

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

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23

ABSTRACT

24 **Background**

25 Tinnitus is a phantom auditory sensation typified by subjective reports of a ringing or buzzing
26 noise, and is associated with reduced quality of life and functional health status. Psychological

27 therapies delivered by psychologists have been found to improve tinnitus-related distress, and
28 although some audiologists deliver psychological interventions, these are not standardized in the
29 UK. There is a lack of clinical psychologists to provide this care, and the remit of the audiologist in
30 the UK has expanded to meet this need. This study provides data on the components of
31 psychological therapies from the literature that patients and clinicians consider may usefully inform
32 audiologists' usual care for tinnitus.

33 **Objectives**

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

36 **Design**

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

40 **Results**

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

47 **Conclusions**

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

52

INTRODUCTION

53
54 Tinnitus is a phantom auditory sensation typified by subjective reports of a ringing or buzzing
55 noise. Prevalence ranges from 5.1% to 42.7%, varying according to definition of tinnitus used and
56 generally increasing with the age of the sample and population investigated (McCormack et al.
57 2016). **The burden experienced by tinnitus patients varies with not only auditory but also mental**
58 **health status**, including but not limited to a reduced sense of control, sleep disturbance, interference
59 with relaxation, emotional distress, **despair, frustration, irritation, depression, fear and worry**
60 (Meikle et al. 2012; Tyler & Baker, 1983). **A review by Pinto and colleagues (2014) highlighted a**
61 **high prevalence of mental health problems in the tinnitus patient population. Thus, interventions**
62 **require flexibility to meet different patient needs. Five percent of people report annoying tinnitus,**
63 **with 1% reporting tinnitus that has a severe impact on their life (Davis & El Rafeie, 2000).**
64 **Attempts to understand why some people suffer with their tinnitus and others do not has encouraged**
65 **the psychological modeling of tinnitus distress.** Hallam (1987) first proposed a psychological model
66 of tinnitus-related distress whereby the tinnitus percept leads to autonomic arousal that inhibits the
67 ability to ignore the tinnitus percept, which in turn heightens autonomic arousal in a self-
68 perpetuating cycle. This early model has since been expanded to incorporate avoidance behaviors as
69 a mechanism by which habituation is prevented (Kröner-Herwig et al. 2003). More recently,
70 McKenna et al. (2014) incorporated cognitive elements into a psychological model in which
71 tinnitus-related distress is caused and maintained by negative automatic thoughts about tinnitus and
72 the safety behaviors that occur as a consequence.

73 A number of psychological therapies that draw on psychological models of tinnitus have
74 been used to help address patients' tinnitus-related distress. The predominant approach is cognitive
75 behavioral therapy (CBT). CBT is a complex intervention designed to address emotional distress,
76 which can be composed of any number of different techniques. Cima and colleagues (2012)
77 identified that CBT for tinnitus has not been tested in a way whereby the individual techniques of
78 CBT are used when indicated by the severity of individual patients' tinnitus complaints. Their

79 solution was a 2-stepped care protocol, with step one including group education (including fear
80 avoidance) and step 2 progressing to a combination of psychological therapies (including cognitive
81 restructuring). Cima compared this ‘stepped care’ to care as usual for people presenting with
82 tinnitus as a primary complaint, finding reduced tinnitus severity and impairment, and improved
83 health-related quality of life for patients receiving one or two steps of specialized care over and
84 above those receiving care as usual. Similarly, Henry and colleagues (2005) developed a 5-step
85 ‘progressive tinnitus management’, with patients receiving screening and group education before
86 more intensive care. Henry and colleagues (2012) have since added CBT to their stepped care
87 model, with results indicating a trend towards improvement in self-perceived functional limitations.
88 Cima and Henry each deconstruct care into organizational frameworks for healthcare to enable
89 more cost-effective services.

90 One component of CBT known as cognitive restructuring involves the identification and
91 modification of negative automatic thoughts. Alternatively, Acceptance and Commitment Therapy
92 (ACT) eschews this approach in favor of cognitive defusion, whereby the clinician helps the patient
93 to change the function of the negative cognitions, rather than modifying them per se (Hayes et al.
94 2012). These are but two examples of a number of different psychological approaches. However,
95 they appear to use opposing mechanisms towards relieving patients of their negative automatic
96 thoughts; whereas ACT encourages acceptance of negative thoughts, the goal of CBT is to change
97 them. Despite this difference both demonstrate more benefit than other interventions or waiting list
98 control conditions (Martinez-Devesa et al. 2010; Westin et al. 2011). Thus, it remains unclear which
99 approach to use and when. **CBT is supported by a considerably greater evidence base than ACT in
100 the tinnitus literature, which has emerged more recently in the last decade (Hesser et al. 2012;
101 Westin et al. 2011). This is not to say that evidence, or lack thereof, does not merit consideration.
102 ACT has been more extensively tested outside of the tinnitus literature, with small to medium
103 effects that are comparable to CBT for anxiety and depression (Arch et al. 2012; Hayes et al. 2004),
104 and reviews and meta-analyses of ACT for chronic pain have resulted in the American**

105 Psychological Association stating that ACT has strong research support for chronic pain (APA,
106 2017; Hann & McCracken, 2014; Veehof et al. 2011). One interpretation of these findings is that
107 CBT for tinnitus will suffice and that no further research on ACT is required. However, the effect
108 sizes reported in these analyses mask a more complicated picture in data indicating that some
109 patients with anxiety problems respond better to ACT than CBT, and *vice versa* (Wolitzky-Taylor
110 et al. 2012). One size does not fit all. Certainly, the stronger the evidence, the more likely the
111 positive outcome, however the field of tinnitus intervention does not currently enjoy a range of
112 evidence-based interventions that can address the diversity of the tinnitus patient population.

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

115 *“Where psychologists are not available, the audiologist’s role should extend to offering*
116 *psychological treatment through CBT or other appropriate counselling techniques.” (DH,*
117 *2009; p.15)*

118
119 The DH has a responsibility to create national policies and legislation to provide strategic
120 direction for the NHS in the UK and influencing global leadership in health and care policy, giving
121 it significant influence over the provision of audiology services in the UK (DH, 2013). The DH
122 states that the reason for this guidance is to “reduce waits for patients” (DH, 2009; p.iv). This goal
123 appears to cohere with the finding that two-thirds of audiologists in the UK do not have the option
124 to refer patients with tinnitus to a psychologist (Hoare et al. 2012). One solution to this problem
125 would be to recruit and train more clinical psychologists. However, until this need is met by
126 psychologists, one possible alternative is to upskill audiologists. Traditionally, counselling for
127 patients with tinnitus-related distress was delivered by hearing therapists in the UK. Hearing
128 therapists are specialist audiologists who have undertaken additional training and responsibilities
129 concerning the emotional effects of audiological problems and counseling including aspects of
130 CBT. However, hearing therapist training has ceased in the UK, with the specialization effectively

131 in the process of being phased out while audiologists take on their responsibilities. It is perhaps
132 unrealistic and undesirable to train all audiologists in a whole package of CBT, and it is unclear
133 which individual “counseling techniques” – whether they be components of CBT, ACT or other
134 approaches – may be considered important for some audiologists to use.

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

150 Our recently published scoping review of psychological interventions for people with
151 tinnitus catalogued over 100 individual components, including cognitive restructuring and defusion
152 (Thompson et al. 2016). This provides a resource to inform audiologists’ usual care. Currently there
153 is no evidence in the literature to determine which components of psychological therapies would be
154 acceptable to audiologists to deliver, and to patients to receive from audiologists. Here we examine
155 consensus using the Delphi survey technique (Gordon & Helmer, 1964; Helmer & Rescher, 1960).
156 The Delphi survey method was developed to reach consensus of expert opinion. Specifically, the

157 Delphi survey involves the presentation of sequential rounds of questionnaires to ‘panelists’.
158 Traditionally this begins with an open-ended question in the first round to enable panelists to
159 generate ideas, with subsequent rounds asking panelists to rate and re-rate these ideas after seeing
160 panelist responses from previous rounds, until consensus is reached or a predetermined end-point is
161 reached. Therefore, the Delphi survey is well placed to meet our aim to determine which
162 components of psychological interventions could inform audiologists’ usual care for people with
163 tinnitus.

164

165

METHODS

166 **Study approvals**

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

169

170 **Panel recruitment, size, and composition**

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

181 The inclusion of patients, audiologists, hearing therapists and psychologists was designed to
182 consider different types of expertise, developed from different positions resulting in different

183 perspectives. Patients' responses would be influenced by their lived experience of tinnitus and of
184 receiving psychological therapy and what they thought was effective for them. **Patient involvement**
185 **in mental health care delivery can improve service accessibility and patient satisfaction (Crawford**
186 **et al. 2002; Simpson & O House et al. 2002).** Clinicians' responses would more likely reflect a
187 broader set of components based on breadth of clinical experience and training. Audiologists' and
188 hearing therapists' responses would be influenced by knowledge of the UK healthcare system, the
189 national health service (NHS), audiology services and regular clinical experience with tinnitus
190 patients and knowledge of their needs; hearing therapists would be expected to have a greater depth
191 of knowledge about counseling techniques due of their specialized training compared to
192 audiologists' short courses. Psychologists' responses would be based on a still greater depth of
193 knowledge about the theory and evidence of psychological therapies, in addition to clinical
194 experience of people with and without tinnitus.

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

202

203 **Survey piloting and administration**

204 A 3-round Delphi survey was developed (Figure 1). Four members of the British Tinnitus
205 Association (BTA) users' panel reviewed survey rounds 1 and 2. The BTA users panel is a
206 voluntary group of people with tinnitus that routinely reads documentation produced by the BTA
207 with a remit to determine face validity of the survey. Survey items were amended according to
208 recommendations made by the users panel and returned to them to confirm the acceptability of any

209 changes made. The survey was hosted at Bristol Online Survey (BOS; University of Bristol, 2016),
210 with round 1 commencing March 2016 and round 3 ending May 2016.

211

212 **Managing attrition**

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

219

220 ***INSERT FIGURE 1 ABOUT HERE***

221

222 **Survey Round 1**

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

229

230 Analysis of round 1.

231 Qualitative data in response to the open-ended question on the essential components were analyzed
232 using a modified Template Analysis (King, 2012). Template analysis began with the identification
233 of *a priori* themes and their respective components that were taken from an earlier scoping review
234 (Thompson et al. 2016). These themes include tinnitus education, psychoeducation, evaluation,

235 treatment rationale, treatment planning, problem solving, behavioral intervention, thought
236 identification, thought challenging, worry time, emotions, social comparison, interpersonal skills,
237 self-concept, lifestyle advice, acceptance and defusion, mindfulness, attention, relaxation, sleep,
238 sound enrichment, comorbidity, treatment reflection, relapse prevention, and common therapeutic
239 skills. Definitions for these themes for thematic analysis are presented in supplemental table 1
240 (Supplemental Digital Content 1).

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

246

247 **Survey Round 2**

248 Panelists were presented with a list of components, derived from panelists' responses in round 1
249 and the results of the scoping review (Thompson et al. 2016). Components of complex
250 psychological techniques were defined using Common Language for Psychotherapy (Marks &
251 Fullana, 2014) where available. Panelists were asked to rate each component on its importance as
252 part of an audiologist-delivered psychological intervention, responding on a 7-point ordinal scale,
253 where selecting points 6 or 7 would indicate that they think that the component was important to
254 include in the intervention, whereas selecting 1 or 2 would indicate that the component should be
255 excluded. Panelists were informed, "for each item in this survey, if 80% of panelists select points 6
256 or 7 on the scale, we intend to include the corresponding component of therapy in a treatment
257 manual for audiologists to deliver if indicated by patients. If 80% of panelists select points 1 or 2 on
258 the scale, we intend to exclude the corresponding component of therapy from a treatment manual
259 for audiologists to deliver if indicated by patients". All items from round 2 were retained in round 3,
260 irrespective of the level of agreement. No survey items in round 2 or 3 were mandatory: panelists

261 were instructed to respond to all survey items unless they determined that they had no
262 understanding of a given component, in which case they were asked not to respond to the item.
263 Missing within-panelist data were not imputed.

264

265 Analysis of round 2.

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

270

271 **Survey Round 3**

272 All panelists were presented with the same list of components as in round 2, with aggregated results
273 indicating the preliminary level of agreement between patients and between clinicians on the
274 importance of including each treatment component for each point of the 7-point response scale.
275 Panelists were not presented with the individual responses of other panelists. Each panelist was also
276 presented with his or her individual responses from round 2. Panelists were asked to reconsider their
277 response to each item using the results from the previous round, responding again on a 7-point
278 ordinal scale. Panelists were again instructed to respond to all survey items unless they determined
279 that they had no understanding of a given component, in which case they were asked not to respond
280 to the item.

281

282 Analysis of round 3

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

287

288 Additional analyses

289 Stability of panelists' responses between rounds 2 and 3 of the survey were measured by
290 calculating Weighted Kappa (K) using R Studio (R Core Team, 2016; Revelle, 2016), where K=1
291 would indicate absolute within-panelist agreement between rounds, and 0 would indicate that
292 agreement between rounds is no better than that expected by chance.

293 Sensitivity analyses were carried out to reduce missing expert panelist data, imputing round
294 3 data for panelists who did not complete it using their round 2 data. Sensitivity analyses were also
295 carried out in relation to the number and identity of components reaching consensus when data were
296 limited to subgroups of panelists (patients, audiologists, hearing therapists, and psychologists). To
297 explore the data while mitigating the underrepresentation of panelist subgroups due to limited
298 recruitment, a weighted analysis was carried out on round 3 data. Clinician subgroups were given
299 equal weight, with the overall number of clinicians given equal weight to patients.

300

301

RESULTS

302 **Panelist demographics and response rates**

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

308

309 **Clinicians.** The mean clinical experience in panelists' respective professions was 14.09
310 years (SD=7.698). Most clinicians had between 10 and 25 years of clinical experience in their
311 respective roles. Of the clinicians, 14 were audiologists, 6 were hearing therapists (one of who
312 withdrew their participation after completing round 1), and 2 were psychologists. Of the two

313 psychologists on the panel, 1 reported their role as consultant clinical psychologist, and the other as
314 cognitive behavioral therapist.

315

316 **Response rates.** Of the 42 panelists, 40 (95%) completed the round 1 questionnaire, 40
317 [100% (cumulative response rate)] completed round 2, and 39 [98% (cumulative response rate)]
318 completed round 3. One hearing therapist and 1 patient withdrew their participation without
319 completing round 2. One further patient dropped out without completing round 3. One hundred and
320 forty nine of the 160 components had a response rate of greater than 94% of panelists. Ten
321 components had a response rate of 92%, and 1 component had a response rate of 90%.

322

323 **Components derived from Round 1**

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

330

331 ***INSERT TABLE 1 ABOUT HERE***

332

333 **Consensus reached in Round 2**

334 Forty-three of 160 components reached consensus ($\geq 80\%$ agreement) in round 2 to be considered
335 important to include in a treatment manual for audiologists to deliver. No components reached
336 consensus to be excluded.

337

338 **Consensus reached in Round 3**

339 Seventy-six components reached final consensus ($\geq 80\%$ agreement) in round 3 to be considered
340 important to include in a treatment manual for audiologists to deliver. These components are
341 presented in table 2 in descending order of percentage agreement. Another 84 treatment components
342 did not reach consensus in round 2 (Supplemental Digital Content 2). No components reached
343 consensus to be excluded. Those components with the highest percentage of agreement to exclude
344 from audiologists' usual tinnitus care include Gestalt techniques (51.35%) and social skills training
345 (44.74%). Components that reaching greater than 10% agreement to exclude are presented in
346 supplemental digital table 3 (Supplemental Digital Content 3 in descending order of the percentage
347 of agreement.

348
349 ***INSERT TABLE 2 ABOUT HERE***

350
351 Weighted analysis of round 3 data (for each giving clinician subgroups equal weight, with
352 the overall number of clinicians given equal weight to patients) also produced seventy-six
353 components reaching consensus. However, 6 of these differed. Those additional components
354 reaching consensus were, 1. Provide information on tinnitus terminology (80.16%); 64. Identify and
355 increase positive thoughts (83.94%); 71. Normalize tinnitus by sharing other people's experiences
356 of it (84.52%); 72. Provide information about the likelihood of successful psychological therapy for
357 tinnitus-related distress (80.16%); 120. Advise the patient on masking (noise which drowns out the
358 tinnitus) and the risks associated with it (82.01%); and 145. Advise the patient on how to maintain
359 practice of psychotherapeutic techniques (82.73%). Those components not reaching consensus in
360 weighted analysis are highlighted in Table 2.

361
362 **Sensitivity analysis**

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

366 Including both patients and clinicians in the survey meant that importance ratings were
367 informed from a number of different experiences and perspectives. By considering only patient
368 responses, 17 components reached consensus to be included in psychologically informed usual care
369 for tinnitus, which **was not the case** when including all data. These components were spread across
370 12 different themes, including evaluation, treatment rationale, treatment planning, behavior
371 intervention, thought identification, social comparison, interpersonal skills, acceptance and
372 defusion, sleep, sound enrichment, comorbidity, and relapse prevention; with no theme represented
373 by more than 2 components (Supplemental Digital Content 4).

374 When considering only clinician responses, 3 components reached consensus that did not
375 when including all data. Two of these three concerned sleep including information on its
376 physiological function (overall=73.68%; clinicians=80%), and advice on changing the sleeping
377 environment and consumption of food, drink and medication (overall= 74.36%;
378 clinicians=80.95%). The third concerned identifying and increasing positive thoughts (overall=
379 78.95%; clinicians=80%). When separating out clinician’s data by profession, 1 other component
380 reached consensus if only decided by audiologists, 30 for hearing therapists and 15 for
381 psychologists (Supplemental Digital Content 4). On average across components, the level of
382 agreement increased by 24.31% (patients 18.16%, clinicians 4.65%, audiologists 6.24%, hearing
383 therapists 20.60%, and psychologists 43.59%).

384

385 **Stability of responses**

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

389

390

DISCUSSION

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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

415 particular finding reflects concerns about poor understanding of tinnitus in the wider population
416 remains uncertain from these data. Whether or not this is the case, could be examined in more in-
417 depth interviews, preferably as part of a process evaluation of any trials including therapies
418 comprised of any of the components considered essential from these data.

419 No components reached consensus to be excluded from psychologically informed usual
420 tinnitus care although some had higher levels of agreement in this direction than others. Perhaps
421 reflecting the low level of evidence for Gestalt therapy (#62) in the literature (Thompson et al.
422 2016), its use received the lowest level of agreement to be included. Similarly, despite its past use,
423 thought stopping (#60) (Henry & Wilson, 1998) was among the components with the lowest level
424 of agreement to include. This is consistent with evidence that using thought suppression as a coping
425 mechanism is associated with greater psychopathology (Aldao & Nolen-Hoeksema, 2010; Aldao,
426 Nolen-Hoeksema & Schweizer, 2010). However, a third of patients on the panel thought that it
427 should be included in tinnitus care. In the absence of standardized tinnitus counseling in UK, this
428 highlights the importance of audiologists maintaining an up-to-date knowledge of the evidence-base
429 in relation to specific psychological techniques including those that paradoxically may have a
430 negative effect on patients.

431 Components concerning neural networks, neurophysiological models of tinnitus, and the
432 auditory system (#7, 8, 6) did not reach consensus overall or by any subgroup of panelists.
433 However, the provision of information specifically on the limbic system (#13) reached consensus
434 overall, with over 80% agreement by patient panelists. The component concerning the limbic
435 system specifically focuses on “how this information can be used to treat tinnitus”, whereas those
436 others concerning neurology and anatomy do not. Therefore it may be the case that this ‘focus’
437 influenced panelists to agree on its inclusion aside from the content of the information specifically
438 on the limbic system. A post-Delphi focus group could explore such interpretations and is an area
439 for further research. A survey of 147 audiology departments in the UK found that only 2
440 departments employed a clinician who had undertaken training in TRT (Hoare et al., 2015); TRT is

441 not funded by the NHS in the UK. This reflects the low level of consensus for neuroanatomy and
442 the neurophysiological model. Components concerning tinnitus education that reached consensus as
443 essential to include were generally less concerned with neurology and anatomy, and more with
444 etiology, maintenance and progression (#4, 5, 12). Six of the 7 components of psychoeducation
445 reached consensus, compared to 8 out of 14 for tinnitus education. This indicates the importance of
446 audiologists possessing a good degree of knowledge of the psychology of tinnitus, rather than just
447 knowledge of anatomy and neurology.

448 The only component from the behavioral intervention theme of components that reached
449 consensus concerned the discussion of fear and avoidance behaviors. Paradoxically, despite
450 agreement to include the provision of information on habituation following exposure (#9),
451 consensus was not reached to include graded exposure therapy, which according to Emotional
452 Processing Theory (EPT) essentially works by habituating the patient (Rachman, 1980).
453 Furthermore, despite associations made between tinnitus and anxiety and depression in the literature
454 (Pinto et al. 2014), the use of techniques designed to address anxiety and depression, namely worry
455 time, cognitive restructuring, behavioral activation, ACT, and Mindfulness (#88, 89, 90) all failed
456 to reach consensus. Overall, this may indicate a lack of consensus on the importance of these
457 specific psychotherapeutic techniques despite their efficacy (Henry & Wilson, 1998; Lindberg et al.
458 1989). An alternative interpretation is that components did not reach consensus due to concern that
459 the degree of competency to deliver them requires extensive training that audiologists are unlikely
460 to be afforded. Another interpretation is that the components did not reach consensus due to a lack
461 of understanding of what the components represent in practice – the panelists may have chosen not
462 to respond if they did not understand the component, as directed in their instructions.

463

464 **Strengths and Limitations**

465 The panel was comprised of patients and clinicians based in the UK. Therefore the results
466 predominantly reflect a western view of mental health within the context of UK audiology practice.
467 As such, the results may not have equal import for other cultures and systems of care delivery.

468 The sensitivity analysis indicated that 15 components reached consensus in the psychologist
469 subgroup of panelists but did not reach consensus in the whole panel. However, the recruitment of
470 only 2 psychologists limits the breadth of knowledge called upon to reach this consensus and
471 increases the risk of bias to particular perspective of psychological therapies. Future research may
472 challenge these findings with a different panel.

473 The benefit of having a range of views from different professional groups in the panel
474 allowed for experts to approach the survey from different perspectives. For instance, the audiologist
475 may be in a better position to consider how much time they may have in their practice to
476 accommodate certain psychological techniques, while the psychologist may have a better
477 understanding of the principles behind said techniques and their applicability to tinnitus. However,
478 due to the low number of psychologists recruited, it is conceivable that such concerns received
479 relatively little consideration here. This may account for why so many cognitive behavioral
480 techniques did not reach consensus, with panelists favoring common therapeutic skills. Common
481 therapeutic skills, those that are not specific to a particular model of psychological therapy,
482 consistently reached consensus in this Delphi survey. The common factors theory of psychological
483 therapies posits that much or all of the benefit of treatment is the result of components that are
484 common to many of the different types of psychological therapy (Rosenzweig, 1936). Common
485 therapeutic skills include relationship factors, expectations, and goal setting (Wampold, 2015). A
486 number of components reaching consensus appear to map onto developing a therapeutic
487 relationship between patient and clinician, such as demonstrating empathy, Socratic questioning,
488 and active listening (for instance, through eye contact and body posture) (#147, 153, 155). The
489 Delphi panel also reached consensus on discussing the patient's expectations (#46, 47) and
490 providing a treatment plan (#49). Thus patient and audiologist preference of common therapeutic

491 skills rather than specific CBT or other techniques aligns with the common factors theory of
492 psychological therapies, as far as concerns audiologist-delivered tinnitus care. However, there was
493 some contradiction, with panelists not reaching consensus on collaborating with the patient on *how*
494 to plan therapy and agreeing on goals together (#45, 48). This appears to be in opposition with the
495 principle of patient-centered care. However, this result may have manifested in response to current
496 training and models of care followed by audiologists in contrast to psychologists. In the UK, while
497 a clinical psychologist will undergo several years of training before lifelong continuing professional
498 development in planning and delivering psychological therapies, audiologists do not have a
499 standardized pathway for training in this respect, and what training does exist is typically limited to
500 short courses (Hoare et al. 2015). The likely resulting disparity in competence may make dynamic
501 patient-audiologist decision-making problematic ‘in the moment’ for audiologists without extensive
502 further training. In contrast, flexible albeit largely predetermined modular care, in which a given
503 presentation indicates a particular component of treatment, may be more manageable for
504 audiologists.

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

514

515

CONCLUSIONS

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

527

528

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534

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538

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614

615 **Figure Legends**

616 Figure 1. Flow diagram of the Delphi survey process

617

618 **Supplemental Digital Content**

619 Supplemental Digital Content 1. Definitions of themes for template analysis

620 Supplemental Digital Content 2. List of treatment components that did not reach consensus in round

621 3

622 Supplemental Digital Content 3. Components with the greatest percentage of agreement indicating

623 they are absolutely unessential to include in an audiologist-delivered psychological intervention

624 Supplemental Digital Content 4. Sensitivity analysis: components that would be considered

625 absolutely essential to include in an audiologist-delivered psychological intervention for people

626 with tinnitus by Delphi panel subgroup in round 3

627 Supplemental Digital Content 5. Weighted Kappa values per component