

# The Effect of Social Support on Quality of Life for Tinnitus Sufferers

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## Abstract

**Objective:** To examine the relationship between tinnitus severity, social support and three quality of life measures. Background data: Research into other conditions shows that social support helps achieve positive outcomes and improved quality of life. For tinnitus, research suggests social support does not impact on quality of life outcomes. However, research has been limited and the measures used have mixed tinnitus severity, tinnitus handicap and social support into one measure. The aim of this research was to examine the relationship using separate measures. **Methods:** One hundred fifty-four tinnitus sufferers (63.7% males, 36.3% females, Age M = 46.4, SD = 14.97) completed the assessment battery. Three sequential multiple regression analyses were conducted to test the hypothesis that social support moderates the effects of tinnitus severity on each of the dependent variables: tinnitus handicap, depression and general well-being. **Results:** The severity of one's tinnitus significantly predicted tinnitus handicap, depression and general well-being, but social support did not moderate the relationship. Social support did have a direct relationship on level of depression and general well-being. **Conclusion:** Tinnitus handicaps appear to be unique but tinnitus sufferers do gain significant benefits from social support.

**Keywords:** depression, hearing loss, quality of life, social support, tinnitus.

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## INTRODUCTION

Tinnitus is the experience of noises in the ear(s) or head that have no external source. It is a subjective experience that varies between patients in the symptoms experienced and the subsequent effects on the person. For sufferers of chronic tinnitus, it can have a major impact on their daily life causing emotional and social dysfunction<sup>1,2</sup>. A major concern for tinnitus sufferers is the effect that tinnitus has on their quality of life. Nobel<sup>3</sup> suggest that a significant proportion of tinnitus sufferers will experience a reduction in quality of life as a result of this complaint.

Quality of life is a term that encompasses the impact of impairment on the psychological, psychosocial, emotional and health effects on an individual. It also relates to the effects the impairment has on lifestyle, the ability to achieve satisfaction with their life and the ability to function within both work and social environments<sup>4</sup>. Erlandsson & Holgers<sup>5</sup> suggest that quality of life is reduced in patients suffering from severe distress in relation to their tinnitus symptoms. Other research has supported this suggesting that a major concern for tinnitus sufferers is the effect it has on their quality of life and for sufferers of chronic tinnitus it can have a major impact on their daily life, causing emotional and social impairment<sup>1,2</sup>. Three specific ways in which tinnitus is known to impact on quality of life are 1) the experience of tinnitus specific handicaps; 2) the incidence of depression; and 3) lowered feelings of general well-being.

It is the people who surround us, our family, friends and co-workers, who combine together to provide a network of social support. This network of social support provides us with physical and emotional comfort. Social networks and social support are increasingly recognised as important determinants of health and well-being in people with chronic conditions<sup>6</sup>. Research into social support has shown it to be an important factor in achieving positive health outcomes for patients with a variety of conditions, from chronic pain to heart disease. Social support has been shown to be a strong indicator for positive outcomes in patients with depression, heart disease and cancer<sup>7</sup>.

It is not only physical disease that can benefit from social support. The effects of mental illness, such as depression and anxiety, can be improved by access to social support<sup>8</sup>. Those who suffer from hearing impairment can also positively benefit from social support in adjusting to their impairment<sup>9</sup>. However, inexplicably, these widely reported benefits of social support in alleviating suffering over a vast array of illnesses and impairments do not seem to extend to tinnitus. Research into the link between social support

and an improvement in quality of life for tinnitus sufferers has been limited. What research there is has shown no significant correlation between social support and quality of life factors, also that experienced social support had no relationship to the perceived severity of tinnitus<sup>10,11</sup>.

The degree of social support received can significantly improve quality of life in sufferers of most chronic human diseases and impairments. Paradoxically, the benefits of social support do not seem to attenuate suffering for those with tinnitus or improve their quality of life, although research in this area has been sparse.

The two studies to date that have sought to assess the impact of social support on tinnitus sufferers<sup>10,11</sup> have both used the same instrument to measure social support: The Tinnitus Handicap/Support Scale<sup>10</sup>. Both studies have found no effect of social support on tinnitus severity or quality of life. In explaining their null findings, Erlandsson et al.<sup>10</sup> suggested that their social support measure may not have been sufficiently sensitive to measure the complexity of social support in patients with tinnitus. Despite this warning, Erlandsson & Hallberg<sup>11</sup> used the same instrument with similar results. A review of the relevant item content for this scale suggests that the instrument is very tinnitus specific (e.g., "Family is concerned about tinnitus"; "Friends are concerned about tinnitus"; "My tinnitus distresses family/friends"). To address this issue, the present study employs a more generic measure of social support, the Multidimensional Scale of Perceived Social Support<sup>12</sup>.

A second criticism of the measures used by Erlandsson et al. is the overlapping item content of scales designed to independently measure tinnitus severity and consequent handicaps or quality of life issues. For example, to assess tinnitus severity, Erlandsson et al.<sup>10</sup> used the Tinnitus Severity Questionnaire. However, this instrument contains several items which would ordinarily be associated with measures of quality of life (e.g., "How much does tinnitus reduce the quality of your life overall?"). Any attempt to assess the moderating role of social support on the relationship between tinnitus severity and consequent reduction in quality of life must avoid cross-contamination of item content between independent and dependent variables. To address this issue, the present study assesses tinnitus severity using the Tinnitus Severity Index<sup>13</sup>, an instrument which measures the sheer intensity of the tinnitus experience and is devoid of content related to quality of life issues.

Using these improved measures, the primary aim of the present study is to assess whether perceived social support moderates the relationship between tinnitus severity and consequent reduction in three quality of life variables (tinnitus specific handicap, depression and general well-being). A secondary aim is to assess and control for the impact of age, gender and antidepressant

use in the moderation relationship. Erlandsson et al.<sup>10</sup> suggest that for tinnitus sufferers it is possible there is one handicap profile for the older tinnitus patients and another profile for the young and middle aged. Erlandsson & Holgers<sup>5</sup> found gender differences in the health status of tinnitus sufferers with women exhibiting the most signs of negative health effects as a result of their tinnitus. Since depression is a large factor in the decrease of quality of life for tinnitus sufferers<sup>5,14</sup> the study assessed the use of antidepressant medication to control for its effects on depression.

For the reasons explained and in contrast to previous findings, it is hypothesized that increased levels of perceived social support will attenuate the relationship between tinnitus severity and the three quality of life variables, after controlling for the effects of age, gender and antidepressant use.

## MATERIALS AND METHODS

One hundred and fifty four participants comprising 63.7% males and 36.3% females with ages ranging from 18 to 94 years ( $M = 46.4$ ,  $SD = 14.97$ ). Twenty three percent of participants reported currently using anti-depressant medication.

The assessment battery consisted of five separate instruments designed to measure tinnitus severity, tinnitus handicap, depression, general well-being and social support. Participants were assessed by the Tinnitus Severity Index<sup>13</sup>; the Tinnitus Handicap Inventory<sup>15</sup>; the Centre for Epidemiological Studies Depression (CES-D) scale<sup>13</sup>; to assess participants' feeling of general well-being the Scales of Psychological Well-being<sup>13</sup> and the Multidimensional Scale of Perceived Social Support<sup>12,16</sup> were used to measure the level of social support received by participants.

## RESULTS

Three sequential multiple regression analyses were conducted to test the hypothesis that social support moderates the effects of tinnitus severity on each of the dependent variables: tinnitus handicap, depression and general well-being. For each analysis the covariates age, gender and antidepressant use were entered as predictors in Block 1, tinnitus severity and social support were entered as predictors in Block 2 and the tinnitus severity and social support interaction (the moderation effect) was entered as the predictor in Block 3. The results for each of the three dependent variables, showing change in overall variance explained by each Block ( $DR^2$ ), and standardised regression coefficients ( $B$ ), standard errors ( $SE$ ), standardised regression coefficients ( $b$ ) and squared semi-partial correlations ( $sr^2$ ) follow.

**Table 1.** Correlations, means, and standard deviations for main variables in the study.

Variable	1	2	3	4	5
1. Tinnitus severity	-				
2. Social support	-0.01	-			
3. Tinnitus handicap	.27**	-0.11	-		
4. Depression	.41**	-.26**	.62**	-	
5. General well-being	-0.15	.47**	-.47**	-.60**	-
M	0.00	5.24	3.46	2.30	3.94
SD	1.00	1.14	0.93	0.73	0.88
Maximum-minimum scores	$z^a$	1-7	1-5	1-4	1-6

<sup>a</sup> Tinnitus severity scores represent a standardised composite of standardised item scores. \* $P < .05$ , \*\* $P < .01$ .

### Tinnitus Handicap

The summary of the sequential regression analysis with tinnitus handicap as the criterion variable is presented in Table 2. The non-significant  $R^2$  in Block 1 showed that the three covariates age, gender and use of antidepressant medication did not explain a significant portion of the variance in tinnitus handicap and none of the three proved to be a reliable predictor. The addition of the two main predictors, tinnitus severity and social support, in Block 2 resulted in a significant increment in  $R^2$  and showed that the severity of one's tinnitus significantly predicted tinnitus handicap. Greater tinnitus severity was associated with an increase in the handicap that is experienced. On the other hand, the degree of social support received did not reliably impact on tinnitus handicap. The addition of the two-way interaction between tinnitus severity and social support in Block 3 did not reliably improve  $R^2$ . Social support did not moderate the relationship between perceived tinnitus severity and experienced tinnitus handicap. Overall, the regression model explained a significant 9% of the variance in tinnitus handicap.

### Depression

The summary of the sequential regression analysis with depression as the criterion variable is presented in Table 3. The non-significant  $R^2$  in Block 1 showed that the three covariates, age, gender and antidepressant medication together failed to explain a significant portion of the variance in depression. The main effects of age and gender were not significant, however antidepressant medication did prove a reliable predictor of depression. Tinnitus sufferers who took antidepressant medication tended to be more depressed. The addition of the two main predictors, tinnitus severity and social support, in Block 2 resulted in a significant increment in  $R^2$  and showed that the severity of one's tinnitus significantly

**Table 2.** Summary of sequential regression analysis: social support as a moderator of the effects of tinnitus severity on tinnitus handicap after controlling for age, gender and antidepressant medication.

Predictors	DR <sup>2</sup>	B	SE	b	sr <sup>2</sup>
Block 1	0.02				
Age		0.00	0.01	-0.02	-0.02
Gender		-0.14	0.16	-0.07	-0.07
Antidepressant medication		-0.28	0.18	-0.13	-0.13
Block 2	.07**				
Age		0.00	0.01	-0.07	-0.07
Gender		-0.09	0.15	-0.05	-0.05
Antidepressant medication		-0.16	0.18	-0.07	-0.07
Tinnitus severity		.25**	0.08	0.27	0.26
Social support		-0.08	0.07	-0.10	-0.11
Block 3	0.00				
Age		0.00	0.01	-0.07	-0.07
Gender		-0.08	0.15	-0.04	-0.05
Antidepressant medication		-0.16	0.18	-0.04	-0.07
Tinnitus severity (A)		.26**	0.08	0.28	0.26
Social support (B)		-0.08	0.07	-0.10	-0.11
A x B		-0.05	0.08	-0.05	-0.05

Model R<sup>2</sup> = .09, P = .014. sr<sup>2</sup> refers to the squared semi-partial correlation, the amount of unique variance in Tinnitus Handicap explained by each predictor after controlling for the other predictors in the regression model. \*\* P < .01.

predicted depression. For those who rated their tinnitus more severe predicted depression was also increased. The degree of social support received was also a significant predictor of the level of depression experienced. As social support increased for tinnitus sufferers the level of depression decreased. The addition of the two-way interaction between tinnitus severity and social support in Block 3 did not reliably improve R<sup>2</sup>. Social support did not moderate the relationship between perceived tinnitus severity and experienced depression. Overall, the regression model explained a significant 29% of the variance in depression.

### General Well-being

The summary of the sequential regression analysis with general well-being as the criterion variable is presented in Table 4. The three covariates included in Block 1 did not explain a significant portion of the variance in general well-being and neither age, gender, nor use of antidepressant medication proved to be reliable predictors. The addition of the two main predictors, tinnitus severity and social support, in Block 2 resulted in a significant increment in R<sup>2</sup> and showed that the severity of one's tinnitus significantly predicted general well-being. Also, the degree of social support received was a significant predictor of the level of

**Table 3.** Summary of sequential regression analysis: social support as a moderator of the effects of tinnitus severity on depression after controlling for age, gender and antidepressant medication.

Predictors	DR <sup>2</sup>	B	SE	b	sr <sup>2</sup>
Block 1	0.05				
Age		-0.01	0.00	-0.11	-0.11
Gender		-0.05	0.12	-0.03	-0.04
Antidepressant medication		-.35*	0.14	-0.2	-0.2
Block 2	.23***				
Age		-0.01	0.00	-0.19	-0.21
Gender		0.03	0.11	0.02	0.02
Antidepressant medication		-0.21	0.13	-0.12	-0.14
Tinnitus severity		.31***	0.06	0.42	0.42
Social support		-.17***	0.05	-0.26	-0.28
Block 3	0.01				
Age		-0.01	0.00	-0.19	-0.21
Gender		0.04	0.11	0.03	0.03
Antidepressant medication		-0.22	0.13	-0.13	-0.14
Tinnitus severity (A)		0.33	0.06	0.44	0.43
Social support (B)		-0.17	0.05	-0.26	-0.29
A x B		-0.06	0.06	-0.08	-0.09

Model R<sup>2</sup> = .29, P < .001. sr<sup>2</sup> refers to the squared semi-partial correlation, the amount of unique variance in Depression Scores explained by each predictor after controlling for the other predictors in the regression model. \*P < .05; \*\*\*P < .001.

**Table 4.** Summary of sequential regression analysis: social support as a moderator of the effects of tinnitus severity on general well-being after controlling for age, gender and antidepressant medication.

Predictors	DR <sup>2</sup>	B	SE	b	sr <sup>2</sup>
Block 1	0.04				
Age		0.01	0.01	0.12	0.12
Gender		0.24	0.15	0.13	0.13
Antidepressant medication		0.11	0.17	0.05	0.05
Block 2	.23***				
Age		0.01	0.00	0.14	0.15
Gender		0.10	0.13	0.06	0.06
Antidepressant medication		0.11	0.15	0.05	0.06
Tinnitus severity		-.14*	0.07	-0.16	-0.17
Social support		.35***	0.06	0.45	0.46
Block 3	0.01				
Age		0.01	0.00	0.13	0.15
Gender		0.09	0.13	0.05	0.06
Antidepressant medication		0.11	0.15	0.05	0.06
Tinnitus severity (A)		-.16*	0.07	-0.18	-0.19
Social support (B)		.35***	0.06	0.46	0.64
A x B		0.07	0.07	0.07	0.08

Model R<sup>2</sup> = .28, P < .001. sr<sup>2</sup> refers to the squared semi-partial correlation, the amount of unique variance in General Well-being explained by each predictor after controlling for the other predictors in the regression model. \*P < .05; \*\*\*P < .001.

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general well-being experienced. A higher level of social support was associated with a greater feeling of general well-being. The addition of the two-way interaction between tinnitus severity and social support in Block 3 did not reliably improve  $R^2$ . Social support did not moderate the relationship between perceived tinnitus severity and general well-being. Overall, the regression model explained a significant 28% of the variance in general well-being.

## DISCUSSION

The primary aim of the present study was to assess whether perceived social support moderated the relationship between tinnitus severity and three quality of life variables: tinnitus specific handicap, depression and general well-being. A secondary aim of the study was to assess the impact of age, gender and antidepressant use on the three quality of life variables. It was expected that perceived social support would attenuate the relationship between tinnitus severity and the three quality of life variables. The results reported here do not support this hypothesis. Social support did not change the relationship between the rated severity of tinnitus and the experience of the three quality of life variables. However, the present results do help clarify the direct effects of perceived social support on the quality of life of tinnitus sufferers.

While participants in this study ranged in age from 18 to 94 years, age was not a significant predictor of the quality of life of tinnitus sufferers. Furthermore, age failed to explain a significant portion of variance in tinnitus handicap, depression or general well-being. Gender was not a significant predictor of quality of life for tinnitus sufferers. For tinnitus sufferers in this study anti-depressant use was not a significant predictor of tinnitus handicap or general well-being. Anti-depressant use, however, was a significant predictor of depression. Participants who used anti-depressant medication tended to be more depressed. However, these results must be interpreted with caution. The relationship between antidepressant medication use and depression is unlikely to be causal in nature. The question has not been answered as to whether the depression preceded the tinnitus<sup>17</sup> or came as a consequence of the tinnitus<sup>17</sup>. For example, will someone with depression get tinnitus as a result of the depression or do they become depressed because they were diagnosed with an incurable condition that can have a severe impact on their life. For those on antidepressant medication it is more likely that their depression was more severe in the first place. Participants who score higher on the depression scale are therefore likely to be more affected by the impact of depression on their life and therefore are more likely to seek treatment. Also antidepressant medication takes time to work and they do not solve the problem that

brought on the depression but help to remove its symptoms. No consideration was taken into account, in this study, as to the length of time that participants had been taking medication and this could be considered in a future study. People suffering from depression find no happiness or joy in activities they once enjoyed or being with family and friends. By its nature and effects there will be an impact on the quality of life for those tinnitus sufferers with depression.

In measuring tinnitus severity it is important to use a measure that focuses exclusively on the sheer intensity of the physical experience of tinnitus and is not contaminated by item content that taps into quality of life issues. In the present study, a measure of tinnitus severity was used that did not confound the degree of tinnitus severity with the handicap experienced from tinnitus. Thus, it was possible to directly assess the relationship between tinnitus severity and quality of life. The results indicate that increased tinnitus severity significantly predicted increased tinnitus handicap, increased depression and a reduced sense of general well-being. Overall tinnitus severity accounted for 29% of the variance in depression, 28% of the variance in general well-being and 9% of the variance in tinnitus specific handicap. This indicates that while tinnitus severity accounts for a large part of the variance in the quality of life for tinnitus sufferers there are still other external factors that are influencing the relationship between tinnitus severity and the three quality of life variables that have not been measured by this analysis.

The results of this analysis suggest that social support did not moderate the relationship between tinnitus severity and the three quality of life variables. Also perceived social support did not have any effect on the experience of tinnitus specific handicaps. Tinnitus is not something that can be cured and if you are unlucky enough to be adversely affected, there is no escaping from these adverse effects. Noble & Tyler<sup>18</sup> suggest that tinnitus is very isolating as those without tinnitus do not understand the mechanisms of tinnitus and its effects, thereby cutting off others' ability to fully share the consequences of the condition. By not being able to share experiences with others you cannot gain the full benefits of comfort from them. To explain tinnitus, the analogy of phantom limb pain is sometimes used (where sensations are perceived to originate from an amputated limb). Unlike pain, however, others do not easily understand tinnitus and perhaps it is because sufferers feel unable to share their experiences with others and gain subsequent comfort from them that tinnitus specific handicaps are robust in resisting the benefits of social support.

Social support, however, did have a significant direct relationship with two of the quality of life variables

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(depression and general well-being). The degree of social support received was a significant predictor of the level of depression experienced. Participants who rated their perceived social support as low had higher depression scores. Also, the degree of social support received was a significant predictor of the level of general well-being experienced. A higher level of perceived social support was associated with a greater feeling of general well-being. This analysis has shown that those who suffer from tinnitus are not immune to the benefits of social support. This is similar to other diseases and chronic conditions (pain, cancer, etc.)<sup>19</sup> where social support can be an important factor in determining disease related outcomes and subsequent quality of life for those with the condition. While the experience of tinnitus handicap does not respond to the benefits of social support, those who experience other detriments to their quality of life due to their tinnitus do receive benefit from having social support from the family, friends and significant others around them. Social support is an important factor for those with tinnitus and can have a positive influence on their quality of life by reducing feelings of depression and increasing the feelings of general well-being. By showing that social support has leverage on the level of depression and the feelings of general well-being of tinnitus sufferers, but not on their tinnitus specific handicaps, this study adds weight to the argument that tinnitus is a unique condition whose handicaps remains inaccessible to the benefits of social support.

There are limitations in this research that need to be taken into account when interpreting the results. This study relied on participants to identify themselves as tinnitus sufferers rather than using a clinical population with an objective acoustic diagnosis of tinnitus. This could be assessed in a further study comparing the two populations to examine if there would be a difference between the groups. Also, the use of an internet based survey rather than the traditional paper and pen method may have limited the type of respondents. Also given the cross-sectional nature of the present study the results should be interpreted with caution as conclusions about causality cannot be determined.

Is there something about tinnitus that makes it a unique condition that seems to stand apart from other conditions? Future research should be directed toward answering this question. Noble<sup>3</sup> suggests that by its nature tinnitus is more personal and private than hearing impairment. Because tinnitus is not able to be perceived by anyone except the one with the tinnitus it is a distressing and disturbing condition for the sufferer. It is possible that the family and friends of someone with tinnitus would be unaware of the unique symptoms

of the impairment and the resulting tinnitus specific handicaps. They would, therefore, be unaware of what form of social support to offer that would be the most beneficial to the sufferer. Future research could address this issue by conducting an intervention targeted at family members, with the aim of improving their knowledge of the impairments and handicaps resulting from tinnitus. A positive outcome for this intervention might enable an appropriately leveraged style of social support to be provided for the sufferer.

If there were a greater understanding as to why tinnitus specific handicaps remain unaffected by social support it would enable those who suffer from tinnitus to be prepared for the effects the condition is going to have on their quality of life. By conducting research that concentrated on the mechanisms of the relationship between tinnitus severity, tinnitus specific handicaps and social support a greater understanding of the intricate mechanisms of this relationship could be established.

## CONCLUSION

For the majority of people with tinnitus it is a condition that they learn to live with. It does not have a large impact on their day-to-day life<sup>4</sup>. For up to 2% of sufferers, however, it is a condition that can severely affect their quality of life. This research has shown that social support does not moderate the relationship between tinnitus severity and the three quality of life variables (tinnitus handicap, depression and general well being). Also, there was not a direct relationship between social support and tinnitus specific handicaps. This lends weight to the argument that tinnitus handicaps are unique, unlike pain and other chronic conditions, and are not easily understood by those who do not suffer tinnitus. This may be because tinnitus cannot be cured and there is no escape from the noise. As Erlandsson et al.<sup>11</sup> suggest, there is possibly a sense of hopelessness related to tinnitus specific handicaps that resists the benefits of social support. However the results of this analysis have shown that tinnitus sufferers do gain benefits from social support. Social support can be a significant factor for those who do suffer from their tinnitus. The results of this research suggest that social support directly affected two out of the three quality of life variables (depression and general well-being). The higher the perceived level of social support the participants rated themselves as being less depressed and having a greater sense of general well-being. Further research into the role that social support plays in the experience of tinnitus for sufferers will increase what is known about the condition, its subsequent effects on the person and how best to alleviate the negative outcomes.

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