ORIGINAL ARTICLE

Quality of Life in Youth With Severe to Profound Sensorineural Hearing Loss

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Importance: Adolescence is a life stage with rapid and major developmental changes, yet little is known about how these changes influence the quality of life of young people who are deaf or hard of hearing (DHH).

Objective: To determine differences in the 3 domains of a hearing-specific quality-of-life instrument between youth who had severe to profound sensorineural hearing loss based on whether they used no technology, hearing aids, or cochlear implants.

Design and Setting: A multi-institutional prospective cohort study.

Participants: A convenience sample of 11- to 18-year-old youths with severe to profound sensorineural hearing loss recruited between January 1 and December 31, 2008.

Main Outcome Measures: Youth Quality of Life–Research Instrument and Youth Quality of Life Instrument–Deaf and Hard of Hearing (YQoL-DHH) scores. The YQoL-DHH was composed of 3 domains: participation, self-acceptance/advocacy, and stigma-related quality of life.

Results: A total of 157 individuals participated. Overall mean (SD) age was 14.1 (2.3) years, and the female-male ratio was 82:75. Forty-nine individuals (31.2%) were not using any technology, 45 (28.7%) were using hearing aids, and 63 (40.1%) were using cochlear implants. Mean age of unilateral or first cochlear implant was 62.9 months. Thirty-eight individuals (24.2%) attended schools with DHH programs, 55 (35.0%) attended schools without DHH programs, and 58 (36.9%) attended schools for the deaf. Statistically significant differences were noted in YQoL-DHH participation and perceived stigma scores between the groups when stratified by technology used and school setting.

Conclusions: These data suggest that the domains of quality of life as measured by our instrument differ significantly among youth based on technology used and school setting. Youth using no technology or cochlear implants tended to score higher than those using hearing aids in mainstream schools with or without DHH programs and in schools for the deaf. The YQoL-DHH instrument is able to detect differences in quality of life within a group of youth with severe to profound hearing loss.

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ADOLESCENCE IS A LIFE STAGE with rapid and major developmental changes, yet little is known about how these changes influence the quality of life (QoL) of young people who are deaf or hard of hearing (DHH). The QoL concept is important to understanding children and youth with hearing loss because of the importance of communication and social participation in everyday life. The World Health Organization has defined QoL as individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns.[1] Health-related quality-of-life (HRQoL) instruments are designed to measure these perceptions in a reproducible and valid way. A patient's perceived QoL may be independent of his or her functional status or medical outcome. Assessment of QoL in children and adolescents who are DHH is particularly challenging because many instruments are developed for adults or as surrogate measures in which a parent or caretaker is asked to assess the child's status. Yet parent report frequently differs from youth's self-reported QoL.[2,3] This discrepancy may be particularly relevant among youth who are DHH because most are born to parents who hear.

Several studies have examined QoL comparing DHH and non-DHH youth using HRQoL measures. Huber[2] studied HRQoL in 29 children ages 8 to 16 years who had been cochlear implant users for at least 3 years using the KINDL$_R$, a generic HRQoL instrument used for children and adolescents. She found the

HRQoL of children ages 8 to 12 years was below the norm for hearing children, but the HRQoL was within the standard range for children ages 13 to 16 years. Wake et al[4] looked at HRQoL in 83 children with varying degrees of hearing loss using the Child Health Questionnaire, a generic measure of HRQoL. These children were compared with a control cohort and were found to have significantly poorer scores on 6 of the 12 scales and on the psychosocial summary score. Although HRQoL has been included in these studies, few studies have examined the correlates of QoL in children and youth with severe hearing loss.

Recently, our group developed, validated cross-sectionally, and published the Youth Quality of Life Instrument–Deaf and Hard of Hearing (YQoL-DHH) module[5] in which DHH youth defined the important concepts in relation to how being DHH affected their fundamental social and emotional needs. Their perceptions were then used to develop the YQoL-DHH module. This tool consists of 3 factors or domain scores that reflect important aspects of life for youth who are DHH: self-acceptance/advocacy, participation, and perceived stigma. One unique advantage of the YQoL-DHH is that it was developed on the basis of survey data provided by adolescents, parents, and adults who were DHH or had expertise in DHH and health care professionals who work with DHH youth. This group of individuals included those who use speech and those who use sign as their primary mode of communication (either American Sign Language [ASL] or Englishlike signing); thus, the YQoL-DHH is relevant and applicable to youth who communicate with spoken or signed language.

The YQoL-DHH was developed to measure youth-reported QoL regardless of degree of hearing loss.[5] We were interested in using the instrument to understand how use of technology affects perceptions of QoL in youth with severe to profound sensorineural hearing loss (SNHL). We analyzed the YQoL-DHH domain scores of a cohort of youth aged 11 to 18 years with severe to profound SNHL who were not using any technology, using at least one hearing aid, or using at least one cochlear implant at the time of participation. On the basis of the possible relationship of preferred mode of communication, classroom setting, and the use of assistive listening technology in children with hearing loss,[6-8] these data were analyzed as a function of these variables as well.

METHODS

RECRUITMENT AND PARTICIPANTS

Institutional review board approval was granted through Seattle Children's Hospital and the University of Colorado, Boulder. A convenience sample of youth ages 11 to 18 years with severe to profound SNHL was recruited by distributing study flyers to schools, clinics, advocacy groups, and professional associations at multiple sites around the United States. Participants were recruited between January 1 and December 31, 2008. Potential participants were screened for the following exclusion criteria: medical or mental health conditions affecting either the youth's QoL to the same or greater degree than hearing loss or ability to complete the survey, refusal of the youth to complete the questionnaire, or age younger than 11 years or older than 18 years. Demographic data, technology used (none, hearing aid, or cochlear implant), and school setting (school for the deaf, mainstream without DHH program, or mainstream with DHH program) were recorded. In addition, participants were asked to specify their communication preferences (sign, speech and sign, or speech). To verify hearing loss, parents signed a medical release of information, allowing a copy of an audiogram completed within the prior year to be obtained from the youth's audiologist. Audiograms were reviewed by a certified audiologist.

SURVEY ADMINISTRATION

Consent and assent were obtained by site staff who had completed human subjects training and had been trained in obtaining informed consent. Eligible participants underwent a reading screen to assess reading level. Those who passed the reading screener were given the Children's Depression Inventory 10-Item Short Form, the Youth Quality of Life–Research Instrument (YQoL-R), a 41-item generic QoL instrument, and the newly developed YQoL-DHH. Each instrument was administered in the youth's preferred mode of communication: written English, web-based English, ASL or Pidgin Signed English DVD, or interviewer supervised ASL or Pidgin Signed English DVD (produced using youth signers who were deaf and fluent in sign language). Youth who did not pass the reading screener but lived within driving proximity to the Texas research site were given the option of an interviewer-administered ASL DVD. Participants were given a $25 gratuity for completing the survey and returning all study materials.

STATISTICAL ANALYSIS

Before analyzing the data, out-of-range and missing values were checked for accuracy against hard copy forms (eg, survey booklets, medical verification forms, and audiograms), and inconsistencies were corrected. No data check was available for data entered onto the web survey platform. After data cleaning, YQoL-R and YQoL-DHH responses were scored such that 10 indicated the highest possible QoL score for self-acceptance/advocacy, participation, and stigma-related QoL. For the perceived stigma domain, a higher score signified lower stigma and higher QoL. Scores were the average of the items when more than 80% of the items within the domain were completed. The distributions (normality) of the scores were checked. Stigma scores had a high-ceiling effect (skewed distribution toward higher QoL ratings). These demographic data were summarized using descriptive statistics.

We tested a null hypothesis that there would be no significant association between YQoL-DHH domain scores of participants who were grouped according to the assistive listening technology they used. That is, we presumed that a youth's adopted communication approach would be accompanied by adaptations, yielding similar distributions and means of measures of QoL across grouping by technology. The groups were compared using χ^2 test for the percentages across technology used.

The participants were stratified by school setting. The YQoL-DHH participation domain score was used as the primary outcome. The YQoL-DHH self-acceptance/advocacy and perceived stigma domain scores were considered secondary outcomes. The scores were compared among the type of technology using analysis of variance (ANOVA) models that controlled for age and mother's educational level. Analyses were conducted with SAS statistical software, version 9.2 (SAS Institute, Inc).

Table 1. Demographic Characteristics of 157 Youths With Severe to Profound Hearing Loss Using Assistive Listening Technology

	Assistive Listening Technology, No. (%)		
Characteristic	None (n = 49)	Hearing Aids (n = 45)	Cochlear Implants (n = 63)
Overall (n = 157)	49 (31.2)	45 (28.7)	63 (40.1)
Age range, y			
11-14 (n = 78)	25 (51.0)	13 (28.9)	40 (63.5)
15-18 (n = 79)	24 (49.0)	32 (71.1)	23 (36.5)
Sex			
Female (n = 82)	27 (55.1)	23 (51.1)	32 (50.8)
Male (n = 75)	22 (44.9)	22 (48.9)	31 (49.2)
Geographic location			
West (n = 64)	23 (46.9)	17 (37.8)	24 (38.1)
Midwest (n = 34)	5 (10.2)	12 (26.7)	17 (27.0)
Northeast (n = 4)	0	1 (2.2)	3 (4.8)
South (n = 55)	21 (42.9)	15 (33.3)	19 (30.2)
Race/ethnicity			
White (n = 95)	30 (62.5)	20 (44.4)	45 (72.6)
Hispanic (n = 25)	12 (25.0)	10 (22.2)	3 (4.8)
African American (n = 8)	1 (2.1)	5 (11.1)	2 (3.2)
Other (n = 27)	5 (10.4)	10 (22.2)	12 (19.4)
Missing (n = 2)	1		1
Mother's educational level			
College graduate (n = 84)	20 (50.0)	21 (52.5)	43 (71.7)
Some college (n = 25)	12 (30.0)	5 (12.5)	8 (13.3)
High school or GED (n = 18)	4 (10.0)	6 (15.0)	8 (13.3)
Less than high school (n = 13)	4 (10.0)	8 (20.0)	1 (1.7)
Missing (n = 17)	9	5	3
Father's educational level			
College graduate (n = 77)	20 (50.0)	19 (54.3)	38 (67.9)
Some college (n = 11)	4 (10.0)	3 (8.6)	4 (7.1)
High school or GED (n = 36)	14 (35.0)	9 (25.7)	13 (23.2)
Less than high school (n = 7)	2 (5.0)	4 (11.4)	1 (1.8)
Missing (n = 26)	9	10	7
Parent's hearing status			
No parent DHH (n = 133)	36 (75)	39 (88.6)	58 (92.1)
Single parent DHH (n = 8)	3 (6.2)	3 (6.8)	2 (3.2)
Both parents DHH (n = 14)	9 (18.8)	2 (4.5)	3 (4.8)
Missing (n = 2)	1	1	

Abbreviations: DHH, deaf or hard of hearing; GED, general educational development.

RESULTS

A total of 157 individuals with verified severe to profound SNHL met inclusion criteria. Demographic data are listed in **Table 1** and **Table 2**. The age distributions were different across the technology groups, with equal distribution among individuals not using any technology, older individuals using hearing aids, and younger individuals using cochlear implants. Although not statistically significant, the Northeast region was underrepresented because of the recruitment sites. Mode of communication was significantly different among the groups; 78.7%, 12.8%, and 8.5% used sign language to communicate at home in the groups using no technology, hearing aids, and cochlear implants, respectively. The distribution was similar for the youth's preferred communication mode.

Forty-nine participants who did not use hearing aids or cochlear implants were more likely to report using sign language to communicate, using ASL at home, attending a school for the deaf, and using sign language to communicate with a parent. Forty-five participants using hearing aids were equally likely to report being in a mainstream school setting, DHH program in a mainstream school, or a school for the deaf. Participants with hearing loss were also equally likely to report using sign, sign and speech, or speech as their preferred mode of communication (Table 2).

Sixty-three participants used cochlear implants, 35 used unilateral cochlear implants, and 17 used bilateral cochlear implants. Age at implant data were unavailable for 11 participants. The mean/median (range) of age for the other participants was as 70.7/54 (10-180) months for participants with unilateral cochlear implants (n = 35) and 47.2/36 (12-162) months at first implant and 132.2/143 (29-180) months at second implant for participants with bilateral cochlear implants (n = 17). Youth and adolescents using cochlear implants were more likely to use speech to communicate at home, use English, and attend a mainstream school.

ANOVA models that controlled for participant age and mother's educational level were used. No significant differences were found comparing overall generic QoL for youth with or without assistive listening devices or for

Table 2. Communication Characteristics of 157 Youths With Severe to Profound Hearing Loss Using Assistive Listening Technology

	Assistive Listening Technology, No. (%)			
Characteristic	None (n = 49)	Hearing Aids (n = 45)	Cochlear Implants (n = 63)	*P* Value
Overall (n = 157)	49 (31.2)	45 (28.7)	63 (40.1)	
How parents communicate with youth at home				
Speech (n = 65)	4 (6.2)	19 (29.2)	42 (64.6)	<.001
Speech and sign (n = 44)	7 (15.9)	20 (45.5)	17 (38.6)	
Sign (n = 47)	37 (78.7)	6 (12.8)	4 (8.5)	
Missing (n = 1)	1 (0.6)			
Language most often used at home				
English (n = 93)	9 (18.4)	29 (64.4)	55 (87.3)	<.001
ASL (n = 39)	29 (59.2)	8 (17.8)	2 (3.2)	
PSE or MCE (n = 4)	2 (4.1)	0 (0)	2 (3.2)	
Spanish (n = 9)	3 (6.1)	6 (13.3)	0 (0)	
Other (n = 12)	6 (12.2)	2 (4.4)	4 (6.3)	
School type				
Mainstream (n = 55)	3 (6.2)	14 (31.8)	38 (64.4)	<.001
Mainstream with DHH (n = 38)	9 (18.8)	14 (31.8)	15 (25.4)	
School for deaf (n = 58)	36 (75.0)	16 (36.4)	6 (10.2)	
Missing (n = 6)	1 (3.8)			
Communication mode				
Speech (n = 63)	3 (6.7)	12 (26.7)	48 (76.2)	<.001
Speech and sign (n = 26)	2 (4.4)	17 (37.8)	7 (11.1)	
Sign (n = 64)	40 (88.9)	16 (35.6)	8 (12.7)	
Missing (n = 4)	2 (1.2)	2 (1.2)		
CDI-S (n = 104)				
Below average (n = 20)	11 (23.4)	3 (6.7)	6 (9.8)	.005
Slightly below average (n = 59)	21 (44.7)	13 (28.9)	25 (41.0)	
Average (n = 54)	7 (14.9)	21 (46.7)	26 (42.6)	
Slightly above average (n = 20)	8 (17.0)	8 (17.8)	4 (6.6)	
Missing (n = 4)	2 (1.2)		2 (1.2)	

Abbreviations: ASL, American Sign Language; CDI-S, Clinical Depression Index 10-Item Short Form; DHH, deaf or hard of hearing; MCE, manually coded English; PSE, Pidgin Signed English.

youth in mainstream schools or schools for the deaf. Differences were found, however, in communication-specific QoL for youth with assistive listening technology in the overall sample and stratified by school type. Youth using no technology had higher scores in the participation QoL domain. In addition, the same group had higher scores in the perceived stigma QoL domain, indicating lower stigma and higher QoL. The youth using no technology or cochlear implants had higher stigma-related QoL domain scores compared with the group using hearing aids. The group using cochlear implants had higher self-acceptance/advocacy scores than those who were using hearing aids.

When stratified by school setting, the youth in mainstream schools with or without DHH programs using cochlear implants had higher participation, self-acceptance/advocacy, and stigma-related QoL scores compared with those using hearing aids. Participation-related QoL scores were highest among youth not using any technology. In the group attending schools for the deaf, the youth using no technology had higher participation and stigma-related QoL domain scores (**Table 3**). When the data were stratified by technology used and preferred mode of communication, there were no differences in any of the YQoL-R measures (**Table 4**). There was only one participant who did not use technology and communicated with speech only. However, in comparing those who used hearing aids or cochlear implants and communicated with speech, those using cochlear implants had higher scores in the participation domain. For those who communicated with speech and sign, there were no differences in domain scores between those who used no technology and those who used hearing aids or cochlear implants. Finally, for those using sign, those who used no technology had higher scores in the participation and stigma-related QoL domains in 2-way comparisons.

COMMENT

The assessment of QoL in adolescents with deafness is relevant to the cultural considerations of medical interventions. Early objections to cochlear implantation of young children with severe to profound hearing loss were based on variable speech and language outcomes and uncertain effect on the children's QoL. It is understood that typically developing infants who undergo cochlear implantation will likely have improved speech perception and production,[9] but few studies have looked at the effect of cochlear implantation on QoL in children with deafness. Lin and Niparko[10] reviewed studies evaluating HRQoL in pediatric cochlear implant recipients. Only 10 studies met the inclusion criteria of original peer-reviewed research article; enrollment of participants younger than 18 years with cochlear implants; use of a HRQoL instrument that incorporated components of

Table 3. Mean YQoL-R and YQoL-DHH Scores for 156 Youths With Severe to Profound Hearing Loss Using Assistive Listening Technology and School Type

	Assistive Listening Technology, Mean (SD)[a]				*P* Value[b]	
School Type	No Device (A) (n = 45)	Hearing Aids (B) (n = 45)	With Hearing Aids or Cochlear Implants (n = 19)	Cochlear Implant (C) (n = 63)	3-Way	2-Way
Overall (n = 157)						
No. of participants	40	39		58		
YQoL-R	83.1 (12.8)	78.8 (12.4)		81.3 (13.0)		
YQoL-DHH						
Participation	71.3 (19.5)	49.9 (18.6)		59.3 (20.7)	<.001	<.001 for A vs B and <.01 for A vs C
Self-advocacy or acceptance	75.8 (14.8)	72.1 (13.8)		78.3 (12.6)		<.10 for B vs C
Stigma-related QoL[c]	75.8 (16.5)	61.8 (22.8)		72.4 (21.7)	<.05	<.01 for A vs B and <.05 for B vs C
Mainstream school with or without DHH program (n = 93)						
No. of participants	8	25		49		
YQoL-R	76.4 (16.8)	77.4 (13.2)		82.1 (13.4)		
YQoL-DHH						
Participation	70.1 (11.6)	51.2 (17.1)		59.4 (20.9)	<.05	<.01 for A vs B and <.05 for A vs C
Self-advocacy or acceptance	75.6 (13.8)	71.6 (14.8)		79.2 (12.6)		<.10 for B vs C
Stigma-related QoL[c]	78.8 (16.4)	64.6 (21.5)		75.0 (20.9)		<.10 for B vs C
School for the deaf (n = 58)						
No. of participants	31					
YQoL-R	85.0 (11.5)		81.2 (10.1)			
YQoL-DHH						
Participation	73.0 (19.7)		51.1 (23.5)			<.001
Self-advocacy or acceptance	76.5 (15.2)		76.8 (7.4)			
Stigma-related QoL[c]	76.5 (15.1)		60.3 (23.7)			<.01

Abbreviations: DHH, deaf or hard of hearing; QoL, quality of life; YQoL-DHH, Youth Quality of Life Instrument–Deaf and Hard of Hearing; YQoL-R, Youth Quality of Life–Research Instrument.

[a] Unadjusted means (SDs).

[b] Two-way comparison with no device as the reference group and 3-way comparisons are reported. *P* values are from analysis of variance models adjusting for age and mother's educational level.

[c] Comparisons based on log transformation of stigma-related scores among 210 youths. Higher score signifies higher QoL (lower stigma).

physical, mental, and social health; and publication in English. At the time of their review, no well-validated, deafness-specific HRQoL instruments were available. Since then, however, our group developed and validated the YQoL-DHH module.[5]

This analysis was designed to explore whether there would be differences in the 3 domain scores of the YQoL-DHH among youth and adolescents with severe to profound hearing loss based on use of technology. Other studies have examined QoL in youth with hearing loss; however, many of these rely on parental report. Parent-child reporting agreement has been documented to be generally low, especially with regard to subjective perceptions, such as QoL and emotions.[2,3] Most deaf children are born to parents with normal hearing, and because of differences between the life experiences of hearing parents and children with hearing loss, it is reasonable to suspect it may be difficult for the parents to fully understand what their child might define for him or herself as optimal QoL.[11,12] More recently, investigators have used self-report instruments to show similar QoL between children with profound hearing loss who use cochlear implants and their fully hearing peers; however, this was done using an instrument that measures HRQoL, not hearing-specific QoL as measured by the YQoL-DHH.[13] Furthermore, the students in this study were older and better able to report on their own perceptions of their QoL.

Our results suggest that the YQoL-DHH instrument is sensitive in detecting differences in QoL within a subpopulation of youth with severe to profound hearing loss. The differences were primarily in participation and perceived stigma scores, with participants using hearing aids reporting the lowest participation scores and stigma-related QoL scores. When comparing participants who attended mainstream schools with or without DHH programs, those using cochlear implants had higher scores in all 3 domains than those using hearing aids. The participants using no technology and attending mainstream schools had the highest participation scores. In the school for the deaf, participants who used no technology had higher participation and stigma-related QoL scores.

On the basis of this data set, the YQoL-DHH is able to detect differences between groups of youth with severe to profound SNHL. No differences were found in the generic YQoL-R scores for any of the comparisons, suggesting that the YQoL-DHH is a discriminative instrument for studying this population.

This study has several limitations. The study population was based on a convenience sample. The participants volunteered to participate in the study. Youth who were more comfortable with themselves and had higher QoL may have been more likely to participate. Furthermore, the demographic differences summarized in

Table 4. Mean YQoL-R and YQoL-DHH Scores for 153 Youths With Severe to Profound Hearing Loss Using Assistive Listening Technology and Communication Mode

	Assistive Listening Technology, Mean (SD)[a]				*P* Value[b]	
Communication Mode	No Device (A) (n = 45)	Hearing Aids (B) (n = 45)	With Hearing Aids or Cochlear Implants (n = 21)	Cochlear Implants (C) (n = 63)	3-Way	2-Way
Speech (n = 63)						
No. of participants	1	12		47		
YQoL-R	76.4	78.7 (10.6)		81.7 (13.7)		
YQoL-DHH						
Participation	27.3	45.5 (11.4)		60.7 (20.9)	<.10	<.10 for B vs C
Self-advocacy or acceptance	56.4	72.1 (9.9)		78.3 (13.6)		
Stigma-related QoL[c]	35.7	68.5 (19.1)		73.9 (22.5)		<.10 for A vs C
Speech and sign (n = 26)						
No. of participants	2					
YQoL-R	74.0 (12.1)	78.8 (14.1)	78.8 (14.1)			
YQoL-DHH						
Participation	55.0 (12.2)		50.8 (21.5)			
Self-advocacy or acceptance	77.1 (7.1)		73.1 (13.1)			
Stigma-related QoL[c]	55.0 (13.1)		57.9 (23.1)			
Sign (n = 64)						
No. of participants	34	12		7		
YQoL-R	83.7 (13.2)	80.0 (11.3)		78.7 (8.8)		
YQoL-DHH						
Participation	74.0 (17.1)	54.4 (18.9)		54.1 (21.7)	<.01	<.01 for A vs B and <.10 for A vs C
Self-advocacy or acceptance	75.6 (15.6)	72.3 (16.9)		81.0 (6.3)		
Stigma-related QoL[c]	79.9 (12.0)	61.8 (23.2)		72.4 (17.8)	<.01	<.05 for A vs B

Abbreviations: QoL, quality of life; YQoL-DHH, Youth Quality of Life Instrument–Deaf and Hard of Hearing; YQoL-R, Youth Quality of Life–Research Instrument.

[a] Unadjusted means (SDs); the SDs are not provided when there is only 1 observation.

[b] Two-way comparison with no device as the reference group and 3-way comparisons are reported. *P* values are from analysis of variance models adjusting for child age and mother's educational level.

[c] Comparisons based on a log transformation of the stigma-related score among 210 youths. Higher score signifies higher QoL (lower stigma).

Tables 1 and 2 may have had an effect on the youth's QoL. Almost 60% of the participants not using any listening technology reported ASL as the language used most often in the home, and 25% of youth in this group had at least one parent who was deaf or hard of hearing. These statistics are not typical for adolescents who are DHH.

Other limitations include information that was unavailable. Although the degree of hearing loss at the time of participation was similar among the study participants, the temporal course of progression of hearing loss was unavailable. Therefore, there was likely some heterogeneity in the duration of deafness among this cohort. Because the participants were 11 to 18 years at the time of enrollment, those who used cochlear implants received their implants at relatively older ages, with a median age at initial implantation of 3 years. Also, the participants were screened for reading ability (reading at or above a fourth-grade level), which may have preselected participants with reading skills that are average for DHH youth.

Future directions should include using the YQoL-DHH tool in an unselected population of youth with hearing loss to look for differences in any subpopulations, including groups based on degree of hearing loss. Also, using the instrument to perform preintervention and postintervention comparisons will be vital in optimizing the QoL of youth with hearing loss.

In conclusion, in a large sample of youth aged 11 to 18 years with severe to profound hearing loss, there were differences in QoL as detected by differences in YQoL-DHH subscores, suggesting that the YQoL-DHH instrument is able to discriminate differences in QoL among a subpopulation of youth with severe to profound hearing loss. Youth using no technology or cochlear implants tended to score higher than those using hearing aids in both mainstream schools with or without DHH programs and schools for the deaf.

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Author Contributions: Drs Sie, Edwards, Schick, and Patrick, and Mr Skalicky had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. *Study concept and design:* Meyer, Sie, Skalicky, Edwards, Schick, and Patrick. *Acquisition of data:* Skalicky, Edwards, Schick, and Patrick. *Analysis and interpretation of data:* Sie, Skalicky, Edwards, Schick, Niparko, and Patrick. *Drafting of the manuscript:* Meyer, Skalicky, and Patrick. *Critical revision of the manuscript for important intellectual content:* Meyer, Sie, Edwards, Schick, Niparko, and Patrick. *Statistical analysis:* Edwards and Patrick. *Obtained funding:* Sie, Edwards, Schick, and Patrick. *Administrative, technical, and material support:* Meyer, Sie, Skalicky, Edwards, and Patrick. *Study supervision:* Skalicky, Schick, and Patrick.

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