Patients' and clinicians' views of the psychological components of tinnitus treatment that could inform audiologists’ usual care: A Delphi survey

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ABSTRACT

Background
Tinnitus is a phantom auditory sensation typified by subjective reports of a ringing or buzzing noise, and is associated with reduced quality of life and functional health status. Psychological
therapies delivered by psychologists have been found to improve tinnitus-related distress, and although some audiologists deliver psychological interventions, these are not standardized in the UK. There is a lack of clinical psychologists to provide this care, and the remit of the audiologist in the UK has expanded to meet this need. This study provides data on the components of psychological therapies from the literature that patients and clinicians consider may usefully inform audiologists’ usual care for tinnitus.

**Objectives**

The aim of this study was to determine which components of psychological therapies are most important and appropriate to inform audiologists’ usual care for people with tinnitus.

**Design**

A 39-member panel of patients, audiologists, hearing therapists, and psychologists completed a 3-round Delphi survey to reach consensus on essential components of audiologist-delivered psychologically informed care for tinnitus.

**Results**

Consensus (≥ 80% agreement) was reached on including 76 of 160 components. No components reached consensus for exclusion. The components reaching consensus were predominantly common therapeutic skills such as Socratic questioning and active listening, rather than specific techniques, for example, graded exposure therapy or cognitive restructuring. Consensus on educational components to include largely concerned psychological models of tinnitus rather than neurophysiological information.

**Conclusions**

The results of this Delphi survey provide a tool to develop audiologists’ usual tinnitus care using components that both patients and clinicians agree are important and appropriate to be delivered by an audiologist for adults with tinnitus-related distress. Research is now necessary to test the added effects of these components when delivered by audiologists.
INTRODUCTION

Tinnitus is a phantom auditory sensation typified by subjective reports of a ringing or buzzing noise. Prevalence ranges from 5.1% to 42.7%, varying according to definition of tinnitus used and generally increasing with the age of the sample and population investigated (McCormack et al. 2016). The burden experienced by tinnitus patients varies with not only auditory but also mental health status, including but not limited to a reduced sense of control, sleep disturbance, interference with relaxation, emotional distress, despair, frustration, irritation, depression, fear and worry (Meikle et al. 2012; Tyler & Baker, 1983). A review by Pinto and colleagues (2014) highlighted a high prevalence of mental health problems in the tinnitus patient population. Thus, interventions require flexibility to meet different patient needs. Five percent of people report annoying tinnitus, with 1% reporting tinnitus that has a severe impact on their life (Davis & El Rafaie, 2000). Attempts to understand why some people suffer with their tinnitus and others do not has encouraged the psychological modeling of tinnitus distress. Hallam (1987) first proposed a psychological model of tinnitus-related distress whereby the tinnitus percept leads to autonomic arousal that inhibits the ability to ignore the tinnitus percept, which in turn heightens autonomic arousal in a self-perpetuating cycle. This early model has since been expanded to incorporate avoidance behaviors as a mechanism by which habituation is prevented (Kröner-Herwig et al. 2003). More recently, McKenna et al. (2014) incorporated cognitive elements into a psychological model in which tinnitus-related distress is caused and maintained by negative automatic thoughts about tinnitus and the safety behaviors that occur as a consequence.

A number of psychological therapies that draw on psychological models of tinnitus have been used to help address patients’ tinnitus-related distress. The predominant approach is cognitive behavioral therapy (CBT). CBT is a complex intervention designed to address emotional distress, which can be composed of any number of different techniques. Cima and colleagues (2012) identified that CBT for tinnitus has not been tested in a way whereby the individual techniques of CBT are used when indicated by the severity of individual patients’ tinnitus complaints. Their
solution was a 2-stepped care protocol, with step one including group education (including fear avoidance) and step 2 progressing to a combination of psychological therapies (including cognitive restructuring). Cima compared this ‘stepped care’ to care as usual for people presenting with tinnitus as a primary complaint, finding reduced tinnitus severity and impairment, and improved health-related quality of life for patients receiving one or two steps of specialized care over and above those receiving care as usual. Similarly, Henry and colleagues (2005) developed a 5-step ‘progressive tinnitus management’, with patients receiving screening and group education before more intensive care. Henry and colleagues (2012) have since added CBT to their stepped care model, with results indicating a trend towards improvement in self-perceived functional limitations. Cima and Henry each deconstruct care into organizational frameworks for healthcare to enable more cost-effective services.

One component of CBT known as cognitive restructuring involves the identification and modification of negative automatic thoughts. Alternatively, Acceptance and Commitment Therapy (ACT) eschews this approach in favor of cognitive defusion, whereby the clinician helps the patient to change the function of the negative cognitions, rather than modifying them per se (Hayes et al. 2012). These are but two examples of a number of different psychological approaches. However, they appear to use opposing mechanisms towards relieving patients of their negative automatic thoughts; whereas ACT encourages acceptance of negative thoughts, the goal of CBT is to change them. Despite this difference both demonstrate more benefit than other interventions or waiting list control conditions (Martinez-Devesa et al. 2010; Westin et al. 2011). Thus, it remains unclear which approach to use and when. CBT is supported by a considerably greater evidence base than ACT in the tinnitus literature, which has emerged more recently in the last decade (Hesser et al. 2012; Westin et al. 2011). This is not to say that evidence, or lack thereof, does not merit consideration. ACT has been more extensively tested outside of the tinnitus literature, with small to medium effects that are comparable to CBT for anxiety and depression (Arch et al. 2012; Hayes et al. 2004), and reviews and meta-analyses of ACT for chronic pain have resulted in the American
Psychological Association stating that ACT has strong research support for chronic pain (APA, 2017; Hann & McCracken, 2014; Veehof et al. 2011). One interpretation of these findings is that CBT for tinnitus will suffice and that no further research on ACT is required. However, the effect sizes reported in these analyses mask a more complicated picture in data indicating that some patients with anxiety problems respond better to ACT than CBT, and vice versa (Wolitzky-Taylor et al. 2012). One size does not fit all. Certainly, the stronger the evidence, the more likely the positive outcome, however the field of tinnitus intervention does not currently enjoy a range of evidence-based interventions that can address the diversity of the tinnitus patient population.

The tinnitus management literature is limited to psychological therapies as delivered by psychologists only. However, the UK Department of Health (DH; 2009) recommends that:

“Where psychologists are not available, the audiologist’s role should extend to offering psychological treatment through CBT or other appropriate counselling techniques.” (DH, 2009; p.15)

The DH has a responsibility to create national policies and legislation to provide strategic direction for the NHS in the UK and influencing global leadership in health and care policy, giving it significant influence over the provision of audiology services in the UK (DH, 2013). The DH states that the reason for this guidance is to “reduce waits for patients” (DH, 2009; p.iv). This goal appears to cohere with the finding that two-thirds of audiologists in the UK do not have the option to refer patients with tinnitus to a psychologist (Hoare et al. 2012). One solution to this problem would be to recruit and train more clinical psychologists. However, until this need is met by psychologists, one possible alternative is to upskill audiologists. Traditionally, counselling for patients with tinnitus-related distress was delivered by hearing therapists in the UK. Hearing therapists are specialist audiologists who have undertaken additional training and responsibilities concerning the emotional effects of audiological problems and counseling including aspects of CBT. However, hearing therapist training has ceased in the UK, with the specialization effectively
in the process of being phased out while audiologists take on their responsibilities. It is perhaps unrealistic and undesirable to train all audiologists in a whole package of CBT, and it is unclear which individual “counseling techniques” – whether they be components of CBT, ACT or other approaches – may be considered important for some audiologists to use.

Almost all English audiology departments also provide hearing aids, directive counseling, sound generators and habituation therapies (in 89-99% of departments), and that many individual audiologists practice more than one of these (Hoare et al. 2012). Care is not standardized, and there are no national minimum training requirements and there is no protocol for how audiologists should deliver CBT or counseling in the UK: audiologists rely on clinical experience and attending short courses if they have the opportunity to do so (Hoare et al., 2015). Hoare and colleagues survey highlights that nearly half of UK audiology services have staff trained to deliver CBT, and nearly half offer some form of CBT (Hoare et al. 2012). Furthermore, if only one third of audiology services have the access to refer patients to psychologists, this represents an unmet care need. As a result, existing evidence does not directly inform current clinical practice where audiologists are expected to undertake this responsibility in some form (Department of Health, 2009). The present manuscript relates to one stage of a larger research program to augment audiologists’ usual tinnitus care using components of psychological therapies typically used by psychologists, alongside the provision of hearing aids, directive counseling, sound generators and habituation therapies (Hoare et al. 2012).

Our recently published scoping review of psychological interventions for people with tinnitus catalogued over 100 individual components, including cognitive restructuring and defusion (Thompson et al. 2016). This provides a resource to inform audiologists’ usual care. Currently there is no evidence in the literature to determine which components of psychological therapies would be acceptable to audiologists to deliver, and to patients to receive from audiologists. Here we examine consensus using the Delphi survey technique (Gordon & Helmer, 1964; Helmer & Rescher, 1960). The Delphi survey method was developed to reach consensus of expert opinion. Specifically, the
Delphi survey involves the presentation of sequential rounds of questionnaires to ‘panelists’. Traditionally this begins with an open-ended question in the first round to enable panelists to generate ideas, with subsequent rounds asking panelists to rate and re-rate these ideas after seeing panelist responses from previous rounds, until consensus is reached or a predetermined end-point is reached. Therefore, the Delphi survey is well placed to meet our aim to determine which components of psychological interventions could inform audiologists’ usual care for people with tinnitus.

METHODS

Study approvals

This study was granted approval by the North West – Preston NHS Research Ethics Committee (reference: 16/NW/0047) and Nottingham University Hospitals NHS Trust (sponsor).

Panel recruitment, size, and composition

Patients were eligible for participation if they self-identified as having received some form of psychological intervention for tinnitus from an audiologist, hearing therapist, or clinical psychologist. They were recruited from the National Institute for Health Research Nottingham Hearing Biomedical Research Unit research participant database, and via response to advertisements disseminated by the British Tinnitus Association at http://www.tinnitus.org.uk/clinical-trials---how-to-find-out-more. Clinicians were eligible for participation if they self-identified as practicing audiologists, hearing therapists or clinical psychologist/psychotherapists who had any experience of delivering a psychological intervention for people with tinnitus, and were recruited by contacting regional audiologist and hearing therapist networks, and personal contacts.

The inclusion of patients, audiologists, hearing therapists and psychologists was designed to consider different types of expertise, developed from different positions resulting in different
perspectives. Patients’ responses would be influenced by their lived experience of tinnitus and of receiving psychological therapy and what they thought was effective for them. Patient involvement in mental health care delivery can improve service accessibility and patient satisfaction (Crawford et al. 2002; Simpson & O House et al. 2002). Clinicians’ responses would more likely reflect a broader set of components based on breadth of clinical experience and training. Audiologists’ and hearing therapists’ responses would be influenced by knowledge of the UK healthcare system, the national health service (NHS), audiology services and regular clinical experience with tinnitus patients and knowledge of their needs; hearing therapists would be expected to have a greater depth of knowledge about counseling techniques due of their specialized training compared to audiologists’ short courses. Psychologists’ responses would be based on a still greater depth of knowledge about the theory and evidence of psychological therapies, in addition to clinical experience of people with and without tinnitus.

Recruitment commenced February 2016 and was completed March 2016. The expert panel consisted of 20 patients and 22 clinicians (14 audiologists, 6 hearing therapists and 2 psychologists) who were recruited by purposive sampling, resulting in a total of 42 experts. An equal number of types of clinicians were targeted for recruitment, however an insufficient number of psychologists consented to participate within the time allotted for recruitment. No panelist disclosed who received or delivered their care so it is unknown whether any of the patients had consulted any of the clinicians on the panel.

Survey piloting and administration

A 3-round Delphi survey was developed (Figure 1). Four members of the British Tinnitus Association (BTA) users’ panel reviewed survey rounds 1 and 2. The BTA users panel is a voluntary group of people with tinnitus that routinely reads documentation produced by the BTA with a remit to determine face validity of the survey. Survey items were amended according to recommendations made by the users panel and returned to them to confirm the acceptability of any
changes made. The survey was hosted at Bristol Online Survey (BOS; University of Bristol, 2016), with round 1 commencing March 2016 and round 3 ending May 2016.

Managing attrition
To mitigate attrition, regular reminders to complete each survey round within the 2-week timescale (per round) were sent to all panelists simultaneously, containing the deadline and the option of an extension being granted on a case-by-case basis where extenuating circumstances were present. No requests were refused. Panelists were granted the option to complete the survey offline, using Microsoft Word for survey presentation, sent via email. Panelists who withdrew their participation were not replaced.

***INSERT FIGURE 1 ABOUT HERE***

Survey Round 1
All panelists were asked the question, “What in your opinion are the essential components of an audiologist-delivered psychological intervention for people with tinnitus?” They were also presented with the instruction to “list and describe these components.” We also surveyed patients on how long ago they received counseling or psychological support for tinnitus and what professional delivered it, and clinicians on job role and length of time in this role. Panelists were given free-text response fields to respond to these questions.

Analysis of round 1.
Qualitative data in response to the open-ended question on the essential components were analyzed using a modified Template Analysis (King, 2012). Template analysis began with the identification of a priori themes and their respective components that were taken from an earlier scoping review (Thompson et al. 2016). These themes include tinnitus education, psychoeducation, evaluation,
treatment rationale, treatment planning, problem solving, behavioral intervention, thought identification, thought challenging, worry time, emotions, social comparison, interpersonal skills, self-concept, lifestyle advice, acceptance and defusion, mindfulness, attention, relaxation, sleep, sound enrichment, comorbidity, treatment reflection, relapse prevention, and common therapeutic skills. Definitions for these themes for thematic analysis are presented in supplemental table 1 (Supplemental Digital Content 1).

Secondly, panelists’ responses were coded to identify components concerning something that a clinician may actively deliver in a psychological intervention for people with tinnitus. Two independent coders performed these analyses and any discrepancies were discussed to reach agreement. If the component was encompassed by a pre-existing theme it was added to it, otherwise, a new theme was added to the template.

Survey Round 2
Panelists were presented with a list of components, derived from panelists’ responses in round 1 and the results of the scoping review (Thompson et al. 2016). Components of complex psychological techniques were defined using Common Language for Psychotherapy (Marks & Fullana, 2014) where available. Panelists were asked to rate each component on its importance as part of an audiologist-delivered psychological intervention, responding on a 7-point ordinal scale, where selecting points 6 or 7 would indicate that they think that the component was important to include in the intervention, whereas selecting 1 or 2 would indicate that the component should be excluded. Panelists were informed, “for each item in this survey, if 80% of panelists select points 6 or 7 on the scale, we intend to include the corresponding component of therapy in a treatment manual for audiologists to deliver if indicated by patients. If 80% of panelists select points 1 or 2 on the scale, we intend to exclude the corresponding component of therapy from a treatment manual for audiologists to deliver if indicated by patients”. All items from round 2 were retained in round 3, irrespective of the level of agreement. No survey items in round 2 or 3 were mandatory: panelists
were instructed to respond to all survey items unless they determined that they had no understanding of a given component, in which case they were asked not to respond to the item.

Missing within-panelist data were not imputed.

**Analysis of round 2.**

Percentage response rates were recorded for each item in the survey. The percentage agreement of patient, audiologist, hearing therapist, and psychologist per survey item was recorded. Components reaching consensus are reported where 80% of all panelist responses are across points 1 and 2, or 6 and 7 on the 7-point ordinal scale.

**Survey Round 3**

All panelists were presented with the same list of components as in round 2, with aggregated results indicating the preliminary level of agreement between patients and between clinicians on the importance of including each treatment component for each point of the 7-point response scale.

Panelists were not presented with the individual responses of other panelists. Each panelist was also presented with his or her individual responses from round 2. Panelists were asked to reconsider their response to each item using the results from the previous round, responding again on a 7-point ordinal scale. Panelists were again instructed to respond to all survey items unless they determined that they had no understanding of a given component, in which case they were asked not to respond to the item.

**Analysis of round 3**

Percentage response rates were recorded for each item in the questionnaire. The percentage of patient, audiologist, hearing therapist and psychologist agreement per survey item was recorded. Components reaching consensus were measured where 80% of all panelist responses were across points 1 and 2, or 6 and 7 on the 7-point ordinal scale.
Additional analyses
Stability of panelists’ responses between rounds 2 and 3 of the survey were measured by calculating Weighted Kappa (K) using R Studio (R Core Team, 2016; Revelle, 2016), where K=1 would indicate absolute within-panelist agreement between rounds, and 0 would indicate that agreement between rounds is no better than that expected by chance.

Sensitivity analyses were carried out to reduce missing expert panelist data, imputing round 3 data for panelists who did not complete it using their round 2 data. Sensitivity analyses were also carried out in relation to the number and identity of components reaching consensus when data were limited to subgroups of panelists (patients, audiologists, hearing therapists, and psychologists). To explore the data while mitigating the underrepresentation of panelist subgroups due to limited recruitment, a weighted analysis was carried out on round 3 data. Clinician subgroups were given equal weight, with the overall number of clinicians given equal weight to patients.

RESULTS
Panelist demographics and response rates

Patients. Patients received psychological therapy or counseling on (mean) average 2.44 years (SD=33.357) prior to completing round 1 of the survey. A majority of patients on the panel received psychological therapy or counseling for their tinnitus within the 1 year. Fourteen patients had received their therapy from an audiologist, 7 from a hearing therapist, 2 from a clinical psychologist, and 7 from a psychological therapist.

Clinicians. The mean clinical experience in panelists’ respective professions was 14.09 years (SD=7.698). Most clinicians had between 10 and 25 years of clinical experience in their respective roles. Of the clinicians, 14 were audiologists, 6 were hearing therapists (one of who withdrew their participation after completing round 1), and 2 were psychologists. Of the two
psychologists on the panel, 1 reported their role as consultant clinical psychologist, and the other as cognitive behavioral therapist.

**Response rates.** Of the 42 panelists, 40 (95%) completed the round 1 questionnaire, 40 [100% (cumulative response rate)] completed round 2, and 39 [98% (cumulative response rate)] completed round 3. One hearing therapist and 1 patient withdrew their participation without completing round 2. One further patient dropped out without completing round 3. One hundred and forty nine of the 160 components had a response rate of greater than 94% of panelists. Ten components had a response rate of 92%, and 1 component had a response rate of 90%.

**Components derived from Round 1**
Panelists proposed 17 components that were not identified in Thompson et al. (2016) that they thought could inform audiologists’ usual tinnitus care (Table 1). Of these, four formed a new theme named ‘support and resource signposting’. This theme included the provision of written materials, suggesting the use of websites, ongoing support options following discharge, and homework review. One component ‘discuss past life experiences’ did not relate to any pre-defined theme so in itself formed a theme.

***INSERT TABLE 1 ABOUT HERE***

**Consensus reached in Round 2**
Forty-three of 160 components reached consensus (>80% agreement) in round 2 to be considered important to include in a treatment manual for audiologists to deliver. No components reached consensus to be excluded.

**Consensus reached in Round 3**
Seventy-six components reached final consensus (>80% agreement) in round 3 to be considered important to include in a treatment manual for audiologists to deliver. These components are presented in table 2 in descending order of percentage agreement. Another 84 treatment components did not reach consensus in round 2 (Supplemental Digital Content 2). No components reached consensus to be excluded. Those components with the highest percentage of agreement to exclude from audiologists’ usual tinnitus care include Gestalt techniques (51.35%) and social skills training (44.74%). Components that reaching greater than 10% agreement to exclude are presented in supplemental digital table 3 (Supplemental Digital Content 3 in descending order of the percentage of agreement).

***INSERT TABLE 2 ABOUT HERE***

Weighted analysis of round 3 data (for each giving clinician subgroups equal weight, with the overall number of clinicians given equal weight to patients) also produced seventy-six components reaching consensus. However, 6 of these differed. Those additional components reaching consensus were, 1. Provide information on tinnitus terminology (80.16%); 64. Identify and increase positive thoughts (83.94%); 71. Normalize tinnitus by sharing other people's experiences of it (84.52%); 72. Provide information about the likelihood of successful psychological therapy for tinnitus-related distress (80.16%); 120. Advise the patient on masking (noise which drowns out the tinnitus) and the risks associated with it (82.01%); and 145. Advise the patient on how to maintain practice of psychotherapeutic techniques (82.73%). Those components not reaching consensus in weighted analysis are highlighted in Table 2.

Sensitivity analysis
One patient completed round 2 of the survey but not round 3. When imputing this patient’s data from round 2, one additional component, “Enquire about and provide information on attitudes and beliefs, their consequences and effect on tinnitus” would have reached consensus.

Including both patients and clinicians in the survey meant that importance ratings were informed from a number of different experiences and perspectives. By considering only patient responses, 17 components reached consensus to be included in psychologically informed usual care for tinnitus, which was not the case when including all data. These components were spread across 12 different themes, including evaluation, treatment rationale, treatment planning, behavior intervention, thought identification, social comparison, interpersonal skills, acceptance and defusion, sleep, sound enrichment, comorbidity, and relapse prevention; with no theme represented by more than 2 components (Supplemental Digital Content 4).

When considering only clinician responses, 3 components reached consensus that did not when including all data. Two of these three concerned sleep including information on its physiological function (overall=73.68%; clinicians=80%), and advice on changing the sleeping environment and consumption of food, drink and medication (overall= 74.36%; clinicians=80.95%). The third concerned identifying and increasing positive thoughts (overall= 78.95%; clinicians=80%). When separating out clinician’s data by profession, 1 other component reached consensus if only decided by audiologists, 30 for hearing therapists and 15 for psychologists (Supplemental Digital Content 4). On average across components, the level of agreement increased by 24.31% (patients 18.16%, clinicians 4.65%, audiologists 6.24%, hearing therapists 20.60%, and psychologists 43.59%).

**Stability of responses**

Weighted Kappa (K) between round 2 and 3 for averaged 0.67 (SD=0.152) across the 160 components. For patients K=0.66 (SD=0.199), for clinicians K=0.64 (SD=0.187) (Supplemental Digital Content 5).
DISCUSSION

Thompson et al. (2016) catalogued over 100 individual therapy components reported in the literature on psychological therapies for people with tinnitus. The potential of this catalogue to inform audiologists’ usual tinnitus care is limited by the absence of weighing the efficacy of its constituent components. The feasibility of including all of these components in a single intervention is questionable due to their large number. This Delphi survey identified a large number of components that a panel of patients, audiologists, hearing therapists and psychologists has agreed are important. This may be because panelists were asked what they thought should be included in audiologist-delivered tinnitus care without indicating what resources may be available, whether that be resources of time, supervision or training. As a result, in any relevant further research including the development of tinnitus care protocols, data from this Delphi survey should also consider trials examining the efficacy of the components described here.

The Delphi method was used here as a means to move towards consensus across patients and clinicians, to reflect their fellow stakeholders views. In terms of stability of panelist responses between round 2 and 3, the result here of K=0.67 indicates substantial agreement (Landis & Koch, 1977) with some malleability of opinion after the presentation of the round 2 data. However, it is unclear whether this change in opinion between rounds may also have been due to chance or confounding variables. However, limiting response periods for each survey round to 2 weeks may have mitigated this. The stability of both patient and clinician responses were approximately equivalent (with only 0.2 difference between mean average weighted Kappa), indicating that on the whole, clinicians were no more influenced by the opinions of fellow clinicians and patients, than patients were influenced by fellow patients and clinicians.

One of the few components with unanimous agreement to include in psychologically informed usual tinnitus care was to dispel misconceptions about tinnitus (#14), indicating that if nothing else, the patient should not leave with incorrect information. The extent to which this
particular finding reflects concerns about poor understanding of tinnitus in the wider population
remains uncertain from these data. Whether or not this is the case, could be examined in more in-
depth interviews, preferably as part of a process evaluation of any trials including therapies
comprised of any of the components considered essential from these data.

No components reached consensus to be excluded from psychologically informed usual
tinnitus care although some had higher levels of agreement in this direction than others. Perhaps
reflecting the low level of evidence for Gestalt therapy (#62) in the literature (Thompson et al.
2016), its use received the lowest level of agreement to be included. Similarly, despite its past use,
thought stopping (#60) (Henry & Wilson, 1998) was among the components with the lowest level
of agreement to include. This is consistent with evidence that using thought suppression as a coping
mechanism is associated with greater psychopathology (Aldao & Nolen-Hoeksema, 2010; Aldao,
Nolen-Hoeksema & Schweizer, 2010). However, a third of patients on the panel thought that it
should be included in tinnitus care. In the absence of standardized tinnitus counseling in UK, this
highlights the importance of audiologists maintaining an up-to-date knowledge of the evidence-base
in relation to specific psychological techniques including those that paradoxically may have a
negative effect on patients.

Components concerning neural networks, neurophysiological models of tinnitus, and the
auditory system (#7, 8, 6) did not reach consensus overall or by any subgroup of panelists.
However, the provision of information specifically on the limbic system (#13) reached consensus
overall, with over 80% agreement by patient panelists. The component concerning the limbic
system specifically focuses on “how this information can be used to treat tinnitus”, whereas those
others concerning neurology and anatomy do not. Therefore it may be the case that this ‘focus’
influenced panelists to agree on its inclusion aside from the content of the information specifically
on the limbic system. A post-Delphi focus group could explore such interpretations and is an area
for further research. A survey of 147 audiology departments in the UK found that only 2
departments employed a clinician who had undertaken training in TRT (Hoare et al., 2015); TRT is
not funded by the NHS in the UK. This reflects the low level of consensus for neuroanatomy and the neurophysiological model. Components concerning tinnitus education that reached consensus as essential to include were generally less concerned with neurology and anatomy, and more with etiology, maintenance and progression (#4, 5, 12). Six of the 7 components of psychoeducation reached consensus, compared to 8 out of 14 for tinnitus education. This indicates the importance of audiologists possessing a good degree of knowledge of the psychology of tinnitus, rather than just knowledge of anatomy and neurology.

The only component from the behavioral intervention theme of components that reached consensus concerned the discussion of fear and avoidance behaviors. Paradoxically, despite agreement to include the provision of information on habituation following exposure (#9), consensus was not reached to include graded exposure therapy, which according to Emotional Processing Theory (EPT) essentially works by habituating the patient (Rachman, 1980).

Furthermore, despite associations made between tinnitus and anxiety and depression in the literature (Pinto et al. 2014), the use of techniques designed to address anxiety and depression, namely worry time, cognitive restructuring, behavioral activation, ACT, and Mindfulness (#88, 89, 90) all failed to reach consensus. Overall, this may indicate a lack of consensus on the importance of these specific psychotherapeutic techniques despite their efficacy (Henry & Wilson, 1998; Lindberg et al. 1989). An alternative interpretation is that components did not reach consensus due to concern that the degree of competency to deliver them requires extensive training that audiologists are unlikely to be afforded. Another interpretation is that the components did not reach consensus due to a lack of understanding of what the components represent in practice – the panelists may have chosen not to respond if they did not understand the component, as directed in their instructions.

Strengths and Limitations
The panel was comprised of patients and clinicians based in the UK. Therefore the results predominantly reflect a western view of mental health within the context of UK audiology practice. As such, the results may not have equal import for other cultures and systems of care delivery. The sensitivity analysis indicated that 15 components reached consensus in the psychologist subgroup of panelists but did not reach consensus in the whole panel. However, the recruitment of only 2 psychologists limits the breadth of knowledge called upon to reach this consensus and increases the risk of bias to particular perspective of psychological therapies. Future research may challenge these findings with a different panel.

The benefit of having a range of views from different professional groups in the panel allowed for experts to approach the survey from different perspectives. For instance, the audiologist may be in a better position to consider how much time they may have in their practice to accommodate certain psychological techniques, while the psychologist may have a better understanding of the principles behind said techniques and their applicability to tinnitus. However, due to the low number of psychologists recruited, it is conceivable that such concerns received relatively little consideration here. This may account for why so many cognitive behavioral techniques did not reach consensus, with panelists favoring common therapeutic skills. Common therapeutic skills, those that are not specific to a particular model of psychological therapy, consistently reached consensus in this Delphi survey. The common factors theory of psychological therapies posits that much or all of the benefit of treatment is the result of components that are common to many of the different types of psychological therapy (Rosenzweig, 1936). Common therapeutic skills include relationship factors, expectations, and goal setting (Wampold, 2015). A number of components reaching consensus appear to map onto developing a therapeutic relationship between patient and clinician, such as demonstrating empathy, Socratic questioning, and active listening (for instance, through eye contact and body posture) (#147, 153, 155). The Delphi panel also reached consensus on discussing the patient’s expectations (#46, 47) and providing a treatment plan (#49). Thus patient and audiologist preference of common therapeutic
skills rather than specific CBT or other techniques aligns with the common factors theory of psychological therapies, as far as concerns audiologist-delivered tinnitus care. However, there was some contradiction, with panelists not reaching consensus on collaborating with the patient on how to plan therapy and agreeing on goals together (#45, 48). This appears to be in opposition with the principle of patient-centered care. However, this result may have manifested in response to current training and models of care followed by audiologists in contrast to psychologists. In the UK, while a clinical psychologist will undergo several years of training before lifelong continuing professional development in planning and delivering psychological therapies, audiologists do not have a standardized pathway for training in this respect, and what training does exist is typically limited to short courses (Hoare et al. 2015). The likely resulting disparity in competence may make dynamic patient-audiologist decision-making problematic ‘in the moment’ for audiologists without extensive further training. In contrast, flexible albeit largely predetermined modular care, in which a given presentation indicates a particular component of treatment, may be more manageable for audiologists.

Responses as to whether or not components are important to include were not mandatory because it could not be expected that each panelist’s knowledge will encompass all that psychological interventions have to offer, or that all patients will recall everything about their past care. However, this approach risked increasing missing data because panelists were advised to avoid responding to components to which their expertise did not cover. Despite the risk, missing data were limited, preserving both the quantity and quality of data. This could suggest that the recruited clinicians possessed a good degree of knowledge on the subject matter and that patients demonstrated good recollection of their care, to the extent that they felt confident to respond, and that the definitions used for the components sufficed for this purpose.

CONCLUSIONS
Many components of psychological therapies that are delivered by psychologists in tinnitus management may be useful to audiologists where they have responsibility for meeting patient need, such as in the UK. However, it is also the case that providers have much to learn from each other, within and across disciplines, as well as from patients and any success in implementing guidelines in the UK may be of interest to policy makers, clinicians and researchers to inform international cross-pollination of ideas and health and care delivery. Whilst there is a wealth of research on psychologist-delivered therapy for tinnitus, how effective any components of those therapies might be when delivered by audiologists is yet to be determined in clinical trials. Since there is as yet no evidence for the effectiveness of audiologist-delivered psychological interventions for tinnitus, current audiology practice should still consider referral on to clinical psychology where available and appropriate.

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DJH and DAH conceived the study. DAH, DMW, MM, AC, DS, DF, DMT and DJH designed the study. DMT developed the protocol. DMT and JT coordinated the Delphi survey. DMT drafted the manuscript. All authors reviewed and approved the manuscript for submission. A patient steering group including Hannah Heath and Debra Williams reviewed study documentation including the protocol.

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**Figure Legends**

Figure 1. Flow diagram of the Delphi survey process
Supplemental Digital Content

1. Definitions of themes for template analysis
2. List of treatment components that did not reach consensus in round 3
3. Components with the greatest percentage of agreement indicating they are absolutely unessential to include in an audiologist-delivered psychological intervention
4. Sensitivity analysis: components that would be considered absolutely essential to include in an audiologist-delivered psychological intervention for people with tinnitus by Delphi panel subgroup in round 3
5. Weighted Kappa values per component