Review

Depression and Deaf Adolescents: A review

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Deafness is a heterogeneous condition with far-reaching effects on social, emotional, and cognitive development. Many regard themselves as members of a cultural minority who use sign language. They should not continue to be neglected in research on depression. The purpose of this article is to investigate depression among the deaf people based on researches results. We identified relevant studies by searching the computerized databases Science Direct, PsycINFO and Medline. Additional relevant studies were identified through the reference sections of studies found during the initial search. In this article we retrieved 11 articles, 8 of them indicated a higher degree of depression amongst deaf people in comparison with hearing ones. The remaining 3 articles showed no difference between two groups. In addition anxiety disorders and insomnia were the highest degrees after depression in deaf people. Mild levels of depressive symptoms are more prevalent in the deaf than in hearing students but more severe depression is not. Although there is no evidence in the literature to suggest that Deaf adults do not experience depressive symptoms, the typical methods of assessing depressive symptoms among the population are inadequate and unreliable .

Keywords: deafness, depression, adolescence

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Introduction

Disability affects the individual, family and society in many aspects and lead to high social and economic consequence in the whole world. Indeed disability is the outcome of restrictions in basic physical, spiritual and mental functions and these restrictions are of vital importance in each individual. The impact of disability on the social – psychological Statuses is undeniable because disability apart from its limitations has psychological effects on a disabled person, Such as emotional-behavior problems (1). Traditionally, deaf people have been excluded from general studies, indeed in spite of an increase in mental health services there had been little empirical research related to prevalence and distribution of disorders of psychiatric symptoms and disorders in the deaf population. The literature search disclosed that there are some articles on deafness and mental health, but most of them discuss mental health and deafness from a practice perspective without providing new data. Most researches on hearing impairment in children focuses on speech and language development(2). On the other hand, the prevalence of mental health problems in community samples of deaf children is approximately 40%.(3). But it is estimated that only 2% of Deaf adults ever receive mental health care(4). Thus in orders to gain a better understanding of the impact of deafness on mental health, studies with more representative samples are needed. Ones of the problems forced for deafness is depression. Depression is a serious mental illness. Categorized depression as the most disabling clinical diagnoses in the world, it has been described as the "common cold" among the mental health problems(5). Delay in attention, diagnosis and treatment depression is important. Because may lead to give up interests and activities and isolated(6).

Deafness

The NAD (National Association for the Deaf) defines the term "deaf" as those persons who are unable to hear well enough to rely on their hearing and to use it as a means of processing information. The NAD refers to "hard of hearing" as those persons who have some hearing, and are able to use

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it for communication purposes, and who feel reasonably comfortable doing so(7). also we can classify those who have lost their hearing before three years of age and whose loss is present before the development of speech and language as pre-lingual, the persons who experience loss at three years of age or older, however, are classified as post lingual(5).

In fact the deaf and hard of hearing are a group of people who mostly experience the world visually and, exist have a unique and vibrant culture, a fact not always appreciated by hearing individuals. Many advocates believe that recognition by the hearing public that a deaf culture exists is a crucial first step toward educating the Nation about the needs of the deaf and hard of hearing(7). While deafness has historically been labeled a disability, many Deaf adults see themselves as members of a unique, non-disabled culture(8). Involvement with a Deaf community contributes positively to self-esteem and social relationships. Members of the Deaf community reported no difference in the QOL (Quality of Life) dimension of social relationships compared with samples from the general population(9).

There are various forms of Deafness Classification (table 1 & 2). The proposed classification in this article is based on research of M.masoud – ul – haqm and colleagues (10).

Table 1. Type of Deafness

NO	Type of deafness	Cases	%
1	Conductive	102	51
2	Sensor neural	74	37
3	Mixed	24	22
4	Total	200	100

Table 2. Amount of Deafness (Audiogram)

NO	Amount dB loss	Cases	%
1	Mild(less than 30 dB loss)	98	49
2	Moderate(30 to 45 dB loss)	52	26
3	Severe(45 to 60 dB loss)	26	13
4	Total(more than 60 dB loss)	24	12

Studies show that the most vulnerable groups are mild and moderate. Therefore most of our searches in this review focus on individuals with mild to moderate deafness, with onset before language have been established. According to the National Center for Health Statistics (NCHS), 3.3 percent of U.S. adults aged 18 years and over were deaf or had a lot of trouble in hearing without the use of a hearing aid during the period 2000–2006 (9). Between one and two people in a thousand of the general population are born deaf or become deaf in early childhood in developed nations (2, 11). There are also similar statistics in Iran (12).

Deafness or hearing impairment increases with age, rising from 0.9 percent among adults under age 45 to 3.1 percent among adults aged 45–64 and 11.1 percent among adults aged 65 and over(9, 11). There are many factors that lead to deafness, According to research after 1990, rates of hearing impairment associated with rubella and unknown causes declined. In a 2011 population-based Dutch study, a hereditary cause for permanent childhood hearing impairment was recorded in 39% of participants, an acquired cause in 30%, miscellaneous causes in 7%, and unknown causes in 24% (9).

The Adolescent deaf

It is often assumed that adolescence is a very ‘‘difficult’’ period of life, with adolescents being highly stressed and moody. It is further assumed that adolescents are under stress because they have to cope with enormous changes in their lives. Some of these changes are in sexual behavior following puberty. There are also large social changes, with adolescents spending much more time with others of the same age and much less time with their parents than they did when they were younger. Adolescence is also a time at which decisions need to be made about the future. In addition to these difficulties, in this tough period, having a hearing disorder would make it even harder and problematic. In deed Deaf adolescents are more depression than their peers (13). Findings that early childhood trauma is a risk factor for depression is not new. Childhood adversities have strong associations with mental health disorders throughout life. Childhood experiences may leading to depression included sexual or physical abuse, feeling ostracized from family and becoming ill or disabled (9).

The vast majority of deaf children (95%) are born in families without any previous experience of deafness (12). Some researchers have identified risk factors that are more specific to adolescents who are deaf. For example, deaf children had born to hearing parents experience depression more than deaf children with deaf parents (6). The Deaf individuals interviewed in the study of K.sheppard and T.badger, described feeling isolated as children because there was no common language within their

families (8). This is an important risk factor since 90% - 95% of deaf children are born to hearing parents. According to researches deaf children can feel excluded and isolated by the hearing world which affects their ability to acquire fundamental social skills for later life this may also cause self-esteem. Poor self-esteem has been identified as a factor contributing to depression and suicide (6).

A range of factors such as communication method, parents' communication competence and school type (residential versus mainstream) have been reported as risk factors specific to deaf children (3, 14). Communication barriers often make it difficult for deaf children to even discuss their symptoms of depression with parent and other health care providers (9). On the other hand deaf children are more likely to have difficulty in disclosing abuse. They may have no language to describe their experiences and their distress because adults in their lives may not understand them if they have no common communication(11). Therefore, few Deaf children receive appropriate treatment for their depression. Especially for those who have suffered physical and sexual abuse. Additionally, children with profound hearing impairments are more likely to be physically disciplined than are normal hearing children (8).

Many studies show the importance of communication for the psychosocial wellbeing of deaf children, despite their modality of communication or degree of hearing loss. Mental distress was worse in individuals reporting more communication problems, lower self-esteem, and less acceptance of hearing loss than in others (9). Also argues increased use of signed communication in the family appears to be linked to a decrease in the prevalence of mental health problems. Deaf and hearing-impaired children from families in which early communication is good are likely to develop rich psychological resources (9, 11).

In a study, teachers in schools for deaf children rated the mental status of three groups of children (mean age 12.8 years) as profoundly deaf, hard of hearing, or with cochlear implants. They reported no differences in psychosocial wellbeing between the groups, but overall prevalence of psychosocial difficulties was almost four times greater than in a group of hearing children (9). Deaf students aged 18–19 years read at a level such as the average 8–9-years-old hearing students. The occurrence of mental disorders in deaf children is significantly related to adverse experiences at school. In adolescence, level of language—whether signed or spoken—used with others at school is associated with peer relationship difficulties (9). Deaf children might be faced with frequent communication breakdowns because of their delayed/deviant syntactic abilities, their use of a manual system of communication, and their limited verbal output(15).

However, it is assumed that the communication difficulties of these Deaf people increase depressive symptoms. The key risk factors are developmental delays associated with early communication deprivation (3). It seems to be related to a large part of quality of life and sense of well-being and happiness of the deaf with their communication and interaction with hearing population and especially the deaf in the school age and adolescence. (3) Communication barriers and low ability to express demands and needs, may lead to give up interests and activities and this predisposes them for mental health problems especially depression. The purpose of this article is to investigate depression deaf individuals based on results to researches. It is assumed that there is a higher rate of depression in Children with early onset, severe to profound deafness (mild and moderate).

Depression

Depressive is an internal sadness combined with overwhelming feelings of hopelessness, despair, helplessness, low self-worth and loss of control. Depression in adolescents may stem from a wide variety of situations that involve social interactions such as, failure loss of a person, rejection and so on, but in some cases depression can be caused by an associated hearing loss (13, 16). The World Health Organization has categorized depression as the most disabling clinical diagnoses in the world, estimated to affect nearly 340 million people worldwide, at any one time (5). Rates of emotional and behavioral disorders are higher in deaf children and adolescents than in hearing peers (3, 9, 17). The prevalence of mental health problems in samples of deaf children is almost 40%. This includes children with transient and mild problems, too (3, 18). This increased prevalence reflects an increased prevalence of both emotional and conduct problems. Symptoms of depression among Deaf adults are not different from symptoms experienced by hearing people. The reports showed that the characteristics and course of depression in the deaf and hard-of-hearing people are similar to the hearing ones(5).

According to the literature, the presentation of depression and depressive mood in the hearing and

the deaf and hard-of-hearing is similar (19, 20). For example: tearfulness, slowed responses, and changes in weight and eating patterns are indicative of depressed mood in both the hearing and the deaf and hard-of-hearing. They reported that the only difference between the hearing and the deaf and hard-of-hearing is that the latter are less likely to tell their symptoms to their families and/or physician and/or mental healthcare professional (5).

A survey conducted in 2007 found that six in 10 people with hearing loss had displayed some of the symptoms associated with depression. People with hearing loss experienced the following symptoms of depression (21)

- One in two had displayed increased irritability and frustration
- One in five had trouble sleeping or experienced restlessness
- Nearly 20 per cent showed a loss of interest or pleasure in most activities
- One in seven was described as being sad, down and miserable most of the time
- One in seven had withdrawn from close family and friends

Research findings suggest that not deafness as such, but other risk factors contribute to psychopathology in deaf adolescents (17). National Health Interview Survey Series conducted a survey whereby they assessed the knowledge, attitudes, and beliefs in the deaf and hard-of-hearing community regarding mental health and mental illness. Their sample consisted of fifty-four deaf volunteers between eighteen-and-seventy years old who preferred to communicate with American Sign Language (ASL). Results suggested that a few deaf individuals 9% (n =5) believed that deafness and hearing loss itself causes mental health problems. The participants overwhelmingly ascribed mental health problems to external causes, such as familial tribulations, own childhood, and poor communication. More specifically, 41% (n = 22) indicated that communication problems, family stresses, and the societal prejudice that accompany deafness and hearing loss leads to problems ranging from suicidal depression to substance abuse to violent behavior . The participants in this study identified communication barrios as the main cause of mental health problems(5).

Briefly, mental disorders – as well as a lack of such disorders – are a result of individual vulnerability and resilience, and environmental risk and protection (13). Deaf children and adolescents are more vulnerable to mental health problems than hearing children (8). The recognition that deafness is not just a pathological disability of hearing impairment but rather a handicap caused by difficulties in interpersonal communication is an important step towards improved health-care accessibility (9, 22).

Methods

A systematic literature search was undertaken which included the central databases Cochrane Library, Medline/PubMed, PsycINFO and scince dairect and an Internet search with Google Scholar. In addition, the reference lists of the articles included were scrutinized to identify relevant articles not found in the data bases, in each of the databases, searches were conducted in several categories (clinical studies, clinical trials, systematic reviews and other reviews). Also the researchers used a variety of key words for hearing impairment and deafness. These key words were combined with key words for mental health, like “deafness and mental health”, “adolescents with impaired hearing and mental health”.

The inclusion criteria: a) were written in English language, b) were published in 1989 or later, c) contained new data, d) studied adolescents with impaired hearing, and e) investigated topics related to the prevalence and distribution of psychiatric disorders in adolescents with impaired hearing.

Results

The prevalence rates of depression in deaf adult populations in different researches have been illustrated in table (3). It indicates the name of researcher, kind of participants, the methodology of research and a brief result.

Table 3. Studies of prevalence rates of depression in deaf adult populations

searcher	Participants	Methods	Results
Leigh & colleagues (1989)	In 62 female and 51 male normally hearing people and 51 female and 51 male deaf people attending the National Technical School for the Deaf (NTID).	Beck Depression Inventory, the Sociotropy-Autonomy Scale, and the Parental Bonding Instrument	Depressive symptoms were associated with perceptions of lower maternal care and higher maternal overprotection. Deaf and hearing subjects did not, however, differ on these perceived maternal

searcher	Participants	Methods	Results
			characteristics.
Kvam et al 2006.USA	Deaf adults N=431)hearing adults N= 42.815)	3 questions from the Symptom Checklist -5 (SCL-90)	Even when controlled for gender and age, the risk of an individual experiencing mental distress was more than doubled for the deaf sample. There were significantly more symptoms of anxiety and depression in the deaf group than in the hearing.
Leigh & Anthony-Tolbert 2001 USA	Deaf college under graduates N=53	The Beck Depression Inventory –II (BDI-II)	%26 of the participants reported having been seriously depressed, 30% had previously been in therapy, 11% of the participants were currently in therapy, 11% had used antidepressants and 2% reported currently being on antidepressants
Werngren-Elgström et al 2003 Sweden	Elderly prelingually deaf persons N=45	Geriatric Depression Scale (GDS) 15 item version and Livingston's Sleep Scale	Mild depressive symptoms Deaf:31% Hearing 9-19% Insomnia: Deaf: 73% Hearing: 30-50% Subjective wellbeing was higher among the deaf than in the hearing samples. One deaf participant was excluded.
K. Sheppard & T. Badger(2010)	Nine Deaf adults, two men and seven women, Ages ranged from 21–65 years	interview transcriptions(ASL) and researcher observations	Childhood experiences leading to depression included sexual or physical abuse, feeling ostracized from family and like a burden. Suicidal gestures communicated severity of depression.
Watt & Davis (1991)	33Female 13.7years 20 male	Revised BDI (n = 50)	the finding that more deaf participants, relative to hearing
	33 female 13.9years 27 male	Original BDI (n = 30) Revised BDI (n = 30)	participants, were classified as mildly depressed
M.masud-ul-haq and colleagues (2008)	Two hundred patients between the ages of 10 to 80- rural (62%) and urban (38%)	All patients were asked questions from a predesigned preform to evaluate any depressive / psychiatric disturbances.	Associated element of depression was seen in 41% and in majority of this group the deafness was noticeably less than 30 DBHL (mild deafness). 44.5% had mild depressive symptoms ranging from agitation to insomnia while 14% had evidence of moderate depressive symptoms.
Landsberger and Diaz(2010)	N= 30 comparison group=60	Archival data & reviewing diagnostic assessments	Among these patients ten percent of the deaf and fifteen percent of the hearing sample had major depression and thirteen percent of the deaf and five percent of the hearing patients were diagnosed with other mood disorders. Twenty percent of the deaf and eighteen percent of the hearing sample had anxiety disorders.

searcher	Participants	Methods	Results
Black and Glickman(2006)	N=64 2 comparison group = 64 & 108	Archival data & reviewing diagnostic assessments	Among the deaf patients, thirty-nine percent were diagnosed with mood disorders, compared to twenty-one percent in the hearing patient group. Of these, 12.5 percent of the deaf and 9.4 percent of the hearing sample had bipolar disorder. Only 2.6 percent of the deaf patients were diagnosed with unipolar depression, compared to 8.3 percent in the hearing sample
Theunissen & colleague(2011)	The study group consisted of 27 children with cochlear implants, 56 children with conventional hearing aids, and 117 normally hearing children.	self-report questionnaires	Hearing-impaired children reliably reported more symptoms of depression than their normally hearing peers. Degree of hearing loss, socioeconomic status, gender, and age were unrelated to the level of depressive symptoms
Sanem Sahli and et al(2009)	30 adolescents with cochlear implant between the ages of 12–19 and upon the control group which consists of 60 adolescents having the similar characteristics	Rosenberg Self-Esteem Scale	Results showed that no significant difference statistically between the depressive emotion values of the cochlear implant group and the control group.

Leigh and colleagues conducted a study whereby they assessed the prevalence of depressive symptoms in 62 female and 51 male normally hearing people and 51 female and 51 male deaf people attending the National Technical School for the Deaf (NTID). They also aimed to determine whether such symptoms were related to the same personality characteristics and developmental factors in deaf and hearing persons. In their study, they compared the prevalence of depressive symptoms and they examined the relationships among depressive symptoms, personality characteristics, and perceived parental behaviors in these two groups. In their study, they administered the revised versions of the Beck Depression Inventory, the Sociotropy-Autonomy Scale, and the Parental Bonding Instrument, each of which were revised for use with a college-aged population, most of whom had limited exposure to American Sign Language. The revisions mainly involve rewriting items to a fourth or fifth grade vocabulary level in order to minimize the influence of English language deficiencies on the participants' responses on psychological questionnaires, Deaf subjects were twenty-five years of age or younger, had hearing loss greater than 80 dB with onset at two-years or earlier, had no additional handicap, and had parents with normal hearing. They found that mild levels of depressive symptoms were more prevalent in the deaf than in the hearing students, but more severe depression was not. More specifically, a significantly greater number of deaf subjects, more than 50 percent, were classified as at least mildly depressed(4).

Kvam and associates made a postal survey of symptoms of depression and anxiety in members of a voluntary register of "people who consider themselves deaf", and compared their scores with a large community sample of people without hearing loss. Four hundred and thirty-one members of the Deaf register responded to the survey (46%), whereas the hearing comparison sample consisted of fifty-one thousand nine hundred and seventy-five people (response rate 64 %). The survey included three items from the Symptom Checklist 5 (SCL-90), 38 asking about feeling fearful as an indication of anxiety, and feeling hopeless about the future and feeling blue as indicators of depression. Twenty deaf participants received a video version with signing upon request. Each of these questions was scored on a four-point scale (1= Not at all, 2= A little, 3= Quite a bit and 4= extremely bothered). The deaf sample reported significantly more symptoms of depression and anxiety. Twenty-one percent of the deaf and four percent of the hearing samples reported feeling "quite a bit" or "extremely"

hopeless about the future, whereas twenty percent of the deaf and four percent of the hearing samples reported feeling blue “quite a bit” or “extremely”. Ten percent of the deaf and one percent of the hearing sample reported feeling fearful “quite a bit” or “extremely”. In both the deaf and the hearing sample, the female respondents felt significantly more fearful than the males (0.78 and 0.66 in the deaf and 0.43 vs. 0.31 in the hearing sample). The hearing females also scored significantly higher on feeling hopeless about the future and feeling blue, while the gender difference on the depression indicators in the deaf sample did not reach significance. In both samples, younger respondents had significantly higher scores on depression symptoms than the older ones. The depressive symptom scores remained higher in the deaf than in the hearing sample when gender and age were controlled. Although the Deaf register includes individuals who consider themselves deaf and use sign language (23).

Leigh and Anthony-Tolbert examined twenty male and thirty-three female deaf college undergraduate students with the Beck Depression Inventory – II.40 There was no comparison group. The assessment was made with the participants’ preferred mode of communication. Twenty-six percent of the students reported having been severely depressed at some time. This is almost twice the prevalence of positive screens for depression of 13.8 percent reported for hearing undergraduate students by Eisenberg and associates (24).

Werngren-Elgström and associates investigated depressive symptoms in nineteen male and twenty-six female members from a population of one hundred and nine prelingually deaf individuals above the age of sixty-five in Skåne, Sweden, and compared this sample to two samples of elderly hearing individuals above the age of sixty-five in the same geographical area; one hundred and thirty-three persons who had been referred to an occupational therapist and/or to a physiotherapist and two hundred and thirty-three persons who had participated in previous studies. Depression was assessed with the 15-item version of the Geriatric Depression Scale39 and the assessment interviews were carried out by the same signing professional. In the deaf sample, fifty-one percent had symptoms of depression, but this prevalence was not very different from the hearing samples (25).

Study K. Sheppard & T. Badger, used a hermeneutic phenomenological methodology. Guided by this methodology and philosophy, the researcher sought to understand the nature of the human experience, and language was the data that gave meaning to the experience. The researcher identified her knowledge, expectations and understanding of health care, deafness, and Deaf culture and incorporated these into her analysis. Participants were recruited from large metropolitan areas of California and Nevada. Flyers were posted at clubs, centers and events frequented by Deaf adults. Flyers identified three means of contacting the researcher, including TTY (teletype) ,e-mail and text messaging. Sampling was purposive; the researcher sought participants who could best speak to the experience. Sampling continued until saturation was attained. Steps included: identifying pre-understandings, gaining understanding through dialogue with participants, gaining further understanding through text and establishing trustworthiness of human subjects’. The interviews were co-created by the researcher and the participant. All interviews were conducted in ASL, and each participant was interviewed three times. Analysis was ongoing during the interview process, which allowed for understanding through engagement of text (i.e. dialogue and transcriptions). To increase her awareness during the interviews and subsequent data analysis, the researcher continually used reflection to heighten her awareness of her own pre-understanding (8).

Watt and Davis used the revised BDI to investigate the prevalence of depression among 50 deaf adolescents in a deaf residential school. The internal consistencies for the revised BDI were not significantly different for deaf participants (.70) and hearing participants (85) Results showed that deaf participants were significantly more depressed as a group (M = 10.52) than hearing participants (M = 6.59). Classification of the BDI scores showed that 50 %of the deaf participants and 20% of the hearing participants scored 10 or greater on the BDI. The percentage of deaf participants who were at least mildly depressed is similar to that reported by Leigh and colleagues (26), even though the participants in the two studies were of different ages. In addition, the mean revised BDI score for deaf participants is comparable in the two studies. However, the finding that more deaf participants, relative to hearing participants, were classified as mildly depressed should be interpreted cautiously. The scores used to classify participants into categories were those

suggested for the original BDI. Further research with clinical samples would be needed to determine the cutoff scores that could reliably discriminate between depressed and no depressed deaf people. In the study by Watt and Davis, even though written questionnaires were used with prelingually deaf adolescents, there were no reported difficulties regarding comprehension or completion of the questionnaires (27).

Study M.masud-ul-hag, et al, was carried out on Patients diagnosed to have ear disease with deafness were randomly selected for the study. They were evaluated with history, clinical examination and pure tone audio-meter and tympanometry (when required) was carried out as a routine in all patients. The equipment's were regularly calibrated. All patients were asked questions from a predesigned preform to evaluate any depressive / psychiatric disturbances. They were divided into having none, mild, moderate or severe categories. The questions included any associated tinnitus, vertigo or hallucinations. Effects of deafness on daily life activities withdrawal from social activities, relationship with people, sleep disturbances, any agitation, anger or any depression, denial, adjustment, conduct disturbances. Questionnaire also included any fear, stress, suicidal thoughts, decreased concentration, restlessness, sweating or palpitations. Any despair, hopelessness, purposeless or inappropriate activity, distressing dreams and desire to recover was specifically included in the preform / questionnaire. Multivariate logistic regression was used to assess the relationship between the dependent variable (mental distress)and the independent variable (hearing status)controlling for the effects of gender and age. The cases were diagnosed to have sensor neural deafness (37%), conductive deafness (51%) and mixed deafness (12%) at our clinic. These cases represented the major ethnic group of central Punjab and included rural (62%) and urban (38%) populations, males (58%) and females (42 %,) educated (21) and uneducated (79%) people. The cause of hearing loss could not be established in 18%, male preponderance was noted in most groups. Main hearing threshold level was 40 DBHL in right ear and 45 DBHL in left ear. The mean age of diagnosis of hearing impairment was approximately 30 years. Late diagnosis was seen to be related to financial background, family size and availability of resources. One patient 0.5% had severe depressive symptoms with a history of attempt to commit suicide once due to intolerable tinnitus and deafness. Mean duration of development of depressive symptoms after deafness was six months.

Landsberger and Diaz, reviewed archival data to investigate the distribution of mental disorders in thirty deaf adults who had been admitted to a Midwestern state psychiatric hospital over a period of ten years, after having been committed by the court to psychiatric treatment in locked psychiatric wards. A comparison group consisted of sixty randomly selected hearing inpatients from the same hospital. None of the psychiatrists who initially assigned diagnoses to the patients were fluent in sign language or specialists in mental health care of deaf patients. Thirty-three percent of the deaf and thirty-eight percent of the hearing patients had a diagnosis of affective disorder. Among these patients ten percent of the deaf and fifteen percent of the hearing sample had major depression. Another ten percent of the deaf patients had bipolar disorder, compared to eighteen percent in the hearing sample, and thirteen percent of the deaf and five percent of the hearing patients were diagnosed with other mood disorders. Twenty percent of the deaf and eighteen percent of the hearing sample had anxiety disorders (28).

In an archival study, Black and Glickman studied sixty-four severely and chronically mentally ill patients who had been discharged from the Deaf Unit at Westborough State Hospital in Massachusetts, USA, over a period of five years. Two comparison groups were included, one with sixty-four hearing patients from the same hospital, selected randomly from the patients who had been discharged during the same time period as the deaf sample. The other comparison group consisted of one hundred and eighty hearing patients who attended the hospital one day in March 2006. The study used archival data from a 5-year period, reviewing diagnostic assessments that had been administered by a specialist multidisciplinary team including a communication specialist. The psychiatric diagnoses were made according to the Diagnostic and Statistical Manual of Mental Disorders, DSM-IV-TR23 and language and communication was assessed with the Language Rating Scale.29 Most of the patients were found to have more than one diagnosis. Among the deaf patients, thirty-nine percent were diagnosed with mood disorders, compared to twenty-one percent in the hearing patient group. Of these, 12.5 percent of the deaf and 9.4 percent of the hearing sample had

bipolar disorder. Only 2.6 percent of the deaf patients were diagnosed with unipolar depression, compared to 8.3 percent in the hearing sample. This means that depression was found to be more than three times as frequent in the hearing patient group, while anxiety disorders were diagnosed in 39.1 percent of the deaf patients compared to 8.8 percent in the hearing patients (29).

The purpose of Theunissen & colleague was to examine the levels of depressive symptoms and the unique contribution of two aspects of emotion regulation (coping and mood states) to the development of depression in hearing-impaired children and a control group, In order to compare the groups, self-report questionnaires concerning symptoms of depression, coping strategies, and mood states were used. The study group consisted of 27 children with cochlear implants, 56 children with conventional hearing aids, and 117 normally hearing children. Hearing-impaired children reliably reported more symptoms of depression than their normally hearing peers. Degree of hearing loss, socioeconomic status, gender, and age were unrelated to the level of depressive symptoms. But attending mainstream schools or using exclusively speech for communication were related to fewer depressive symptoms. The associations with depressive symptoms differed between the groups. For hearing-impaired children, the cognitive aspects (coping) and the affective aspects (mood states) of emotional functioning contributed separately to the prediction of depressive symptoms. For normally hearing children an integration of cognitive and affective aspects was detected: adequate coping skills prevented the development of negative mood states and in turn depressive symptoms, Hearing-impaired children reported more depressive symptoms than normally hearing children. Prevention and treatment of depression in hearing-impaired children could focus on the use of coping strategies adequately, because these strategies have a direct relation with the level of depression (30).

Study Sanem Sahli and et al conducted with the study group which consists of 30 adolescents with cochlear implant between the ages of 12–19 and upon the control group which consists of 60 adolescents having the similar characteristics. At the end of the application results showed that the scores of these two groups which they got according to their answers were compared statistically. When the results were examined, there seemed to be no significant difference statistically between the depressive emotion values of the cochlear implant group and the control group. Apart from this, in this study, we examined changes in the level of depressive emotion according to different variables. As a result, it was found out that in both groups level of depressive emotion was lower for adolescents who had had preschool education, had brothers/sisters, high level of income, whose father and mother had higher levels of education. On the other hand, the birth sequence and the child's father's profession did not seem to have any effect on the child's level of depressive emotion(13).

Discussion

Unfortunately the Deaf adolescent's adult's feelings and experiences are intensified by communication barriers and by isolation from family and peers. Membership in the Deaf culture increases a sense of belonging and social support of peers; this may ultimately be the resource that helps a Deaf individual through his or her depressive symptoms (8). The communication difficulties of these Deaf people increase depressive symptoms. The key risk factors are developmental delays associated with early communication deprivation. It seems to be related to the quality of life and sense of well-being and happiness of the deaf with their communication and interaction with hearing population and especially the deaf in the school age and adolescence. Communication barriers and low ability to express demands and needs, may lead to give up interests and activities and this make them be at risk for mental health problems especially depression.

Studies have found that deaf individuals have higher rates of psychiatric disorder than those who are hearing, at the same time they encounter difficulties in accessing mental health services too. Although there is no evidence in the literature to suggest that Deaf adolescents do not experience depressive symptoms, the typical methods of assessing depressive symptoms among the population are inadequate. Depression screening tools may be unreliable for Deaf people, because they have not been validated with a culturally Deaf population. Deaf individuals are often misdiagnosed by health-care providers because methods of expression and communication are misinterpreted (30). Most Deaf adolescents leave the health-care setting without discussing depressive symptoms with their provider (31); therefore, it is estimated that only 2% of Deaf people ever receive mental health

care (32). As described in the literature, Deaf adolescents are rarely able to obtain culturally competent care for depression (6, 27, and 29) Terms commonly used to communicate depression among hearing people may not be understandable to Deaf adolescents too (33).

According to our findings through literature review, here are some suggestions that seem to be helpful. These include strategies to reduce communication and relationship problems in Deaf which are: 1) Provide educational programs on healthy relationships for deaf adolescents; 2) Encourage family members to sign or use the preferred made of communication even in private discussions; 3) Provide deaf mentors and deaf coaches available for deaf adolescents.

There are also same strategies to reduce depression in deaf people such as: Providing ongoing interventional programs, use of ASL fluently by mental health experts, providing mentoring etc. Society must be made aware of the special risks that deaf children and adolescents may be at risk for mental health problems. With regard to the huge deaf population in our country, there should be more attention to their mental health from early childhood and more mental service should be provided specifically for them (34, 35).

Conclusion

Mild levels of depressive symptoms are more prevalent in the deaf than in hearing students but more severe depression is not. Although there is no evidence in the literature to suggest that Deaf adults do not experience depressive symptoms, the typical methods of assessing depressive symptoms among the population are inadequate and unreliable.

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References

1. Gallucci M, Ongaro F, Meggiolaro S, Antuono P, Gustafson DR, Forloni GL, et al. Factors related to disability: evidence from the "Treviso Longeva (TRELONG) study". Arch Gerontol Geriatr. 2011;52(3):309-16 .
2. Walker R. Child mental health and deafness. Paediatrics and Child Health. 2013;23(10):438-42.
3. Hindley PA. Mental health problems in deaf children. Current Paediatrics. 2005;15(2):114-9.
4. Leigh IW, Robins CJ, Welkowitz J, Bond RN. Toward greater understanding of depression in deaf individuals. Am Ann Deaf. 1989;134(4):249-54 .
5. Friedman. J. Predictors of Depressive Symptoms in Persons with Deafness and Hearing Loss. Philadelphia: Faculty of Drexel University; 2008.
6. Turner O, Windfuhr K, Kapur N. Suicide in deaf populations: a literature review. Ann Gen Psychiatry. 2007;6:26 .
7. Berry JA, Stewart AJ. Communicating with the Deaf During the Health Examination Visit. The Journal for Nurse Practitioners. 2006;2(8):509-15.
8. Sheppard K, Badger T. The lived experience of depression among culturally Deaf adults. J Psychiatr Ment Health Nurs. 2010;17(9):783-9.
9. Fellinger J, Holzinger D, Pollard R. Mental health of deaf people. The Lancet.379(9820):1037-44.
10. Masud-Ul-Haq M, Shahid H, Saqib K, Khalid M. DEAFNESS AND DEPRESSION. Bio-8Doc. 2008;24:143-6.
11. Hindley PA. Mental health problems in deaf children. Current Paediatrics. 2005;14:114-9.
12. Movallali G, Nemati S. Difficulties in Parenting Hearing-Impaired Children. Audiol. 2009;18(1-2):1-11. persian.
13. Sahli S, Arslan U, Belgin E. Depressive emotioning in adolescents with cochlear implant and normal hearing. International Journal of Pediatric Otorhinolaryngology. 2009;73(12):1774-9.
14. Motamedi SH, Seyednour R, Noorikhajavi M, Afghah S. A study in depression levels among mothers of disabled children. IRJ. 2007;5(5):3-7.
15. Hughes MC, James SL. Deaf children's revision behaviors in conversations. J Commun Disord. 1985;18(4):227-43.
16. Dehkhoda A, Bahmani B, Dadkhah A, Naghiyaee M, limohamadi F, Goudarzipour k. Spiritually-Oriented Cognitive Therapy in Reduction of Depression Symptoms in Mothers of Children with Cancer. IRJ. 2013;11(17):53-8.
17. Van Gent T, Goedhart AW, Treffers PD. Self-concept and psychopathology in deaf adolescents: preliminary support for moderating effects of deafness-related characteristics and peer problems. Journal of child psychology and psychiatry, and allied disciplines. 2011;52(6):720-8.
18. Diaz DR, Landsberger SA, Povlinski J, Sheward J, Sculley C. Psychiatric disorder prevalence among deaf and hard-of-hearing outpatients. Comprehensive Psychiatry. 2013;54(7):991-5.
19. Altshuler KZ, Spady F. The emotionally disturbed deaf child: A first program of research and therapy. Journal of Communication Disorders. 1978;11(2-3):171-186.
20. Grinker R. Psychiatric diagnosis, therapy, and research on the psychotic deaf, final report. Washington, D.C: U.S. rehabilitation services Administration; 1969.
21. Ishine M, Okumiya K, Matsubayashi K. A close association between hearing impairment and activities of daily living, depression, and quality of life in community-dwelling older people in Japan. J Am Geriatr Soc. 2007;55(2):316-7.
22. Alexander A, Ladd P, Powell S. Deafness might damage your health. Lancet. 2012;379(9820):979-81.

23. Kvam MH, Loeb M, Tambs K. Mental health in deaf adults: symptoms of anxiety and depression among hearing and deaf individuals. J Deaf Stud Deaf Educ. 2007;12(1):1-7.
24. Leigh IW, Anthony-Tolbert. S. Reliability of the BDI-II with deaf persons. Rehabilitation Psychology. 2001;46(2):195-202.
25. Werngren-Elgström M, Dehlin O, Iwarsson S. Aspects of quality of life in persons with pre-lingual deafness using sign language: subjective wellbeing, ill-health symptoms, depression and insomnia. Archives of gerontology and geriatrics. 2003;37(1):13-24.
26. Leigh IW, Robins C, Welkowitz J, Bond R. Toward greater understanding of depression in deaf individuals. American Annals of the Deaf. 1989;134:249-5.
27. Watt JD, Davis FE. The prevalence of boredom proneness and depression among profoundly deaf residential school adolescents. Am Ann Deaf. 1991;136(5):409-13.
28. Landsberger SA, Sajid A, Schmelkin L, Diaz DR, Weiler C. Assessment and treatment of deaf adults with psychiatric disorders: a review of the literature for practitioners. Journal of psychiatric practice. 2013;19(2):87-97.
29. Black PA, Glickman NS. Demographics, psychiatric diagnoses, and other characteristics of North American Deaf and hard-of-hearing inpatients. Journal of deaf studies and deaf education. 2006;11(3):303-21.
30. Theunissen SC, Rieffe C, Kouwenberg M, Soede W, Briaire JJ, Frijns JH. Depression in hearing-impaired children. Int J Pediatr Otorhinolaryngol. 2011;75(10):1313-7.
31. Pollard R. Q, Adams J. W. Mental Health and Deaf and Hard Of Hearing Individuals. In: Handbook To Service The Deaf And Hard Of Hearing: A Bridge To Accessibility (Eds Adame, G.W. & Rohring, and P.S). San Diego, Ca: Elsevier Academic Press; (pp.121-132); 2004.
32. Friedman J. Predictors of Depressive Symptoms in Persons with Deafness and Hearing Loss. Philadelphia: Faculty of Drexel University; 2008.
33. Steinberg AG, Sullivan VJ, Loew RC. Cultural and linguistic barriers to mental health service access: the deaf consumer's perspective. Am J Psychiatry. 1998;155(7):982-4.
34. Movallali G. My child id deaf, necessary knowledge for any mothers has deaf child. T. edition, editor. Tehran: USWR Publication; ; 2011.
35. Movallali G, Sajedi F. A Persian Cued Speech website from the deaf professionals' views. IRJ. 2013;11(18):16-21.