



RESEARCH ARTICLE

Toward Rehabilitation: Emotional and Behavioral Problems and Quality of Life among Females with Hearing Disabilities in Tabuk, Saudi Arabia

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Hearing disability is prevalent to different degrees in Saudi Arabia (SA) as they usually exhibit more emotional and behavioral problems. Little is known about these problems and how they affect quality of life (QOL) in deaf and hard hearing (DHH) females, so insights about these problems will help in rehabilitation for this group. The study aimed to explore emotional and behavioral difficulties (EBD) and QOL among hearing disability females in Tabuk, SA. A convenience sample (95) of participants of all DHH females was taken using a cross-sectional descriptive research design from Al Amal Center for hearing disability females and preparatory & secondary schools that incorporate female students who were hard hearing at Tabuk City, SA. An interviewing sheet composed of three parts was used for data collection; females' basic data, strengths and difficulties questionnaire (SDQ) & Youth Quality of Life-Deaf and Hard-of-Hearing questionnaire (YQOL-DHH). Data analysis was accomplished by the Statistical Package for Social Science software, version 23 (SPSS Inc. Chicago, IL, USA). Results pointed out that the total difficulties of emotional, hyperactivity, conduct, and peer problems were high at 32.81 (SD = 4.50). More than three-quarters (75.8 %) of DHH participants were high needs while their prosocial behavior strength of participants was low. Furthermore, participation, self-acceptance & advocacy scales were lower and perceived stigma was higher. Based on logistic regression, older age, complete deafness, being in secondary education, and perceived stigma were significantly positive predictors for high needs. While, being participated, self-accepted & advocating are negative predictors of high needs. DHH females have more EBD and poorer QOL. Most female participants were high needs but the prosocial behavior strength of participants was low reflecting no problem in this area. More participated, self-accepted & advocacy females are negative predictors of high needs. Thus, improving participation and self-acceptance of DHH females in the home, school & community can be effective strategies to improve QOL for this group.

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INTRODUCTION

Hearing disability affects a lot of people worldwide as it is the leading cause of disability in the fourth level. It prevents development, involving speech, language, and societal development [1]. Nearly 5.3% of the world's population suffers from hearing disability with significant consequences on their quality of life (QOL) [2]. The greatest affected regions of hearing disability in the world are South Asia and sub-Saharan Africa. It causes major problems and a strong influence on the daily living of the affected people that need to be properly discussed [3]. Hearing loss prevalence with different categories in Saudi Arabia (SA) is 1.4% [4].

Developmental changes and their influence on QOL in this age in deaf and hard-hearing (DHH) females are less recognized [5]. There is reduced access to social information for this group as the majority of them were born to normal-hearing parents who are unprepared & unaware of dealing with DHH children, in addition, there are limited services for early detection and intervention of DHH children in SA [6, 7, 8]. Furthermore, DHH individuals suffer emotional & behavioral problems that affect their QOL due to their failure to communicate effectively [9, 10]. Besides, deafness can cause undesirable life orientation, especially with young individuals suffering from hearing disability who require support to appreciate and develop coping emotions within their lives [11].

The Strengths and Difficulties Questionnaire (SDQ) is a brief measure of the pro-social behavior and psychopathology of 3-17-year-olds. Its reliability and validity make it a useful measure that can be filled by parents, teachers, or youths that determine emotional, prosocial, and conduct problems in persons with hearing disabilities. It is a five-factor structure that is recommended to be used among DHH people [12, 13]. SDQ has been translated and validated in many languages including Arabic, the validation data of the SDQ by a few recent studies indicated that the scale anticipated effective mental health consequences and demonstrated structural integrity between cultures in many Arab countries such as Oman, Saudi Arabia, and Qatar [14, 15, 16]. A study confirmed that DHH individuals are more EBD than others and the most marked behavioral difficulties in peer relationships [17]. Furthermore, DHH people suffer more negative feelings than normal peers resulting in undesirable effects on their QOL [10].

Quality of life involves psychological, physical, environmental, personal & social relationships. Furthermore, religious and spiritual beliefs [18]. The presence of DHH children in the family often disturbs the extent of interaction between family members, so DHH adolescents often face difficulties [19]. A study indicated that QOL is poorer described in persons with hearing disabilities matched to their hearing persons, although the magnitude of these variances is different between studies. A supplement to the evaluation of EBD is computing the perception of the QOL [18]. Youth Quality of Life-Deaf and Hard of Hearing (YQOL-DHH) scales can be taken for QOL evaluation in DHH individuals. It is a useful and practical instrument for professionals, parents, and researchers who deal with DHH youth to take care of their needs. It can be used to follow up on deaf persons for suitable beneficial interventions such as psychotherapy [20].

One of the programs under the Saudi Vision 2030 is the QOL program. Its goal is to improve QOL for all Saudi citizens, especially DHH people [21]. Studying QOL is vital to better understanding the essentials of DHH females because communication & participation socially are vital for daily living [5]. Despite some signals that poor QOL may be accompanied by more EBD in persons with hearing loss [22]. To our knowledge, these problems have not been examined in this group in Tabuk City, SA. and the existing study is rare. Hence, the first step in resolving the problem is to evaluate the present situation, so our study aims to explore EBD and QOL among females with hearing disability in Tabuk, SA

MATERIAL AND METHODS

Study design

A cross-sectional research design was used in this study.

Setting and sample

The present study data was collected from from Al Amal Center for hearing disability females, preparatory and secondary schools that incorporate female students who were hard hearing in Tabuk City, SA.

Sample size calculation

Small number of DHH for the randomization technique; consequently, a convenience sample of all DHH females who fit to criteria of inclusion was taken. The inclusion criteria were Saudi DHH females, aged 12 to 19-years old years, using sign language, not diagnosed with mental or psychiatric disorders before, free from other hereditary or health problems, having parental consent or agreeing to contribute to this study.

Study measures and data collection

The researchers established an interviewing sheet after reviewing the related research work. The interview sheet consists of three parts. Part I: basic data of participants such as age, hearing status, educational level, mother's educational level, father's educational level, and hearing status of both mother and father. Part II: Self-reported SDQ for 11–17 years [23, 24]. It includes 25 items graded on a three-point Likert scale (not true, somewhat true, and certainly true; range 0–2). It consists of 5 subscales. Each one has 5 items on emotional problems (e.g. frequently tearful or depressed), conduct problems (e.g. frequently tell lies or cheats”), hyperactivity (e.g. Restless, overactive”), peer problems (e.g. Rather friendless, prefers to play lonely”), and prosocial behavior (e.g. Often offers help to others”). Each subscale has the highest score of ten and the lowest one is zero. We can obtain the total score of difficulties by finding the sum of the scores of the first four scales while the fifth prosocial scale is considered the strength group. The total range of difficulties score was from 0 to 40 divided into low need (0-15), some need (16-19), and high need (20-40). The conduct problems score was (0-5), 6, and (7-10) for low need, some need & high need, respectively. Emotional symptoms score and hyperactivity score were (0-5), 6, (7-10) for low need, some need & high need, respectively. Also, peer problem scores were (0-3), (4-5), and (6-10) for low need, some need & high need, respectively. On the contrary, prosocial behavior score was (6-10) low need, (5) some need & (0-4) high need as the lower score on the strength or power subscale reflects a problem in this area while the high score on the subscale of difficulty reflects problems in each subscale. Good Internal consistency was documented for SDQ, with Cronbach's alpha range from 0.63 to 0.85. Part III: YQOL-DHH questionnaire [25]. This was designed to measure the QOL of DHH youth aged 11 to 18 years. It involves 32 items which are divided into three domains: perceived stigma, self-acceptance/advocacy, and participation. The first two domains are positive, therefore high score shows improvement in QOL, and the last domain is negative, therefore low score of this domain shows improvement in QOL. Each item takes a score on an 11-point rating scale from 0 (not at all) to 10 (very much). 14 items for self-acceptance/ advocacy (e.g. “I know how to stand and speak about myself”), 8 items about perceived stigma (e.g. “I feel people bully me”), and 10 items relating to participation (e.g. “I feel it is hard to contribute or engage in large groups”). The score per domain is transformed on a scale from 0 to 100. Items 23–32 were reversed scores. Negatively expressed items were reversed scores as 10 showed a high OOL score. The YQOL-DHH tool displays good validity and reliability for evaluating QOL in DHH adolescents. Psychometric analyses of the YQOL-DHH questionnaire produced satisfactory scores with internal consistency (Cronbach's alpha = 0.84–0.86) and test–retest reliability (ICCs = 0.79–0.88). The validity through confirmatory factor analysis for the three domains ranged from 0.28–0.70. The tools were validated by five experts and displayed high validity.

The data collection was from the beginning of December 2023 to the last of February 2024. The data collection was done through an interview by an interviewing schedule. The first author distributed the questionnaires to the participants after dividing the participants into small groups of 4 to 6 females for each group. At the interview beginning, the second author clarified the study's purpose and took informed approval from the participants after emphasizing the confidentiality of data. He explained how to complete the two questionnaires. Then, each question was translated using all communication methods for DHH students as lip-reading, gestures, and signed language. The authors confirmed that all participants understood the two questionnaires. The accomplishment of the questionnaire took about 40–45 min.

Ethical considerations

An acceptance of the project proposal was taken by the Deanship of Scientific Research at the University of Tabuk before the start of the data collection process. The ethical consideration about approval of the study was taken. Additional approval was attained from the previously mentioned settings of data collection. The researchers clarified the study's purpose and took informed approval from the participants after emphasizing the confidentiality of data. They also, informed about their chance to extract at any time and that the study will not have risks for them.

Statistical methods

The investigation of data by IBM software (IBM Corp., Armonk, N.Y., USA)', version 23. The females' basic data, SDQ females' scores, and YQOL-DHH scores were described using descriptive statistics as the number, percentage mean, and standard deviation. Binary logistic regression analysis was done to identify high-needs DHH females and their basic characteristics and YQOL-DHH scales. Among the basic data variables, age is a continuous variable. The other variables of basic data are categorical: hearing status, educational level, mother education, father education, and mother and father hearing status. The first category was considered a reference for other categorical variables. Statistically, values were considered significant at $p < 0.05$.

RESULTS

Table 1: Participants' basic data (n= 95).

Age		
- 12-15	59	62.1
- 16-19	36	37.9
Mean \pm SD	14.71 \pm 2.05	
Hearing status		
- Hard hearing	29	30.5
- Deafness	66	69.5
Education		
- Middle school	58	61.1
- Secondary school	37	38.9
Mother education		
- Illiterate	18	18.9
- Read and write	41	43.2
- Secondary education	21	22.1
- university education	15	15.8
Father education		
- Illiterate	11	11.6
- preparatory school	18	18.9
- Secondary school	19	20.0
- University education	47	49.5
Mother and father hearing status		
- No parent DHH	72	75.8
- Single parent DHH	12	12.6
- Both parent DHH	11	11.6

Table 1 clarifies the basic data of the study participants. The mean age of them is 14.71. Besides, more than two-thirds of the study females (69.5%) were deaf and more than half of them (61.1%) were middle school. Furthermore, 43.2% and 49.5% of the participants have read and write mothers and a university-educated father, respectively. Also, a small proportion of them (11.6%) have DHH fathers and mothers.

Table 2: SDQ mean participants' scores (n= 95).

- Emotional problems	7.10	1.25
- Hyperactivity scale	8.43	1.34
- Conduct problems	8.58	1.49
- Peer problems	8.68	1.11
- Prosocial behavior	7.47	1.27
- Total difficulties score	32.81	4.50

Table 2 shows the distribution of the study participants' mean scores of SDQ. It is reported that the mean scores of the four scales of SDQ were high. As stated emotional, hyperactivity, conduct, and peer problems were 7.10 (SD = 1.25), 8.43 (SD = 1.34), 8.58 (SD = 1.49), and 8.68 (SD = 1.11), respectively. In addition, the participant's mean total difficulties score was also high 32.81 (SD = 4.50). On the contrary, the prosocial behavior mean score of participants was slightly close to the average 7.47 (SD = 1.27).

Table 3: Participants' mean scores for YQOL-DHH (n= 95).

- - Self-Acceptance & Advocacy	45.21	6.61
- - Perceived Stigma	56.36	5.42
- - Participation	40.65	5.72

Table 3 displays the mean scores distribution of females for YQOL-DHH items. It is indicated that the mean scores of participation, self-acceptance & advocacy scales were 40.65 (SD = 5.72), and 45.21 (SD = 6.61), respectively. On the other hand, the perceived stigma mean score of participants was 56.36 (SD = 5.42).

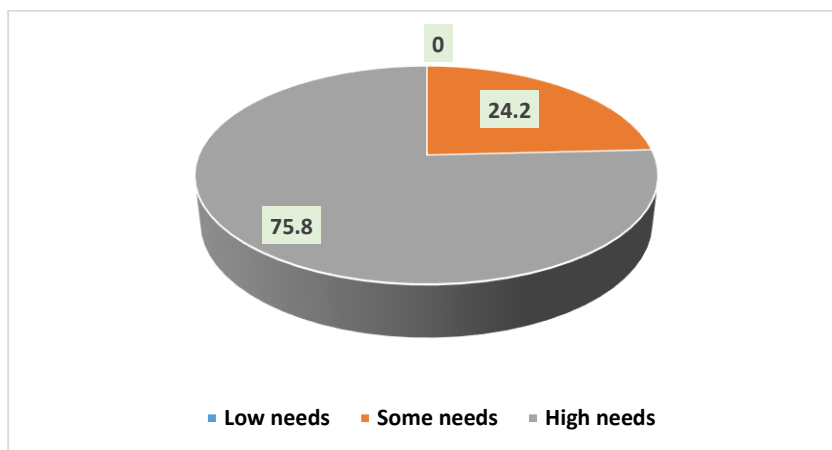


Figure 1: the participants' total difficulties score for YQOL-DHH (n= 95).

Figure 1 represents the participants' total difficulties score for YQOL-DHH. It was obvious that more than three-quarters of participants (75.8 %) had high needs. On the contrary, no one of the participants was located in the low-need category.

Table 4: Binary logistic regression analysis of the association of high-needs Participants with their basic characteristics and YQOL-DHH domains (n= 95).

Variables	High needs predictors	P value
	OR [95%CI]	
Age	1.765 (1.110-2.862)	0.016*
Hearing status		

Hard hearing	Ref	
deafness	4.278(1.537-11.678)	0.034*
Education		
Middle Education	Ref	
Secondary education	1.754 (1.120-2.850)	0.025*
Mother education		0.201
Illiterate	Ref	
preparatory school	0.431(0.117-1.874)	0.267
secondary school	0.859(0.210-3.709)	0.850
university education	0.678(0.320-2.599)	0.771
Father education		0.623
illiterate	Ref	
preparatory school	0.960(0.949-1.050)	0.662
secondary school	0.943(0.965-1.134)	0.725
university education	0.939(0.959-1.129)	0.716
Mother and father hearing status		0.186
no parent DHH	Ref	
Single parent DHH	4.1 20(0.910-18.671)	0.056
Both parent DHH	1.0 30(0.450-2.334)	0.947
Self-Acceptance & Advocacy	0.671 (0.551- 0.872)	0.001*
Perceived Stigma	2.6 18(1.231- 5.519)	0.013*
Participation	0.6 79(0.531- 0.875)	0.003*

Table 4 explains binary logistic regression analysis of association high-needs participants with their basic characteristics and YQOL-DHH items. It is clear that being older age [OR=1.765]1.110-2.862), p=0.016], complete deafness [OR=4.278]1.537-11.678[, p=0.034], being in secondary education [OR=1.754]1.120-2.850), p=0.025] and perceived stigma [OR=2.618 (1.231- 5.519), p=0.013] are

positive predictors for high needs as they are more exposed to be high needs person. On the other hand, being participated [OR=0.679 (0.531- 0.875), p=0.003] and self-accepted & advocacy [0.671 (0.551- 0.872), p=0.001] are negative predictors for high needs and low chance to be high needs participants.

DISCUSSION

The interaction with diversity of population and the right to assure equality to all populations is one of the challenges in the 21st century especially with disabled people as DHH people which are sign language users. DHH females often face language difficulties in interacting with people who do not use sign language which leads to serious concerns that affect their social, emotional cognitive development and also a reduced knowledge of their own life and QOL [26,27], Early recognition of EBD in hearing loss individuals is vital for diagnosis and early intervention [28]. Yet restricted Saudi research has focused on evaluating EBD and QOL among this neglected group. Hence we will explore these factors. Firstly, several factors complicate the understanding of EBD and QOL between DHH children and adolescents due to the low prevalence of this group resulting in small sample sizes and differences in results.

Our current study displayed that hearing disability females frequently suffer from EBD. As observed the mean scores of the four scales of SDQ were high reflecting substantial risk of clinically significant peer, emotional, hyperactivity, and conduct problems. Similarly, a meta-analysis study involving twelve studies using SDQ provided estimated effect sizes of - 0.01 (95 % CI -0.32, 0.13) for self-ratings of SDQ. The study reported that hearing impairment children and adolescents had scores of EBD about a quarter to a third of a standard deviation higher than hearing peers do. In

addition, the study recommended providing support to improve social relationships, especially with their peers [17]. In addition, our results were the same as the previous study, showing that participants with hearing loss suffer from psychopathology such as internal and external difficulties [29]. Similarly, several studies demonstrated EBD was increased in children with more profound degrees of hearing loss compared to children without hearing loss [30, 31, 32]. Besides, another study using self-version of SDQ found significantly more peer problems than the normal hearing adolescents group [33]. This is due to variances in their experiences and access to sound. It can be said that conduct, hyperactivity, and emotional and peer problems among DHH participants may be due to poor language development that causes isolation from society, and difficulty participating at school, work, community, and even with family resulting in EBD.

On the contrary, the strength subscale of prosocial behavior mean score of participants was slightly close to the average 7.47 (SD = 1.27) reflecting unlikely clinically significant problems in this area and presenting that our Saudi female participants were helpful, volunteers, and respected feelings of other people. Similarly, the prior study compared self-reported and parent EBD and OOL among hearing loss adolescents with normal adolescent girls which indicated significant self-reported EBD than adolescent boys, and more prosocial behavior for adolescent girls [34]. Similarly, a descriptive observational study conducted by Agung et al., 2021 in Indonesia. It has shown that the power subscale of prosocial behavior mean score showed increased in children using hearing aids than children with cochlear implants and this means low need and unlikely clinically significant problems in prosocial behavior. This is due to the difference in sound stimulus process between the participants of his study and our study [35].

It was observed in our study that three-quarters of participants were high-needs participants as total difficulties mean score was 32.81 and this reflects significant problems and difficulties. This was the same as the Saudi study to assess the social-emotional experiences of DHH persons in Saudi Eastern province society using 12 participants. The study showed lower self-concept and negative self-image in DHH persons than in their hearing peers [36]. Furthermore, a prior study revealed that DHH children were more likely to rate themselves at the borderline level for EBD on the SDQ [37]. Another previous study reported total difficulty score of children using hearing aids was 20 (91%) which is considered a borderline degree of high needs category [35]. Besides, a study in Ethiopia revealed that DHH students suffer more severe EBD across all dimensions of SDQ [38]. An explanation for this finding is that deafness as a disability was accompanied by some concerns such as participation, and emotional & psychological problems that disturb the QOL of the DHH females [39].

Perceived QOL is a perception of an individual of his location in life in the background of the value and culture in which they live regards to their goals, ethics & potentials [40]. In the current study, the mean scores of participation, self-acceptance & advocacy scales were lower scores indicating lower QOL. An explanation for this finding is that EBD affects the QOL of the DHH females. Based on current and prior studies, our findings are in line with the survey study conducted on 305 DHH Saudi participants through social media of DHH clubs and organizations in Riyadh, Dammam, Jeddah, and Jazan to explore the QOL among Saudi DHH adults using the YQOL-DHH questionnaire. The study reported significantly lower scores on the self-acceptance and relationships domains participants [41]. Furthermore, McAbee et al., 2017 & Yigider et al., 2020. Their results showed lower QOL of DHH students than their typical hearing peers especially in school and social relations [42, 22]. Similarly, a review and meta-analysis on QOL in youth with hearing loss recognized 16 studies using diversity measures of QOL and 11 of these studies pointed to poor QOL among youth with hearing loss than the hearing one [18]. In addition, a study in Nigeria to evaluate the QOL of DHH students in Ibadan. The study reported that the majority (57.8%) of DHH students had poor QOL [43].

A higher perceived stigma mean score was detected by our study and this reflects poor OOL for this age group. In addition, a study by Ashori & Jalil-Abkenar, 2020, the study evaluates QOL and regulation of cognitive emotions among DHH adolescents. Their findings detected higher scores of perceived stigma mean scores of 61.26 (SD = 3.81) compared to 56.36 (SD = 5.42) in our study

[44]. In addition, a cross-sectional study in the U.S. studied QOL of DHH adolescents, ages 11 to 18, joining mainstream schools. The study reported high levels of the perceived stigma domain that reflects lower QOL of his participants [45].

The study findings from binary logistic regression analysis revealed that older age, complete deafness, were significantly more likely to be high needs and more EBD than others. The current study's results are consistent with numerous studies that detected a high proportion of DHH children were below two standard deviations of the mean scores for SDQ than normative population & hearing loss degree was a significant predictor of the total difficulties, conduct, emotion, and hyperactivity scores on the SDQ [46]. This effect may be attributed to the fact that more than two-thirds of our study participants were deaf and had no access to language early in life than hard of hearing participants. Consistent findings were also observed in a systematic review, which indicated an association between age at the intervention of hearing-impaired children and adolescents and psychopathological symptoms [47]. In addition, these results were in accordance with other studies indicating that hearing loss is a significant predictor of psychosocial problems. [48]. On the contrary, a study done in the Victorian Childhood Hearing Longitudinal Databank by Ong et al., 2023 reported that EBD was experienced in the same proportions of children with mild hearing loss compared to children with moderate-profound hearing loss (18.3% vs. 20.6%) and age is not a positive predictive factor of EBD as the reduction in EBD scores observed among the older in both groups of DHH children [49]. Furthermore, another study reported contradicting results that age was not a significant predictor of scores on the SDQ [46]. This may be due to the difference in the age groups between these studies' participants and our study participants.

It was reported from our study findings that perceived stigma are positive predictor for high-needs participants that reflect more EBD and lower QOL. Our findings were the same as a previous study accomplished by Ong et al., 2023, demonstrating that poor health-related OOL is usually found in children with EBD [49]. In addition, the previous study by Patrick, et al., 2011 reported that low scores of self-acceptance, advocacy, and participation and a high score of perceived stigma of DHH youth accompanied by increased levels of mental symptoms [25].

On the contrary, the current study suggested more participation, self-acceptance & advocacy of participants were found to be negative predictors for high needs and this means less liability to EBD. This result is consistent with the previous study by Theunissen et al 2014 [50]. On the same line, another study by Aanondsen et al., 2023 for DHH adolescents aged 15–20 in central and northern Norway. This study revealed significant associations between communication skills, mental health problems and QOL as DHH children conveyed significantly more EBD [51]. Similarly, prior study reported more EBD were significantly predicted with poor QOL [34]. Consequently, the current study results highlighted a closely relation between EBD and poor QOL in DHH adolescent females, suggesting that dealing with these problems may enhance their QOL. These findings shed light on the importance of attending to EBD to improve QOL and counseling of DHH females about EBD. Moreover, health and social service providers should confirm that all counseling services are available to this group.

STRENGTHS AND LIMITATIONS

A major strength is the use of validated assessment tools (SDQ and YQOL-DHH) and that study is considered the first in SA that assessed EBD and QOL among females with hearing disability in Tabuk. Focusing on DHH female adolescents is a major strength because the EBD and QOL experiences of females might be different from those of men because they have different experiences in school due to segregation in the educational system in SA. A major limitation was the low response of study participants, using self-report questionnaires and a relatively small sample size may limit the generalization of the study findings. Including participants from different regions could be useful for upcoming studies to provide a complete image of the study phenomenon so; further research using a large sample size from different locations in SA was recommended.

CONCLUSION AND IMPLICATIONS FOR CLINICAL PRACTICE

Despite a great effort by SA to provide rehabilitation services for DHH people to lower EBD and improve their QOL. This study confirmed prior findings that DHH females have more EBD and poorer QOL as the total difficulties of emotional, hyperactivity, conduct, and peer problems were high 32.81 resulting in high needs female participants for more than three quarters (75.8 %) but prosocial behavior strength of participants was low reflect no problem in this area. Furthermore, participation, self-acceptance & advocacy scales were lower and perceived stigma was higher indicating lower QOL. Based on logistic regression, older age, complete deafness, being in secondary education, and perceived stigma were significantly positive predictors for high needs. On the other hand, participating, self-accepted & advocacy are negative predictors of high needs. Thus, improving participation and self-acceptance of deaf people at home & school can be effective strategies to improve QOL for deaf people. The present study highlights the need for intervention that is targeted at preventing EBD and improving the QOL of deaf people. Then, the data provided from this study may help healthcare providers & policymakers in designing and implementing suitable strategies for early detection of EBD and the broad creation of public policies to reduce the long-term effects of EBD among this group and improve their QOL. Addressing such predictors of our study can increase the effectiveness of interventions at the level of home, school, and community.

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