ABBREVIATIONS

ACE = Active Communication Education; CCM = Chronic Care Model; HHC = hearing health care; HLSM = hearing loss self-management
ABSTRACT

Objective: To evaluate the capacity of a self-management assessment tool to identify unmet hearing health care (HHC) needs; to determine whether such an assessment yields novel and clinically useful information.

Design: Hearing loss self-management (HLSM) was assessed with the Partners in Health scale and the Cue and Response interview from the Flinders Chronic Condition Management Program™. The results of the scale and the interview were compared to determine the extent to which they each contributed to the assessment of HLSM.

Study Sample: Thirty older adults who currently receive HHC.

Results: The two assessment tools were useful in identifying the specific domains in which participants lacked good HLSM skills. While participants tended to have a high level of knowledge about hearing loss and technology-based interventions, many reported the presence of unmet psychosocial needs with no clear plan for addressing them. There was considerable variation in terms of the extent to which their audiologists facilitated shared decision-making.

Conclusions: The results suggest that HLSM has the potential to play an important role in audiological rehabilitation. A HLSM assessment tool that more precisely matches the unique needs of people with hearing loss should be developed, along with interventions to meet those needs.
INTRODUCTION

The effects of hearing loss extend beyond the physiology of the auditory system and reach into the domains of communicative, behavioural, cognitive, and psychosocial functioning (Kramer et al., 2002; Bainbridge & Wallhagen, 2014). Consequently, living well with a hearing loss does not depend exclusively on the use of devices, such as hearing aids or cochlear implants, to compensate for peripheral auditory dysfunction. Rather, it is contingent upon the acquisition, mastery, and application of an array of skills to manage the multidimensional impact of hearing loss on everyday life, an active and ongoing process known as self-management (National Health Priority Action Council, 2006).

With its biomedical approach and strong reliance on technology-based interventions, the hearing health care (HHC) system tends to treat hearing loss as if it were an acute health condition. However, permanent hearing loss is a chronic condition that requires long-term, ongoing management. Self-management is a key driver of successful health outcomes for chronic conditions and a fundamental component of the Chronic Care Model (CCM), an established organisational framework that describes best-practice clinical care for chronic conditions at the client, clinician, health system, and community levels (Wagner et al., 2001; Bodenheimer et al., 2002). The implementation of programs that foster self-management skills yields significant benefits for clients and clinicians alike, including better quality of life, greater independence, increased likelihood of adhering to and succeeding with treatment, fewer unplanned interactions with the health care system, lower health care expenditure, and more efficient allocation of clinical resources (Lorig et al., 2001; Norris et al., 2001).
In an audiological context, hearing loss self-management (HLSM) strategies are taught as part of the Active Communication Education program (ACE; Hickson et al., 2007a), C2Hear (Ferguson et al., 2016), and a number of other auditory rehabilitation programs (Kramer et al., 2005; Thorén et al., 2014; Preminger & Rothpletz, 2016). These strategies include communicative problem-solving skills (Hickson et al., 2007a; Preminger & Yoo, 2010; Ferguson et al., 2016) and ‘psychosocial exercises’ in which individuals are invited to talk about their thoughts and feelings about hearing loss and its impact on personal relationships (Preminger & Ziegler, 2008; Preminger & Yoo, 2010). In keeping with the evidence base supporting the use of self-management interventions for other chronic conditions, these programs have been shown to improve psychosocial wellbeing (Hickson et al., 2007a; Thorén et al., 2014), reduce activity limitations and participation restrictions (Hickson et al., 2007b; Preminger & Yoo, 2010), foster greater knowledge of hearing loss and hearing aids (Ferguson et al., 2016), and improve quality of life (Kramer et al., 2005), suggesting that HLSM has an important role to play in audiology. However, since the explicit purpose of such rehabilitation programs is to improve communicative function, the HLSM component is typically limited to activities that directly relate to achieving this goal. Currently, there are no known interventions in audiology designed to address the full spectrum of HLSM skills, which would additionally include coming to terms with and accepting the hearing loss; understanding the causes, characteristics, and effects of hearing loss; monitoring for the development of new problems and responding appropriately; working collaboratively with HHC professionals; and managing the effects of the hearing loss on psychosocial wellbeing (Clark et al., 1991).

With the exception of ACE (Hickson et al., 2007a) and C2Hear (Ferguson et al., 2016), auditory rehabilitation programs and associated interventions to improve HLSM have made
few inroads into routine clinical care in audiology. Barker et al. (2014) undertook a content analysis of British policy documents outlining standards of care for hearing loss and for a group of designated chronic conditions, with the aim of determining how well they conformed to the CCM (Wagner et al., 2001). While neither standard fully exemplified the CCM, the audiological policies mapped especially poorly onto the model’s framework, with particular deficiencies observed in the self-management support component. The successful transition of HLSM interventions from a research environment to clinical practice may be hindered by the perception that HLSM is too complex to address within the space of a typical appointment and the lack of available resources to guide clinicians in prioritising areas of need. It is therefore possible that a clinical tool for assessing HLSM across a range of domains could assist the clinician in identifying unmet needs and tailoring subsequent HLSM interventions to the capabilities, resources, and preferences of the individual client.

A small number of self-management assessment tools are in current use for other chronic conditions. The majority are condition-specific and thus cannot be directly applied to other chronic conditions. Of the available generic measures, the most widely used is the assessment component of the Flinders Chronic Condition Management Program™ (Battersby et al., 2003). The Flinders Chronic Condition Management Program™ is a semi-structured assessment, planning, and motivational process that yields an assessment of a client’s self-management skill and aids the clinician in the development of individualised, realistic, and achievable goals for enhancing self-management skills and effecting behavioural change. The program’s complementary assessment tools, the Partners in Health scale and the Cue and Response interview, were developed in response to the observation that service coordinators taking part in a coordinated care trial instinctively provided care on the basis of clients’ ability to self-manage, rather than the severity of their health condition (Battersby et al.,
The efficacy of the Partners in Health scale and the Cue and Response interview has been demonstrated for a diverse range of health conditions, including arthritis, cardiovascular and respiratory diseases, and Type 1 diabetes (Battersby et al., 2015). The Partners in Health scale and the Cue and Response interview have been modified for use with adults with hearing loss and were reported in a pilot study of seven participants to be well-received (Convery et al., 2016). However, the clinical utility of the tools has not been systematically evaluated in a larger sample of people with hearing loss. The aim of the current study was therefore to investigate whether the Partners in Health scale and the Cue and Response interview can be used to assess HLSM in a sample of older adults who are current recipients of HHC.

METHOD

Participants

The participants in this study were a subset of a larger group who took part in a hearing aid field trial. As such, the inclusion criteria were: (1) bilateral hearing thresholds within the fitting range of the hearing aid; (2) between 50 and 85 years of age; and (3) current user of bilateral hearing aids with ≥1 year of hearing aid experience. The exclusion criteria were: (1) presence of active ear disease; (2) non-English speaking; and (3) additional disabilities that would preclude participation in a research study. Participants were recruited from a database of research volunteers maintained by the National Acoustic Laboratories. Eighty-five individuals were contacted to obtain the final sample of 30 participants, who ranged in age from 51 to 85 years (median = 73 years). Ten participants were female and 20 were male. All had been clients of the Australian HHC system for 1.5 to 37 years (median = 7.5 years).
Sixteen participants were eligible for public hearing services, while the remaining 14 received hearing services privately.

Materials

*Partners in Health scale*

The original Partners in Health scale (Table 1) is a 12-item questionnaire that assesses the respondent’s self-management capability in the domains of knowledge, partnership in treatment, recognition and management of symptoms, and coping (Battersby et al., 2003; Smith et al., 2017). The four-factor structure of the scale has been confirmed with Bayesian confirmatory factor analysis (Smith et al., 2017). Respondents complete the scale independently and provide a rating for each item on a scale of 0 to 8, with higher scores reflecting better self-management skills. The aim of the Partners in Health scale is to obtain the client’s perspective on his/her self-management capability without influence from the clinician. The scale takes approximately 5-10 minutes to complete.

While the Partners in Health scale was developed as a generic tool that could ostensibly be used with any chronic condition, it employs more medical vocabulary (e.g. *doctor, medication, symptoms*) than is typically used in an audiological context. The wording of each item was therefore revised, and one item ultimately removed, as the result of an iterative consultation process with seven adults with hearing loss (Convery et al., 2016), a task that was undertaken with written permission from the developers of the Flinders Chronic Condition Management Program™ (Lawn, personal communication). Table 1 shows the
modified 11-item Partners in Health scale that was used in the current study, alongside the original items.

*Cue and Response interview*

The Cue and Response interview is completed collaboratively by the clinician and the client. The interview focuses on the same items from the Partners in Health scale, but uses cue questions to explore the client’s understanding and knowledge of the item and to identify barriers and facilitators to good self-management. For example, the cue questions associated with item 10, *I manage the effect of my hearing loss on my social life (e.g. my ability to participate, how I mix with other people, and my personal relationships)*, include *How does your hearing loss affect the way you socialise with other people? Tell me about the people who support you. What aspects of your social life would you like to change?* The clinician records answers in the client’s own words, paying particular attention to what the client knows, what the client does, and behaviours and beliefs that indicate readiness to change. Since the goal of the Cue and Response interview is to obtain information about the client’s capacity for self-management, the focus of the interview is restricted to assessment, not the recommendation of problem-solving strategies. Motivational interviewing techniques are used during the interview process, which include asking open-ended questions, affirming the client’s strengths to build rapport, listening reflectively to demonstrate understanding and express empathy, and summarising the key points made by the client (Battersby et al., 2010).

At the end of the discussion of each item, the clinician provides a rating on the same scale of 0 to 8 that was used in the Partners in Health scale. Client and clinician perspectives are then compared. When there is a discrepancy between clinician and client ratings of 3 or more, this
signals an area for further discussion and provides an opportunity for the score to be adjusted. In the end, a single score is agreed upon for each item that reflects the perspectives of both the client and clinician. Scores of 5 and above indicate that the client is self-managing well in that area; scores of 4 and below indicate that a targeted intervention is needed in that self-management domain. The Cue and Response interview takes approximately 15-20 minutes to administer, although this can vary due to the individualised nature of the procedure.

In routine clinical practice, only the agreed-upon score yielded by the Cue and Response interview, which reflects both client and clinician perspectives, is typically considered in subsequent rehabilitation planning. For the purposes of the current study, however, the Partners in Health scale score was also examined in isolation to determine the relative contributions of each component of the HLSM assessment.

Procedure

Participants attended the laboratory for a single appointment during which they underwent pure-tone audiometric testing and an assessment of HLSM, as measured by the Partners in Health scale and the Cue and Response interview. Years of hearing aid experience, gender, age, and the system through which the participant received HHC services (public or private) were elicited with a questionnaire.

Participants were compensated for their travel expenses. The treatment of participants was approved by the Australian Hearing Human Research Ethics Committee and the University of Queensland Medical Research Ethics Committee and conformed in all respects to the
Australian government’s National Statement on Ethical Conduct in Human Research (National Health and Medical Research Council, 2007).

Authorised use of the Flinders Chronic Condition Management Program™ tools is contingent upon completion of a two-day workshop run by an accredited trainer. The first author (EC) undertook this training in November 2014.

Data Analysis

Correlation analysis (Pearson’s product-moment or point-biserial, as appropriate to the type of variable) was performed to determine whether the participants’ demographic characteristics were correlated with the Partners in Health scale and the Cue and Response interview scores. Dependent samples t-tests were used to determine whether there were significant differences between the Partners in Health scale and the Cue and Response interview scores.

The responses to the Cue and Response interview were analysed using content analysis, a qualitative method for extracting meaning from textual data. A directed approach was used, in which the text is examined for the presence of concepts or ideas (“themes”) that have been pre-selected from existing theory or literature (Hsieh & Shannon, 2005). Three themes were chosen based on findings that current clinical practice in audiology is biomedically focused, device-centred, and clinician-led (Ekberg et al., 2014; Grenness et al., 2015; Pryce et al., 2016): (1) clinician minimisation of the psychosocial impact of hearing loss; (2) lack of client knowledge of non-technological interventions for hearing loss; and (3) clinician-led versus shared decision-making. Since participant responses to each item on the Cue and Response
interview were relatively short, they were written down verbatim at the time of the interview. Responses were examined for their relevance to audiological practice and then grouped according to theme.

RESULTS

As shown in Table 2, the mean total Partners in Health scale score was 71.0 out of a maximum possible score of 88, with a standard deviation of 8.68. Across the participant group, total scores ranged from 47 to 88. There was no significant correlation between the Partners in Health scale score and age (r = -0.21, p = 0.27), gender (r_{pb} = 0.34, p = 0.07), four-frequency (0.5, 1, 2, and 4 kHz) pure-tone average across both ears (r = 0.22, p = 0.24), years of hearing aid experience (r = 0.24, p = 0.19), or whether the participant received health care services through the private or public system (r_{pb} = -0.01, p = 0.97).

The mean total Cue and Response interview score was 68.7 out of a maximum possible score of 88, with a standard deviation of 7.69. Across the participant group, total scores ranged from 52 to 82. Correlation analysis revealed a significant effect of age on the Cue and Response interview score, with younger participants demonstrating significantly better HLSM overall (r = -0.39, p = 0.035). There was no significant correlation between the Cue and Response interview score and gender (r_{pb} = 0.26, p = 0.16), four-frequency (0.5, 1, 2, and 4 kHz) pure-tone average across both ears (r = 0.22, p = 0.25), years of hearing aid experience (r = 0.24, p = 0.21), or whether the participant received HHC services through the private or public system (r_{pb} = -0.02, p = 0.94). A t-test for dependent samples revealed that the Cue and Response interview score was significantly lower than the Partners in Health
scale score on the Monitoring Changes ($t = 2.66, p = 0.01$), Emotional Wellbeing ($t = 3.37, p = 0.002$), and Social Life ($t = 4.09, p < 0.0001$) items.

According to the Cue and Response interview scores on the individual items, the participant group demonstrated the best HLSM for Attending Appointments ($\bar{x} = 7.6$) and Accessing Services ($\bar{x} = 7.1$) and the poorest HLSM in the domains of Social Life ($\bar{x} = 4.8$) and Emotional Wellbeing ($\bar{x} = 5.5$). Within each item, the number of participants for whom an intervention to improve HLSM would be indicated (i.e. a score of 0-4) ranged from 0 (Attending Appointments) to 13 (Social Life).

*Clinician minimisation of the psychosocial impact of hearing loss*

When completing the Partners in Health scale, many participants indicated that they were able to manage the effect of their hearing loss on their emotional wellbeing fairly well (score of 5/8) to very well (score of 8/8). During the Cue and Response interview, however, the same participants would often describe their experiences of particular situations using negative emotional descriptors (Participant 27: ‘Angry, sad, upset, anxious, frustrated... all of the above, really. It’s momentary, not prolonged, but those feelings are there, and they do affect you’; Participant 30: ‘You get anxious about going to new places. I already have trouble seeing, and with the hearing on top of that... you start to worry about whether or not you’ll be able to cope’). When their attention was drawn to the fact that these words represented emotional states, and were encouraged by the experimenter to delve more deeply into these experiences, participants would often realise that their hearing loss had more of an impact on their emotional wellbeing than they had previously thought. Participant 20 further
noted that he had not recognised the cumulative impact of what he had, up until now, considered to be isolated incidents:

‘Well, when you list it out like that... I get frustrated with my daughter-in-law for trailing off at the end of sentences, I get frustrated when my wife’s rummaging in the cutlery drawer and trying to talk to me when she should know better... yeah, it does build up into this general sense of frustration that you don’t know how to deal with, because it’s coming at you from all sides.’

Participant 21 had never considered that a discussion of the emotional impact of her hearing loss was within an audiologist’s scope of practice, saying, ‘I’ve never had a conversation like this with my audiologist... she’s never given the impression that this was the kind of thing she’d be interested in talking about.’ The same participant also believed that it would seem ‘out of place’ to raise emotional concerns when her audiologist was ‘concentrating on the computer, you know, when she’s focusing on getting my hearing aids adjusted right.’

In contrast, when responding to the Knowledge of Hearing Loss item, the majority of participants described the characteristics of their hearing loss in terms of its biomedical characteristics rather than its psychosocial effects. Participants typically referred to the frequency range in which their hearing loss was greatest (Participant 18: ‘[My hearing loss] has a noticeable effect in the upper frequencies’). Many participants were additionally able to identify the cause of their hearing loss (Participant 7: ‘It’s caused by otosclerosis... the nerve loss is a response to that. It improved somewhat after a stapedectomy’).

_Lack of client knowledge of non-technological interventions_
Participants’ responses to the Knowledge of Treatment and Adherence items during the Cue and Response interview were almost exclusively couched in terms of their knowledge and use of hearing aids. Participants demonstrated a sophisticated level of knowledge of hearing aid functions (Participant 30: ‘*When I press the button on this side, it activates the directional microphones, which are for noisy situations*’), and, as a group, tended to be consistent full-time users of their hearing aids. Relatively fewer participants were aware of other forms of assistive technology (Participant 21: ‘*My streamer’s changed my life. I can hear on the phone, receive messages, watch TV, and listen to music. It all comes through my hearing aids*’). Those who did mention these interventions tended to be those who had acquired their hearing loss at a younger age or those who had worn hearing aids the longest. Participant 3, whose entry into the HHC system was prompted by tinnitus, rather than hearing loss, was the only participant who mentioned hearing protection (‘*I make sure I use hearing protection when I’m mowing the lawn and that sort of thing. If I don’t my tinnitus gets worse and I know I could eventually lose more hearing*’).

Similarly, in response to the Monitoring Changes item, most participants identified a hearing aid issue as an event that would trigger a visit to their audiologist (Participant 10: ‘*The [hearing aid] settings weren’t quite right, so I had them reprogrammed. Then they started using up more batteries, and they fixed that, too*’; Participant 15: ‘*I make sure I change the wax guards and the battery if I find I can’t hear all of a sudden*’). Fewer participants nominated a decline in hearing as an event to watch for; the participants who did so tended to be those who had experienced such an event in the past or whose hearing thresholds were prone to fluctuating (Participant 7: ‘*My ENT said that with otosclerosis it can get worse, so I know I need to be vigilant about getting a test whenever it starts to get harder to hear*’).
No participant in the study could identify any non-technological interventions for hearing loss (Participant 12: ‘I can’t remember being told much about managing my hearing loss. They did give me a lot of gadgets, though. I have a volume control telephone, an FM system, and headphones for watching TV’). Participant 17 responded to this question with ‘Do you mean sign language?’ Several other participants reported that hearing aids were the only intervention they had ever been offered and that if there were any other choices, they were not aware of what they were (Participant 14: ‘Well, aside from hearing aids, there really isn’t anything else, is there?’).

The majority of participants were aware of the limitations of hearing aids and the need for non-technological management strategies, but this knowledge did not emerge until they were asked what they believed their immediate family knew about managing a hearing loss. Participants overwhelmingly reported that their family mistakenly believed that hearing aids are intended to ‘solve’ hearing loss, and that once hearing aids have been acquired, communicative strategies such as attracting the participant’s attention before speaking or turning on closed captioning are no longer necessary. Participant 14 said, ‘My wife understands very little [about my hearing loss]. She doesn’t take note of the fact that I can’t hear, she speaks to me from behind... she doesn’t know why I don’t understand.’ Participant 9 reported that her husband, despite having a hearing loss himself, ‘doesn’t make any compensation for mine. I tap him on the shoulder to get his attention, but he doesn’t do that for me... it hurts that I’m the one who always has to make allowances.’

Clinician-led versus shared decision-making
As shown by the score ranges in Table 2, there was more individual variation in the responses to the Shared Decision-Making item than for any other item in the HLSM assessment. During the Cue and Response interview, some participants described a highly paternalistic, clinician-led style of practice (Participant 8: ‘I was just told I needed hearing aids. I don’t recall that there were any decisions about that per se, just “You need hearing aids” and that’s that’), while others described their relationship with their audiologist as a partnership (Participant 15: ‘I’m able to say, “No, that’s not good” or “I’d prefer something else”. We make decisions together; she’s really quite good about that’). Participant 7 highlighted the importance of clinicians listening to clients and taking their experiences into account when making clinical decisions, saying, ‘I respect their knowledge to a point, but I’ve got confidence in my own experience. The audiologist needs to hear what I need’.

According to the responses to the Shared Decision-Making item, practice style seemed to vary on an individual clinician basis, even within the same clinical setting. For example, participants 1 and 18 attend the same clinic but see different audiologists. Participant 1 reported that ‘[my audiologist] doesn’t really communicate... there’s not much of a relationship there. She tells me what to do and I go out and do it’, whereas Participant 18 described his audiologist as ‘very collaborative. She’s very competent, empathetic... we decided together that it was time to go with stronger hearing aids. She’d suggested it some years back but I wasn’t ready, so she was happy to wait.’

Some participants expressed a preference for, or expectation of, a clinician-led style of practice on the grounds that the audiologist was the expert (Participant 2: ‘They’ll answer any questions I have but I don’t have too many... they would tell me what I needed to do’;
Participant 14: ‘The audiologist has always made the decisions. I don’t know what I need, and they’re the experts’.

DISCUSSION

The data elicited by the Partners in Health scale and the Cue and Response interview revealed an uneven distribution of HLSM skills in a sample of older adults who are current clients of the Australian HHC system. As a group, the study participants demonstrated a sophisticated level of knowledge about hearing loss and appeared to face few barriers to accessing and engaging with HHC services. However, their knowledge of strategies for managing hearing loss was primarily limited to hearing aids and other technology-based interventions. More importantly, the majority of participants reported the presence of unmet psychosocial needs with no clear plan for addressing them as part of their current rehabilitation program. Participants reported social isolation; reduced value from social events; and feelings of anger, anxiety, and frustration arising from communicative interactions, yet few, if any, of these issues had been raised in past appointments with their audiologist. In some cases, participants reported that their audiologist did not ask them about their social or emotional wellbeing, whereas in others, participants were reluctant to raise these issues themselves, either because of personal discomfort or because they believed such problems were outside an audiologist’s scope of practice. There was considerable individual variation with regard to the participants’ reports of the clinical interaction style employed by their audiologist. Some participants reported that their relationship with their audiologist was a collaborative partnership, while others described a highly paternalistic, clinician-directed style of clinical practice. Taken as a whole, the results of the HLSM assessments suggest that the Australian HHC system is not meeting the needs of its clients equally in all areas.
The three themes that emerged from the verbal responses to the Cue and Response interview – clinician minimisation of the psychosocial impact of hearing loss, lack of client knowledge of non-technological interventions for hearing loss, and the use of clinician-led versus shared decision-making – reinforce what has been reported in the literature. In an analysis of client-clinician interaction patterns, Grenness et al. (2014) found that the case histories obtained by audiologists tended to be weighted toward the identification of underlying biomedical issues, thus communicating to the client at the outset that the problems arising from hearing loss should be defined in biomedical terms. Further studies suggested that the application of a biomedical framework to the clinical decision-making process persists throughout the diagnosis and management planning stages, with less attention given to the psychosocial implications of the hearing loss (Grenness et al., 2015; Meyer et al., 2017).

A significant consequence of the biomedical approach to treating hearing loss is the firmly entrenched view that hearing aids are the default intervention in audiology, a perspective that was held by the participants in the current study. Despite evidence that there is greater acceptance of an intervention when the client is offered the opportunity to choose from a range of options (Laplante-Lévesque et al., 2012), client focus groups report that their individual preferences are rarely explored and hearing aids are often the sole intervention offered by the audiologist (Kelly et al., 2013; Pryce et al., 2016).

The continuum of clinical practice styles reported by participants in the current study broadly supports what has been reported in the literature. While a recent survey of Australian audiologists revealed a preference for, and theoretical understanding of, person-centred care (Laplante-Lévesque et al., 2014), studies have demonstrated that audiologists do not
necessarily practice in accordance with this belief (Kelly et al., 2013; Ekberg et al., 2014; Pryce et al., 2016). Person-centred care is an integral component of chronic condition management and refers to the idea that it is the person, not the health condition, who is being treated (World Health Organization, 2007). Person-centred care is conceptualised as an equal partnership between client and clinician in which health care is provided in a ‘holistic, individualised, respectful, and empowering’ manner (Morgan & Yoder, 2012). It is diametrically opposed to a paternalistic, clinician-directed style of practice, in which the client is largely a passive recipient of treatment. A consequence of this paternalistic style is the expectation that the clinician, rather than the client, should take ultimate responsibility for the client’s health and wellbeing, which is in turn linked with suboptimal adherence, satisfaction, and outcomes, both for hearing loss specifically (Laplante-Lévesque et al., 2012; Knudsen et al., 2013) and for chronic health conditions more generally (Wagner et al., 2001; Bodenheimer et al., 2002).

The open-ended format of the Cue and Response interview provided nuanced and individualised information about client needs that the Partners in Health scale alone did not. The scores on the Emotional Wellbeing and Social Life items of the Cue and Response interview were significantly lower than the Partners in Health score, suggesting that a questionnaire-based method of eliciting this information may underestimate the level of difficulty clients experience in these two domains. For the Social Life item, this may also be due to its focus on the quantity, rather than quality, of social interactions. It has been suggested in the literature that such a quantitative approach may overlook those clients who are attending as many social events as they always have, but who are now, as a result of their hearing loss, deriving less value from their social interactions (Keidser & Seeto, 2017). The cue questions on the Cue and Response interview, in contrast, are intended to elicit
qualitative details about the client’s social life, and as such, may uncover important information that may otherwise never have come to light. However, the valuable information obtained from an interview-style tool should be balanced with the need for clinical efficiency and the reality that clinicians cannot spend unlimited time with every client.

Our results suggest that several of the Partners in Health scale items have less relevance in an audiological context than they would for an individual with another chronic health condition, such as diabetes or asthma. While there is no question that the information elicited by the Healthy Lifestyle item is important for quality of life, it is of limited utility for audiologists, whose scope of practice does not extend to recommending changes to a client’s dietary or exercise regimen. There does appear to be some value, however, in narrowing the scope of this question such that it focuses primarily on sleep habits and stress management. Several participants noted a bidirectional link between fatigue and their ability to understand speech, in line with findings that individuals recruit additional cognitive resources when listening under challenging acoustic conditions (Lemke & Besser, 2016) and that the increased listening effort put forth by people with hearing loss may result in greater sleep needs (Nachtegaal et al., 2009). Another participant reported that for him, high levels of stress were associated with more intrusive tinnitus, a relationship that has also been suggested in the literature (Betz et al., 2017).

Study Limitations

Caution should be exercised in generalising the results of this study to a wider population. The participants in this study had all volunteered to take part in a research study and were likely more highly motivated than the average member of the hearing-impaired community.
Additionally, the participants were drawn from a geographic area of high socioeconomic status, meaning that they were less likely than average to face economic barriers to accessing HHC; this is supported by the fact that overall, the group attained high scores, with little individual variation, on the Attending Appointments and Accessing Services items of the Partners in Health scale. It is possible that a more diverse group of participants may have yielded different results. Similarly, the Cue and Response interviews were all administered by a single clinician. It is possible that the results of the study were influenced by the clinician’s skill set and experience level.

Future Directions

Although the results of this study suggest that HLSM has the potential to play an important role in clinical practice, future research should focus on developing a HLSM assessment tool that more closely matches the unique needs of people with hearing loss. Further research in this area should extend beyond the identification of unmet needs to the development of interventions designed to address those needs, particularly in the area of psychosocial wellbeing.

CONCLUSION

The Partners in Health scale and the Cue and Response interview, two complementary tools for assessing self-management in clients with chronic conditions, were trialled with a group of older adults with hearing loss. The results confirm the current biomedical focus of the Australian HHC system and suggest that more should be done to identify and address the psychosocial issues arising from hearing loss. There is scope for further refining these tools
such that they reflect the unique needs of people with hearing loss and provide clinical information that allows subsequent interventions to be more precisely tailored to the individual.

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DECLARATION OF INTEREST

The authors declare no conflicts of interest.
REFERENCES


Table 1. The original version of the Partners in Health scale items and the version that was modified for audiological use.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Topic</th>
<th>Original version</th>
<th>Modified version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Knowledge of Hearing Loss</td>
<td>1. Overall, what I know about my health condition is</td>
<td>1. Overall, what I know about my hearing loss is</td>
</tr>
<tr>
<td></td>
<td>Knowledge of Treatment</td>
<td>2. Overall, what I know about the treatment (including medications) of my health condition is</td>
<td>2. Overall, what I know about the management of my hearing loss is</td>
</tr>
<tr>
<td>Partnership in Treatment</td>
<td>Adherence</td>
<td>3. I take medications or carry out the treatments asked by my doctor or health worker</td>
<td>3. I manage my hearing loss as asked by my hearing health professional</td>
</tr>
<tr>
<td></td>
<td>Shared Decision-Making</td>
<td>4. I share in decisions made about my health condition with my doctor or health worker</td>
<td>4. I share in decisions made about my hearing loss with my hearing health professional</td>
</tr>
<tr>
<td></td>
<td>Accessing Services</td>
<td>5. I am able to deal with health professionals to get the services I need that fit with my culture, values, and beliefs</td>
<td>5. I am able to deal with hearing health professionals to get the services I need that fit with my culture, values, and beliefs</td>
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<tr>
<td></td>
<td>Attending Appointments</td>
<td>6. I attend appointments as asked by my doctor or health worker</td>
<td>6. I attend appointments as asked by my hearing health professional</td>
</tr>
<tr>
<td>Recognition and management of symptoms</td>
<td>Monitoring Changes</td>
<td>7. I keep track of my symptoms and early warning signs (e.g. blood sugar levels, peak flow, weight, shortness of breath, pain, sleep problems, mood)</td>
<td>7. I keep track of any changes in my health condition (e.g. sudden or gradual drop in hearing, pain or infection in my ears, hearing aids stopped working, problems handling or inserting my hearing aids)</td>
</tr>
<tr>
<td></td>
<td>Taking Action</td>
<td>8. I take action when my early warning signs and symptoms get worse</td>
<td>8. I take action when I notice these changes</td>
</tr>
<tr>
<td>Coping</td>
<td>Physical Activity</td>
<td>9. I manage the effect of my health condition on my daily activities and physical activities (e.g. walking, hobbies, and household tasks)</td>
<td><em>Item removed</em></td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Emotion Wellbeing</td>
<td>10. I manage the effect of my health condition on how I feel (e.g. my emotions and my spiritual wellbeing)</td>
<td>9. I manage the effect of my hearing loss on how I feel (e.g. my emotions and my spiritual wellbeing)</td>
<td></td>
</tr>
<tr>
<td>Social Life</td>
<td>11. I manage the effect of my health condition on my social life (e.g. my ability to participate, how I mix with other people, and my personal relationships)</td>
<td>10. I manage the effect of my hearing loss on my social life (e.g. my ability to participate, how I mix with other people, and my personal relationships)</td>
<td></td>
</tr>
<tr>
<td>Healthy Lifestyle</td>
<td>12. Overall, I manage to live a healthy lifestyle (e.g. no smoking, healthy food, moderate alcohol, regular physical activity, sleep well, manage stress and worry)</td>
<td>11. Overall, I manage to live a healthy lifestyle (e.g. no smoking, healthy food, moderate alcohol, regular physical activity, sleep well, manage stress and worry)</td>
<td></td>
</tr>
</tbody>
</table>
Table 2. The mean, standard deviation, and range of the scores attained by the participants (N = 30) on each item of the Partners in Health scale and the Cue and Response interview. Significant p values indicate items for which there was a significant change from the score on the Partners in Health scale to the score on the Cue and Response interview.

<table>
<thead>
<tr>
<th>Item</th>
<th>Partners in Health scale</th>
<th>Cue and Response interview</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Standard deviation</td>
</tr>
<tr>
<td>Knowledge of Hearing Loss</td>
<td>5.8</td>
<td>1.26</td>
</tr>
<tr>
<td>Knowledge of Treatment</td>
<td>5.9</td>
<td>1.36</td>
</tr>
<tr>
<td>Adherence</td>
<td>6.5</td>
<td>1.17</td>
</tr>
<tr>
<td>Shared Decision-Making</td>
<td>6.0</td>
<td>2.13</td>
</tr>
<tr>
<td>Accessing Services</td>
<td>6.9</td>
<td>1.49</td>
</tr>
<tr>
<td>Attending Appointments</td>
<td>7.6</td>
<td>0.82</td>
</tr>
<tr>
<td>Monitoring Changes</td>
<td>7.0</td>
<td>1.35</td>
</tr>
<tr>
<td>Taking Action</td>
<td>6.4</td>
<td>1.59</td>
</tr>
<tr>
<td>Emotional Wellbeing</td>
<td>6.4</td>
<td>1.38</td>
</tr>
<tr>
<td>Social Life</td>
<td>6.0</td>
<td>1.51</td>
</tr>
<tr>
<td>Healthy Lifestyle</td>
<td>6.5</td>
<td>1.23</td>
</tr>
<tr>
<td>Total Score</td>
<td>71.0</td>
<td>8.68</td>
</tr>
</tbody>
</table>

1A t-test could not be carried out on the Attending Appointments item because the initial and final scores were identical for all participants.