Mental Health in Deaf Adults: Symptoms of Anxiety and Depression Among Hearing and Deaf Individuals

Marit H. Kvam
Mitchell Loeb
SINTEF Health Research Institute
Kristian Tambs
National Institute of Public Health

Individuals with disabilities encounter practical and social problems beyond those experienced by nondisabled individuals. This extra burden may in turn increase the risk of developing mental health problems. The objective of this article is to disclose the mental health situation among deaf individuals compared to a control sample of hearing individuals. The analyses are based on two separate Norwegian postal surveys, one among the general population (1995–1997) and one among the deaf population (2001). A shortened version of the Hopkins Symptom Checklist was used to disclose the degree of mental distress among the respondents. Three questions common to the studies were analyzed to determine differences between the two groups. Analyses revealed that the deaf respondents showed significantly more symptoms of mental health problems than the hearing respondents. The results point to the need for focussing more attention on the mental health of deaf children and adults. Society must be made aware of the special risks that deaf children and adults encounter with respect to mental health.

It is commonly accepted that people with physical disabilities or suffering from chronic diseases may encounter practical and/or social problems in everyday life that reduce their activity level beyond those experienced by individuals without disability. The problems encountered may in turn increase the risk of developing mental health problems. The small amount of international published research in the area supports this claim (Chwalisz & Vaux, 2000; Tate et al., 1994). In a Norwegian study, Eide and Roysamb (2002) analyzed the interrelation between psychological problems, social activity, and social network on the one hand and self-reported level of disability or activity limitations on the other. They concluded that an individual’s activity limitations are predictive of the level of psychosocial problems they experience. Turner and Beiser (1990) found in the United States that the risk for clinically significant emotional distress was two to four times higher among persons with chronic diseases or disabilities than among persons with no disability.

Persons with mental health problems often need specialized treatment and/or therapy. It is therefore important for their well-being that both symptoms of emotional distress and factors that may expose them to the extra risk of developing emotional or psychological problems are elucidated. To further examine the relationship between disability and emotional distress, this article will compare the mental health problems found in an adult deaf population with those of a corresponding survey within the general population in Norway.

Hard of Hearing and Deaf Individuals Are Vulnerable

Persons with hearing loss may be either hard of hearing or deaf. Hard of hearing individuals have a
hearing loss that affects their daily life but can use their own hearing to communicate under favorable conditions, either with or without hearing aids. Deaf individuals are unable to understand speech through their auditory sense even when wearing hearing aids. In addition to the communication barriers they experience, hard of hearing and deaf children are, more often than hearing children, victims of physical, emotional, and sexual abuse (Knutson, Johnson, & Sullivan, 2004; Kvam, 2004; Sullivan & Knutson, 2000). This increases the risk of mental health problems throughout life (Downs & Harrison, 1998; MacMillan et al., 2001; Read, 1998).

Luey, Glass, and Elliot (1995) found that those who lost their hearing at 3 years of age or more may experience a more reduced quality of life than those who have had hearing loss since the early months of life. They suggest that the former group may feel a sorrow that follows the loss of hearing the spoken language. This is supported by de Graaf and Bijl (2002). They interviewed 523 adults in the Netherlands. The respondents had a hearing loss of more than 60 dB in the better ear. They reported that among the female respondents 32.4% with severe hearing loss before the age of 3 and 43.2% with a later hearing loss showed signs of mental distress. The corresponding numbers among male respondents were 27.1% and 27.7%, respectively. The authors compared their findings with data available from statistics among the Dutch general population (26.6% for women and 22.0% for men) and concluded that the mental health status was poorer among hard of hearing and deaf individuals than in the general population.

Also a Danish study (Clausen, 2003) found more mental health problems among hard of hearing and deaf adults than in the general population. The study further demonstrated that the greater the degree of hearing loss, the more the mental health problems experienced. Tambs (2004) found in a Norwegian sample of about 50,000 subjects (the Nord-Trøndelag Hearing Loss study—the NTHL study) that hearing loss was associated with substantially reduced mental health ratings (greater degree of depression and self-esteem) among young and middle-aged persons, in particular men aged 20–64 years with a minimum 50 dB HL low frequency (0.25–0.5 kHz) loss, including a few deaf persons. Eide and Gundersen (2004) concluded from the same material that there was a positive correlation between degree of hearing loss and reported mental health problems and a negative correlation between degree of hearing loss and reported quality of life.

These studies described an increased risk of mental distress among hard of hearing and deaf individuals. This article will focus on people who regard themselves as deaf. The analysis will compare the degree of self-reported mental distress among a group of deaf individuals with results from a corresponding survey among the hearing population in Norway in order to disclose to what degree the risk of mental health problems among deaf individuals is increased.

Methods

Two Norwegian postal surveys supplied data for analysis: the NTHL study and the Deaf study.

Participants

The hearing sample. The NTHL study took place from 1995 to 1997 (Tambs, 2004). A randomly selected population sample of 51,975 subjects (47% men and 53% women) aged 20 years or more completed audiometric tests and a series of questions about mental health (mean age 50.2 years, SD = 17.0; 42.5% of the sample was 45 years of age or younger). The NTHL study was part of the larger Nord-Trøndelag Health Study—HUNT 2 (Holmen, Bratberg, Vatten, & Lund-Larsen, 2003), which included numerous and varied medical examinations. The participation rate of the NTHL was 64%.

Audiometric tests were performed on 50,520 (97.2%) of the sample. Using a cutoff of 30 dB or more (calculated mean at 250, 1,000, and 2,000 Hz, World Health Organization [WHO], 1991) in the better ear as indicative of hearing impairment, 7,905 individuals (15.6% of those tested) were determined to have a hearing loss. The remaining 42,815 individuals make up the hearing population and are used as a control sample in this article. Among this subsample 49.1% was 45 years of age or younger.

The deaf sample. The Deaf Register, containing the names and addresses of most of those Norwegians
who regard themselves as deaf, became the source of potential respondents to the Deaf study. Registration in the Deaf Register was voluntary, but all who were regarded as deaf and in need of sign language were encouraged to enroll. Potential candidates were identified, for instance, among students enrolled in schools for the deaf, deaf individuals consulting a social worker or a chaplain for the deaf, and deaf individuals in contact with an audiologist. The register was approved by the Norwegian Data Inspectorate.

The response rate among the deaf was 46% (N = 431), with a gender distribution of 41% male and 59% female respondents. Most of them (77%) were born deaf or lost their hearing before the age of 4 years, 11% became deaf aged 4–8 years, 4% aged 9–18 years, and 8% were 19 years or older when they became deaf. The use of hearing aids was not reported; however, it was noted that none of the respondents had a cochlear implant. Most of them had attended a school for the deaf using sign language as the means of communication between the students (78%). The rest (22%) had attended a local school. Among the respondents, 50.8% were 45 years or younger.

Measures

The mental health status was to be disclosed through parts of the Hopkins Symptom Checklist (SCL-25). SCL-25 is a commonly used instrument to measure an individual’s mental health status (A. Winikur, D. Winikur, Rickels, & Cox, 1984). Tambs and Moum (1993) have demonstrated that a strongly abbreviated checklist, reduced from 25 to only five items, correlates well (r = .92) with the SCL-25. Thus, the SCL-5 can be used as an indicator of symptoms of anxiety and depression or mental distress. Strand, Dalgard, Tambs, and Rognerud (2003) also reported a very similar correlation between the full and the shortened instrument.

Only three items from the SCL-5 were common to the two studies, and these were selected for purposes of comparison:

1. Feeling fearful
2. Feeling hopeless about the future

The first item provides an indication of anxiety, whereas the remaining two items measure symptoms of depression. Preliminary calculations, using an available data set (Tambs & Moum, 1993), showed that the SCL-3 correlates with the SCL-25 score, r = .87.

Response categories reflect the extent to which one feels bothered by any of the three problems during the last 14 days. Each of these questions was scored on a four-point scale: not at all, a little, quite a bit, extremely.

In addition to general demographic questions, such as gender and age, the questionnaire for the deaf sample included some specific background questions, including the age when they became deaf, details of school and boarding situations during childhood, parental relationships, episodes of physical and sexual abuse (to be discussed in a later article), and if they at any time had received professional help with mental health problems. Because these variables were not collected in the NTHL study, this article will focus solely on the age and sex of the respondents.

Procedures

The questionnaire was translated into Norwegian Sign Language (NSL) by a social worker (native NSL signer). The translation was informally approved by another NSL user. Along with the written questionnaire, there was a message to the recipients that they could send an e-mail, send a letter, or make a telephone call (through adapted central) to the Deaf Register to receive a videotaped sign language version of the questionnaire. Twenty respondents asked for the video version. All responses were to be filled in on the paper questionnaire. Whether the video version was used was not registered in the questionnaire.

Data analyses

Statistical analyses were performed using programs available in the Statistical Package for Social Sciences (SPSS for Windows release 11.0). The significance of observed associations and/or differences between variables was tested using the Student’s t test, analysis of variance (ANOVA, F test), and the chi-square statistic (Pearson’s χ²). A difference was considered to be statistically significant if p < .05.
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 odds ratio (OR) with 95% confidence intervals (CIs) was used to indicate a significant association. (95% CI that exclude the value 1.0 is considered statistically significant.) Response categories for mental distress variables were dichotomized for the logistic regression analyses: not at all versus at least a little. The sum score for SCL-3 was also dichotomized: scores of 2.0 or over being indicative of “severe mental distress” and scores below 2.0 indicative of little or no mental distress.

Results

A larger proportion of those in the NTHL study responded not at all to the indicators of mental distress than did the deaf respondents, whereas respondents from the Deaf study more often reported extremely to each of the anxiety and depression indicators than did the NTHL respondents.

Whereas 1%, 4%, and 2% of the respondents in the NTHL study answered quite a bit and/or extremely on each of the three questions, the percentage among the deaf respondents was 10%, 21%, and 20%, respectively. Differences between the distributions of the answers (not at all, a little, quite a bit, extremely) in the two studies were statistically significant, $\chi^2(3, N = 40,674) = 269.96, p < .001$ for feeling fearful; $\chi^2(3, N = 40,568) = 397.91, p < .001$ for feeling hopeless; and $\chi^2(3, N = 40,592) = 535.96, p < .001$ for feeling blue.

Women were significantly more anxious (feeling fearful) than men in both the NTHL and Deaf studies expressed, on average, significantly more feelings of hopelessness ($F(2, 40,011) = 53.67, p < .001$ and $F(2, 390) = 8.19, p < .001$) and feeling blue ($F(2, 40,039) = 58.37, p < .001$ and $F(2, 387) = 3.37, p = .035$) for NTHL and Deaf studies, respectively. Mirroring the results presented in Table 1, arithmetic means for each of the three measures of mental distress were significantly higher for those in the Deaf study.

Overall, assessing the SCL-3 scale, 7% of respondents scored 2.0 or over on the SCL-3 sum score for women and $M = 1.33, SD = 0.66$ for men) ($t(40, 124) = 20.51, p < .001$ and $t(386) = 2.35, p = .02$, respectively) and were significantly more depressed (feeling hopeless and blue) than men only among those in the NTHL survey. Although mean scores among women were higher than among men for feelings of hopelessness and blue in the Deaf study, the difference failed to reach significance.

Age had little bearing on the measurement of anxiety in either study; however, younger respondents in both the NTHL and Deaf studies expressed, on average, significantly more feelings of hopelessness ($F(2, 40,011) = 53.67, p < .001$ and $F(2, 390) = 8.19, p < .001$) and feeling blue ($F(2, 40,039) = 58.37, p < .001$) and were significantly more depressed (feeling hopeless and blue) than men only among those in the NTHL survey. Although mean scores among women were higher than among men for feelings of hopelessness and blue in the Deaf study, the difference failed to reach significance.

Within the deaf group, effects of age when losing hearing were assessed. Those who became deaf at a younger age (either before 4 years or before 9 years of age) did not express feeling fearful or feeling blue significantly more often than did those who lost their ability to hear at a later age. They did, however, express feelings of hopelessness significantly more often than those who became deaf later in life. Whereas 52.2% of subjects who became deaf before age 4 reported being at least “a little” bothered by feelings of hopelessness, the corresponding occurrence among subjects who became deaf after age 4 was 34.8% ($\chi^2(3, 393) = 9.56, p = .023$). The proportions among subjects who became deaf before and after age 9 were 50.5% and 24.4%, respectively ($\chi^2(3, 393) = 10.85, p = .013$). Overall, assessments of the SCL-3 scale, 7% of respondents scored 2.0 or over on the SCL-3 sum score

Table 1  Distribution of symptoms of mental distress (in percent) among deaf (Deaf study) and hearing subjects (NTHL study)

<table>
<thead>
<tr>
<th></th>
<th>Deaf study (N = 431)</th>
<th>NTHL study (N = 42,815)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all A little Quite a bit Extremely n</td>
<td>Not at all A little Quite a bit Extremely n</td>
</tr>
<tr>
<td>Fearful</td>
<td>69 21 7 3 388</td>
<td>90 9 1 0 40,286</td>
</tr>
<tr>
<td>Hopeless</td>
<td>53 26 16 5 393</td>
<td>82 14 3 1 40,175</td>
</tr>
<tr>
<td>Blue</td>
<td>45 35 17 3 390</td>
<td>81 17 2 0 40,202</td>
</tr>
</tbody>
</table>
Furthermore, there was no statistical difference observed in mean SCL-3 scores between the subjects who became deaf before the age of 4 years and those who became deaf later in life; however, as a group, those who became deaf before 9 years of age expressed more mental distress (through higher mean SCL-3 scores) \( (M = 1.67, SD = 0.70) \) than did those who became deaf after 9 years of age \( (M = 1.42, SD = 0.61) \) \( (t(374) = 2.16, p = .034) \).

Based on the demonstrated impact of gender and age on association between hearing status and mental distress, it was decided to perform a multivariate logistic regression analysis in order to assess the impact of hearing status on symptoms of mental distress controlling for the effects of gender and age. The results are presented in Table 2.

Even controlling for the effects of gender and age, the odds of an individual experiencing mental distress (measured either as a single component—feeling fearful, hopeless, or blue—or as a sum score SCL-3) are significantly greater among those who are deaf.

### Discussion

This study has described and compared the responses to questions on mental health between Norwegian deaf respondents and a sample from the hearing population. The deaf subjects demonstrated more symptoms of depression and anxiety than the hearing sample.

The results among Norwegian deaf adults are in line with those described by Turner and Beiser (1990), who claimed that the risk for clinically significant emotional distress was two to four times higher among persons with chronic diseases or disabilities as compared to nondisabled persons. The results also strongly support earlier findings among hard of hearing and deaf individuals (Chwalisz & Vaux, 2000; Clausen, 2003; Eide & Gundersen, 2004; Tate et al., 1994). Tambs (2004) referred mainly to hard of hearing subjects. His results for severely hearing impaired young and middle-aged people are consistent with the Deaf study, although the reduction in reported mental health status among the hard of hearing was less pronounced. Compared to the Dutch survey (de Graaf & Bijl, 2002), the difference between deaf and hearing was also larger in the Norwegian population.

As in the Dutch study, deaf females in Norway seemed to have more mental health problems than deaf males, though overall, the gender difference failed to reach statistical significance.

This result is different from that observed by Tambs (2004), who found more problems among males. Perhaps this difference reflects a gender–hearing severity interaction effect, in which mental health is more affected by a hearing loss in general among men than among women, whereas women suffer more than men when completely deaf, though this assertion has yet to be tested.

Luey et al. (1995) suggested a reduced quality of life among individuals who became deaf after the age of 3 compared to those who became deaf earlier in life. This is supported by de Graaf and Bijl (2002), who found more symptoms of mental distress among the group that became deaf after age 3 than among those who had been deaf since the early months of life.

The current study found a tendency in the opposite direction, but only the item “feeling hopeless” reached statistical significance. Stress experienced exclusively by people born deaf may in part be associated with the parents not understanding the toddler’s reactions and communication before the child was diagnosed as deaf, and vice versa. However, this point needs to be further studied.

### Table 2 Results of multivariate logistics regression analyses of hearing status, gender, and age on mental distress

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variables</th>
<th>OR</th>
<th>95% CI for OR Lower</th>
<th>95% CI for OR Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fearful</td>
<td>Hearing status</td>
<td>1.95</td>
<td>1.75</td>
<td>2.18</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>2.07</td>
<td>1.94</td>
<td>2.22</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>1.01</td>
<td>0.96</td>
<td>1.05</td>
</tr>
<tr>
<td>Hopeless</td>
<td>Hearing status</td>
<td>2.03</td>
<td>1.84</td>
<td>2.25</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>1.23</td>
<td>1.17</td>
<td>1.30</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>0.84</td>
<td>0.81</td>
<td>0.87</td>
</tr>
<tr>
<td>Blue</td>
<td>Hearing status</td>
<td>2.24</td>
<td>2.03</td>
<td>2.48</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>1.50</td>
<td>1.42</td>
<td>1.57</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>0.92</td>
<td>0.89</td>
<td>0.95</td>
</tr>
<tr>
<td>SCL-3</td>
<td>Hearing status</td>
<td>2.62</td>
<td>2.35</td>
<td>2.92</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>1.61</td>
<td>1.49</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>0.93</td>
<td>0.88</td>
<td>0.98</td>
</tr>
</tbody>
</table>
Some methodological issues that arise from the comparisons made between the studies should be addressed. The response rate was different (64% among the hearing and 46% among the deaf sample), and the studies were carried out in different periods (the NTHL study in 1995–1997 and the Deaf study in 1999–2000). Both studies were based on structured questionnaires requiring that the respondents read and understand the questions and evaluate their own situations. Certain questions may have been prone to misinterpretation. This may more often have been the case among deaf than among hearing responders. Additionally, it is not clear whether responding to questions on the video versus printed questions may have impacted results. There was no question about whether respondents had previous counseling or psychotherapy, which would have provided information about access to mental health services.

Despite the methodological uncertainties, the results presented here contribute to a deeper knowledge and understanding of mental health in deaf individuals. The differences between the deaf group and the control sample are so marked that it is unlikely they reflect only methodological problems and should focus new attention on the mental health of the severely hard of hearing/deaf population. The risk of an individual experiencing mental distress (feeling fearful, hopeless, or blue) was more than doubled for the deaf group, even when controlled for gender and age.

Conclusion
The results clearly demonstrate the vulnerability of deaf individuals to mental health problems. The overall comparison shows significantly more symptoms of anxiety and depression in the deaf group than in the hearing sample of respondents. It is likely that some of the mental health problems may stem from childhood, or, for example, from different etiologies of deafness, socioeconomic issues, or different experiences related to stigma and discrimination. More research about the consequences of different risk factors specific to deaf individuals is needed. The results indicate that society should expend greater efforts to lessen the specific burdens associated with deafness during childhood as well as adulthood. Deaf citizens, irrespective of age, should have sufficient access to adapted mental health services.

References
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