Deaf Adult's Knowlege of Internal Anatomy and Physiology

Tracy L. Leyva, BS Nursing
Valerie N. Whiteford, BS Nursing
Elaine Jones, Ph.D., RN, Associate Professor
College of Nursing, University of Arizona
Tucson, Arizona

Abstract

The purpose of this study was to describe deaf adults' knowledge of internal anatomy and physiology. An important nursing role is to provide health education. Health teaching is more effective if it builds on the learner's pre-existing knowledge. There is evidence that deaf individuals may understand less about their internal bodies than their hearing cohorts, and therefore may misunderstand health education provided by nurses. A sample of 10 deaf adults participated in this study by drawing known internal body parts on blank, unisex outlines of the human body. They were then asked to explain the function of the identified body parts. A professional sign language interpreter translated the human subjects consent form and the research instructions into sign language for the study participants, and then translated their explanations of the body functions into voice to be audio-taped and transcribed. Inter-rater reliability for scoring the drawings was established at 90% agreement, using sample drawings, prior to scoring the deaf adults' drawings and again mid-way through data collection. Deaf adults named an average of 9.9 internal body parts. The most frequently named organs were the heart, brain, and lungs. Interview data about organ functions were analyzed using Crider's (1981) hierarchical model. Inter-rater reliability for categorizing participants' explanations of organ functioning was established at 100% agreement. Participants were unable to correctly identify any function for the named parts 69% of the time. Preliminary comparisons of these results with other studies of hearing adults suggest that deaf adults' may have a lower baseline understanding of anatomy and physiology, and that nurses may need to begin health teaching with a review of relevant anatomy and physiology. Generalizability is limited by the small sample size and the non-representative demographic characteristics of the sample, in relation to the larger deaf community.

Introduction

Nurses are often responsible for teaching self care to diverse groups of people with complex health problems. Principles of adult education indicate that teaching is most effective when it builds on existing knowledge and experience. Many self-care topics presuppose that the individual has a basic understanding of their own internal anatomy and physiology. Unfortunately, there is little research foundation for estimating the actual baseline knowledge

among the general public and even less about deaf adults' understanding of basic anatomy and physiology.

Conceptual Framework

Internal body image (IBI) was conceptualized as an extension of the Self-Concept Mode of Roy's (1984) Adaptation Model (Jones, Badger, & Moore, 1992). Roy (1984) defines body image as "how one's body looks to one's self and how one feels about how one's body looks." Much of the research to date focuses on the psychological aspects of body image. Jones et al. (1992) divided body image into two components: external and internal. Internal body image is conceptualized as a function of knowledge of internal anatomy and an understanding of physiological functioning of the body parts. For the purposes of this research, external body image, as defined by Roy (1984), was excluded from investigation.

Literature Review

There is considerable research about the development of IBI in children. The consensus in the literature is that IBI becomes more accurate and sophisticated as children age (Badger & Jones, 1990; Brumback, 1977; Crider, 1981; Porter, 1974; Smith, 1973). In 1974 Porter reported that 144 children between the ages of six and eleven named the heart, brain, and bones most frequently. Gibbons' 1985 study used the Inside-the-Body Test (IBT) to gather data about IBI from 10 deaf and 10 hearing children. The author reported that deaf children only named 27 body parts compared to 84 named by hearing children. The most frequently named organs in both groups were the heart, brain, and bones. Badger and Jones (1990) modified Gibbons' (1985) study and used a much larger sample of 80 deaf and 190 hearing children. They found that deaf children consistently named significantly fewer internal body parts than did their hearing cohorts. These two studies support the idea that deaf individuals are less knowledgeable about their bodies than their hearing counterparts.

There is little research to date on IBI among adults. Much of what is available tends to focus more on the psychosocial aspects, described by Roy (1984) as external body image (Champion, Austin, & Tzeng, 1983; Selekman, 1983). One of the first studies to include adults was conducted by Tait and Asher (1955). In their study using the IBT, 100 adult psychiatric patients, 100 naval academy candidates, and 50 medical-surgical patients named the heart, lungs, and stomach were the organs most frequently. Kardish (1994) sampled eleven elderly men with generally higher incomes and educational levels than the participants in this study. The total number of body parts named by those adults was 13.27. A similar study by Finley (1997) described the IBI of nine males and three females with end stage renal disease. The average age of the participants was 59.9 years and the average educational level was 11.6 years. The mean number of body parts identified was 11.0. In another study (Cobb, 1999), persons with various types of ostomies reported the brain, heart, and lungs most frequently.

As the literature illustrates, deaf children are known to have less information than hearing children about human anatomy and physiology (Badger & Jones, 1990; Gibbons, 1985). There is little information about IBI among hearing adults, and there have been no prior investigations of IBI among deaf adults. This study represented a first step in learning whether there are differences in IBI between deaf and hearing adults, as well as between deaf and hearing children.

Methods

Research Questions. A descriptive comparative design was used to address the following research questions. 1) What do deaf adults know about internal anatomy? 2) What do deaf adults understand about the physiology of identified body parts? 3) How does deaf adults' knowledge of internal anatomy and physiology compare with the knowledge of hearing adults?

Sample. A convenience sample of eight male and two female deaf adults was recruited at an agency serving the deaf community. Individuals ranged from 23 to 59 years old with a mean education level of 8.4 years, and with no one above the 12^{th} grade level. All participants were free of other major disabilities and deaf since birth or very early in childhood. A professional interpreter translated the human subjects' disclaimer form into sign language in order to obtain informed consent.

Instruments. The IBT was administered to measure the adults' knowledge of the internal body. Individuals were given a blank, unisex body outline and were instructed to draw in and label all body parts. Subjects were allowed to use symbols, such as Xs or circles, when they were uncertain how to draw a particular organ. No one took longer than fifteen minutes to complete the task. The drawings were scored using an established coding dictionary. Body parts were counted if they were in the correct general vicinity of the actual organ, regardless of spelling or artistic accuracy. The researchers were trained to an inter-rater reliability of 90% agreement by a faculty researcher with extensive prior experience in using the IBT. The training sessions were conducted before beginning data collection, using sample drawings from earlier studies. Inter-rater reliability was assessed again mid-way through data collection to ensure consistency in scoring the IBI drawings and found to be at 90% agreement.

During the Body-Function interview, participants were asked to describe the functions of those body parts named. The sign language interpreter's voiced translation of the participants' physiologic descriptions was audiotaped and later transcribed. Physiologic function data were categorized by modifying criteria outlined by Crider (1981). Functions for each body part that were identified incorrectly or not described at all were categorized as "No Function." The "Simple Function" category included technically correct single body part functions and the "Complex Functions" category contained only those responses that related the functions of two or more body systems to one another.

Results

The deaf adults in this study named an average of 9.9 body parts. The heart, brain, bones, lungs and stomach were the most frequently named organs. For the vast majority of organs identified, participants were either unable to describe any of the physiologic functions or described single functions only.

Discussion and Conclusion

Strengths. Because this study is the first to investigate the IBI of deaf adults, it represents an important first step in evaluating the health knowledge of an all too often neglected community. The study design accommodated deaf adults' preference for sign language by engaging a professional sign language interpreter to assist in data collection .

Limitations. The two main weaknesses of this study are small sample size and demographic characteristics that are not representative of the larger deaf community. The study sample was most similar to a subgroup of deaf adults who are "traditionally under served," a term used to refer to a somewhat marginalized lower-functioning segment of the deaf community with particular deficits in academic achievement (Long & Clark, 1994). The IBT and Body-Function interview were the instruments chosen for data collection because of their use in prior studies. However, the researchers noted that the deaf participants were consistently reluctant to draw, and seemed intimidated by the drawing task. Hence, the data collected may not accurately reflect the participants' true internal body image.

Comparisons Across Studies. Our study design did not include a comparison group of hearing adults, and there have been no studies of IBI among hearing adults with educational levels similar to the sample of deaf adults who participated in study. Therefore, it is impossible to know with any certainly whether the low number of named body parts and lack of understanding of physiology among our sample was related to deafness or low education, or some interaction of factors influencing IBI. However, the average number of body parts named by deaf adults in this study was quite similar to the number identified by deaf children (Badger & Jones, 1990). Those children identified significantly less body parts than hearing children and far fewer than hearing adults in other studies (Kardish, 1994, Cobb, 1999). Additional study of IBI among a larger, more representative sample of deaf adults will be necessary in order to learn what factors influence similarities and differences in IBI among deaf versus hearing adults.

Conclusion and Clinical Implications: This study was performed to learn deaf adults' baseline understanding of human anatomy and physiology, in order to guide nurses in developing appropriate, effective health education for those clients. Results suggest that deaf adults with low levels of educational achievement may know little about their internal anatomy and physiology. Therefore, nurses providing health teaching to deaf adults with low educational levels may need to begin at a very basic level and should expect to take more time with these clients, with the assistance of a professional sign language interpreter.

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