

## Older Adults and Hearing Aids

Kari R. Lane\*

*Sinclair School of Nursing, University of Missouri, 11 Hospital Dr., Columbia, MO 65211, USA*

\*Corresponding author: Kari R. Lane, Sinclair School of Nursing, University of Missouri, 11 Hospital Dr., Columbia, MO 65211, USA, Tel: 573-882-0285; Fax: 573-884-4544; E-mail: laneka@missouri.edu

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### Abstract

**Background:** Working with older adults and their hearing problems can be a challenge. This intervention titled "Hearing Aid Reintroduction-HEAR©" was developed to specifically address the challenges older adults face when attempting to adjust to hearing aids.

**Objective:** The aim of this study was to provide preliminary data using theories of Critical Educational Gerogogy and International Classification of Functioning.

**Methods:** Fifteen participants were instructed to use the HEAR intervention following a systematic 30-day program. These participants gradually increased the time hearing aids were worn while consecutively increasing the listening difficulty level.

**Conclusion:** The older adult participants aged 70-85 years increased their hearing aid use time between 1-8 h per day with 50% of participants able to wear the hearing aids for at least 4 h. Hearing aid satisfaction also improved. While the HEAR intervention may be feasible, additional testing is warranted.

**Keywords:** Hearing loss; Presbycusis, Hearing aid; Adjustment; Audiology; Older adults

older adults [11,12]. Interdisciplinary efforts may strengthen adherence in this group [13].

### Introduction

Older adults between the ages of 65 and 75 years' experience age related hearing loss, or presbycusis, frequently. As many as 38% of older adults in this age range have some form of hearing loss and that number rises to 54% as persons continue to age [1]. It is concerning that many of these older adults also fail to adjust to hearing aids the first time they try to wear them. This may be due to the timeframe from onset of hearing loss to treatment, however, a substantial number of older adults' struggle. This has been termed "hearing aids in the drawer" as persons buy the hearing aids and then stop wearing them and instead of returning the aids, they leave them in their dresser drawers, forgotten [1-3].

### Literature Review

Researchers have found associations between hearing loss multiple co-morbidities in recent years. These co-morbidities include: decreased quality of life, depression, delirium, social isolation, and ability to complete activities of daily life [4-7]. Perhaps more importantly, many older adults feel unsafe in their homes due to the inability to hear warning alarms, doorbells, and the phone ringing [8,9].

Hearing aids are the most common treatment for presbycusis, in the absence of hyperacusis. Evidence has been found that supports hearing aids improve quality of life [10]. Nurses have a need to improve communication with older adults in order to provide health related teaching. Healthcare practitioners, such as nurses, nurse practitioners, nurse care managers, physicians, and physician assistants are in an ideal situation to influence and encourage hearing aid adjustment in

### Methods

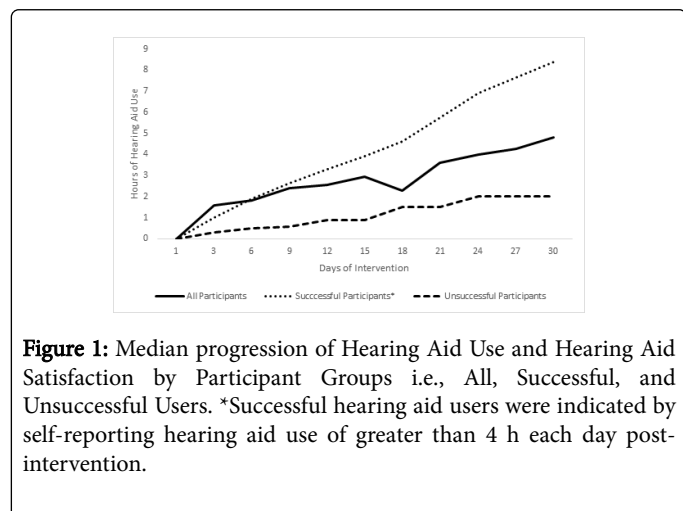
The Hearing Aid Reintroduction (HEAR)© intervention is a gradual and systematic reintroduction to hearing aids. Designed by the author using patient-centered approaches, HEAR© addresses sensory overload and uses both Critical Educational Gerogogy (CEG) and International Classification of Functioning (ICF) theories to support its implementation [14-17]. The CEG focuses on learning guidelines for older adults including pacing activities, repetition, reinforcement, reading levels, appropriate terminology, structure, and hands-on learning [14,15]. ICF focuses on abilities as well as personal factors and environmental modifications [16,17]. The HEAR intervention uses these principles to assist the older adult in advocating for themselves with practical hands-on activities, practice, and frequent reinforcement [13].

The HEAR intervention begins the duration of hearing aid use at one hour per day and increases this time one hour every three days. Sound complexity is increased each day as well. Beginning with listening to sounds the house makes (fans, furnace, dishwasher, etc) to much more complex listening situations such as crowded restaurants or theaters. The intervention is currently supported through the use of a workbook that helps to guide the participant through the 30-day intervention. The workbook provided detailed participant instructions, helpful tips, and encouragement. The participant is able to record the amount of time they wore their hearing aids as well as their listening environment and any concerns or questions they experienced. The workbook was printed in a large font and worded at a 5th grade reading level. A registered nurse also visited with the participant, in

addition to audiology visits, on a weekly basis. The nurse provided additional support, answered questions, and practiced more difficult skills with the participant [13].

**Study Design:** A single group pre/post-test design was used. We examined both hearing aid wear time and satisfaction with hearing aids in a convenience sample of 15 men and women. Researchers completed an a priori sample size calculation with a power level of 0.80 and alpha level of 0.05 indicating that 10 participants would be sufficient to detect a 2 h change in hearing aid wear time. The study was approved by the University Institutional Board Review Committee and all participants provided informed consent prior to screening. Inclusion criteria were those individuals who were over 60 years of age and had a hearing loss of some kind. The participants were included if they owned hearing aids, but did not wear them for more than two hours per day. Participants were also required to have functioning hearing aids (verified by a board certified audiologist on the study team) and be cognitively intact (deemed by a score of 4 or higher on the Six-Item Screener) [13,18].

The duration of hearing aid use was recorded by each participant in their workbook on a daily basis. If the participant inserted and removed their hearing aids more than once during the day we asked them to indicate what time they inserted and remove throughout the day. We decided a priori that four hours of hearing aid use during one day would indicate successful use. Satisfaction with hearing aids was measured using the Glasgow Hearing Aid Benefit Profile (GHABP) using one question “How satisfied are you with your hearing aids?” both before and after the intervention [19]. The GHABP has been deemed valid and reliable by Gatehouse [19].

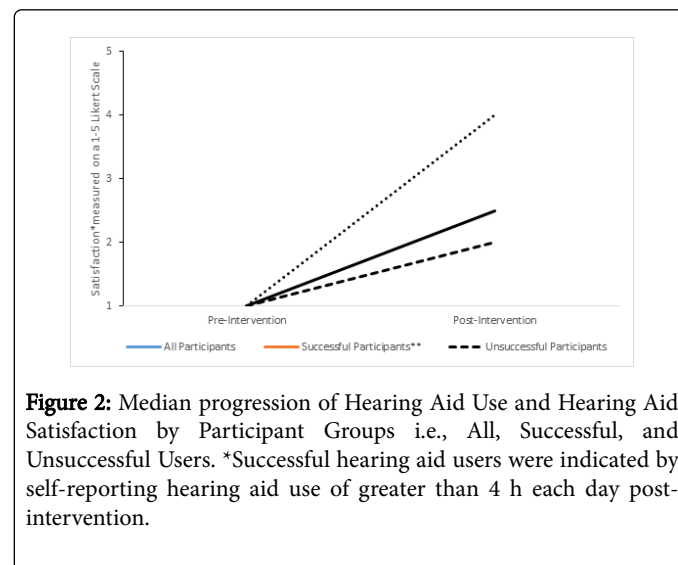


**Figure 1:** Median progression of Hearing Aid Use and Hearing Aid Satisfaction by Participant Groups i.e., All, Successful, and Unsuccessful Users. \*Successful hearing aid users were indicated by self-reporting hearing aid use of greater than 4 h each day post-intervention.

**Data Analysis:** After data was cleaned, entered into a database, and verified, differences in pre and post-test scores on hearing aid use and satisfaction were analyzed using Wilcoxin signed-rank test for non-parametric variables. The data analysis was completed using SAS 9.8 statistical software [13].

**Results:** This sample of 15 adults aged 70-85 years had a mean of 78 years. The sample was primarily Caucasian with one African American. Most completed college. Most paid for their hearing aids out of pocket (without insurance). The median hours of hearing aid use are depicted in Figures 1 and 2. Successful participants increased their hearing aid use from pre-test to post-test from 0 h to 8.4 h compared to unsuccessful participants 0 h to 2 h (p=0.0001) [13]. In addition, the satisfaction with hearing aids increased from pre-test to

post-test in successful participants 1-4 and unsuccessful participants 1-2 (p=0.0037) [13].



**Figure 2:** Median progression of Hearing Aid Use and Hearing Aid Satisfaction by Participant Groups i.e., All, Successful, and Unsuccessful Users. \*Successful hearing aid users were indicated by self-reporting hearing aid use of greater than 4 h each day post-intervention.

### Limitations

There are several limitations to this paper, including the small sample size and lack of a control group. Future studies will enhance the sample size and add randomized control groups. A single-group pretest-posttest design was chosen for two reasons, as participants had already experienced a failure to adjust, they have served as their own control group. Secondly, this preliminary work will assist in determining safety and efficacy, as is consistent with Phase I trials. This small non-random study will help to pave the path for future studies. As it stands one-half of participants, remained unsuccessful, and further exploration will be needed. In addition, diversity was minimal in the sample size, this limitation may influence how the intervention workbook is presented and further developed.

### Discussion

These results provide some preliminary evidence that at least some older adults can benefit from CEG and ICF approaches to hearing aid adjustment. Literature supporting the use of CEG in hearing aid adjustment was not found in the literature previously and little was found related to older adults with failed attempts at adjustment. This study provides preliminary data that may be of use to develop interventions for improving adherence in this group. Further studies are still needed [13]. We have found very little published literature evaluating the effects of any intervention to facilitate hearing aid adjustment with older adults who had a previous failure. Further studies are needed to determine sustainability.

There may be a need for additional nursing support in the adjustment phase of hearing aid education. Nursing support has been noted to include care managers, who are able to facilitate change due to the ability to know their patients well, and understand their needs for learning and adjustment. Care managers use evidence-based practices to provide support in making behavior changes. By assisting with behavioral and emotional impact on the patient, care managers can increase perceived empowerment and support patients to develop confidence.

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