Dispositional mindfulness, gratitude and self-compassion: factors affecting tinnitus distress

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Abstract

Objectives: There is evidence to suggest that mindfulness-based treatments are effective at reducing tinnitus distress by changing the way individuals respond to their tinnitus. Further research is required to assess the impact of factors associated with mindfulness-based treatments on tinnitus distress. This study examines whether dispositional mindfulness, gratitude and self-compassion are associated with psychological and tinnitus distress. **Methods:** In this cross-sectional study, 182 participants with tinnitus completed online questionnaires. Measures for dispositional mindfulness, gratitude, self-compassion, tinnitus distress, psychological distress and cognitions about tinnitus were completed. **Results:** More dispositional mindfulness, gratitude, and self-compassion were associated with lower tinnitus distress and psychological distress. More negative cognitions and fewer positive cognitions about tinnitus was associated with more tinnitus and psychological distress. **Conclusions:** Dispositional mindfulness, gratitude and self-compassion are associated with the experience of distress in people with tinnitus. Future research should continue to explore the contribution of these qualities in developing a cognitive style that helps protect against distress, and whether interventions that enhance these qualities lead to better clinical outcomes.

Keywords: Mindfulness; Gratitude; Self-compassion; Tinnitus.

Tinnitus is the perception of sound in the absence of an external acoustical stimulus (Baguley et al., 2013), possibly occurring due to an imbalance in the auditory pathway between excitatory and inhibitory functions (Eggermont & Roberts 2012). Tinnitus is very common, with prevalence rates estimated at 30% (McCormack et al., 2016), however most people cope well with tinnitus, with 5-10% reporting mild disturbance and 0.5-2% reporting severe disturbance and impaired quality of life (e.g. Henry et al., 2005). Because distress in tinnitus is not well correlated with reported psychoacoustic properties (Andersson, 2003), various explanatory models have indicated that psychosocial factors affect tinnitus distress.

Chronic tinnitus parallels other conditions such as chronic pain (Moller, 1997) and can be understood from a biopsychosocial perspective (Gatchel et al., 2007). Key psychological models of tinnitus are based on Cognitive Behavioral Theory (CBT) where negative or catastrophic cognitions about tinnitus drive selective-attention, fear and fear-avoidance, leading to increased tinnitus distress (Cima et al., 2011; Handscomb et al., 2017; Kleinstäuber et al., 2013). The cognitive-behavioral model of tinnitus put forward by McKenna et al., (2014) suggests that automatic negative cognitions about tinnitus lead to unhelpful safety-seeking behaviors, particularly avoidance of tinnitus and distress, and attentional narrowing onto tinnitus. These thoughts, behaviors and attentional changes are proposed to maintain tinnitus distress and intrusiveness, and prevent habituation. This is based on cognitive behavioral theory; that negative interpretations of our experiences (such as tinnitus) cause distressing emotional and unhelpful behavioral consequences (e.g. Beck, 1979). CBT for tinnitus, based on this model, is effective at reducing distress (NICE, 2020). However, a significant proportion of people do not benefit from CBT, suggesting that additional, more effective treatments should be explored. For example, one study found that more than 50% did not report clinical improvement from a group- based CBT (Andersson et al., 2005).

Mindfulness Based Cognitive Therapy for tinnitus (MBCT-t) has proven efficacy (McKenna et al., 2017; 2018) and the NICE treatment guidelines for tinnitus (NICE, 2020) now state that MBCT-t should be considered as a treatment for chronic tinnitus. Studies of mindfulness-based treatments

conducted across other populations with various psychological and physical conditions have suggested mediating factors of reduced emotional and cognitive reactivity, repetitive negative thinking and increased self-compassion and psychological flexibility (Alsubaie et al., 2017). Such cognition and thinking styles are likely to be relevant to tinnitus, and qualitative findings suggest MBCT-t leads to similar effects in tinnitus samples (e.g. Marks et al., 2020). MBCT-t could also be more cost-effective than traditional CBT if delivered in a group format. However further work is required to assess what factors associated with mindfulness might relate to tinnitus distress. This may not always be intuitive; for example, more *positive* thoughts about tinnitus were not found to be associated with lower levels of distress; only more negative thoughts were associated with higher levels of distress (Handscomb et al., 2017).

MBCT-t includes the following components: mindfulness practice to develop purposeful attention and a mindful awareness toward all experience (positive and negative)**,** loving-kindness meditation and discussion about compassion to develop self-compassion, and the use of a pleasant events diary to develop gratitude (McKenna et al., 2017). Extant research shows that these three constructs (dispositional mindfulness, gratitude and self-compassion) have been associated with the development of a radically new relationship with tinnitus following successful treatment with MBCT-t, one characterized by 'allowing' rather than 'fighting' (Marks et al., 2020). Although this study had a small sample size, it is of particular interest as these constructs are not described in existing psychological models of tinnitus distress.

Mindfulness definitions include "to pay attention on purpose, in the present moment, and nonjudgmentally" (Kabat-Zinn, 1994, 4). As avoidance is a key maintenance factor in tinnitus distress, it is theoretically consistent to suggest that mindfulness would counter unhelpful avoidance strategies in this population. Self-compassion is a complex process, and a helpful definition describes three elements (Neff, 2003a): self-kindness, common humanity and mindfulness. Self-compassion contributes to psychological well-being, resilience and positive outcomes in physical and mental health conditions, (MacBeth & Gumley, 2012; Sirois & Rowse, 2016). Gratitude, as a dispositional trait, is defined as an

orientation towards noticing and appreciating the positive in life and is associated with lower psychopathology and better wellbeing and physical health in non-clinical samples (Wood et al., 2010) and chronic health conditions (Sirois & Wood, 2017). These constructs, though related to the key factors of cognition, avoidance and selective attention, are theoretically distinct, and all are likely to affect the way in which people relate to their tinnitus. In turn, this is likely to affect the degree of distress they experience because of tinnitus (e.g. Handscomb et al., 2017). By directly exploring the association of these constructs within a tinnitus population, it is possible to ascertain whether already existing occurrence of mindfulness, compassion and gratitude contributes to wellbeing in people with tinnitus, outside of specific treatments such as MBCT.

The current study aims to determine the relationship between dispositional mindfulness, gratitude and self-compassion with tinnitus distress and general psychological distress within a tinnitus population. It is hypothesized that dispositional mindfulness, gratitude and self-compassion are negatively associated with both tinnitus-related and psychological distress. It is also hypothesized that negative cognitions about tinnitus in general would be positively associated with tinnitus distress and psychological distress. Based on previous findings, it was hypothesized that positive cognitions about tinnitus in general would show no association with distress (Handscomb et al., 2017).

Method

Participants

Individuals were recruited via postings on social media pages (largely the British Tinnitus Association Twitter page), an announcement at a Tinnitus Information Day and through circulation of emails within an audiology department. Sample size was calculated using G*power software (Faul et al., 2007). A minimum sample size of 94 participants was required to detect a small effect size of .20 (Cohen, 1992) with 90% power and alpha at .05. Inclusion criteria were: (1) reporting prolonged spontaneous tinnitus for a minimum of three months, (2) self-reporting of sufficient English-language skills to feel able to

consent and complete questionnaires, (3) be over 18 years of age, (4) be based in the UK. If participants did not meet all of these criteria or did not indicate their consent to the study, then they would not participate any further.

A total of 346 participants were interested in the study, however 126 participants did not meet inclusion criteria and 38 participants indicated their consent but did not answer any further questions. A remaining 182 participant data sets were analyzed. The majority of participants were White British (87.4%) and female (60%). The mean age was 51.26 years (range 22-76, SD=12.71).

Procedure

The study was of quantitative, cross-sectional design, conducted online using Qualtrics software. Individuals who clicked on the study link were directed to the information page where they were informed of the study details. If participants chose to proceed they gave informed consent, and only continued with the full study if they met the essential criteria. The questionnaire took approximately 20 minutes to complete and a debrief sheet was provided at the end. Participants were asked to complete the study in one day and remained entirely anonymous throughout.

Measures

Demographic information was provided and participants then rated: how problematic their tinnitus was (none, mild, moderate, severe, very severe), how long they have had tinnitus, if they had their tinnitus assessed by a doctor and if they had previously received any treatment. The following self-report questionnaires were completed.

Dispositional mindfulness.

The Five-Facet Mindfulness Questionnaire Short form (FFMQ-SF; Bohlmeijer et al., 2011) is a 24-item questionnaire that assesses five facets of mindfulness: observing, describing, acting with awareness,

non-judging of inner experience and non-reactivity to inner experience. Respondents rate how frequently they have specific experiences (e.g. 'I notice the smells and aromas of things' and 'I'm good at finding the words to describe my feelings') on a 1 to 5 scale (5 meaning very often/always). Total FFMQ-SF scores highly correlate with the full form FFMQ (Baer et al., 2006). Cronbach's alpha for the FFMQ-SF was .85 in the current study.

Gratitude.

The Gratitude Questionnaire-6 (GQ-6; McCullough et al., 2002) is a widely used measure assessing the extent to which people experience gratitude in everyday life. Respondents endorse six statements on a 1 to 7 Likert scale (7 meaning strongly agree), for example 'I have so much in life to be thankful for' and 'I am grateful to a wide variety of people'. Alpha coefficients for the GQ-6 have ranged from .76 to .84 in previous research and were .85 in the current study.

Self-Compassion.

The Self-Compassion scale short form (SCS-SF) is a 12-item scale with near perfect correlation with the full 24-item self-compassion scale (Neff, 2003a), with good internal consistency, Cronbach's alpha ≥ 0.86 (Raes et al., 2011). There are six subscales: self-kindness, mindfulness, common humanity, isolation, self-judgment and over-identified, the latter three scales reverse-scored. Participants rate the degree to which they engage in compassionate responses on a 1 to 5 Likert scale (5 meaning almost always), for example 'when something upsets me I try to keep my emotions in balance' and 'when I'm going through a very hard time, I give myself the caring and tenderness I need'. A total score should be used for the SCS-SF and its alpha coefficient in the current study was .86.

Tinnitus cognitions.

The Tinnitus Cognitions Questionnaire (TCQ; Wilson & Henry, 1998) is a 26-item questionnaire assessing the content and frequency of thoughts about tinnitus. There are 13 statements relating to

negative thoughts, e.g. “if only the noise would go away”, and 13 statements relating to positive thoughts, e.g. “there are worse things in life than tinnitus”. Both are scored on a 5-point response options ranging from ‘never’ to ‘very frequently’, with TCQ-positive items scored inversely, so that a higher score indicates fewer positive thoughts. The questionnaire has good test-retest reliability, the authors reporting Cronbach’s alpha of 0.91, replicated in this study for the total TCQ score (Cronbach’s’ alpha = 0.9) and the positive (Cronbach’s’ alpha = 0.9) and negative (Cronbach’s’ alpha = 0.94) subscale scores (Cronbach’s’ alpha = 0.9).

Tinnitus distress.

The Tinnitus Functional Index (TFI; Meikle et al., 2012) is a 25-item questionnaire that assesses tinnitus distress and the negative impact of tinnitus across seven domains (intrusiveness, cognition, sense of control, sleep, relaxation, auditory, emotional impact and quality of life). An example item from this scale is “Over the past week did you feel in control in regard to your tinnitus?”. Participants respond on a 0 to 10 scale, a mean score is calculated relative to the number of questions answered, this is multiplied by 10 to provide a final score. Scores range from 0-100, with 100 indicating tinnitus as very distressing. The TFI shows good internal consistency and reliability (Fackrell et al., 2016) and the alpha coefficient score for the TFI in the present study was .9.

Psychological distress.

The 10-item Clinical Routine Outcome Measure, (CORE10; Barkham et al., 2013), is a brief pan-diagnostic measure of psychological distress over the past week. There are 10 statements, an example item is “I have felt tense, anxious or nervous”. These are scored on a 0 to 4 scale, with a maximum score of 40 indicating severe psychological distress. The CORE10 is highly correlated with other measures of psychological distress and it has good psychometric properties (Barkham et al., 2013). Cronbach’s alpha of the CORE10 in the current study was .7.

Data Analysis

Data were directly transferred from Qualtrics software to SPSS and items were scored according to their manuals. Data were checked for outliers by visually inspecting box plots and calculating z-scores. All of the z-scores were below 3.29, indicating no extreme outliers according to conventional criteria (e.g. Tabachnick & Fidell, 2007). Data met the assumptions of linearity with at least approximately linear relationships found between the dependent variables (TFI and CORE10) and independent variables (age, tinnitus duration, FFMQ-SF, GQ-6, SCS-SF, and TCQNeg/Pos and TCQTotal). Durbin-Watson values were close to 2 indicating independence of residuals. Homoscedasticity was checked and met, evidenced through visual inspection of plots of studentised residuals against unstandardized predicted values. To check the normal distribution of the data this study examined skewness and kurtosis, values fell between +1.5 and -1.5 indicating normality (Tabachnick & Fidell, 2007).

Multiple imputation for missing data.

In total 47 participants were missing at least one data point equating to 6.5% of all data. Data was found to be missing at random, indicated by a non-significant result from Little's test (Little, 1988). Multiple imputation using predictive mean matching, with 5 imputations and 50 iterations, was applied at the item level for each questionnaire to handle missing values in the data set. Total scores were calculated for each questionnaire across the five imputations to provide a combined mean. Correlations were conducted on each of the five imputed data sets and an average coefficient was calculated.

Bivariate correlations were conducted to explore the relationship between variables. All data analysis was conducted using SPSS software.

Results

Participants rated tinnitus as no problem (3%), a mild problem (20%), a moderate problem (38%), a severe problem (28%) or a very severe problem (11%). This was consistent with a mean TFI score of

48.74 *(SD*=23.08), where scores between 32 and 53 indicate tinnitus as a moderate problem. On average psychological distress was also reported as moderate [Mean CORE10 = 15.63 (*SD*= 6.16)]. In total 60% of participants reported seeing a doctor for their tinnitus and 73% had received at least one form of treatment. The most commonly reported duration of tinnitus was 10 years or more (40%).

Table 1 displays pooled means, standard deviations and Pearson correlation coefficients for age, tinnitus duration, the FFMQ-SF, GQ-6, SCS-SF, TFI, CORE10, TCQNEG, TCQPOS and TCQTOTAL. Cohen's standard was used to evaluate the strength of the relationship between variables, where coefficients around .1 indicated a small effect size, .3 a moderate effect size and .5 and above a large effect size (Cohen, 1992).

In line with the hypotheses, there were significant negative correlations between the key constructs of mindfulness, self-compassion and gratitude and tinnitus distress; these were small for the FFMQ-SF and moderate for the GQ-6 and SCS-SF. Furthermore, there were significant, negative correlations between each of these constructs and psychological distress (CORE10); correlations were moderate for the FFMQ-SF and GQ-6, and large for the SCS-SF. Thus greater levels of mindfulness, self-compassion and gratitude were associated with lower levels of tinnitus distress and psychological distress.

Correlations also indicated, as predicted, that more negative thoughts about tinnitus were associated with more distress. Furthermore, and unexpectedly, fewer positive thoughts about tinnitus was associated with more tinnitus distress. The analysis also indicated that the combined scale, more negative and fewer positive thoughts about tinnitus (TCQ total) were also associated with more tinnitus distress.

Both subscales on the TCQ and the TCQ total score were also positively associated with psychological distress, as indicated by moderate (TCQPos) and large (TCQNeg and TCQTotal) effect sizes. This implies that psychological distress is greater when there are more negative thoughts and

fewer positive thoughts about tinnitus. Tinnitus duration showed no correlations with psychological distress or tinnitus distress.

[Insert Table 1 here]

Discussion

This study demonstrates that greater levels of dispositional mindfulness, gratitude and self-compassion in a sample of adults with tinnitus are associated with lower levels of tinnitus distress and psychological distress. Individuals reporting a greater tendency towards dispositional mindfulness, self-compassion and gratitude reported a lower tendency towards experiencing distress about tinnitus and psychological distress, with small to large effect sizes. This finding is in line with research from both the general population (e.g. MacBeth, & Gumley, 2012; Wood, et al. 2010) and samples with chronic health conditions (e.g. Sirois & Rowse, 2016; Sirois & Wood, 2017). Such results highlight the importance of these constructs for mental health and wellbeing within a tinnitus sample, which has important implications for models of and treatments for tinnitus. Developing our understanding of how mindfulness, self-compassion and gratitude relate to the experience of tinnitus may lead to the development of models of tinnitus with more explanatory power, as well as related treatment approaches that may help tinnitus patients to develop greater resilience in the face of this challenging condition. Furthermore, considering that people with tinnitus report higher levels of comorbid psychiatric conditions such as anxiety and depression (Pinto et al., 2014), and that mindfulness, self-compassion and gratitude are associated with lower levels of psychopathology, this further supports the importance of exploring the relationships between such constructs more closely in tinnitus.

These findings support evidence from qualitative data that the benefits experienced by patients undergoing MBCT-t are associated with the cultivation of mindfulness, self-compassion and gratitude (Marks et al., 2020). This study additionally indicates that it may be possible that existing levels of such qualities could affect the way in which tinnitus is experienced, and that interventions that directly

target gratitude and self-compassion more explicitly may also be worth exploring as treatments for tinnitus. Of course, the cross-sectional design of this study limits such conclusions, but does offer support to the argument that future research could aim to explore these qualities in more depth.

The benefits of mindfulness-based interventions have been associated with reduced emotional and cognitive reactivity and repetitive negative thinking (Alsubaie et al., 2017), patterns which are known to perpetuate tinnitus distress. This study, along with Marks et al. (2020) suggests that mindfulness, gratitude and self-compassion could offer an individual a way of responding differently to their tinnitus which enables them to minimize the negative cycles described by the cognitive model of tinnitus (McKenna et al., 2014). For example, being more mindful encourages people to respond to their tinnitus, in a non–judgmental way without reacting negatively to it. Self-compassion may enhance emotion-regulation (Neff, 2003b) and facilitate a kinder relationship with the challenging aspects of tinnitus, whilst supporting people in taking a broader view of their experience in the context of shared human suffering, reducing feelings of isolation. Gratitude involves an orientation and tendency to notice and appreciate the positives in life, and for tinnitus patients could help to move from a focus that has become narrowed onto tinnitus to remembering things they can appreciate, such as the beauty surrounding them, or the recognition that their tinnitus is not as bad as other people's (e.g. Marks et al., 2020). The ability to notice and appreciate positives in others, can also help people feel more confident in seeking support.

This research replicates and builds upon previous findings regarding the relationships between tinnitus cognitions and tinnitus-related and psychological distress. It replicated the predicted findings and cognitive model of tinnitus (McKenna et al., 2014) where negative cognitions are strongly associated with distress. Additionally, and in contradiction to previous findings which found no correlation between positive cognitions and distress (Handscomb et al., 2017) this study found a moderate, but significant association between more positive tinnitus cognitions and lower distress.

Limitations and future research.

Limitations of the study include the possibility of a sampling bias, for example those who are more mindful, self-compassionate or appreciative may be more likely to complete a survey. Also, as subjects are asked to report their own perceptions or impressions on two or more constructs in the same survey it may produce spurious correlations among the items measuring these constructs owing to response styles, social desirability, priming effects which are independent from the true correlations among the constructs being measured (Podsakoff et al., 2003). There was a lack of diversity in this study with 87.4% of the sample being White British. This reflects the population in the UK, which was recorded as 87.1% White British in the last census (Office for National Statistics, 2013), but reaching out to black and minority ethnic communities within tinnitus research should be considered by future researchers. The study did not control for hearing loss, which has been related to tinnitus distress (Andersson et al., 2009). The study is correlational, therefore results only indicate existing relationships between variables, and directionality cannot be determined. It may well be the case that there is a higher order construct, such as neuroticism, that encourages an individual to be more distressed across all aspects of their life and that this is not tinnitus specific. However, this was not explored as the current study aimed to focus on positive qualities that can be developed through existing psychological interventions. Theory suggests that mindfulness, gratitude and self-compassion are attitudinal qualities that may be relatively stable over time, but it is possible that tinnitus itself could affect levels of these positive qualities. This study also utilized short-forms of the FFMQ-SF, SCS-SF and CORE10, chosen to reduce participant burden and encourage a high response rate (Deutskens et al., 2004) and therefore subscale analysis was not performed.

Declaration of interest

The authors confirm that there are no known conflicts of interest associated with this research. There has been no financial support for this work.

Ethics

Ethical approval for this study was granted by the University of Bath Psychology Research Ethics Committee (number 18-109).

Informed Consent

All participants gave informed consent and were informed that participation in the study was voluntary.

Author contributions

MR: contributed to study design and executed the study, conducted literature searches, collected data, conducted analysis and wrote the paper. FV: contributed to the design of the study and assisted with editing the final manuscript. EM: developed the idea, and design for the study and contributed to manuscript preparation.

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