difficulty in emotion expression in students with hearing problems compared to their hearing counterparts. Therefore, the research highlights new findings in the field of some emotional problems of students with hearing problems; We conclude that the findings of this research can encourage researchers to conduct similar researches in the field of emotional problems of this group and to discuss the necessary practical solutions in order to reduce these problems in them.

8. Author Contributions

Both authors made the statistical analyses, data collection, interpretation of data, and writing and revising the manuscript.

9. Acknowledgments

We would like to thank the students with hearing loss, school principals, and teachers for their participation in the study.

10. Conflicts of Interest

The authors declare there is no conflict of interest in this article.

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