

Quantifying the Obvious: The Impact of Hearing Aids on Quality of Life

Sergei Kochkin, Ph.D.
Knowles Electronics Holdings, Inc.
Itasca, Illinois USA.

Introduction

At a press conference in May 1999 Dr. James Firman , President and CEO of the National Council on the Aging (NCOA) released some of the findings from perhaps the largest study ever conducted in the world on the effects of untreated hearing loss on adults with hearing loss as well as their families. The study, which was commissioned by the NCOA was funded by the Hearing Industries Association (HIA). The actual field work and analysis was conducted by the Seniors Research Group utilizing the National Family Opinion Panel (NFO).

The purpose of this synopsis paper is to present the executive level findings from the NCOA database as conducted by Knowles Electronics with the expectations that hearing health care providers, physicians and consumers will come to a greater understanding of the impact that hearing aids have on the lives of the hearing-impaired and their families.

Methodology

Sampling. In November, 1997 a short screening survey was mailed to 80,000 members of the National Family Opinion (NFO) panel. The NFO panel consists of households that are balanced to the latest U.S. census information with respect to market size, age of household, size of household, and income within each of the nine census regions, as well as by family versus non-family households, state (*with the exception of Hawaii and Alaska*) and the nation's top 25 metropolitan statistical areas.

The screening survey covered only three issues: 1) physician screening for hearing loss, 2) whether the household had a person "*with a hearing difficulty in one or both ears without the use of a hearing aid*", and 3) whether the household had a person who was the owner of a hearing instrument. This short survey helped identify nearly 15,000 hearing impaired individuals and also provided detailed demographics on those individuals and their households. The response rate to the screening survey was 65. Next a sample of 3,000 individuals with a self-admitted hearing loss ages 50 and over were randomly drawn from the identified panel of hearing-impaired households. Equal samples of 1,500 hearing aid owners and non-owners were drawn from the panel.

Survey design. Utilizing information from previously developed industry surveys (*Knowles MarkeTrak, Knowles/Northwestern University Pygmalion survey*), interviews with industry researchers and academia, and a review of the literature on the psychosocial and physical aspects of hearing loss, Senior Research Group designed an eight page legal-size questionnaire comprised of 300+ questions for the individual with hearing loss and a four page legal-size questionnaire comprised of 150 questions for the spouse or family member of the identified respondent. The comprehensive survey covered a myriad of topics including: self and family assessment of hearing loss, psychological well-being, social impact of hearing loss, quality of relationships, life satisfaction, general health, self and family perceptions of benefit of hearing aid (*users only*), reasons for purchasing hearing aids (*users only*), reasons for not purchasing hearing aids (*non-users only*), and attitudes towards hearing health and hearing aids. In addition, a number of personality scales, which were deemed relevant to this study were included in the survey.

The National Family Opinion Panel (NFO), which conducted the field work for this study in the spring and summer of 1998, sent respondents one questionnaire for themselves and one for their spouse,

family member or close friend to fill out. The hearing-impaired respondent who received the survey packet was asked to give the survey to the family member or friend of their choice, who was most familiar with them. While hearing aid owner and non-owner samples were matched on important census demographics, NFO was unable to match them on severity of hearing loss, since hearing loss was not measured in the MarkeTrak screening panel survey.

Response rates were impressively high among both the hearing impaired and their family or friends, 79% and 71% respectively (*sample sizes of 2,364 and 2,132 respectively*). After analyzing the returned surveys for usability (*e.g. minimal missing information*), in excluding the substantial number of hearing aid owners who rarely or never used their hearing aids, and in choosing family survey returns which also had a concurrent respondent survey, the final sample sizes for respondents and family members were reduced to 2,069 and 1,710 respectively.

Hearing loss assessment measure. As part of the research design, in addition to quality of life items a paper and pencil assessment of hearing loss was administered with the anticipation that the results of this assessment would be used to control for hearing loss when comparing the quality of life of hearing aid users and non-users. The key hearing assessment tool used was the American Academy of Otolaryngology-Head and Neck Surgery Five Minute Hearing Test (FMHT). The FMHT is a fifteen question test measuring self-perceived hearing difficulty in a number of listening situations (*e.g. telephone, multiple speakers, television, noisy situations, reverberant rooms*) as well as self-assessments of some signs of hearing loss (*e.g. people mumble, inappropriate responses, strain to hear, avoid social situations*). Each item of the FMHT is traditionally scored on a four point scale taking the values “never”, “occasionally”, “half the time” and “almost always”. The developers of the NCOA survey utilized a 5 point Likert attitude scale with the end-point anchors “Strongly agree” and “strongly disagree”. Previous research has shown that the FMHT is significantly correlated with standard audiological measures such as speech reception thresholds (SRT), speech discrimination scores (SDS), air conduction thresholds, and pure tone measures.

Respondent subjective hearing loss scores were simply calculated as the mean of the fifteen items (since the FMHT is unidimensional). Next respondents were grouped into one of five hearing loss quintiles based on their mean overall subjective hearing loss score. Each quintile represents 20% of the total sample. These ranged from quintile 1 (*the 20% of respondents with the least severe hearing loss as measured by the FMHT*) to quintile 5 (*the 20% with the greatest hearing loss*). The quintile system was utilized for all analysis as a means for controlling for differences in hearing loss between hearing aid user and non-user samples.

Results.

Demographics and analysis. In general all five cohorts were reasonably balanced on nearly all demographics including age, sex, marital status, occupation, etc. However, household income was shown to decrease as a function of hearing loss with age controlled, but less severely for hearing aid users. For each of the five cohorts on the wide variety of variables measured in this study, mean differences between aided and unaided subjects were statistically compared using the t-test procedure or the z test for differences for proportions.

Key findings. The results for this study were impressive and we believe corroborated by the smaller correlational and experimental studies as reported in the literature. Hearing aids clearly are associated with improvements in the social, emotional, psychological, and physical well-being of people with hearing loss in all hearing loss categories from mild to severe. As such, these findings clearly provide

strong evidence for the value of hearing aids in improving the quality of life of people with hearing loss. Specifically hearing aid usage is positively related to the following quality of life issues: Greater earning power (especially the more severe hearing losses); Improved interpersonal relationships (especially for mild-moderate losses) including greater intimacy and lessening of negative dysfunctional communication; reduction in discrimination toward the person with the hearing loss; reduction in difficulty associated with communication (primarily severe to profound hearing losses); reduction in hearing loss compensation behaviors; reduction in anger and frustration; reduction in the incidence of depression and depressive symptoms; enhanced emotional stability; reduction in paranoid feelings; reduced anxiety symptoms (however, this could be related to lower income and reduced physical health status, which are also correlates of hearing aid usage); reduced social phobias (primarily severely impaired subjects); improved belief that the subject is in control of their lives (locus of control); reduced self-criticism; Improved cognitive functioning (primarily severe to profound hearing loss); improved health status and less incidence of pain; and enhanced group social activity.

Secondly in this study both respondents and their family members were asked to independently rate the extent to which they believe their lives were improved specifically due to hearing aids. Both the mild and the more serious hearing loss groups reported significant improvements in nearly every area measured; Relationships at home and with family, Feelings about self, Life overall, Mental health, Social life, Emotional health, Physical health.

Given that this is an observational study, that is we compared hearing loss subjects both aided and unaided, we cannot of course, say that hearing aid usage ‘caused’ all these wonderful quality of life improvements. Short of stating definite causality, the evidence is quite compelling and perhaps suggestive of causality for the following reasons:

- < The sample, the largest of its kind is nationally representative of hearing loss subjects ages 50 and above. Thus, we need not be concerned with spurious findings due to sampling methodology.
- < Many of the findings held up across all hearing loss quintiles from mild to profound.
- < The specific findings were corroborated within the study. That is we noted significant differences between users and non-users. Secondly at the end of the survey we asked respondents and their family members to specifically indicate if their life was improved as a result of wearing hearing aids in 16 quality of life areas. Both respondents and their family members indicated significant benefit due to hearing aids in most areas measured.
- < The differential efficacy between the 16 quality of life parameters noted by respondents and their family members (low of 4% to high of 74% improvements) indicates that a positive halo or acquiescence did not exist in this sample of respondents.
- < The survey findings are consistent with other correlational and especially the randomized control studies and pre-post hearing aid fitting studies among smaller more narrowly defined samples.
- < The findings are consistent with the literature on factors impacting hearing loss; that is the theoretical improvements which should occur if hearing loss is alleviated.
- < The findings are consistent with the observations of clinicians and dispensers of hearing aids.
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A Call to Action

We believe that this study challenges every segment of the hearing aid industry to intensify interaction and communication with the medical community about the value of hearing aids in alleviating many of the problems associated with hearing loss. We believe this study also demonstrates for the first time that individuals with even a mild hearing loss can experience dramatic improvements in their quality of life. This finding is significant because we believe that the challenge to the hearing aid industry is to demonstrate to “baby-boomers” with emerging hearing losses that we offer something to them of value

early on in their lives and that they do not need to wait until retirement to receive service from us. If we can change our messages about hearing loss and its treatment, hearing aids, we can begin a dialogue with people who need our products and services but who, up until now, may not have recognized their problem or comprehended what we can offer.