



Archived at the Flinders Academic Commons:

<http://dspace.flinders.edu.au/dspace/>

'This is the peer reviewed version of the following article:
Veale, H., Gill. L., Ng, S. G., LIND, C., & Bond, M. J. (2012).
Self-reported hearing handicap and mental health in
Australia: Some preliminary findings. Australian and New
Zealand Journal of Audiology, 32, 2, 106 – 114.

which has been published in final form at

<http://www.australianacademicpress.com.au/>

"Article Copyright 2012 The Authors."

"Published edition Copyright 2012 Australian Academic
Press. Published version of the paper reproduced here
with permission from the publisher."

Self-Reported Hearing Handicap and Mental Health in Australia: Some Preliminary Findings

HOLLY VEALE¹, LAURA GILL¹, SWEE GUAN NG¹, CHRISTOPHER LIND¹ AND MALCOLM J. BOND²

¹ Speech Pathology and Audiology, Flinders University, Australia

² Discipline of General Practice, Flinders University, Australia

It has long been suggested that the consequences of adult hearing impairment (HI) include stress, anxiety and depression, yet relatively little formal assessment of mental health status amongst adult Australians who have acquired HI has been reported. This questionnaire-based study investigated the self-reported hearing handicap and mental health characteristics of a sample of 375 Australian adults with HI who were members of Better Hearing Australia (BHA) in six Australian states/territories. Participants completed two mental health questionnaires; the Kessler Psychological Distress Scale-10 (K-10; Kessler, Andrews, Colpe, & Hiripi, 2002) and the Depression-Anxiety-Stress Scale (DASS; Lovibond & Lovibond, 1995) as well as the short version of the Hearing Handicap Inventory for Adults — Screening Version (HHIA-S; Newman, Weinstein, Jacobson, & Hug, 1990). No difference was found in the prevalence of psychological distress amongst participants compared to that of the Australian adult population. It was noted, however, that increased severity of self-reported hearing handicap was associated with higher levels of self-perceived psychological distress. In turn, high or very high levels of psychological distress measured on the K-10 were correlated with depressive states more than with stress or anxiety ratings on the DASS. The results highlighted the need to incorporate a combination of questionnaire-based measures in evaluating self-reported mental health and hearing handicap.

Mental health problems account for a large percentage of disease burden in Australia, and are among the greatest causes of disability as well as reduced quality of life and productivity. In 2003, mental illness was reported to account for 13% of the total burden of disease in Australia (Australian Institute of Health and Welfare [AIHW], 2006), ranking third behind heart disease and cancer. Results from the National Mental Health survey conducted in 2004/2005 by the Australian Bureau of Statistics (ABS) indicated that 11% of all persons have a current long-term mental or behavioural problem. While some attempts were made in this report to relate mental health issues to comorbid chronic health conditions, adult hearing impairment (HI) was not among these conditions. However, adult acquired HI is one of the most prevalent disabilities in developed countries and its impact on psycho-social well-being and mental health has been widely reported (Heine & Browning, 2002).

In Australia, it is estimated that 16.6% of the adult population have HI (Wilson et al., 1999). HI leads *inter alia* to a disruption in conversation and imposes a constant strain on interpersonal relationships (Cooper, 1976, Anderson & Noble, 2005). Withdrawal from

Correspondence and reprint requests: Christopher Lind, PhD, Senior Lecturer in Audiology, Speech Pathology and Audiology, Flinders University, PO Box 2100, Adelaide, SA 5000, Australia. E-mail: chris.lind@flinders.edu.au

social contact, leading to isolation and loneliness, is common, with misunderstanding parts of speech contributing to heightened suspiciousness, and loss of background sounds having a disorientating effect (Jones & White, 1990; Thomas, 1981). The psychosocial consequences of HI have been linked with poor mental health indicators such as high levels of depressive symptoms (Zazove, Meador, Aikens, Nease, & Gorenflo, 2006), low self-esteem (De Graaf & Bijl, 2002), and anxiety induced social isolation (Thomas, 1981). There is evidence of poorer mental health in adults with HI compared to normally hearing individuals (Stephens, 1980; Tambs, 2004; Thomas & Gilhorne-Herbst, 1980), yet there is no clear pattern of co-occurrence between adult acquired HI and mental health status among Australian adults.

Studies in other first world countries have indicated that HI and deafness may result in more people with and/or higher levels of psychological distress than in the general adult population. A Danish study by Clausen (2003) reported by Kvam, Loeb, and Tambs (2006) found greater levels of mental health concerns among adults with HI compared to the general population. Similarly, in the Netherlands, De Graaf and Bijl (2002) found that mental status was poorer among hearing impaired adults than in the adult population. A large study by Tambs (2004) of over 50,000 Norwegian subjects found that HI was associated with substantially reduced mental health particularly among young and middle aged adults. Together, these studies give rise to the question raised by the current study, whether mental health issues are more common and/or are more severe among adults who have HI than among the general adult population.

Commonly, adults who have HI have been noted to report stress, anxiety and depression as a consequence of their HI (Andersson & Green, 1994; Tambs, 2004). Similarly, mental health is not seen as a unitary phenomenon and its applicability to adult HI may rest on a closer analysis of different

subtypes of clinical presentation. There has been agreement across research into different health domains that it may be subdivided into more specific domains each with its unique clinical presentation (Beck, Epstein, Brown, & Steer, 1988; Costello & Comrey, 1967; Lovibond, 1998; Lovibond & Lovibond, 1995; Watson, Clark, & Carey, 1988). The model described by Mineka, Watson, and Clark (1998) has gained a substantial body of empirical support (Brown, Chorpita, & Barlow, 1998; Clark, Steer, & Beck, 1994; Joiner, Catanzaro, & Laurent, 1996; Watson et al., 1995). This model separates mental health into three separate domains of *depression*, *anxiety* and *stress*. In this classification, depression is described as a mood disorder characterised by (a) the lack of ability to experience pleasure, (b) low self-esteem and (c) states of dissatisfaction where the individual perceives a low probability in attaining their life goals. By contrast, anxiety is characterised by physiological states of hyper-arousal such as shortness of breath, heart palpitations and panic. It also encompasses psychological aspects of heightened fear and anticipation. This is distinguished from the experience of stress which may be manifested as a variety of emotional states including symptoms of both anxiety and depression. However, stress can also be uniquely characterised as a state of irritability and nervous tension resulting from continued difficulty in meeting the every day demands of life. It has been suggested that a distinction between depression, anxiety and stress may provide clinicians with a better understanding of mental health and its implications, leading to better management and treatment protocols (Lovibond, 1998; Lovibond & Lovibond, 1995).

While many measures of self-reported hearing handicap are currently used in audiological practice to determine the impact of HI on a person's everyday interaction and lifestyle, the effect of this perceived handicap on a person's mental health has been little explored. This questionnaire-based study aimed to address the relationships between self-perceived hearing handicap and self-

reported mental health among a group of Australian adults who are members of Better Hearing Australia (BHA). Specifically, the study addressed (a) the prevalence of reported general psychological distress among a group of hearing impaired Australian adults, (b) the distribution of depression, anxiety and stress among those participants reporting high and very high levels of psychological stress, and (c) the relationship between hearing handicap and general psychological distress. The results of this study give some initial insights into the prevalence of and factors influencing mental health issues among adult Australians who have acquired HI.

METHOD

Participants

Participants in this study were all adults who were on the membership rolls of BHA branches nationally. BHA is a nonprofit self-help organisation which provides hearing impaired adults with community support and rehabilitation services (BHA, 2007). All 18 BHA branches were contacted requesting their consent for recruitment of their

members. A total of 1196 members of BHA were contacted to participate in this study. To participate in this study, the BHA members had to (a) be Australian residents of at least 18 years of age, (b) be a member of BHA, (c) have a self-reported HI, and (d) be able to complete the written questionnaire. Three hundred and seventy-five participants (376/1196 or 34.1%) returned their questionnaires. Respondents ranged in age from 28 to 96 years with a mean age of 68.5 years; 125 were male (33.3%) and 249 were female (66.6%). The questionnaire-based data gathered in this study prevented direct clinical assessment of participants' HI and, as such, hearing-related data were limited to self-reported hearing handicap. The distribution of participants by BHA branch is presented in Table 1.

In order to contact potential participants each participating BHA branch was sent sufficient prepaid questionnaire packages for mailing to each branch member. The BHA branches were asked to mail these packages to their members. Completed questionnaires and signed consent forms were returned directly to Flinders University, Speech

TABLE 1

Recruited Branches Nationwide Showing the Number of Questionnaire Packages Sent to Each Branch, the Number of Completed Packages Received and the Overall Percentage Contribution to the Total Response Rate

Better Hearing Branch	Number of Packages Posted to Each Branch	Number of Completed Packages	Percentage Contribution
Adelaide	11	6	1.6
Ballarat	28	13	3.5
Brisbane	120	50	13.3
Bundaberg	16	8	2.1
Canberra	58	33	8.8
Gosford/Central Coast	50	13	3.5
Melbourne	350	81	21.6
Newcastle	80	45	12.0
Perth	45	16	4.3
Sunshine Coast	50	12	3.2
Sydney	369	94	25.1
Wagga Wagga	19	2	0.5
No response		2	0.5
TOTAL	1196	375	100

Pathology and Audiology for coding and analysis. All data were entered into SPSS for descriptive and inferential statistical analysis.

Materials

The questionnaire packages sent to all participants comprised a participant information sheet, a consent form and a single questionnaire. The questionnaire data analysed in this study included the set of demographic questions, two mental health questionnaires; the Kessler Psychological Distress Scale -10 (K-10; Kessler, Andrews, Colpe, & Hiripi, 2002) and the Depression-Anxiety-Stress Scale (DASS; Lovibond & Lovibond, 1995) and the short version of the Hearing Handicap Inventory for Adults (HHIA-S; Newman, Weinstein, Jacobson, & Hug, 1990). Questions for all items required either 'tick the box' or short answer responses. The demographic questionnaire comprised 27 questions requesting information pertaining to participant's postcode, age, gender, marital and employment status, followed by questions specifically focused at participant's hearing health, including the diagnosis of their HI, HI rehabilitation and tinnitus.

The K-10 is a 10-item questionnaire designed to measure the severity of non-specific psychological distress (Kessler et al., 2002). It has been validated in the Australian population against clinical diagnoses of depressive episode and generalised anxiety disorders. It is routinely used for public health telephone surveys and is used for the ABS regular survey of Australian health (Andrews & Slade, 2001). Questions are related to participants' general well being in the past 4 weeks. The scale uses a 5-point response option for each item; all of the time (5 points), most of the time (4 points), some of the time (3 points), a little of the time (2 points), and none of the time (1 point). Although there is no currently agreed standard for determining cut-off points to identify the prevalence and severity of psychological distress, the ABS National Health Survey in 2004/2005 used criteria developed by Andrews and Slade (2001) to

group scores into four levels of psychological distress; low (10–15 points), moderate (16–21 points), high (22–29 points) and very high (30–50 points). To provide a direct comparison with the ABS prevalence figures, these categories were applied to the data from this study.

The DASS is a 42-item questionnaire designed to measure the negative emotional states of depression, anxiety and stress by determining the core features of each syndrome. Participants were instructed to rate the extent to which they had experienced each state over the past week, on a four-point severity/frequency scale. Scores for all items were summed and expressed as a percentile that is indicative of severity; normal (0–78), mild (78–87), moderate (87–95), severe (95–98) and extremely severe (98–100). Scores were interpreted relative to the already established means and standard deviations for a large normative sample of the Australian population (Lovibond & Lovibond, 1995).

The HHIA-S is a 10 item self-assessment scale designed to measure the effects of hearing loss on the emotional and social state of adults with HI (Newman, et al., 1990). Participants indicated whether they experienced hearing difficulties in the proposed situations with three response options: *yes* (4 points), *sometimes* (2 points) or *no* (0 points). The responses for the 10 questions were scored and summed to give a total score. Results were compared to normative data for the HHIE-S (Ventry & Weinstein, 1982), where scores are grouped into three levels of hearing handicap; no handicap (0 to 8 points), mild to moderate handicap (10–24 points) and severe handicap (26–40 points).

RESULTS

A sample of 375 adult members of BHA responded to a postal survey incorporating self-reported both mental health and hearing handicap questionnaires in order to investigate the patterns of co-occurrence of HI and mental health issues in a sample of Australian adults who have HI. The first research question addressed from the resultant data was the

TABLE 2

Comparison of -10 Prevalence Figures Between ABS 2004/2005 National Health Survey and the Hearing Impaired Sample.

K-10 Severity Categories	ABS 2004/2005 National Health Survey (n = 25,900)	Expected Number of Participants	Observed Number of Participants (n = 367)	Percentage of Participants
Low	63%	231	223	61%
Moderate	24%	88	100	27%
High	9%	33	29	8%
Very high	4%	15	15	4%

prevalence of general psychological distress among this group of adults by comparison with the Australian adult population. To address this question, the total scores of the participants on the K-10 were compared to the K-10 data obtained from the ABS 2004/2005 National Health Survey (ABS, 2006). Total scores for the K-10 questions were categorised by psychological distress severity level (Andrews & Slade, 2001). In the current sample, data (see Table 2) were analysed using a one sample chi square analysis based on the expected and observed (ABS, 2006) prevalence values. Results revealed no statistically significant difference in general psychological distress across all levels of severity, compared to that of the general Australian population ($\chi^2 = 2.40, df = 3, ns$). Further, when the current sample was compared by gender no statistically significant difference was found in psychological distress levels between males and females, $\chi^2 = 2.72, df = 1, ns$ (see Table 3).

TABLE 3

Number (and Percentage) of Males and Females in the K-10 Severity Categories for General Psychological Distress (N = 367).

K-10 Severity Category	Male (%)	Female (%)
Low	78 (63.41)	145 (59.43)
Moderate	36 (29.27)	64 (26.23)
High	7 (5.69)	22 (9.02)
Very high	2 (1.63)	13 (5.33)
Total	123 (100)	244 (100)

The second question addressed the distribution of depression, anxiety and stress domains in those participants reporting high and very high levels of psychological stress. The distribution of the three domains was determined for the 44 participants reporting high or very high levels of general psychological distress in the K-10. The 14 DASS questions relating to each of depression, anxiety and stress for each participant were summed to give a raw score for depression, anxiety and stress domains for these individuals. These raw scores were converted to z scores, enabling comparisons to be made between the three scales (Lovibond & Lovibond, 1995). The mean z score for each of depression, anxiety and stress, across these participants were then calculated. A one way analysis of variance comparing the z scores between domains revealed a statistically significant result, $F_{(2,42)} = 7.90, p < .001$. Tukey's post-hoc pair-wise comparisons indicated a significant difference only between depression and stress domains (see Figure 1). These results suggest that participants who reported high or very high levels of psychological distress tended to report more depressive states than stress-related difficulties.

The final question addressing the relationship between self-reported hearing handicap and general psychological distress was determined by comparing the HHIA-S to the K-10.

Total scores for the HHIA-S and the K-10 were categorised into their corresponding severity levels. A chi-square analysis (Table 4) comparing results across the two domains

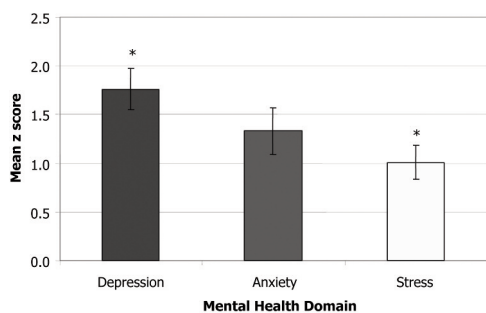


FIGURE 1

Distribution of depression, anxiety and stress domains as measured on the DASS in those participants who reported high and very high levels of psychological stress on the K-10 ($n = 44$).

Note * $p < .001$.

showed a statistically significant association between hearing handicap severity levels and general psychological distress severity levels ($\chi^2 = 23.50$, $df = 1$, $p < .001$) such that increasing severity of self-perceived hearing handicap was positively related to increasing severity of self-perceived psychological distress.

In summary, these results indicate that this group of participants showed no greater psychological distress than the general adult Australian population. Those who reported high levels of distress, tended to report depressive symptoms more than stress-related symptoms. Further, higher levels of self-perceived hearing handicap co-occurred with higher levels of self-perceived psychological distress.

DISCUSSION

The current study investigated the co-occurrence of self-reported hearing handicap and mental health issues amongst 375 adults with HI recruited from the membership of BHA. The mean age of the participants was 68.5 years and the sample comprised two-thirds women and one-third men. The results from this study suggest that there is no difference in prevalence of general psychological distress among this sample of adults compared to that of the general Australian population. These results are similar to Tambs' (2004) finding that HI does not affect mental health rating amongst older persons. In the current study, there was no statistically significant difference in the prevalence of general psychological distress between males and females.

'Mental health' is recognised as an umbrella term, covering an array of different psychological conditions, some of which (e.g., stress and anxiety) are commonly reported to be associated with HI (Andersson & Green, 1994; Kvam et al., 2006). Of interest in this study was the inter-relationship between the broad category of psychological distress (as assessed by the K-10) and the commonly reported psychological dimensions of anxiety, stress and depression (as measured by the DASS) amongst this group of hearing impaired adults, particularly amongst those who reported high scores on the K-10. Analysis amongst the 44 adults reporting high or very high levels of psychological distress on the K-10 of the component DASS scores indicated that scores on the depression scale of the DASS were signifi-

TABLE 4

Percentage of Participants in Each of the Self-Reported HHIA-S Categories of Severity (after Ventry & Weinstein, 1982) and General Psychological Distress (K10) Categories ($n = 366$).

HHIA-S Category	Low	Moderate	High	Very High
No handicap	10.8%	8.0%	3.4%	0.0%
Moderate handicap	36.5%	15.0%	13.8%	0.0%
Severe Handicap	52.7%	77.0%	82.8%	100%
Total	100%	100%	100%	100%

cantly higher than those on the stress scale, although not significantly higher than the levels of reported anxiety. This suggests that negative consequences of psychological distress are more likely to be borne of depressive emotions than of those related to stress and the relationship between adult acquired HI and depression remains to be better understood.

De Graaf and Bijl (2002) suggest that low self-esteem and poor acceptance of one's HI are important predictors of mental distress in hearing impaired adults. The majority of participants in this study reported low levels of general psychological distress, yet there was some variability in the degree of reported hearing handicap for a given level of distress. As a general rule, as the level of reported psychological distress increased so did the instances of reported severe hearing handicap. At very high levels of psychological distress, all participants reported a severe hearing handicap. Overall, the results from the current study indicate that hearing impaired adults who describe high levels of psychological distress are more likely to also report severe levels of hearing handicap.

The sample in the current study, although large, is limited in its generalisability to a larger population by both age and psychosocial biases. The age range of the adults in the BHA sample was wide, covering almost 70 years but it was skewed towards older age and it has been noted that many of the psychosocial responses to adult acquired HI increase with age (Andersson & Green, 1994). From a psychosocial perspective it can be assumed that members of BHA by the very nature of their membership with the organisation may be seen to be motivated to seek help, be educated in hearing loss, and be more willing to recognise their HI and hearing difficulties than others who are not members of a support organisation such as BHA. It has been suggested that self-help groups tend to 'capture' people who are more likely to be motivated for self-help, feel more positive about themselves, recognise their strengths and present with fewer psychological health concerns (Chamberlin, Rogers, & Ellison,

1996). As a result of these sampling biases, the results of the current study may underestimate the effect of HI on mental health.

A number of additional factors may contribute to self-reported mental health issues and need to be taken into account when drawing conclusions about any causal relationship between HI and mental health. The proportion of participants who had pre-existing mental health problems or who may be on drug regimens related to their mental health remains unknown. In light of the limitations of the sampling methods in the current study it is recognised that a more representative sample may provide results that can be better generalised to Australian adults with HI. The sampling methods utilised in this study also resulted in the inability to obtain clinical audiometric data from participants. Provision of audiometric data would enable determination of more specific relationships between HI and mental health.

Finally, incorporating more dynamic measures of psychological health in conjunction with the measures used in the current battery which tap into (more static) residual difficulties, will provide a more holistic profile of how HI and mental health co-occur. Such dynamic measures may include the Selection, Optimisation and Compensation model (Freund & Baltes, 2002) which reflects the adaptation and life management skills with which adults manage their lives. This may also better reflect the dynamic nature of HI and adults' responses to it.

Although there was no difference in the prevalence of mental health issues in this sample of adults with HI compared to the general Australian population, potentially important relationships were discovered about the specific types of psychological distress, as well as between self-reported hearing handicap and mental health issues. Further research into this area should be aimed at improving the representativeness of the sample to confirm and extend understanding in this important relationship.

ACKNOWLEDGEMENTS

The authors wish to acknowledge Chrissy O'Reilly and Kate Treloar for their instigation of and participation in this project. The authors would like to thank Alan Kier, the (then) National BHA president for his support of this project. Finally, we acknowledge FACES for their financial assistance with the project.

REFERENCES

- Anderson, D.L., & Noble, W. (2005). Couples' attributions about behaviours modulated by hearing impairment: Links with relationship satisfaction. *International Journal of Audiology, 44*, 197–205.
- Andersson, G., & Green, M. (1994). Anxiety in elderly hearing impaired persons. *Perceptual and Motor Skills, 81*, 553–554.
- Andrews, G., & Slade, T. (2001). Interpreting scores on the Kessler psychological distress scale (K10). *Australian and New Zealand Journal of Public Health, 25*, 494–497.
- Australian Bureau of Statistics. (2006). Mental health in Australia: A snapshot 2004/2005. Cat No. 4824.0.55.001. Canberra, Australia: Author.
- Australian Institute of Health and Welfare (2006). Australia's Health 2006, AIHW Cat. No. AUS 73. Canberra, Australia: Author.
- Beck, A.T., Epstein, N., Brown, G., & Steer, R. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology, 56*, 893–897.
- Better Hearing Australia. (2007). Welcome to Better Hearing Australia — Helping People Hear Better. Retrieved from www.betterhearing.org.au/
- Brown, T.A., Chorpita, B.F., & Barlow, D.H. (1998). Structural relationships among dimensions of the DSM-IV anxiety and mood disorders and dimensions of negative affect, positive affect, and autonomic arousal. *Journal of Abnormal Psychology, 107*, 179–192.
- Chamberlin, J., Rogers, E.S., & Ellison, M.L. (1996). Self-help programs: A description of their characteristics and their members. *Psychiatric Rehabilitation Journal, 19*(3), 33–42.
- Clark, D.A., Steer, R.A., & Beck, A.T. (1994). Common and specific dimensions of self-reported anxiety and depression: implications for the cognitive and tripartite models. *Journal of Abnormal Psychology, 103*, 645–654.
- Cooper, A.F. (1976). Deafness and psychiatric illness. *British Journal of Psychiatry, 129*, 216–226.
- Costello, C.G., & Comrey, A.L. (1967). Scales for measuring anxiety and depression. *Journal of Psychology, 66*, 303–313.
- Cox, R.M., & Alexander, G.C. (2002). The international outcome inventory for hearing aids (IOI-HA): Psychometric properties of the English version. *International Journal of Audiology, 41*, 30–35.
- De Graaf, R., & Bijl, R.V. (2002). Determinants of mental distress in adults with a severe auditory impairment: differences between prelingual and postlingual deafness. *Psychosomatic Medicine, 64*, 61–70.
- Erdman, S. (1993). Counselling hearing-impaired adults. In J. G. Alpiner & P. McCarthy (Eds.). *Rehabilitative audiology: Children and adults* (pp. 374–413). Baltimore, MD: William & Wilkins.
- Freund, A.M., & Baltes, P.B. (2002). Life-management strategies of selection, optimisation and compensation: measurement by self-report and construct validity. *Journal of Personality and Social Psychology, 82*, 642–662.
- Gatehouse, S. (1994). Components and determinants of hearing aid benefit. *Ear and Hearing, 15*, 30–49.
- Heine, C., & Browning, C. J. (2002). Communication and psychosocial consequences of sensory loss in older adults: overview and rehabilitation directions. *Disability and Rehabilitation, 24*, 763–773
- Joiner, T.E., Catanzaro, S.J., & Laurent, J. (1996). Tripartite structure of positive and negative affect: depression and anxiety in child and adolescent psychiatric inpatients. *Journal of Abnormal Psychology, 105*, 401–409.
- Jones, E.M., & White, A.J. (1990). Mental health and acquired hearing impairment: A review. *British Journal of Audiology, 24*, 3–9.
- Kessler, R.C., Andrews, G., Colpe, F., & Hiripi, E. (2002). Short screening scales to monitor population prevalence and trends in non-specific psychological distress. *Psychological Medicine, 32*, 959–976.
- Kvam, M.H., Loeb, M., & Tambs, K. (2006). Mental health in deaf adults: symptoms of anxiety and depression among hearing and deaf individuals. *Journal of Deaf Studies and Deaf Education, 12*, 1–7.
- Lovibond, P.F. (1998). Long-term stability of depression, anxiety and stress syndromes. *Journal of Abnormal Psychology, 3*, 520–526.
- Lovibond, S.H., & Lovibond, P.F. (1995). *Manual for the depression anxiety stress scales* (2nd ed.). Sydney, Australia: Psychology Foundation of Australia.
- Miller, R.L., Pallant, J.F. & Negri, L.M. (2006). Anxiety and stress in the postpartum: Is there more to postnatal distress than depression? *BioMed Central Psychiatry, 6*(12), 1–11.

- Mineka, S., Watson, D., & Clark, L.A. (1998). Comorbidity of anxiety and unipolar mood disorders. *Annual Review of Psychology, 49*, 377–412.
- Mulrow, C.D., Aguilar, C., Endicott, J.E., Tuley, M.R., Velez, R., Charlip, W.S., Rhodes, M.C., Hill, J.A., & DeNino, L.A. (1990). Quality-of-life changes and hearing impairment. *Annals of Internal Medicine, 113*, 188–193.
- Mulrow, C.D., Tuley, M.R., & Aguilar, C. (1992). Sustained benefits of hearing-aids. *Journal of Speech and Hearing Research, 35*, 1402–1405.
- Newman, C.W., Weinstein, B.E., Jacobson, G.P., & Hug, G.A. (1990). The hearing handicap inventory for adults: Psychometric adequacy and audiometric correlates. *Ear and Hearing, 11*, 430–434.
- Nieuwenhuijsen, K., de Boer, A., Verbeek, J., Blonk, R., & van Dijk, F. (2003). The Depression Anxiety Stress Scales (DASS): Detecting anxiety disorder and depression in employees absent from work because of mental health problems. *Occupational and Environmental Medicine, 6* (Suppl. 1), I77–I82.
- Stephens, S.D. (1980). Evaluating the problems of the hearing impaired. *Audiology, 19*, 205–220.
- Tambs, K. (2004). Moderate effects of hearing loss on mental health and subjective well-being: Results from the Nord-Trondelag hearing loss study. *Psychosomatic Medicine, 66*, 776–782.
- Thomas, A.J., & Gilhome-Herbst, K. (1980). Social and psychological implications of acquired deafness for adults of employment age. *British Journal of Audiology, 14*, 76–85.
- Thomas, A.J. (1981). Acquired deafness and mental health. *British Journal of Medical Psychology, 54*, 219–229.
- Ventry, I., & Weinstein, B. (1982). The hearing handicap for the elderly: A new tool. *Ear and Hearing, 3*, 128–134.
- Watson, D., & Clark, L.A. (1984). Negative affectivity: The disposition to experience aversive emotional states. *Psychological Bulletin, 96*, 465–490.
- Watson, D., Clark, L.A., & Carey, G. (1988). Positive and negative affect and their relation to anxiety and depressive disorders. *Journal of Abnormal Psychology, 97*, 346–353.
- Watson, D., Weber, K., Assenheimer, J.S., Clark, L.A., Strauss, M.E., & McCormick, R.A. (1995). Testing a tripartite model: 1. Evaluating the convergent and discriminant validity of anxiety and depression symptom scales. *Journal of Abnormal Psychology, 104*, 3–14.
- Wilson, D.H., Walsh, P.G., Sanchez, L., Davis, A.C., Taylor, A.W., Tucker, G., & Meagher, I. (1999). The epidemiology of hearing impairment in an Australian adult population. *International Journal of Epidemiology, 28*, 247–252.
- Wong, J., Cheung, E., Chan, K., Ma, K., & Tang, S. (2006). Web-based survey of depression, anxiety and stress in first-year tertiary education students in Hong Kong. *Australian and New Zealand Journal of Psychiatry, 40*, 777–782.
- Zazove, P., Meador, H.E., Aikens, J.E., Nease, D.E., & Gorenflo, D.W. (2006). Assessment of depressive symptoms in deaf persons. *Journal of American Board of Family Medicine, 19*, 141–147.