



Perception of quality of life for adults with hearing impairment in the LGBT community

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ABSTRACT

The purpose of this study was to examine the perception of both generic and disease-specific quality of life (QoL) in adults with hearing impairment who are members of the lesbian, gay, bisexual, and transgender (LGBT) community. Eighty-three adults who self-identified as having hearing impairment and as being members of the LGBT community and 80 adults with hearing impairment who do not self-identify as being members of the LGBT community (comparison group) participated in this study. The mean age of the participants in the LGBT group was 64.65 years, and the mean age for the comparison group was 63.26 years. Demographic information about the participants included: self-identification in the LGBT community, age, current and previous gender, relationship status, and hearing aid use. Participants received an audiometric evaluation and completed a disease-specific QoL instrument (Hearing Handicap Inventory for the Elderly/Adults) and a generic QoL instrument (Short-Form 36 Health Survey). The results from this study indicate that factors such as gender, relationship status, and hearing aid use are related to the perception of QoL for individuals with hearing impairment who are members of the LGBT community. Differences were found between the participants in the LGBT group and the comparison group.

Learning outcomes: After reading this article, readers should be able to: (1) describe the disease-specific QoL affects of hearing loss on members of the LGBT community compared with a group of adults with hearing impairment who are not members of the LGBT community, (2) describe the gender differences in perception of QoL for members of the LGBT community and participants not in the LGBT community, and (3) discuss clinical implications of the findings.

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1. Introduction

According to the World Health Organization (1997), the measurement of health and health-related outcomes should include some estimation of a person's well-being, which can be assessed by measuring the improvement in the quality of life (QoL) related to health care. A simple definition for the QoL is "how good or bad you feel your life to be" (Bradley et al., 1999, p. 80). The measurement of QoL can be accomplished by using generic or disease-specific instruments. Generic QoL instruments assess the perception of the overall health of a person while disease-specific QoL instruments focus on the perceptions related to a specific disease or disorder. Examples of generic QoL instruments that have been used in audiology

Abbreviations: QoL, quality of life; SIP, sickness impact profile; HHIA, Hearing Handicap Inventory for adults; HHIE, Hearing Handicap Inventory for the Elderly; CPHI, communication profile for the hearing impaired; SF-36, short form 36 health survey; MCS, mental component summary of SF-36; PCS, physical component summary of the SF-36; LGBT, lesbian, gay, bisexual, and transgender; BPTA, better ear puretone average; SNR, signal-to-noise ratio.

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include the short form health survey (SF-36; Ware & Sherbourne, 1992), sickness impact profile (SIP; Bergner, Bobbitt, Carter, & Gilson, 1981), and the World Health Organization's Disability Assessment Schedule II (WHO-DAS II; World Health Organization, 1999). Examples of disease-specific QoL instruments used widely in audiology include the communication profile for the hearing impaired (CPHI; Demorest & Erdman, 1987), Hearing Handicap Inventory for the Elderly (HHIE; Ventry & Weinstein, 1982), and the International Outcomes Inventory-Hearing Aids (IOI-HA; Cox & Alexander, 2002).

Health-related QoL has been the focus of research in audiology. While a person's extent of hearing impairment is correlated with QoL, extent of hearing impairment in and of itself is not a good predictor of QoL (Mulrow et al., 1990). According to the National Institutes of Health (U.S. Department of Health and Human Services, 2010), many factors influence QoL including cultural, psychological, interpersonal, philosophical, and health status. Researchers have specifically examined some of the factors that contribute to hearing-related QoL: age (Gordon-Salant, Lantz, & Fitzgibbons, 1994), auditory processing (Fire, Lesner, & Newman, 1991; Jerger, Oliver, & Pirozzolo, 1990), gender (Garstecki & Erler, 1999), and personality (Cox, Alexander, & Gray, 2007).

The negative consequences of hearing impairment have been investigated using QoL instruments. Bess et al. (1989) reported that older adults' scores on the SIP increased as hearing impairment increased. Similar results have been found more recently in large population-based studies. Chia et al. (2007) and Dalton et al. (2003) found, for adults ages 49 years and older, that poorer scores on the SF-36 were associated with more severe levels of hearing impairment.

Interventions for hearing impairment have been shown to improve QoL in both generic and disease-specific instruments. Interventions for hearing impairment encompasses many clinical services including the provision of hearing aids, cochlear implants, hearing assistance technology and audiologic rehabilitation (defined as clinical services aimed at reducing or preventing the effects of hearing impairment on communication and functioning). Abrams et al. (2002) reported significant improvement for the mental component summary (MCS) scale of the SF-36 in a group of adults who wear hearing aids. Chisolm et al. (2007) conducted a meta-analysis and found that the provision of hearing aids did improve adults' health-related QoL as measured by both generic (SF-36) and disease-specific (HHIE) instruments. Preminger and Meeks (2010) used a disease-specific instrument (HHIE) and its significant other version (HHIE-SP; Newman & Weinstein, 1988) to examine the congruence of disease-specific QoL between couples. They found a relationship between negative affect and perceived disease-specific QoL. Hawkins (2005) reviewed the results of 12 studies that used group programs emphasizing counseling and communication strategies. He concluded that there was evidence to suggest that there is short-term benefit from participation in this type of program, including improvement in the perception of QoL.

As stated previously, the perception of QoL is influenced by cultural factors. Growing interest in the diversity of individuals with communication disorders has prompted researchers, clinicians, and organizations such as the American Speech-Language-Hearing Association (ASHA) to focus on groups that contribute to the diversity of the clinical population. In the cultural competency document, ASHA lists the following sources of diversity: "ethnicity, religious beliefs, sexual orientation, socioeconomic levels, regionalisms, age-related peer groups, educational background and mental/physical disability" (American Speech-Language-Hearing and Association, 2004, p. 1). Inclusion of sexual orientation reflects a growing recognition that diversity arises from sources other than those traditionally seen as contributing to diversity: that is, minority racial and ethnic groups.

For the purposes of this discussion, sexual orientation is defined as one's location along a continuum between attraction to someone of a different (heterosexual) and the same (homosexual) gender as one's own self-identified gender. Groups of people who fall on the homosexual end of the continuum include lesbian, gay and bisexual (or pansexual) people who tend to enter into same-sex relationships. While members of these groups comprise a minority of people in the United States, speech-language pathologists and audiologists are likely to encounter members of this community in their clinical practices. Population estimates are difficult to derive because some ethnic groups are less likely to identify as belonging to these groups because of the stigma present in the mainstream culture (Pathela et al., 2006; Ross, Essien, Williams, & Fernandez-Esquer, 2003) and possible alienation from family and community (U.S. Department of Health and Human Services, 2003). However, Mosher, Chandra, and Jones (2005) reported that there are 4.5 million Americans between the ages of 18 and 44 years that self-identify as homosexual or bisexual. According to the 2000 U.S. Census (n.d.), at least one household was headed by a same-sex couple in 99% of the counties in the United States.

The differences in QoL based on sexual orientation or sexuality have generally not been the focus of research. Sandfort, Graaf, and Bijl (2003) used the SF-36 to examine differences between homosexual and heterosexual adults. They found that heterosexual men reported higher levels of general and mental health, emotional role functioning, social functioning, and vitality than heterosexual men. However, the same differences were not found between homosexual and heterosexual women. King et al. (2003) reported that homosexual men and women had significantly greater levels of psychological distress than their heterosexual counterparts. Little research has addressed the group of adults with hearing impairment who are also members of the lesbian, gay, bisexual, and transgender (LGBT) community. A decade ago, LeBlanc and Tully (2001) stated this under-represented group was an example of "professional neglect through not being recognized as a group worthy of exploring" (p. 58).

One of the authors and a colleague (Kelly & Robinson, 2011) used a web-based survey to examine potential barriers to seeking and receiving services for communication disorders as perceived by people in the LGBT community. While the percentage of adults with hearing impairment seeking services in this survey was similar to that reported by Kochkin (2005), only 4% of the people who reported seeking services also reported disclosing their sexual orientation and/or identity to their clinicians. Participants who did not disclose this information to their clinicians tended to report that they were afraid to

disclose that information because they did not want to be perceived or treated in a negative way. This fear seemed to be well-founded because the majority of participants also felt their clinicians exhibited bias towards a heterosexual orientation and lifestyle. Despite the perception of bias, the vast majority of participants felt it was important to be able to disclose their sexual orientation and/or identity. Finally, when participants were asked if they felt their membership in the LGBT community would pose a barrier to seeking services for their hearing impairment, participants felt it would.

In a previous exploratory study, the authors (Kelly & Atcherson, 2011) used generic (structured interview) and disease-specific (HHIE) QoL instruments to compare the perception of QoL in non-consulting adults with hearing impairment who are in same-sex versus different-sex relationships. The results indicated that there are perceived differences in disease-specific QoL based on sexual orientation. Using the HHIE, participants with hearing impairment in the different-sex relationships reported significantly more emotional consequences of hearing impairment than those in the same-sex relationships. In addition, when comparing between members of the couples, those in the different-sex relationships reported significantly more emotional and total consequences than their significant others. There were no significant differences in perceived consequences of hearing impairment between the members of the same-sex couples as measured by the HHIE. There were also differences based on the generic QoL interview based on sexual orientation. More participants in the same-sex group reported emotional health and social life as contributors to overall QoL than participants in the different-sex group. Participants in the different-sex group tended to report physical health, emotional health, and spirituality as contributors to overall QoL. Similar to the HHIE results, couples in the same-sex group demonstrated more congruity of themes than couples in the different-sex group.

One of the main limitations in the Kelly and Atcherson (2011) exploratory study was the small sample size, which was limited only to those who had not consulted for services. The small number of participants in that study precluded the ability to examine factors that may have contributed to the perception of QoL for the under-studied same-sex group. The purpose of this present study was to more closely examine the perception of both generic and disease-specific QoL in adults with hearing impairment who are members of the LGBT community.

2. Materials and methods

2.1. Participants

Ethical approval for this study was obtained from the University of Arkansas at Little Rock Institutional Review Board and the University of Canterbury Human Ethics Committee. Demographic information about the study participants is shown in Tables 1 and 2. Participants for this study were divided into two groups. The first group (LGBT group) was recruited from the database of participants who previously participated in the web-based survey and the exploratory study, and by word of mouth. Participants met the following inclusion criteria: (1) at least 18 years of age, (2) acquired hearing impairment as an adult, (3) self-identify as a member of the LGBT community, and (4) willing and able to travel to a hearing clinic for data collection. Another group of participants was recruited and used as a comparison group. The participants in the comparison

Table 1
Number of participants who self-identified with terms used to describe membership in the LGBT community.

Term	Male (N = 55)	Female (N = 28)
Bisexual	5	4
Gay	50	3
Lesbian	0	24
Transgender	0	0
Other (please specify)	0	0

Note: Because participants were allowed to select more than one term, the totals for each gender may be greater than the total number of participants in the LGBT group.

Table 2
Number of participants who self-identified in each category for the non-continuous variables for both groups.

Variable	LGBT (N = 83)	Comparison (N = 80)
Gender		
Male	55	46
Female	28	34
Relationship status[*]		
In relationship	44	57
Not in relationship	39	23
HA use		
Aided	35	43
Unaided	48	37

* Variable is significant at $p < 0.05$.

group were recruited in the same manner and by posting advertisements online and in various community centers. Participants in the comparison group met the same inclusion criteria as the LGBT group, with the exception of self-identification in the LGBT community. Participants in this group must not self-identify as a member of the LGBT community.

There are three main ways that researchers define members of the LGBT community for research purposes (Berg-Kelly, 2003; Hegna & Larsen, 2007; Marshal, Friedman, Stall, & Thompson, 2009; Remafedi, French, Story, Resnick, & Blum, 1998; Silenzio et al., 2007; Thompson & Morgan, 2008; Worthington, Navarro, Savoy, & Hampton, 2008). One way is to ask participants about their sexual attraction. A second way is to ask them about their sexual behaviour. Finally, researchers can ask participants about their sexual identity or self-label. These three methods may be assessing different aspects of sexuality because the results produced using each do not always align. In addition, people may change in their attraction, behaviour, and self-identity over time in different ways (Diamond, 2008; Dickson, Paul, & Herbison, 2003; Fergusson, Horwood, Ridder, & Beautrais, 2005). When comparing more than one method of assessment the literature seems to indicate that reporting same-sex behaviour is more common than reporting same-sex identity (Wells, McGee, & Beautrais, 2011). Aspinall and Mitton (2008) argued that the use of self-identity is most appropriate when researchers wish to monitor discrimination of a group rather than monitor sexual behaviour per se. For the purpose of this paper, participants were recruited on the basis of self-identification.

One hundred and seventy-four (174) individuals were interested in participation in the study and were contacted via telephone and/or email by the first author to ensure they were eligible for participation. Of those interested, 168 met the inclusion criteria. Five of the eligible participants were unable to attend their scheduled appointments for data collection at a hearing clinic or did not return their data packets. Therefore, data were analyzed for the 163 people who completed data collection: 83 were in the LGBT group, and 80 were in the comparison group.

2.2. Procedures

To obtain an objective measure of the degree of hearing impairment, an audiological evaluation was performed on all study participants. Because the participants were located in various regions across the United States, the first author contacted audiologists in communities near the participants' residences to conduct the hearing evaluations. All hearing evaluations were conducted by clinicians holding the license necessary to obtain hearing evaluations in his or her state. Two audiometric variables resulting from the evaluation were included in the data analysis: better ear puretone average (BPTA) and signal-to-noise ratio loss (SNR loss). The BPTA is an average of the puretone thresholds at 0.5, 1, and 2 kHz for the better hearing ear. The SNR loss is obtained by administering the Quick Speech-in-Noise Test (QuickSIN; Etymotic Research, 2001) and represents the increase in signal (e.g., speech) relative to noise (e.g., speech babble) needed by a participant to understand speech in noise compared with people who have normal hearing. The QuickSIN is administered to both ears simultaneously. The greater the SNR loss value, the more difficulty the participant will experience understanding speech in background noise.

To assess the perception of disease-specific and generic QoL, participants were given the HHIE or HHIA and SF-36 at the time of their hearing evaluation. The HHIE contains 25 items that comprise two subscales: emotional consequences of hearing impairment and social/situational effects. The higher the HHIE score, the greater the perception of emotional and/or social consequences. The HHIA contains similar items, but is most appropriate for use with adults under the age of 65 years (Newman, Weinstein, Jacobson, & Hug, 1990). For ease of reference, the disease-specific QoL instrument will be labeled "HHIE" throughout this discussion. The SF-36 contains 36 response items that comprise eight subscales and two component scales: physical component summary (PCS) and mental component summary (MCS). The component scales are standardized to a mean of 50 and a standard deviation of 10. The higher the score on the SF-36, the more positive the perception of health status. The two subscales of the HHIE and the two component scales of the SF-36 were included in the data analysis.

Packets containing a copy of the hearing evaluation and the completed questionnaires were returned to the first author via mail. Participants were asked to return the packets containing the data sets to the researchers within one week of the hearing evaluation. If the packets were not returned within that time, participants were contacted to remind them to return the packets.

2.3. Data analysis

Descriptive statistics were calculated for all study variables. Analysis of variance (ANOVA) was used to examine differences between participants in the LGBT and comparison groups on the following variables: age, better ear puretone average, signal-to-noise ratio loss, HHIE Emotional scale, HHIE Social/Situational scale, SF-36 MCS and SF-36 PCS. For the each group, ANOVA was used to examine the perception of quality of life (i.e., HHIE and SF-36) based on the following grouping variables: gender, relationship status, and hearing aid status. That is, for each group, ANOVA was used to determine if there were any differences in perception of quality of life for: (1) males vs. females, (2) those in a relationship vs. those not in a relationship, and (3) those who wear hearing aids vs. those who do not. The alpha level for all tests was set at 0.05.

3. Results

When asked to select the terms that best described their membership in the LGBT community, participants were allowed to select more than one term. Most male participants in the LGBT group self-identified with the term "gay" and most female

participants in the LGBT group self-identified with the term “lesbian.” A total of 9 participants in the LGBT group self-identified as “bisexual” and no participants self-identified as “transgender” in this study. Table 1 shows the number of participants who self-identified with each term. Table 2 shows the distribution of participants in each group with respect to gender, relationship status, and hearing aid use. When asked to nominate their current gender, 55 participants in the LGBT group and 46 participants in the comparison group stated “male”. A total of 28 participants in the LGBT group stated “female” while a total of 34 participants in the comparison group stated “female”. The results of a crosstabulation indicated that the distribution of gender was not significantly different for the two groups ($\chi^2 = 1.328$, $p = 0.249$). When asked to nominate a previous gender, all of the participants reported “n/a” or nominated the same gender as their current gender. When asked their relationship status, 44 participants in the LGBT group reported being in a committed relationship and 39 reported not currently being in a relationship. Fifty-seven participants in the comparison group reported currently being in a committed relationship while 23 reported they were not. The results of a crosstabulation indicated that the distribution of relationship status for the two groups was significantly different ($\chi^2 = 5.749$, $p = 0.016$). Thirty-five participants in the LGBT group reported using hearing aids, while 48 reported they did not. In the comparison group, 43 participants reported using hearing aids and 37 reported they did not. The results of a crosstabulation indicated that the distribution of hearing aid use for the two groups was not significantly different ($\chi^2 = 2.190$, $p = 0.139$).

Means and standard deviations for the continuous study variables are shown in Table 3. There were no significant differences between the groups on audiometric variables; therefore, the groups were combined for the following analyses. When examining the relationship between the demographic and audiometric variables, there were no significant differences in participant age, BPTA, or SNR loss based on gender or relationship status. Participants who wore hearing aids exhibited significantly higher BPTA than those who did not wear hearing aids: $F(1,161) = 11.988$, $p = 0.001$. In addition, participants who wore hearing aids were significantly older than those who did not: $F(1,161) = 21.033$, $p < 0.001$. There was no significant difference between SNR loss and hearing aid status: $F(1,161) = 0.653$, $p = 0.420$.

There were significant differences between the groups on the quality of life (QoL) instruments. Participants in the LGBT group exhibited significantly higher scores on both the HHIE Emotional and Social/Situational scales than participants in the comparison group: $F(1,161) = 43.89$, $p < 0.001$ and $F(1,161) = 44.462$, $p = 0.036$, respectively. Participants in the LGBT group also exhibited higher scores on the SF-36 PCS than participants in the comparison group: $F(1,161) = 4.737$, $p = 0.031$. There was no significant difference between the groups on the SF-36 MCS: $F(1,161) = 1.192$, $p = 0.277$.

Tables 4 and 5 show the means, standard deviations, and effect sizes for the QoL instruments based on gender for the LGBT and comparison groups, respectively. Because there were significant differences between the groups based on the QoL

Table 3

Means, standard deviations, and effect sizes (Cohen's d) for the continuous variables for the study participants in both groups.

Variable	LGBT ($N = 83$)	Comparison ($N = 80$)	Effect size
Age (in years)	64.65 (5.89)	63.26 (6.25)	
BPTA ^a	54.14 (7.02)	52.75 (7.06)	
SNR loss ^b	11.25 (2.35)	10.91 (2.50)	
HHIE emotional scale [*]	12.31 (2.01)	10.09 (2.26)	$d = 1.034$
HHIE social/situational [*]	11.57 (1.90)	10.95 (1.80)	$d = 0.333$
SF-36 MCS	49.79 (7.94)	48.44 (7.81)	
SF-36 PCS [*]	41.51 (3.54)	40.23 (4.64)	$d = 0.310$

^a Average threshold in dB HL at 0.5, 1, and 2 kHz for the better hearing ear.

^b Signal-to-ratio loss as measured by the Quick Speech in Noise Test.

^{*} Variable is significant at $p < 0.05$. Effect sizes are presented only for significant findings.

Table 4

Means, standard deviations, and effect sizes (Cohen's d) for QoL instruments based on gender for LGBT group.

	Male ($N = 55$)	Female ($N = 28$)	Effect Size
HHIE Emotional scale	12.42 (2.11)	12.11 (1.89)	
HHIE Social/situational	11.58 (1.93)	11.54 (1.92)	
SF-36 MCS [*]	43.38 (9.16)	52.57 (3.69)	$d = 1.32$
SF-36 PCS	41.15 (4.78)	42.87 (2.44)	

^{*} Variable is significant at $p < 0.05$. Effect sizes are presented only for significant findings.

Table 5

Means, standard deviations, and effect sizes (Cohen's d) for QoL instruments based on gender for comparison group.

	Male ($N = 46$)	Female ($N = 34$)	Effect size
HHIE Emotional scale	10.35 (2.23)	9.74 (2.27)	
HHIE social/situational	11.11 (1.66)	10.74 (1.99)	
SF-36 MCS	48.37 (8.32)	48.54 (7.18)	
SF-36 PCS	39.74 (4.82)	40.88 (4.37)	

Note: None of the comparisons were significant at the $p < 0.05$ level.

instruments, each group was analyzed separately. For the LGBT group, there were no significant differences on HHIE Emotional or Social/Situational scales based on the participant's gender: $F(1,81) = 0.433, p = 0.513$; $F(1,81) = 0.011, p = 0.918$, respectively. There were significant differences in the SF-36 based on gender. Males exhibited lower MCS scores than females: $F(1,81) = 5.373, p = 0.023$. There were no significant differences in the PCS scores based on gender: $F(1,81) = 3.178, p = 0.078$. For the comparison group, there were no significant differences on HHIE scores based on gender for either the Emotional scale ($F(1,78) = 1.448, p = 0.232$) or the Social/Situational scale ($F(1,78) = 0.834, p = 0.364$). Likewise, there were no significant differences on the SF-36 MCS ($F(1,78) = 0.010, p = 0.922$) or the PCS ($F(1,78) = 1.189, p = 0.279$) for the comparison group.

There were significant differences for the QoL variables based on relationship status. Those results are shown in Tables 6 and 7. Participants in the LGBT group who reported being in a committed relationship scored significantly lower on both the HHIE Emotional and Social/Situation scales: $F(1,81) = 61.0, p < 0.001$; $F(1,81) = 34.15, p < 0.001$, respectively. Participants in the LGBT group who reported being in a committed relationship exhibited significantly higher PCS scores than those who were not in a committed relationship: $F(1,81) = 5.34, p = 0.023$. There were no significant differences in MCS scores based on relationship status: $F(1,81) = 1.8, p = 0.183$ for the LGBT group. For the comparison group, participants reporting being in a relationship exhibited lower scores on the HHIE for both the Emotional ($F(1,78) = 10.514, p = 0.002$) and Social/Situational ($F(1,78) = 10.248, p = 0.002$) scales than those not in a relationship. There were no significant differences in SF-36 MCS ($F(1,78) = 1.852, p = 0.177$) or PCS ($F(1,78) = 0.693, p = 0.408$) based on relationship status for participants in the comparison group.

Finally, differences in QoL were also found based on hearing aid status. Those results are shown in Tables 8 and 9. Participants in the LGBT group who reported wearing hearing aids exhibited significantly lower HHIE Emotional and Social/Situation subscale scores: $F(1,81) = 23.24, p < 0.001$; $F(1,81) = 14.227, p < 0.001$, respectively. However there were no significant differences on the SF-36 MCS or PCS scales based on hearing aid status: $F(1,81) = 0.656, p = 0.420$; $F(1,81) = 0.605, p = 0.439$, respectively for the LGBT group. For the comparison group, participants who reported wearing hearing aids exhibited lower HHIE Emotional ($F(1,78) = 5.400, p = 0.023$) and Social/Situational ($F(1,78) = 7.226, p = 0.009$) scales than

Table 6

Means, standard deviations, and effect sizes (Cohen's *d*) for QoL instruments based on relationship status for LGBT group.

	In relationship (<i>N</i> = 44)	Not in relationship (<i>N</i> = 39)	Effect size
HHIE emotional scale*	11.07 (1.56)	13.72 (1.52)	<i>d</i> = 1.76
HHIE social/situational*	10.59 (1.63)	12.67 (1.59)	<i>d</i> = 1.29
SF-36 MCS	50.89 (7.67)	48.55 (8.25)	
SF-36 PCS*	42.72 (3.94)	40.63 (4.28)	<i>d</i> = 0.51

* Variable is significant at $p < 0.05$. Effect sizes are presented only for significant findings.

Table 7

Means, standard deviations, and effect sizes (Cohen's *d*) for QoL instruments based on relationship status for comparison group.

	In relationship (<i>N</i> = 57)	Not in relationship (<i>N</i> = 23)	Effect size
HHIE emotional scale*	9.60 (2.21)	11.91 (1.24)	<i>d</i> = 1.29
HHIE social/situational*	10.56 (1.86)	11.30 (1.92)	<i>d</i> = 0.39
SF-36 MCS	47.69 (8.52)	50.30 (5.36)	
SF-36 PCS	40.50 (4.44)	39.54 (5.14)	

* Variable is significant at $p < 0.05$. Effect sizes are presented only for significant findings.

Table 8

Means, standard deviations, and effect sizes (Cohen's *d*) for QoL instruments based on hearing aid status for LGBT group.

	Aided (<i>N</i> = 35)	Unaided (<i>N</i> = 48)	Effect size
HHIE emotional scale*	11.40 (2.21)	12.98 (1.61)	<i>d</i> = 0.82
HHIE social/situational*	10.51 (1.72)	12.33 (1.68)	<i>d</i> = 1.07
SF-36 MCS	50.62 (7.78)	49.18 (8.17)	
SF-36 PCS	42.16 (3.79)	41.43 (4.51)	

* Variable is significant at $p < 0.05$. Effect sizes are presented only for significant findings.

Table 9

Means, standard deviations, and effect sizes (Cohens' *d*) for QoL instruments based on hearing aid status for comparison group.

	Aided (<i>N</i> = 43)	Unaided (<i>N</i> = 37)	Effect size
HHIE emotional scale*	9.56 (2.59)	10.70 (1.63)	<i>d</i> = 0.53
HHIE social/situational*	10.47 (1.86)	11.51 (1.59)	<i>d</i> = 0.60
SF-36 MCS	48.87 (7.99)	47.95 (7.67)	
SF-36 PCS	40.55 (4.50)	39.85 (4.84)	

* Variable is significant at $p < 0.05$. Effect sizes are presented only for significant findings.

those who do not wear hearing aids. There were no significant differences based on hearing aid status for the SF-36 MCS or PCS: $F(1,78) = 0.277$, $p = 0.600$; $F(1,78) = 0.443$, $p = 0.508$, respectively.

4. Discussion

4.1. Study limitations

Before a discussion of the results can be undertaken, the study limitations should first be addressed. As with previous studies, one limitation of this study is the relatively small sample size. Because of the stigma attached to membership in the lesbian, gay, bisexual, or transgender population, and to hearing impairment, recruiting these participants in studies can prove difficult. However, smaller sample sizes do not preclude the importance of conducting research on this under-represented population.

Because of the difficulties typically experienced in recruiting participants who have a hearing impairment and are members of the LGBT community, inclusion criteria were not specifically designed to create groups with equal sizes or to ensure that the sample would include participants that self-identified as lesbian, bisexual, gay, and transgender. As a result, there were significantly more males than females participating in this study and there were no participants that self-identified as transgender. The ratio of males to females in the LGBT community is not well known and has not been reported in large-scales studies.

In addition, even though care was taken to recruit a comparison group that was similar to the LGBT group, there was a significant difference between the groups in terms of relationship status. That is, there was a higher proportion of participants in the comparison group who reported being in a committed relationship compared with the LGBT group (71.25% and 53%, respectively). While there are no data on the proportion of LGBT individuals in committed relationships for this age group, the [American Psychological Association](#) (n.d.) reported that between 40% and 60% of gay men are in a committed relationship and between 45% and 80% of lesbians are in a committed relationship.

4.2. Demographic and audiometric variables

When examining the relationships between the demographic and audiometric variables, there were no significant differences between male and female participants in terms of their age, degree of hearing impairment (BPTA) or ability to understand speech in noise (SNR loss) for either group. There were also no differences in these variables based on the participant's relationship status. As expected, hearing use and degree of hearing loss were significantly related. That is, participants who wore hearing aids exhibited greater degrees of hearing impairment than participants who did not wear hearing aids. Somewhat surprisingly, there was no significant relationship between SNR loss and hearing aid status. It was expected that participants with greater amounts of SNR loss would be experiencing greater degrees of difficulty in their everyday lives and might be more likely to attempt to remediate those difficulties in the form of amplification.

4.3. QoL instruments

There are two component scales for the SF-36. The MCS scale is comprised of the responses to items that include the concepts of vitality, social functioning, and role limitations. In contrast, the PCS scale is comprised of the responses to items that include the concepts of role limitations due to physical health problems, bodily pain, and general health. Both scales are standardized to a mean of 50 and a standard deviation of 10. Participants in this study had a mean of 49.79 (LGBT group) and 48.44 (comparison group) on the MCS scale, indicating perceptions of the mental components of QoL were around the normative mean for both groups. The participants in this study had a mean PCS score of 41.51 (LGBT group) and 40.23 (comparison group), indicating their perceptions of the physical components of QoL were around one standard deviation below the normative mean. The mean component scores of participants in this study are similar to other studies that used the SF-36 (e.g., [Abrams et al., 2002](#); [Chia et al., 2007](#); [Hickson, Worrall, & Scarinci, 2007](#)). Interestingly, the mean age of participants in those studies were in their seventies. Although there was a significant difference between the groups on the SF-36 PCS, the effect size difference between the groups, was not large ($d = 0.310$). That is, the groups were more similar to each other than they were to the normative mean.

The groups differed significantly in their perception of disease-specific QoL. For both scales of the HHIE, participants in the LGBT group reported greater perception of consequences of hearing impairment on their lives. The effect size difference for the Emotional scale was relatively large ($d = 1.034$) while the effect size for the Social/Situational scale is smaller ($d = 0.333$). This finding differs from the previous, exploratory study ([Kelly & Atcherson, 2011](#)) that found participants in the same-sex group exhibited lower HHIE scores than participants in the different-sex group. One possibility for these differences may be that the participants in the previous study were older (mean age in the 70 s) and yet had better hearing both in terms of PTA and SNR loss than participants in this study. That is, because participants in this study were younger and had more hearing impairment, the effect of their hearing impairment may be quite different in their daily lives than that of the older, better-hearing participants in the previous study. Indeed, [Hosford-Dunn and Halpern \(2000\)](#) raised this very issue when they collected normative data on patients ages 6–101 using the Satisfaction of Amplification in Daily Life (SADL; [Cox & Alexander, 1999](#)) in a private practice setting when the original SADL was normed on older males in a Veterans Affairs setting.

Unfortunately, only 22 of the patients in Hosford-Dunn and Halpern's study were under 60 years of age. The listening demands in daily life across the lifespan may differentially influence disease-specific QoL.

There were significant differences in the perception of QoL for the participants in the LGBT group based on gender. However, these differences were found for the generic QoL instrument (SF-36) and not the disease-specific instrument (HHIE). There were no significant differences based on gender for the comparison group. Female participants in the LGBT group exhibited higher scores on the MCS than male participants. That is, female participants had a more positive perception of the MCS than did the male participants. When viewed by gender, the female participants in this study exhibited mean MCS scale scores slightly above the normative mean ($M = 52.57$) while the male participants exhibited MCS scale scores nearly one standard deviation below the normative mean ($M = 43.38$). However, for both male and female participants in the LGBT group, the mean PCS scale scores were nearly one standard deviation below the normative mean. It may be that the difficulties encountered as a result of hearing impairment such as social isolation and withdrawal, difficulty participating in conversations in the presence of background noise, and relationship stress affect the mental component of QoL more than the physical component of QoL for the women in the LGBT group. However, for the men in this study, both components of QoL seem equally affected.

The lack of difference based on gender for the disease-specific QoL instrument may seem somewhat surprising given the results of Garstecki and Erler (1999). In their study, the female participants were more likely to admit their communication problems, assigned greater importance to effective communication, were more likely to use non-verbal strategies, were more likely to report feelings of anger and stress, and reported more negative emotional reactions to hearing problems. In the Garstecki and Erler study, sexual orientation/identification was not explicitly asked, so the number of participants who were members of the LGBT community is not known. Another difference between the Garstecki and Erler study and the present study is that the former used the CPHI to measure gender differences. The CPHI measures different constructs from the HHIE and that could be a contributing factor to the differences in findings. In addition, the Garstecki and Erler study examined gender differences in adults over the age of 65 years. In the present study, the mean age of participants was 64.65 years (LGBT group) and 63.26 years (comparison group). The results of this study were more similar to the data presented by Erdman and Demorest (1998a, 1998b) who reported little differences in the responses of male and female participants on the CPHI. The mean age for participants in the Erdman and Demorest study was the same as the mean age of the participants in the current study ($M = 64.65$ years). It could be that there are gender differences in older adults' perception of QoL and adjustment to hearing problems whereas those differences are not seen for younger adults.

The participants in this study also exhibited differences in QoL based on relationship status. Participants in both groups who were in a committed relationship reported lower scores on both the Emotional and Social/Situational subscales of the HHIE. In addition, participants in the LGBT group in a committed relationship exhibited higher scores on the MCS scale of the SF-36. These scores indicate that participants in this study who were in committed relationships exhibit more positive perceptions of QoL than those not in committed relationships. People who experience hearing impairment often rely on their partners for communication both in private and in public (Hallberg & Barrenäs, 1993; Scarinci, Worrall, & Hickson, 2008; Stephens, France, & Lormore, 1995; Wallhagen, 2010), those who are not in committed relationships may be forced to cope with the effects of hearing impairment alone. This finding was more marked for the LGBT group than the comparison group. The effect sizes for both groups for the HHIE Emotional scale was relatively large ($d = 1.76$ for LGBT group, $d = 1.29$ for comparison group). However, the effect size for the HHIE Social/Situational scale was much larger for the LGBT group ($d = 1.29$) than for the comparison group ($d = 0.39$). In addition, only participants in the LGBT group exhibited differences on the PCS based on relationship status ($d = 0.51$). Members of the LGBT community may experience difficulty integrating into all aspects of society, that is, they may be marginalized in one or more aspects of their lives (Otis, Rostosky, Riggie, & Harmin, 2006). Therefore, the reliance on a partner may be even greater for people with hearing impairment who are members of the LGBT community.

Not surprisingly, hearing aid status was also found to be related to the perception of QoL for both groups. As expected, participants who reported wearing hearing aids exhibited lower scores on both the Emotional and Social/Situational subscales of the HHIE. These findings are consistent with other literature reported above suggesting that intervention for hearing impairment, particularly in the form of hearing aids, improves the perception of disease-specific QoL. What is not clear from the design of this study is what additional intervention such as audiologic rehabilitation participants may have undergone prior to the study. Although hearing aid status was related to the perception of disease-specific QoL, it was not a significant factor in the perception of generic QoL for these participants. It has been noted, however, that generic QoL instruments are not as sensitive to treatment effects as disease-specific instruments (e.g., Abrams, Chisolm, McArdle, & Wilson, 2005; Bess, 2000). Interestingly, while the pattern of responses was similar between the groups, effect sizes were larger for the LGBT group than the comparison group for both the Emotional ($d = 0.82$ and 0.53 , respectively) and Social/Situational ($d = 1.07$ and $d = 0.60$, respectively) scales.

5. Conclusions

The purpose of this study was to examine the perception of generic and disease-specific QoL in adults with hearing impairment who are members of the LGBT community compared with a matched group who were not members of the LGBT community. In general, the results of this study indicate there are more effects of study variables on the perception of QoL for the participants in the LGBT group than participants in the comparison group, both in terms of the number of significant variables and the size of their effects. The perception of generic QoL for participants in this study was similar to that reported in previous studies in adults with hearing impairment. That is, participants scored around the normative mean in their

perceptions of the mental components of QoL, but scored below the normative mean in their perceptions of the physical components of QoL. This finding indicates that participants in this study may be experiencing similar perceptions of generic QoL as the general population of adults with hearing impairment. However, because previous research using the SF-36 with adults with hearing impairment have focused on older adults, more research is now needed to determine if the perception of generic QoL differs as a function of age for the general population of adults with hearing impairment.

Gender effects were found for the mental component of the generic QoL measure for the LGBT group. However, no gender differences were found for the participants in the comparison group. Previous studies have not specifically examined the perceptions of generic QoL based on gender for adults with hearing impairment, although Sandfort et al. (2003) reported gender differences in QoL in a group of LGBT members. Further research is needed to flesh out the difference in perceptions found for these members of the LGBT community relative to the general population of adults with hearing impairment. The effects of relationship status on perception of QoL were greater for the LGBT group than for the comparison group. The effect sizes for the HHIE were larger for the LGBT group and there were also differences on the generic QoL based on relationship status for the LGBT group. No differences based on relationship status were found for the comparison group for the generic QoL measurements.

Finally, the HHIE was more sensitive to the effects of treatment (i.e., hearing aids) than the SF-36 for the participants in this study. More research is still needed to help clinicians and researchers understand the factors that contribute to the perception of QoL for adults with hearing impairment who are members of the LGBT community. However, the results from this study do indicate that factors such as gender, relationship status, and hearing aid use are related to the perception of QoL for members of the LGBT community in ways that are different from the general population of adults with hearing impairment.

Appendix A. Continuing education

CEU questions

1. Which of the following statements best describes the relationship between extent of hearing impairment and perception of QoL?
 - a. There is little relationship between extent of impairment and QoL.
 - b. Extent of impairment is a good predictor of QoL.
 - c. Extent of impairment is a poor predictor of QoL.
 - d. Extent of impairment is directly related to QoL.
2. Which of the following statements best describes the impact of intervention for hearing impairment on QoL?
 - a. Interventions for hearing impairment have been shown to improve QoL in both disease-specific and generic instruments.
 - b. Interventions for hearing impairment have been shown to improve QoL in neither disease-specific nor generic instruments.
 - c. Interventions for hearing impairment have been shown to improve QoL in disease-specific but not generic instruments.
 - d. Interventions for hearing impairment have been shown to improve QoL in generic but not disease-specific and instruments.
3. Approximately how many Americans between the ages of 18 and 44 years self-identify as homosexual or bisexual?
 - a. 2.6 million
 - b. 3.2 million
 - c. 4.5 million
 - d. 5.8 million
4. Results from this study indicate which of the following?
 - a. Participants in the LGBT group exhibited significantly higher MCS scores than the comparison group.
 - b. Participants in the LGBT group exhibited significantly lower MCS scores than the comparison group.
 - c. Participants in the LGBT group exhibited significantly lower HHIE scores than participants in the comparison group.
 - d. Participants in the LGBT group exhibited significantly higher HHIE scores than participants in the comparison group.
5. Which of the following statements best describes the study findings relative to gender?
 - a. There were significant differences in the perception of QoL for the male and female participants in the comparison group only.
 - b. There were significant differences in the perception of QoL for the male and female participants in the LGBT group only.
 - c. There were significant differences in the perception of QoL for the male and female participants in both the LGBT and comparison group.
 - d. There were no significant differences in the perception of QoL for the male and female participants for either group.

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