

The Evaluation Results of a Public Health Tool to Help Teachers Effectively Accommodate and Teach Children with Cochlear Implants in Mainstream Classrooms

Louise C. Palmer, Jana Eisenstein, Eric C. Twombly, and Kristen D. Holtz

Until relatively recently, those who were profoundly deaf or hard of hearing had few options to overcome them. But in the 1980s, the United States (US) Food and Drug Administration (FDA) approved the limited use of cochlear implants (FDA, 2010). Cochlear implants bypass the damaged or nonfunctioning parts of the ear to create a representation of sound for the wearer. By December 2010, approximately 219,000 people worldwide had received cochlear implants, and, in the US alone, roughly 42,600 adults and 28,400 children had received the implants (National Institute on Deafness and Other Communication Disorders [NIDCD], 2011).

What is more, the number of children with cochlear implants is expected to increase greatly (ibid). The expanded use of cochlear implants relates in part to improvements in the safety of cochlear implantation procedures, which allowed the age of implantation to drop since the technology's invention. Indeed, children as young as 12 months old can and often do receive cochlear implants (ibid). The declining eligible implantation age is important, because the younger a child is at implantation, the more likely he or she will learn to understand and use spoken language proficiently (Connor and Zwolan, 2004; Kileny, Zwolan, & Ashbaugh, 2001).

The expanded use of cochlear implants by children at young ages has coincided with greater mainstreaming of classrooms in schools in the US. Mainstreaming is an educational approach in which children with mild disabilities are taught in the same classrooms as typically-abled children. Children with cochlear implants are increasingly entering mainstream schools in pre-k, Kindergarten, or first grade, but because their

influx into mainstream elementary school systems is a relatively new phenomenon, mainstream schools are rarely equipped to adequately accommodate and effectively teach them (Sorkin & Zwolan, 2004). Moreover, the challenges of creating accommodating and effective educational settings for children with cochlear implants typically fall on their teachers, who suffer from a relative lack of systematic resources to overcome these challenges. As a result, teachers often rely on information from parents and piecemeal internet searches, creating limitations on their learning about cochlear implants and its educational implications, not only for children with cochlear implants, but also for their peers.

The Cochlear Implant School Toolkit

To help teachers overcome these challenges, and the related ones faced by children with cochlear implants, their parents, and their peers, KDH Research & Communication, with funding from NIDCD, created The Cochlear Implant School Toolkit (The Toolkit). It has four components:

- A Parent's Guide to help parents prepare their children, their children's schools, and themselves for their children's entries into mainstream classrooms
- A lesson plan and DVD for typical children with activities to create peer acceptance and to smooth the integration of children with cochlear implants into mainstream classrooms
- A website with supportive and interactive features for parents, teachers, and children

- A Teachers' Guide & DVD that provide concrete strategies and examples for teaching a student with a cochlear implant, tips for creating an inclusive classroom, suggestions for classroom modifications, and testimonials from parents and teachers who have been through the mainstreaming process with a child with a cochlear implant

Because teachers serve as the frontline providers of educational opportunities and mainstream inclusion for children with cochlear implants, we focus specifically and solely on the evaluation of the Teachers' Guide & DVD in this brief. We will report the evaluation results of the Toolkit's Parent's Guide, the lesson plan and DVD for typical children, and the website and how they work in concert with the Teachers' Guide & DVD in subsequent research briefs.

Research questions and methodology

The evaluation of the Teachers' Guide & DVD hinges on the following research questions:

- To what extent does the exposure to the Teachers' Guide & DVD increase an elementary school teacher's knowledge of, attitudes about, and self-efficacy toward having a child with a cochlear implant in the classroom?
- To what extent do elementary school teachers who are exposed to the Teachers' Guide & DVD perceive them as a helpful tool to accommodate and effectively teach a child with a cochlear implant in his or her classroom?

To address these research questions, we used a quasi-experimental, pretest/post-test two group design in which we recruited participants into the evaluation and assigned them to either an experimental or control group. Once in the evaluation, we exposed the experimental group participants to the Teachers' Guide & DVD and the control group participants to cochlear implant fact sheets from NIDCD.

The participants included 58 teachers with no previous experience teaching a child with a cochlear implant. We drew participants from eight states, including California, Iowa, Massachusetts, Missouri, New Hampshire, North Carolina, Pennsylvania, and Wyoming. Roughly 65 percent of participants teach kindergarten, while the remainder teach first grade. The majority of participants (61 percent) teach in suburban communities. Many (roughly 40 percent) teach in schools where 80 percent of more of students are Caucasian. Most participants (91 percent) are Caucasian women. At the time of the evaluation, nearly half (47 percent) of the participants were between the ages of 35 and 54, while 38 percent were younger than 35.

All participants took a pretest survey that contained 17 demographics questions, 15 knowledge questions about cochlear implants and teaching children with cochlear implants, eight Likert-scale attitude questions, and 10 Likert-scale self-efficacy questions. The post-test survey, which the participants took after either their exposure to the Teachers' Guide & DVD or the NIDCD cochlear implant fact sheets, contained the same knowledge, attitude, and self-efficacy questions from the pretest survey, though, for the experimental group participants, it also included questions about their perceptions of the Teachers' Guide & DVD and, for the control group participants, questions about their perceptions of the NIDCD cochlear implant fact sheets. Once we completed the data collection, we cleaned the survey data and analyzed them using univariate, bivariate, and logistical regression procedures in STATA.

There are important limitations to this methodology. The small sample size and homogeneity of participants limits the generalizability of the data, meaning that the results cannot be applied confidently to all elementary school teachers. The limited generalizability of the study suggests that a larger evaluation with a more representative population of teachers is warranted. Still, the data from the sample provide a key examination of a public health tool to help teachers effectively accommodate and teach students with cochlear implants.

Key results

Participants exposed to the Teachers' Guide & DVD exhibited greater gains in knowledge about cochlear implants than those who reviewed only fact sheets.

Indeed, compared to the control group participants, those who were in the experimental group showed statistically significant increases in knowledge on a range of topics, including the process of hearing and the technical aspects of a cochlear implant. More specifically, between the pretest and post-test, those who were exposed to the Teachers' Guide & DVD had significantly greater gains in knowledge about the problems faced by children with cochlear implants when transitioning between activities; the physical problems that children with cochlear implants may experience; and methods to troubleshoot a nonfunctional cochlear implant.

Compared to the control group, participants who were exposed to the Teachers' Guide & DVD also showed greater gains on the types of effective questions to ask parents with children with cochlear implants at planning meetings, and their knowledge about IEPs and how they relate to a child with a cochlear implant.

Exposure to the Teachers' Guide & DVD produced an insignificant change in teachers' attitudes.

Nearly all participants in both groups had very positive attitudes towards mainstreaming children with cochlear implants before their exposure to either the Teachers' Guide & DVD or the NIDCD fact sheets. The strongly positive attitudes before the interventions made attitudinal improvements, particularly in the short time between the pretest and post-test survey, unlikely. Still, compared to the control group, there was a greater though statistically insignificant decline in the percentage of experimental group participants who felt the need for more training to teach a child with a cochlear implant. The flipside of this result is that those who were exposed to the Teachers' Guide & DVD may feel more prepared than control group teachers to teach a child with the cochlear implant in their classrooms.

Exposure to the Teachers' Guide & DVD positively impacted teachers' self-efficacy.

Experimental group participants' self-efficacy increased between pretest and post-test on a number of measures, including their confidence to manage the technical aspects of a student's cochlear implant, such as troubleshooting a nonfunctional cochlear implant; to develop effective teaching strategies; to work with the parents of the student with the cochlear implant; and to make appropriate accommodations to the classroom and effectively set up the classroom space.

Participants were generally satisfied with the Teachers' Guide & DVD.

Eighty-eight percent of experimental group participants liked the amount of content in the Teachers' Guide & DVD and rated them "very helpful" on a five-point scale. Eighty-four percent found the content relevant to teaching a child with a cochlear implant for the first time. Another indication of participant satisfaction was a high retention rate from pretest to post-test. All but six participants completed both surveys.

Discussion

The evaluation results suggest that the exposure to the Teachers' Guide & DVD relates to increases in teachers' knowledge about cochlear implants, the educational and social needs of the children who have them, and methods to accommodate and teach them effectively. The results also suggest that a teachers' exposure to the Teachers' Guide & DVD improves their self-efficacy, though in a less dramatic way than in their knowledge gains. Though these data cannot

be extrapolated to the population of elementary school teachers throughout the US, the results suggest that the Teachers' Guide & DVD may benefit some who will teach a student with a cochlear implant for the first time. Still, the relatively small difference between the experimental group teachers' generally substantial increases in knowledge and their gains in self-efficacy suggests that any additional modifications to the Teachers' Guide & DVD before its widespread distribution as a public health and educational tool should include strategies to lessen that gap. In the end, teachers need both the information to effectively accommodate and teach students with cochlear implants and the belief that they can do so effectively.

Ultimately, the growth in the number of children with cochlear implants who will enter mainstream classrooms produces a need for an effective intervention that can moderate teachers' anxiety, which may stem from feeling ill-equipped to support a student with a cochlear implant and unfamiliarity with the technology (MED-EL, 2008; Sorkin & Zwolan, 2004). When coupled together, these anxiety-producing factors can inhibit a teacher's ability to effectively help the student and his or her peers from achieving academically and socially. The results of this evaluation show promise that the Teachers' Guide & DVD can help to overcome these factors and meet an emerging if latent demand. Indeed, the results suggest that teachers would use the Teachers' Guide & DVD if it was available to them.

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LOUISE C. PALMER is a research associate I at KDH Research & Communication, where she develops, directs, and evaluates public health projects for vulnerable populations.



JANA EISENSTEIN is a research assistant at KDH Research & Communication. Ms. Eisenstein's research focuses on vulnerable populations and health and science literacy.



ERIC C. TWOMBLY is a principal research associate and the Director of Organizational Studies at KDH Research & Communication.



KRISTEN D. HOLTZ is the founder and president of KDH Research & Communication. Dr. Holtz's research and applied

work focus on the development and evaluation of innovative approaches for health promotion, disease prevention, and substance abuse education.

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