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The Burden of Hearing Loss on the Quality of Life Among Adults with Medicare Supplement Insurance

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Presenter Disclosures

Kevin Hawkins, PhD

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No relationships to disclose



Background

- Hearing loss affects approximately one-third of Americans 60 years and older and can have a significant negative impact on the quality of life (QOL) of seniors. (1)
 - Based on data from the 2008 Medicare Health Outcomes Survey (HOS), nearly 15% of adults in Medicare managed plans have self-reported hearing loss. (2)
- Hearing loss may affect individuals in ways that may not be communicated to healthcare providers in a typical setting.
 - Problems associated with hearing loss may be depression, apparent inattention or cognitive impairment, strained social relationships, emotional issues, social isolation, decreased functioning and reduced alertness leading to safety issues. (3)
- Of the 36 million Fee-For-Service Medicare enrollees in 2009, 27% purchased Medigap coverage (4)
 - Although this group is large, very little research had been done exclusively on them.

Objectives



- The primary objectives of this study were to:
 - Estimate the prevalence of hearing loss among those with Medicare Supplement Insurance (i.e. Medigap) coverage.
 - Identify characteristics (patient demographics, socioeconomics, and health status) associated with hearing loss.
 - Evaluate the association between hearing loss and self-reported QOL.

Population Studied



- About 2.9 million people are covered by an AARP® Medicare Supplement Insurance plan.
 - These plans are insured by UnitedHealthcare Insurance Company (for New York residents, UnitedHealthcare Insurance Company of New York).
 - These plans are offered in all 50 states, Washington DC, and various US territories.
- The Health Update Survey (HUS) was administered to 15,000 insureds in May 2008.
 - The HUS is a self-administered survey that includes all the questions on the Medicare Health Outcomes Survey (HOS).
 - The instrument includes several questions on demographics, socioeconomics, chronic medical conditions, and health status measured via the Veteran's RAND (VR) -12 item survey.
 - The VR-12 is widely used and validated in other applications with older adults (5,6).

Methods



- Study respondents were categorized into one of two groups based on their response to the survey question, “Can you hear most of the things people say—with a hearing aid if that’s how you hear best?” questions about hearing loss:
 - Those who responded “no” and are likely to have hearing loss
 - Those that responded “yes” represented the comparison group (i.e. no-hearing loss)

Three analyses were performed:

Analysis One: Descriptive Table-Described the sample and compared demographics, socioeconomics, clinical characteristics, and QOL measures between the hearing loss and no hearing loss group using univariate techniques without adjusting for differences in case-mix.

- Case-Mix (independent variables)
 - Demographics-age, gender, race, marital status, and residence
 - Socioeconomics-income and education
 - Health Status- Body Mass Index (BMI), 10 common chronic conditions (e.g. diabetes, hypertension, etc.), and an indicator if the survey was completed by the person it was addressed to or by someone else.
 - QOL (Outcome Measures)-Psychical (PCS) and Metal (MCS) Component Scores
- Chi-square and Student t tests were used to test for differences in categorical and continuous variables.

Statistical Analysis

Analysis Two: Propensity Weighted Descriptive Tables

- Similar to analysis one, but was case-mix adjusted to account for demographic, socioeconomic and clinical differences between the groups. Propensity score weighting techniques were used to adjust the case-mix between those with and without hearing loss.
- The propensity score analyses involved four steps.
 - Step 1: A logistic regression design to estimate the impact of each case-mix measure on the log-odds of hearing loss was estimated.
 - Step 2: The log-odds values obtained for each person in the sample were converted to his or her predicted probability of being in the hearing loss or no hearing loss group where he or she actually belongs.
 - Step 3: Involved creating case weights for each respondent and using these weights to re-estimate all of the values for each of the case-mix and QOL measures.
 - Step 4: Compared quality of life for those in the hearing loss and comparison group, using the weighted data to adjust for case-mix differences.



Statistical Analysis

- **Analysis Three:** Used weighted Ordinary Least Squares (OLS) models to estimate the impact of hearing loss on the QOL measures controlling for case-mix differences.
 - Independent variables were the same as those used in the logistic modeling with the addition of an indicator for hearing loss
 - Outcome measures were the PCS and MCS
 - This second stage regression
 - *Adjusted for any remaining differences between the groups after PS weighting*
 - *Allowed for the comparison of the impact of hearing loss to other common chronic conditions on QOL*



Results – Respondent Characteristics

- The survey response rate was 37%, with a final sample size of 5,515 beneficiaries after all exclusions were applied. Of these, 573 (10.4%) had hearing loss.
- Respondents had the following characteristics:
 - 94.9% of respondents were White.
 - Most, 56.5% were 75 years of age or older.
 - 58.1% were female.
 - Most (54.2%) had higher than a high school education.
 - 45% were in the middle income ranges of \$20,000 - \$79,999.
 - Most respondents were overweight or obese (57.4%).
 - The most common comorbidity was hypertension (61.4%), followed by arthritis of the hip/knee (37.8%) and arthritis of the hand/wrist (35.3%).



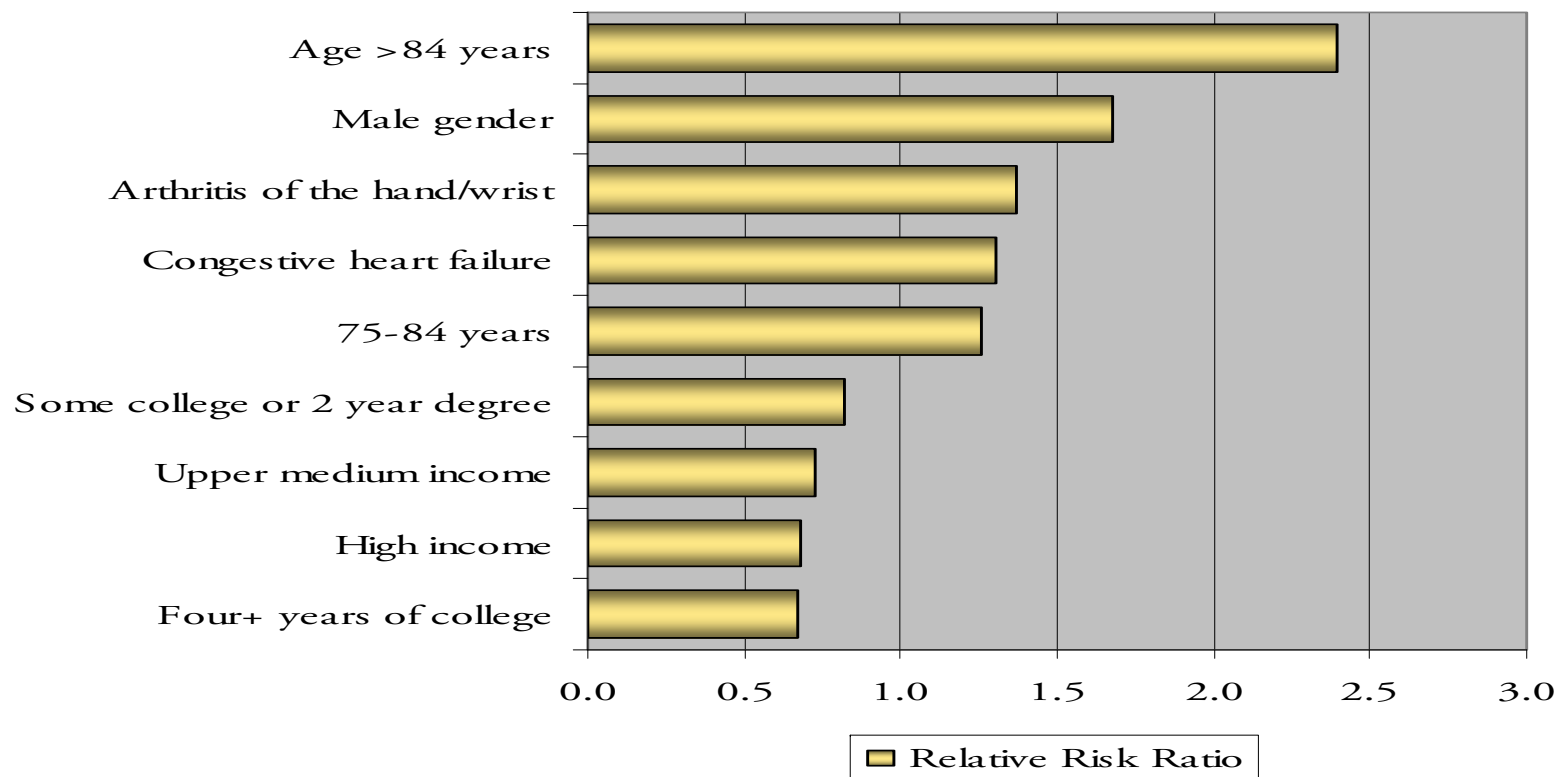
Results – Predictors of Hearing Loss

- Based on logistic regression models, numerous demographic and clinical characteristics predicted the likelihood of hearing loss.
- The following chart shows the Relative Risk Ratio (RRR) for each independent variable.
- The RRR shows the likelihood of having hearing loss relative to the comparison group.
 - A RRR greater than one represents an increased likelihood of hearing loss; whereas, a value less than one represents a decreased likelihood.
 - For example, those aged 85 years or older were 2.4 times as likely to be at risk of hearing loss; whereas, those with four or more years of college were 0.6 times as likely to be at risk of hearing loss.
- Only the statistically significant variables (each $p < 0.01$) are shown.

Results – Predictors of Hearing Loss



Statistically Significant Logistic Regression Models
Predicting the Likelihood of Hearing Loss

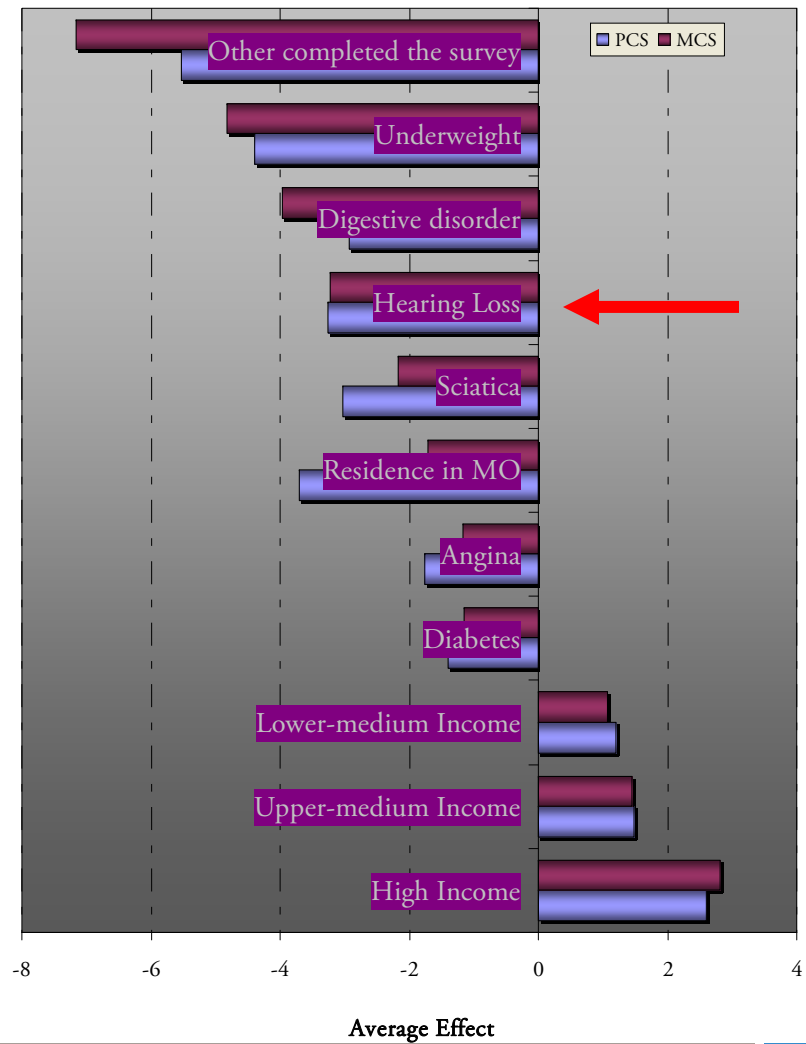


Results – Quality of Life



- The results of the OLS models showing the impact of hearing loss, respondent demographics, socioeconomics, and health status on QOL are shown on the next slide.
 - The graph shows the average effects of the significant ($p < 0.01$) variables in the model.
 - The average effect measures each variables independent impact on QOL relative to the comparison group.
 - A negative average effect indicates a negative impact on QOL while a positive average effect indicates a positive impact on QOL.
- Hearing loss was one of the greatest negative factors affecting QOL.
 - Hearing loss decreased the average physical component score (PCS) and mental component score (MCS) by 3.22 and 3.25 points, respectively.

Statistically Significant Weighted Ordinary Least Squares Regression Models Predicting QOL Summary Scores



Conclusions



- In this study, the percent of respondents reporting hearing loss (10.4%) was lower than findings using HOS survey data based on managed Medicare plans (15%) and significantly lower than average estimates for the entire Medicare population (~30%). (1,2)
 - These differences are likely attributable to the overall better health status of AARP® Medicare Supplement Insurance plan members compared to the HOS members as measured by higher PCS and MCS scores.
- Demographic and clinical predictors of hearing loss were consistent with previous reports.
- Higher socioeconomic status (income and education) was associated with lower risk of hearing loss.
 - We speculate that this is attributable to decreased exposure to environmental noise hazards years earlier while at work.
- The similar impact on PCS and MCS indicates the importance of hearing loss from both a physical and mental health standpoint.
- Hearing loss had a stronger negative influence on QOL (PCS and/or MCS) than most of the comorbidities measured, namely heart problems, diabetes, hypertension, and arthritis.

Limitations



- Consists only of beneficiaries with AARP Medicare Supplement Insurance plan coverage.
- Limited to respondents at least 65 years of age.
- The response rate was 37% and the time frame of the study (12 months) was limited.
- Self reported nature of survey.
- Temporal relationship of hearing loss and QOL is not known.

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