An Experiential Learning Exercise Exploring BSN Nursing Students' Cognitive and Affective Knowledge of Age Associated Sensory Changes

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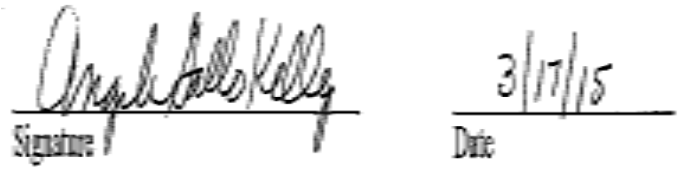

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Abstract

The focus of this quasi-experimental pre-post study with mixed methods was to assess the effect of an experiential learning activity on freshmen and sophomore nursing students' cognitive and affective knowledge of sensory changes that occur in older adults as part of the aging process. Based on Kolb's Experiential Learning Theory, the students took part in an interactive learning experience using low fidelity simulation which included a Sensory Kit, a Power Point© Presentation and Unfair Hearing Test©. Participants were guided through reflective observation, abstract conceptualization, active experimentation and concrete experience during the study. An overall increase in cognitive knowledge was found to have occurred in all subgroups which included those who have either worked or lived with older adults or have had previous training in a geriatric sensitivity training program as well as those who have not in the aforementioned categories. The total sample (N=72) had a pre-test Mean±SD of 58.06±12.29 and post-test Mean±SD of 80.97±9.06 with a $p < 0.0001$. Affective knowledge was analyzed using the coding method in which the written data was organized into four themes: Student Experience; Anticipated Feelings of Older Adults as Experienced by the Students; Changes in Participants' Feelings towards Older Adults after the Experience and Influence on Participants for Future Practice with Older Adults. The subjects reported an overall sense of empathy along with anticipated feelings of frustration and anger, gaining a greater sense of respect and admiration for older adults as well as special safety concerns to address in their plans of care.

Chapter 1

Introduction

Background of the Problem

One of the fastest growing age groups in the United States are those 65 and older, whose numbers have increased by 21.1% from the years 2000 to 2010 (United States Census Bureau, 2010). The rapid increase in the aging population is a global phenomenon. (Lin, Bryant & Boldero, 2011). Between the years 2012 to 2050 those 65 and older are projected to grow in numbers from 43 million to 75 million (Ortman, Velkoff &Hogan, 2014). The projected increase in the aging population suggests that nursing students will likely work with older adults (OA) in some capacity in their careers (Lun, 2011). Most traditional undergraduate students have limited experience working with older adults (Wood, 2002). Therefore, nursing students need to gain an appreciation and knowledge of changes associated with healthy aging to help older adults maintain their quality of life. With older people living longer now than at any time in history, maintaining their quality of life will allow them to live independently for as long as possible (Grady, 2011).

Sensory changes are a normal part of the aging process and can affect an OAs' activities of daily living. Helping nursing students learn and experience the sensory changes associated with aging may increase their knowledge and appreciation for older adults' daily challenges and experiences. Exposing undergraduate nursing students to an experiential learning exercise of the sensory changes of aging may enhance their understanding of these changes.

Purpose/Statement of the Problem

The purpose of this study was to measure nursing students' cognitive and affective knowledge related to sensory changes in older adults through experiential education.

Traditional undergraduate nursing students will be working with OAs through practicum or service oriented experiences in their educational program and most likely in their professional career. Students under the age of 30 may find it challenging to grasp the normal sensory changes of aging and how they may impact the quality of life of OAs. Experiencing these changes through a simulation exercise of aging-associated sensory changes may help students acquire an appreciation of how these changes affect OA's daily lives. Students may not be aware that daily activities such as engaging in conversations, reading the newspaper and walking down the stairs can be cumbersome for older adults.

This study addressed a number of needs in nursing collegiate gerontological education. Currently anecdotal evidence is available on the use of the Sensory Simulation Kit and the Unfair Hearing Test© in undergraduate nursing students (Van Son & Fitzgerald 2012; Wood, 2002). Also, this study provided additional anecdotal evidence which may be useful to nursing faculty when teaching students about aging-related sensory changes.

Research Questions

The research questions for this quasi-experimental pre-post study with mixed methods were:

1. What is the effect of an experiential educational intervention on BSN nursing students' cognitive and affective knowledge of sensory changes common in older adults?
2. In undergraduate nursing students, does prior exposure to older adults impact cognitive and affective knowledge of sensory changes common in older adults?

Theoretical Framework

Learning that occurs from direct experience is experiential learning. The experiential learning model follows an outline for exploring and reinforcing the bonds between education, personal development and work (Kolb, 1984). Not all learning experiences are educational or do

not achieve the desired outcome of learning if it is not associated with future experiences (Dewey, 1938). Some experiences do not achieve the desired outcome of learning if the result is hindering or interfering with future experiences (Dewey, 1938).

The process of experiential learning is a four-stage cycle accompanying four learning modes (Kolb, 1984). These four modes are concrete experience, reflective observation, abstract conceptualization, and active experimentation. During the concrete experience stage, individuals are engrossed in the immediate situation and rely on their emotion, feeling and their instinctive responses to a given situation; whereas the abstract conceptualization stage requires one to think logically and make a prudent evaluation in order to generate ideas from their observations into reasonably sound theories (Atkinson & Murrell, 1988). Both of these stages are in a continuum with one another and characterize how individuals seize the information from their environments ranging from active involvement in a situation to disengaged analysis (Atkinson & Murrell, 1988).

Another stage is reflective observation. In the stage of reflective observation, there is an unbiased viewpoint toward learning where many alternatives are considered (Atkinson & Murrell, 1988). During the active experimentation stage, the participant is doing or actively involved in the experience and is willing to take risks in the learning process. It is important in this stage to test previous produced concepts (Atkinson & Murrell, 1988). Reflective observation and active experimentation are also on a continuum. The learner moves from the immediate experience of doing which formulates the foundation for the reflective and observation process.

The need to measure a person's individual tendencies or preferences toward learning resulted in Kolb's Learning Style Inventory, which assesses and individual's learning style. Kolb

defines learning style as a favored way of processing knowledge from the environment (Laschinger, 1990). The four learning style categories relate to the continuum in the learning cycle are convergent, divergent, assimilative and accommodative. The convergent learning style depends on the learning abilities of active experimentation and abstract conceptualization (Kolb, 1984). The strength of learners who are convergent lies in their ability to solve problems and make decisions. These types of learners do well in standard intelligence tests (Kolb, 1984). The divergent learners, who are direct opposite of the convergent learners, develop their strength from concrete experience and reflective observation. They are highly imaginative, view situations from many perspectives and adapt, rather than react to situations (Kolb, 1984).
The learning abilities that prevail for the assimilator are from abstract conceptualization and reflective observation. The expertise of assimilators is grounded in inductive reasoning and the creation of theoretical models. Assimilators are more concerned with ideas and abstract concepts rather than concentrating on people (Kolb, 1984). Opposite of the assimilator is the accommodator. Accommodators thrive in experience and experimentation. They learn best by doing and getting involved in new experiences and are not afraid to take risks and have the flexibility to adapt immediately to any given situation (Kolb, 1984).

The core focus of experiential learning is how the role of experience impacts the learning process. The social changes of the 1960s provided the inspiration for developing this learning theory. Opportunities for poor and minority students increased during this period and there was a need to address various learning styles (Kolb, 1984). Theoretical concepts and philosophies that were traditional in the academic setting needed to be useful in the every-day lives of these populations. A large number of minority students did not have the arduous preparation in the textbook way of learning but had their own unique styles that were more tangible (Kolb, 1984).

This theory aligns well with the small private university's mission to underserved populations. Experiential learning theory is also applicable to the working population or non-traditional students in general such as the mature adult population. Since the number of career changes in adults continues to increase, newly acquired knowledge must be applicable and significant to past learning experiences. It can be quite intimidating for adult students to return to the educational setting. A more creative and fruitful learning experience can be provided for these learners by combining work, study, theory and practice (Kolb, 1984). Experiential learning can be expressed as learning that results from reflection on an experience and purposeful engagement. The assumptions that came about from reflection can become a part of the continuous learning cycle (Cano, 2005).

The use of a sensory kit to simulate changes associated with aging has been reported in the literature (Gardner & Benzing, 1990; Wood, 2002; Van Son & Fitzgerald, 2012). For this study, each volunteer undergraduate student received a Sensory Kit which uses low-fidelity simulation activities to experience some of the challenges faced by OAs regarding sensory changes. The Unfair Hearing Test© was administered to the group at the same time. The aim of this experience was to impact the student's cognitive and affective knowledge regarding sensory changes of older adults.

The phases of Kolb's Learning Theory are on a continuum (Figure 1). For this study, the students completed a pretest and then viewed and listened to a presentation using PowerPoint© slides which guided them through the reflective observation (watching) and abstract conceptualization (thinking) phases. Active experimentation (doing) was experienced through the use of the Sensory Kit and Unfair Hearing Test©, and then they progressed to the concrete experience phase (feeling). Once the students used the Sensory Kit and listened to the Unfair

Hearing Test©, they participated in the reflective stage of what they have experienced in this activity. During their reflection, it was anticipated that a sense of appreciation and empathy would be generated about sensory changes experienced by OAs. The concrete experience stage led the students to engage in the immediate situation, using their emotions and feelings that stemmed from their instinctive responses. Feeling the discomfort of dry hard legumes in their shoes or not being able to read the fine print of the newspaper clipping allowed them to experience the frustration and unpleasant feelings OAs endure. In the abstract conceptualization stage, the students were able to think logically about their experience and formulate interventions to promote safety and effective communication in their encounters with OAs.

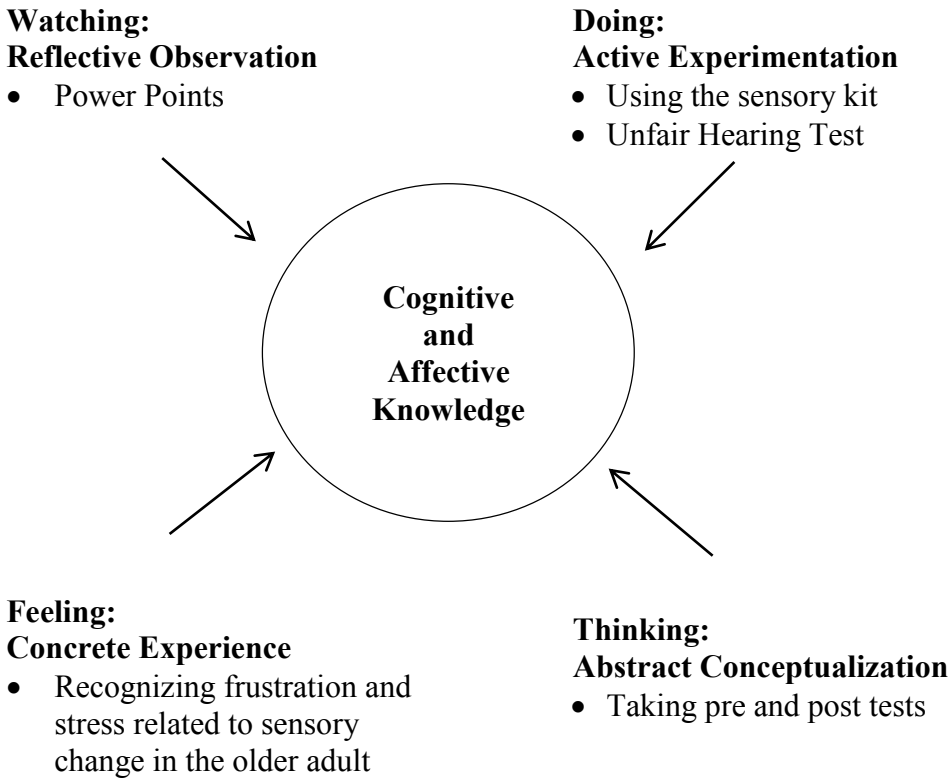

Figure 1. Researcher's Interpretation of the Application of Kolb's Learning Model to the Study Intervention

The program was designed to teach about the sensory changes of aging and incorporated all aspects of Kolb's Learning Theory. Through the use of the PowerPoint© slides, Unfair Hearing Test© and Sensory Kit, all domains of thinking, doing, feeling and watching were experienced by the participants. Cognitive and affective knowledge was assessed and measured to determine if learning had occurred.

Terminology and Definitions

- *Older adults (OA)* were defined as any individual, female or male, age 65 and over.
- *Undergraduate college nursing students* were defined as those freshman and sophomore students who are pursuing a Bachelor of Science degree in a small private university.
- *Experiential Learning* refers to learning that occurs from direct experience (Kolb, 1984). Experiential learning was accomplished during a 50 minute simulation exercise using a Sensory Simulation Kit and Unfair Hearing Test©.
- *Sensory changes* included significant age related declines attributed mainly to declining sensory capabilities (Glisky, 2007). Sensory changes were simulated using a Sensory Simulation Kit and the Unfair Hearing Test© (Sight and Hearing Association, 2007).
- *Affective knowledge* was defined as growth in feelings or emotional domains (Bloom's Taxonomy of Learning Domains, 2010). Affective knowledge was measured using the Affective Knowledge Questions.
- *Cognitive knowledge* was defined as mental skills. Cognitive knowledge was measured using the pre and posttest.
- *Sensory Kit* is a low- fidelity simulation tool made up of the following items: Plastic sandwich bag, pair of vinyl gloves, piece of yellow cellophane, piece of newspaper clipping, small button, needle and thread, piece of sandpaper, handful of split peas, pieces

of white, light yellow, blue and green paper and a piece of chocolate or hard candy. This is a tool used to teach students about the distinct changes that occur with aging (Van Son & Fitzgerald, 2012).

- *Unfair Hearing Test* is an interactive audio presentation that simulates age related changes in hearing (Sight and Hearing Association, 2007).

Chapter 2

Synthesis of the Literature

Introduction

Many undergraduate college nursing students enter higher education from the perspective of a youth oriented culture. Upon graduation, it is expected that students will express a sense of empathy and sensitivity in their interactions with their clientele (Gardner & Benzing, 1990). Benefits of simulation in education include increasing motivation and interest, improving cognitive learning and improving affective learning by creating a sense of empathy (deTornyay & Thompson, 1987). Babic and Crangle (1987) found that some simulations in geriatrics can focus too much on the losses that occur with aging promoting negative attitudes; however, an increase in the level of empathy was reported.

Critique and Synthesis of Previous Research

Experiential learning in higher education. Experiential Learning has its origins from the works of Dewey, Lewin and Piaget (Kolb, 1984). The goal of those who utilize experiential learning programs is to inspire a desire to learn in those being taught (Sibthrop, Schumann, et al., 2011). John Dewey is known as the most influential educational theorists of the twentieth century (Kolb, 1984). Disenchanted with the educational system's traditional approach to learning in the 1930's, Dewey was progressive in his approach stating, "I take it that the fundamental unity of the newer philosophy is found in the idea that there is an intimate and necessary relation between the processes of actual experience and education" (Dewey, 1938, p. 20). When one looks back at an experiential learning activity, and determines its usefulness, and utilizes this knowledge to perform another activity, then experiential learning has occurred (Dewey, 1938).

Most often, BSN nursing students receive newly acquired knowledge in the lecture format. The Experiential Learning Model dares those who educate to change and modify their way of teaching (Woffinden & Packham, 2001). Learning by doing encourages the learners to be engaging in their learning experiences. While an educator can stand in front of the classroom and demonstrate how something is done, in order to be a truly experiential experience is to lead the students through an activity (Woffinden & Packham, 2001). Most students are partial to one or two types of learning styles, yet in order for learning to occur, all of the stages of Kolb's learning theory must be experienced (Lisko & O'Dell, 2010).

Experiential learning and sensory changes in older adults. The process of aging affects all systems of the body. Decreases in the senses of vision, hearing, taste, smell and touch occur gradually (Nusbaum, 1999).

All people can expect changes in vision that are age related (Stuen & Faye, 2003). A condition known as presbyopia occurs in which the lens of the eye becomes more dense and yellow and elasticity is decreased (Stuen & Faye, 2003). This condition can be accommodated with reading glasses. Older adults need more light than those younger since the pupil of the eye decreases in size with aging. Therefore, it is necessary to provide additional lighting for OAs for tasks such as reading or manipulating their environments. Twice the amount of illumination is required for people over age 60 than those aged 20 (Linton & Lach, 2007). Non-florescent indirect lighting provides the most appropriate source of lighting to diminish glare. An increase in the fibrosis of the eye makes accommodation more difficult for the OA. Inexpensive, yet imaginative props can be used to simulate sensory changes that occur with aging. The use of yellow plastic report cover covered with Vaseline allows the learner to experience how vision is distorted along with color perception caused by changes in the ocular lens (Gardner & Benzing,

1990). Looking through two layers of a sandwich bag along with a piece of yellow cellophane can simulate the difficulty OAs have with reading text on prescription pill bottles, newspaper or phone book (Van Son, 2005).

Age related hearing loss is known as presbycusis. Noise exposure and/or exposure to ototoxic drugs can predispose OAs to additional hearing loss (Mackenzie, 2012). Exposure to loud sounds throughout life is attributed to one third of all hearing loss in OAs (Tabloski, 2006). Two types of hearing loss commonly experienced by OAs are conductive and sensorineural. When there is a problem with the external or middle ear, conductive hearing loss occurs. Infections or impacted cerumen is attributed to this type of hearing loss (Tabloski, 2006). Conductive hearing loss is also affected by thickening of the tympanic membrane along with loss of its elasticity (Rughwani, 2011). Those experiencing conductive hearing loss will have difficulty distinguishing low-frequency sounds (Rughwani, 2011). Sensorineural hearing loss occurs when there are problems within the inner ear. Impairments of the cochlea and auditory nerve create alterations in sound (Tabloski, 2006). Those with sensorineural hearing loss have difficulty distinguishing high-frequency sounds (Rughwani, 2011). A combination of both conductive and sensorineural hearing loss can occur. The Unfair Hearing Test© is a highly effective program simulating alterations in commonly used words as they may be heard by a person with various forms of hearing losses (Van Son, 2005).

As one ages, the sense of smell decreases as well as the ability to differentiate between different smells (Boyce & Shone, 2006). Half of one's smell detection can be affected by the aging process (Rughwani, 2011).The sense of smell along with the sense of taste sharply declines in the sixth and seventh decades of life (Linton & Lach, 2007). Decreases in smell can lead to potentially dangerous situations such as not being able to recognize the odor of smoke, gas or

spoiled foods. Food smells also stimulate saliva production, thus stimulate hunger. This alteration can reduce the enjoyment of eating and decrease appetite, thus affecting one's nutritional status (Rughwani, 2011). Participants can hold their noses while tasting various items such as chocolate or salt-free crackers to demonstrate the decreased sense of smell and taste. The sense of touch and sensitivity to high-frequency vibration also occurs with the aging process (Linton & Lach, 2007). A prominent finding in a study done by Stephens and Choo (1998) was the rapid deterioration of the extremities with its effect of the thermal senses. The potential for burns or injury is greatly increased as a result of the inability to detect extremes of temperatures or presence of foreign bodies. The application of rubber gloves and touching various textures such as sandpaper can be used to experience tactile deficits that may occur with the aging process (Gardner & Benzing, 1990).

Wood (2002) expressed her concern with undergraduates having difficulty in understanding the normal functional and sensory changes that occur with the OA. She developed an aging simulation exercise to actively engage students in the learning experience of growing old. Aging simulation has been used in a variety of settings over the years as part of ongoing educational offerings for health professionals as well as undergraduate college students (Wood, 2002). Supplies such as Vaseline smeared glasses, cotton balls, dried beans and ear plugs were used in the simulation. The intent of this simulation was to have the students acquire an awareness of how these changes of aging impact the daily lives of OAs and becoming more considerate of an older person's feelings losing their independence resulting from the decrease in sensory-motor function (Wood, 2002). Students found this to be a worthwhile experience which increased both cognitive and affective knowledge.

Gardner and Benzing (1990) stated that the facilitator needed to prepare questions related to what was experienced in the simulation in a debriefing discussion. Questions should take into account both the cognitive and affective learning objectives in order to assess if objectives were met (Wolf & Duffy, 1979 as cited in Gardner & Benzing, 1990).

Experiential learning and sensory changes in nursing curricula. A variety of articles and research studies discussing geriatric education in health care disciplines using experiential learning to teach students as well as faculty about the field of geriatrics were found. However, the literature is limited in geriatric simulation with nursing students compared to other specialties. The literature is clear that a need exists to integrate gerontological nursing content in nursing curricula (Baumbaush, et al., 2012; Cline, et al., 2012; Miller, et al., 2010; Plowfield, et al., 2006; Green, et al., 2005; Kelly, et al., 2005).

Nursing students will be confronted with many challenges in caring for the OA population in various healthcare settings. In the long term care setting, independence and self-esteem are threatened because of the limitations due to changes that accompany the aging process (D'Wynter, 2006). The experiential learning experience can assist students in developing approaches in dealing with changes in vision and hearing. Strategies such as optimizing lighting conditions, using large font, speaking slowly and directly in front of the OA person can be used (D'Wynter, 2006). In order to determine if learning has occurred, student engagement or active learning must have taken place (Karasik, 2012). By engaging students in the learning process, their attention can be captured with the hopes of making them open and immersed in the concepts being taught (Karasik, 2012). According to Van Son & Fitzgerald (2012) the use of the Sensory Kit will enhance this knowledge. Van Son & Fitzgerald stated that the use of the Sensory Simulation Kit will integrate Kolb's theory of experiential learning by

allowing for reflection and discussion of the significance of the experience along with the interventions needed to be implemented based on the experience (Van Son & Fitzgerald, 2012). Yurick (1979) compared the lecture-simulation format to the lecture-discussion format to teach sensory changes and the environmental adaptation needs of the OA. Yurick (1979) found that there was no significant difference in the attitudes or acquired knowledge of the two groups, but the simulation learners felt more positively about the simulation sessions than the comparison group did about the discussion methods.

Gaps in undergraduate nursing curricula do exist in the area of gerontological nursing content. Educational efforts are being made to address a potential health care crisis to meet the needs of an increasing OA population (Miller, Van Son, Cartwright & Allen, 2010). Miller et al. (2010) addressed the need for faculty education in the Northwestern region of the United States which involved 11 baccalaureate schools of nursing and 235 faculty members participated. Given the current state of budget cuts in education, they highlighted free and inexpensive gerontological teaching resources which included websites, YouTube videos and CD-ROMs. A Sensory Kit was given to each of the participants so they could experience the challenges faced by the OA regarding sensory changes (Miller et al., 2010). Increasing knowledge of aging and providing experiences in the care of older adults may improve nursing students' attitudes regarding careers in gerontology (Heise et al., 2012). In order to provide actual simulated instruction, Heise et al., (2012) used Van Son's Sensory Kit to allow students to actively engage in learning about the sensory changes that appear with aging. It was stated that students acquire a deeper understanding of healthy aging as they obtain experiences in geriatric simulation throughout their coursework in their undergraduate nursing program (Heise et al., 2012).

Shepherd, McCunnis, Brown and Hair (2010) compared the methods of two different types of simulation as a teaching strategy in order to provide the evidence base of which method was more effective. Comparing the use of role play and the use of manikins indicated no significant difference in the nursing students' scores except in the area of communication where the role play scored higher (Shepherd et al., 2010). Treymayne et al. (2011) used an aged simulation suit to teach empathy to nursing students by simulating some of the physiological changes of aging. The simulation suit was found to be a useful learning tool to demonstrate the musculoskeletal and sensory changes of aging (Treymayne, 2010). Pacala, Boult and Hepburn (2006) modeled a version of the Aging Game from Duke Medical School to expose their students to the experiences of aging. This program was a half day workshop coupled with the other half in a seminar format and involved a large number of supplies and volunteers to serve as actors. Student perceptions and awareness to all of the physical, sensory and cognitive changes that accompany aging were broadened (Pacala et al., 2006).

Diachun, Dumbrell, Byrne and Esbaugh (2006) conducted a study to challenge their belief that students would have a superior training experience than by instructive approach alone. The study did not find that the experiential learning approach resulted in improved geriatric knowledge, attitude or interest in the field of geriatrics over the didactic approach one year after the experiential experience. Yurick (1979) did a study to compare lecture-simulation teaching method to the lecture-discussion method in encouraging attitude change as well as cognitive learning experience of nurses regarding revisions in the environment to accommodate the needs of OAs who were experiencing sensory changes. Those participants who experienced the simulation sessions had more positive responses than those who experienced the discussion sessions (Yurick, 1979).

Rationale for Study

Most of the primary literature reviewed was based on the use of high fidelity simulation. Some medical schools use high fidelity simulators to teach medical students about sensory and functional losses that occur with aging. Several non-research based articles described the use of easily acquired and inexpensive materials to teach students, faculty and staff about these changes but were not research based and provided anecdotal evidence (Van Son & Fitzgerald, 2012; Wood, 2002,) The University of Pittsburgh Institute on Aging provides ongoing geriatric sensitivity training programs entitled, *Ageless Wisdom: A Sensitivity Training Program* to employees of a major healthcare organization and to the general public. These experiential learning activities allow its participants to experience both the normal and abnormal changes of the aging process. While literature on simulation in various healthcare disciplines is great, literature is limited regarding geriatric simulation with nursing students compared to other specialties. Almost all of the literature reviewed stresses the need to further integrate gerontological nursing content into nursing curricula.

An urgent need exists for nursing students to pursue careers working with older adults. Employment opportunities will continue to increase for nurses not only in the acute care setting, but in the long term and community settings as well (Hoogerduijn, Grobbee, & Schuurmans, 2014; Dumas, Blanks, Palmer-Erbs & Portnoy, 2009; Knickman & Snell, 2002). By providing opportunities for nursing students to work with OAs in various settings as well as incorporating gerontological principles throughout undergraduate curriculum may promote healthier attitudes and knowledge toward old age.

Chapter 3

Methods

Design

Experiential learning activities have been performed in classroom settings with undergraduate students to introduce the functional and sensory changes that occur with the aging process have provided the framework for this study. According to Wood (2002), undergraduate students struggle to comprehend the sensory and functional changes that occur in older adults. Wood (2002) conducted a classroom activity which involved an experiential learning activity to help students better comprehend the effect of these losses on the lives of older adults. Van Son, et al. (2012) conducted a similar classroom simulation with nursing students and shared that sensory changes are a typical alteration that occurs with the aging process. Improved understanding of sensory and functional changes that occur with aging allows students to improve their geriatric assessment skills (Van Son, et al., 2012). A quasi-experimental pre-post study combined with a mixed methods approach was conducted in order to determine if there would be any changes in the cognitive knowledge of BSN nursing students after viewing the PowerPoint© presentation(Appendix A), using the Sensory Kit(Appendix B) and listening to the Unfair Hearing Test© (2007). Permission was granted by Catherine Van Son, PhD, RN (Appendix C) to use the Sensory Kit and by the Sight and Hearing Association (Appendix D) to use the Unfair Hearing Test©.

The quasi- experimental component of the study using a pre-posttest design examined the relationship between the above research activities and the effects on students' cognitive and affective knowledge (Burns & Grove, 2009). The quasi-experimental approach was considered appropriate given the lack of comparison groups and manipulation of treatments. Extraneous variables included whether the subject has ever worked or lived with older adults and if they

have ever experienced a geriatric sensitivity training program in any workplace. The qualitative component explored the students' affective knowledge when they described their experiences regarding age related sensory changes, the feelings they expected older adults to have regarding sensory changes and any changes in their feelings regarding OAs. Student themes were identified through the review of their written experiences.

Population

The population targeted included a convenience sample of full time freshman and sophomore undergraduate BSN students at a small private university in southwestern Pennsylvania. This population was easily accessible and generated a sample population of 72. Students were excluded from this study if they have taken the Concepts of Gerontology (NU 210) course or have previously earned a bachelor's degree. Nursing students who reside both on and off campus were eligible to participate. Undergraduate students who returned to school to earn a second degree were not eligible since it was expected that they would have had more work experience and perhaps previous work exposure with older adults. Recruitment began in the fall 2014 semester during the Freshman Year Seminar class and during the first week of the NU 2161 sophomore clinical orientation classes. Ongoing recruitment efforts continued through September of 2014.

Procedures

Approval through the Institutional Review Board (IRB) of Carlow University was obtained to protect the human rights of the participants (Appendix E). Students were informed that their participation was completely voluntary and that their refusal to participate in the study would in no way affect their status at the university or on grades in their nursing courses. Each

participant was given an explanation and purpose of the study prior filling out the Informed Consent Form (Appendix F).

The recruitment plan began by contacting the dean and director of nursing, the director of the undergraduate nursing program and the course facilitator of sophomore level via e-mail. Faculty who were teaching the Freshman Year Seminar course for freshman nursing students in fall 2014 were also contacted to discuss meeting with freshman level nursing students during one of their classes to recruit these students for the study. An informal meeting was set up to meet with these individuals to inform them of and explain the study in detail.

The director of the undergraduate nursing program who is also a faculty member of the Freshman Year Seminar course, had confirmed the plan to present and conduct the research during the October 17, 2014 class involving freshman nursing students. Sophomore nursing students were recruited during the first week of the NU 2161 sophomore clinical orientation classes to participate in the study. Sophomore nursing students were also sent e-mails reminding them of the study and the data collection times. Flyers were posted in designated areas on campus. Data was collected over a two week period in October 2014. Permission was granted from the appropriate personnel to post flyers in the nursing education building, student resident halls and commuter lounge in order to recruit participants. RSVPs were sent via e-mail to the chief researcher; however walk- in participants were not turned away, provided they met eligibility. Permission to utilize smart classrooms was obtained through room scheduling personnel of the university.

Junior undergraduate nursing students distributed and collected the consent forms along with the research questionnaire packets and Sensory Kits. Demographic information collected included the age, year in school, whether or not the participant has ever worked or lived with an

OA relative, or have ever experienced a geriatric sensitivity training session in any other class. No names or student identification numbers were used to ensure confidentiality of the participants. Barriers to participation in the research project included consistent room availability and sophomore students' motivation and availability to participate.

Once the students completed the demographic sheet (Appendix G) and pre-test (Appendix H), they participated in the experiential learning experience. Once the presentation was finished, the students completed the post-test (Appendix H) and the affective knowledge questionnaire (Appendix I). The five forms which included the demographic data sheet, the pre-test, the post test, and four queries were separated into individual packets and assigned numbers in order to analyze data at the end of the study. The Unfair Hearing Test© worksheet (Appendix J), was also collected and stored in individual packets, but not used for data analysis. The participants were informed that the Unfair Hearing Test© answers (Appendix K) would be available at the completion of the study upon request. The chief researcher has stored the data in a locked file cabinet.

Vision changes were experienced by the students as they looked through the double layers of a plastic bag and covered with yellow cellophane. Arthritic changes were experienced by placing dried legumes in their shoes and ambulating around the research room. The participants donned non-latex gloves and rubbed their fingers along a piece of sandpaper and tried to thread a sewing needle which simulated the peripheral and tactile changes associated with aging. Participants also held up the double layer plastic bag in front of fellow participants to simulate the difficulty of fine motor skills trying to thread the needle while experiencing age related vision changes. Changes in taste and smell were experienced as participants ate a chocolate candy while holding their noses. These inexpensive props which made up the Sensory

Kit allowed the participants to actively experience the changes of vision, the osteoarthritic and peripheral neuropathies, and the changes in taste and smell that accompany aging. The Unfair Hearing Test© had distorted commonly used words that depicted both sensorineural and conductive forms of hearing loss. Participants listened to and wrote down the words as they perceived them. Participants were provided the correct answers to the hearing exercise upon request once the data was analyzed.

A decrease in visual accommodation continues with aging since the lens of the eye is unable to change shape for near vision (Hogstel, 2001). The use of folded sandwich bags placed over newspaper print simulated this change. The yellowing of the eye that causes a change in color discrimination was demonstrated by placing a piece of yellow cellophane over four small squares of blue, green, yellow and white paper as they tried to distinguish the colors. The white and blue squares appeared yellow and green respectively. The progression of hearing loss and sound discrimination is known as presbycusis caused by changes in the organ of Corti and loss of nerve cells in the eighth cranial nerve (Hogstel, 2001). It is challenging for an OA to distinguish between high frequency and low intensity sounds from such letters *s, f, t* ,*th* and *ch,* (Mauk, 2014). These hearing changes were demonstrated through the use of the Unfair Hearing Test© (2007). Fewer taste receptors do exist with aging, however coexisting medical conditions are present in those experiencing a significant loss of taste and smell (Ferrini & Ferrini, 2012). Olfactory and taste changes were simulated through holding one's nose while eating a piece of chocolate candy. Tactile changes were simulated by wearing non-latex vinyl gloves and handling a strip of sandpaper.

Instruments

A ten question pre-posttest true/false questionnaire and four open ended affective knowledge queries were used in this pilot study. Both of these instruments were developed by the researcher since no reliable or valid tool exists to assess cognitive and affective knowledge regarding experiential age related sensory education.

Data Analysis

Ten true and false questions (Appendix D) were administered to the undergraduate nursing students prior to and after the simulation. The answers were compared to determine if an increase in cognitive knowledge had occurred. Affective knowledge was assessed by reviewing the responses to the open ended questions (Appendix E).

Data analysis included both quantitative and qualitative analysis. The quantitative portion of the study compared the difference between pre and post testing. Descriptive statistics were reported for continuous variables, as means and standard deviations. The percent of change and direction of change between pre and post-test were reported. Categorical variables were reported as frequencies and percentages.

The qualitative narrative was used to describe participants' experiences, thoughts, feelings and attitudes towards aging after they have completed the experience. Given the exploratory nature of this pilot study, the sample size of N=72 participants was determined based upon the feasibility of recruitment and the expected precision of the effect size estimates to be obtained. With a minimum sample size of 72 and a confidence coefficient of 0.95, there was 0.235σ precision to estimate population means and interval with a width equal to 0.24.

Chapter 4

Results

Analysis and Summary of Quantitative Data

Data were collected over five one hour sessions from October 1, 2014 through October 17, 2014. A total of 124 freshman and sophomore nursing students were invited to participate in the study and a sample size of 72 or 58% of the 124 total numbers of students agreed to be in the study. All 72 of the participants met eligibility requirements and completed all pre and post testing and answered the four queries. BSN characteristics (see Table 1) being analyzed were the current semester in school, having ever worked with older adults, having ever lived with older adults or having had any previous geriatric sensitivity training. Participants were between the ages of 18 and 20 and the Mean ± SD was 18.5 ± 0.63. Forty-one (56.94%) have previously worked with older adults and 27 (37.5%) have lived with older adults. Nine (12.5%) have previously experienced geriatric sensitivity training.

Table 1

Characteristics of BSN Student Sample (N=72) Completing the Educational Session.

BSN Characteristics	Total Sample n (%)
Current Semester	
First Year Fall Semester	49 (68.06)
Second Year Fall Semester	21 (29.17)
Third Year Fall Semester	2 (2.78)
Ever worked with older adults	
Yes	41 (56.94)
No	31 (43.06)
Ever lived with older adults (do not include parents)	
Yes	27 (37.50)
No	45 (62.50)
Ever experienced geriatric sensitivity training in any class or workplace	
Yes	9 (12.50)
No	63 (87.50)
Age (Years)	Mean±SD:(18.5±0.63)

A representation of the effect an experiential educational intervention on BSN nursing students' cognitive knowledge of sensory changes common in older adults included the data analysis comparing the difference between pre and post testing. Descriptive statistics were reported for continuous variables, as means and standard deviations. The use of descriptive statistics generated new knowledge about the increase in cognitive knowledge in which limited research has been conducted (Burns & Grove, 2009). Categorical variables were reported as frequencies and percentages. The percentage of change and direction of change between pre and post-tests were reported.

Research question one

The first research question focused on the effect of an experiential educational intervention on BSN nursing students' cognitive knowledge of sensory changes common in older adults. Frequency distributions were used to compare correct answers of pre and post-test questions. An overall increase in cognitive knowledge ranging from (↑ 3%-61%) was shown in the post-test with the exception of question number nine which showed a decrease of 32% (see Table 2). Areas that reflected the greatest amount of knowledge increase were question #2 regarding the thinning of the lens of the eye (61%), question #4 regarding the change in pupil size(53%) and question #5 concerning the change in the number of taste buds with aging (69%). Question #9 asked about the type of hearing loss caused by cerumen impaction. It was revealed that 32% of the participants scored less on the post- test than on the pre- test.

Table 2

Outcome Frequency Distribution Pre & Post-test of Cognitive Knowledge of Age Associated Sensory Changes.*

Variable	Pre-test Answered Correct Freq (%)	Post-test Answered Correct Freq (%)	Change of knowledge Pre and Post ↓ or ↑ X%
All senses are affected by the aging process.	66 (91.67)	72 (100)	↑ 8%
The lens of the eye thins with the aging process	15 (20.83)	59 (81.94)	↑ 61%
Older adults can easily distinguish between shades of blue and green.	65 (90.28)	72 (100)	↑ 10%
The pupil size of the eye does not change with aging.	29 (40.28)	67 (93.06)	↑ 53%
The number of taste buds decreases with aging.	8 (11.11)	58 (80.56)	↑ 69%
Older adults are more sensitive to the tastes of bitter and sour than sweet and salty.	27 (37.5)	29 (40.28)	↑ 3%
There are fewer olfactory (smell) nerves with aging.	59 (81.94)	69 (95.83)	↑ 14%
Older adults can easily distinguish between soft sounds of c's, f's and s's.	60 (83.33)	71 (98.61)	↑ 15%
Sensorineural hearing loss is caused by cerumen (wax) impactions.	36 (50.00)	13 (18.06)	↓ 32%
Older adults tend to hear the lower tone of men's voices easier than women's voices.	59 (81.94)	70 (97.22)	↑ 16%

Research question two

The second research question focused on whether prior exposure of the nursing students to older adults impacted cognitive knowledge of sensory changes common in older adults. Forty-one participants have had working experiences with older adults as compared to 31 participants

without such experience. An overall increase in knowledge was shown in both groups of those living with older adults and those who have not lived with older adults. Twenty-seven participants have lived with older adults and 45 participants have stated that they have never lived with older adults. Both groups which included those who have working experiences with older adults and those who have not, gained a substantial amount of knowledge regarding the thinning of the lens of the eye as demonstrated in an increase of 66% and 55% respectively. Participants who have had previous working experience with older adults had a significant knowledge base (97.56%) who answered correctly, compared to (80.65%) who have had no previous working experience with older adults. Both groups have shown a notable increase in taste bud change knowledge which has shown an increase by 61% and 81%. Taste sensitivity knowledge in only showed marginal increase in knowledge for those with previous working experience compared to no change in knowledge for those who have not had any working experience with older adults (see Tables 3 and 4).

Table 3

Outcome Frequency Distribution Pre & Post-test of Cognitive Knowledge of Age Associated Sensory Changes Stratified by Working Experiences with Older Adults.*

	With Working Experiences with Older Adults (N=41)			Without Working Experiences with Older Adults (N=31)		
Variable	Pre-test Answered Correct Freq (%)	Post-test Answered Correct Freq (%)	Change of knowledge Pre and Post ↓ or ↑ X%	Pre-test Answered Correct Freq (%)	Post-test Answered Correct Freq (%)	Change of knowledge Pre and Post ↓ or ↑ X%
All senses are affected by the aging process.	37 (90.24)	41 (100)	↑ 10%	29 (93.55)	31 (100)	↑ 6%
The lens of the eye thins with the aging process	7 (17.07)	34 (82.93)	↑ 66%	8 (25.81)	25 (80.65)	↑ 55%
Older adults can easily distinguish between shades of blue and green.	40 (97.56)	41 (100)	↑ 2%	25 (80.65)	31 (100)	↑ 19%
The pupil size of the eye does not change with aging	17 (41.46)	37 (90.24)	↑ 49%	12 (38.71)	30 (96.77)	↑ 58%
The number of taste buds decreases with aging.	4 (9.76)	29 (70.73)	↑ 61%	4 (12.90)	29 (93.55)	↑ 81%
Older adults are more sensitive to the tastes of bitter and sour than sweet and salty.	17 (41.46)	19 (46.34)	↑ 5%	10 (32.26)	10 (32.26)	No Change
There are fewer olfactory (smell) nerves with aging.	39 (95.12)	40 (97.56)	↑2%	20 (64.52)	29 (93.55)	↑ 29%
Older adults can easily distinguish between soft sounds of c's, f's and s's.	34 (82.93)	40 (97.56)	↑ 15%	26 (83.87)	31 (100)	↑ 16%
Sensorineural hearing loss is caused by cerumen (wax) impactions.	23 (56.10)	8 (19.51)	↓ 37%	13 (41.94)	5 (16.13)	↓ 26%
Older adults tend to hear the lower tone of men's voices easier than women's voices.	35 (85.37)	39 (95.12)	↑ 10%	24 (77.42)	31 (100)	↑ 23%

Table 4

Outcome Frequency Distribution Pre & Post-test of Cognitive Knowledge of Age Associated Sensory Changes Stratified by Living Experiences with Older Adults.*

	With Living Experiences with Older Adults (N=27)			Without Living Experiences with Older Adults (N=45)		
Variable	Pre-test Answered Correct Freq (%)	Post-test Answered Correct Freq (%)	Change of knowledge Pre and Post ↓ or ↑ X%	Pre-test Answered Correct Freq (%)	Post-test Answered Correct Freq (%)	Change of knowledge Pre and Post ↓ or ↑ X%
All senses are affected by the aging process.	26 (96.30)	27 (100)	↑ 5%	40 (88.89)	45 (100)	↑ 11%
The lens of the eye thins with the aging process	5 (18.52)	20 (74.07)	↑ 56%	10 (22.22)	39 (86.67)	↑ 64%
Older adults can easily distinguish between shades of blue and green.	26 (96.30)	27 (100)	↑ 5%	39 (86.67)	45 (100)	↑ 13%
The pupil size of the eye does not change with aging.	12 (44.44)	26 (96.30)	↑ 52%	17 (37.78)	41 (91.11)	↑ 53%
The number of taste buds decreases with aging.	1 (3.70)	22 (81.48)	↑ 78%	7 (15.56)	36 (80.00)	↑ 64%
Older adults are more sensitive to the tastes of bitter and sour than sweet and salty.	9 (33.33)	11 (40.47)	↑ 7%	18 (40.00)	18 (40.00)	No Change
There are fewer olfactory (smell) nerves with aging.	24 (88.89)	27 (100)	↑ 11%	35 (77.78)	42 (93.33)	↑ 16%
Older adults can easily distinguish between soft sounds of c's, f's and s's.	21 (77.78)	26 (96.30)	↑ 19%	39 (86.67)	45 (100)	↑ 13%
Sensorineural hearing loss is caused by cerumen (wax) impactions.	11 (40.74)	4 (14.81)	↓ 26%	25 (55.56)	9 (20.00)	↓ 26%
Older adults tend to hear the lower tone of men's voices easier than women's voices.	21 (77.78)	27 (100)	↑ 22%	38 (84.44)	43 (95.56)	↑ 11%

Table 5 identifies pre and post testing of cognitive knowledge of those participants who have had previous geriatric sensitivity training compared to those who have had no training. Nine of the participants had previous experience in geriatric sensitivity training and 63 had no previous experience. It was shown in the post-test that 100% of the participants who have had experience and inexperience in geriatric sensitivity had learned that all senses are affected by the aging process. Those who had previous geriatric sensitivity training had a 67% increase and those who have not had previous training showed a 60% increase in knowledge of changes in the lens of the eye. In both pre and post testing, those with previous geriatric sensitivity training scored 100% regarding distinguishing between shades of greens and blues, while those without previous training scored 88.89% in the pre-test and 100% in post testing. Both groups showed a significant increase in knowledge regarding taste bud changes, 78% and 68% for previous training and no training respectively. It was shown that the type of hearing loss caused by cerumen impactions showed a decrease in both groups of 33% and 32%. All of the participants who have had previous geriatric sensitivity had the knowledge that the lower tone of men's voices were easier to hear while 79.37% of those without previous training had this previous knowledge which increased to 96.83% in the post test.

Table 5

Outcome Frequency Distribution Pre & Post-test of Cognitive Knowledge of Age Associated Sensory Changes Stratified by Geriatric Sensitivity Training.*

	With Geriatric Sensitivity Training (N=9)			Without Geriatric Sensitivity Training (N=63)		
Variable	Pre-test Answered Correct Freq (%)	Post-test Answered Correct Freq (%)	Change of knowledge Pre and Post ↓ or ↑ X%	Pre-test Answered Correct Freq (%)	Post-test Answered Correct Freq (%)	Change of knowledge Pre and Post ↓ or ↑ X%
All senses are affected by the aging process.	6 (66.67)	9 (100)	↑ 33%	60 (95.24)	63 (100)	↑ 5%
The lens of the eye thins with the aging process	1 (11.11)	7 (77.78)	↑ 67%	14 (22.22)	52 (82.54)	↑ 60%
Older adults can easily distinguish between shades of blue and green.	9 (100)	9 (100)	No Change	56 (88.89)	63 (100)	↑ 11%
The pupil size of the eye does not change with aging.	7 (77.78)	8 (88.89)	↑ 11%	22 (34.92)	59 (93.65)	↑ 59%
The number of taste buds decreases with aging.	0 (0.00)	7 (77.78)	↑ 78%	8 (12.70)	51 (80.95)	↑ 68%
Older adults are more sensitive to the tastes of bitter and sour than sweet and salty.	2 (22.22)	5 (55.56)	↑ 33%	25 (39.68)	24 (38.10)	↓ 1%
There are fewer olfactory (smell) nerves with aging.	7 (77.78)	9 (100)	↑ 22%	52 (82.54)	60 (95.24)	↑ 13%
Older adults can easily distinguish between soft sounds of c's, f's and s's.	8 (88.89)	9 (100)	↑ 11%	52 (82.54)	62 (98.41)	↑ 16%
Sensorineural hearing loss is caused by cerumen (wax) impactions.	5 (55.56)	2 (22.22)	↓ 33%	31 (49.21)	11 (17.46)	↓32%
Older adults tend to hear the lower tone of men's voices easier than women's voices.	9 (100)	9 (100)	No Change	50 (79.37)	61 (96.83)	↑ 17%

The Wilcoxon signed-rank test was used to assess the overall percentage of correct answers of two sets of scores which involved the pre and post- test from the participants (Field, 2009). Scores that were compared included overall percentage of correct answers in the total sample and subgroups for those who have working experiences with older adults and those who have not; those who have lived with older adults and those who have not and comparing those who have had previous geriatric sensitivity training and those who have not. The statistical comparisons in Table 6 between pre and post-tests in the total sample have shown statistical significance that the findings are real and not based on chance alone.

Table 6

Overall percentage of correct answers of Cognitive Knowledge of Age Associated Sensory Changes at Pre & Post-test.

Overall Percentage of Correct Answers	Pre-test Mean ± SD	Post-test Mean ± SD	P*
Total Sample (N=72)	58.06±12.29	80.97±9.06	<0.0001
With working Experiences with Older Adults (N=41)	60.49±9.99	80.73±9.32	<0.0001
Without working Experiences with Older Adults (N=31)	54.84±14.34	81.29±8.85	<0.0001
With Living Experiences with Older Adults (N=27)	57.78±10.86	80.37±10.18	<0.0001
Without Living Experiences with Older Adults (N=45)	58.22±13.19	81.33±8.42	<0.0001
With Geriatric Sensitivity Training Experiences with Older Adults (N=9)	60.00±12.25	81.11±9.28	0.0078
Without Geriatric Sensitivity Training Experiences with Older Adults (N=63)	57.78±12.37	80.95±9.11	<0.0001

* Wilcoxon Signed-Rank Tests were used for the comparisons.

Analysis and Summary of Qualitative Data

Globally, there is a vital need for all people to acquire and retain reliable and accurate knowledge regarding the aging process (Wurtele & Maruyama, 2013). Wurtele & Maruyama (2013) found that curricular intervention was able to decrease students' negative attitudes towards older adults. Negative attitudes of students did decrease in a study by Snyder (2005) who used small group discussion, problem solving activities, a simulation exercise and older adult interview. After compiling the qualitative data (Appendix L), the four queries investigating the effect on affective knowledge was analyzed using the coding method in which the written data was organized into themes.

Theme 1: student experience

The participants described their experiential learning experience as "surprising" and indicated that they had no realization that such changes occur with the aging process. They were quite surprised to see how drastic sensory changes were in older adults. A sense of empathy was gained by the students as they expressed their frustration of not being able to see clearly, having difficulty with fine motor tasks and not being able to interpret the pronunciation of words in the Unfair Hearing Test©. Responses by the student participants regarding their experiences included:

"…interesting to see how your senses change as you age"
"…made me realize what changes once you become older"
"…showed me how drastic sensory changes are as we age"
"…surprised by all of the sensory changes that go on as you get older"
"I did not know how much senses actually change."
"I was surprised that the changes were that major."

"…made me realize how an old person feels when being spoken to"

"…learned how your senses change as you get older"

"…parts of the test were frustrating because I couldn't hear well"

Theme 2: Anticipated feelings of older adults as experienced by the students

Overwhelmingly, the participants described the perceived feelings of older adults undergoing such changes as feeling "frustrated, angry, irritated, sad and scared." Participants also described the experience as feeling "let down by their body" and "wishing they were younger." Daily life experiences involving our senses have now become great challenges. Several participants indicated that older adults would be pleased that college students had undergone this experience and will now have an understanding of what older adults have to deal with on a daily basis. The student participants anticipated the following feelings of older adults after completing the program:

"now younger people understand what we are going through that they did this experiment"

"happy knowing younger people will understand their changes after experiencing the simulation"

"older adults will feel like that younger people have a better understanding for what they undergo every day"

"…may appreciate that a younger person took a walk in their shoes"

"…afraid, have a hard time doing normal things"

"…frustrated, feel like they cannot control their bodies"

"…really frustrated and depressed"

"…feel let down by their body"

"…more dependent on others and irritable"

Theme 3: Changes in participants' feelings towards older adults after the experience

The participants overwhelmingly stated that they now felt the need to be more patient, understanding and empathetic. A sense of appreciation of older adults was also expressed and having a better understanding of completing what is perceived as simple daily tasks has been voiced. This experience allowed them to "walk in the shoes" of older adults. The student participants expressed the following changes in their feelings towards older adults after the educational experience:

"…..more empathetic"
"….more sympathetic"
"…more understanding"
"feel sad and want to be more helpful"
"…made me think and wonder to myself how it would be to live like that every day"
"…give them credit for dealing with these obstacles"
"…respect and understand them so much more"
"…greater respect for elderly individuals just completing daily activities"
"…more patient when talking with them"

Theme 4: Influence on participants for future practice with older adults

Participants again echoed that they will be more patient and understanding in their future practice with older adults. It is essential that nurses implement their plans of care that reflect interventions to maintain the dignity and safety of older adults. The following specific interventions were also expressed by participants regarding their future practice with older adults:

"…will explain everything in a way they understand"
"…will be a better nurse because of this experience"
"…will take time explaining things to them"
"…will need to present information to them in different ways"
"…will not use color to describe how to take medications"
"…will be better able to communicate with them"
"… may consider working with them now that I understand them better"

Summary of Findings

An overall increase in cognitive knowledge by the participants was shown in the post-test assessment. A range increase from 3% to 69% was shown throughout the ten true and false questions (Table 2). Question number nine, however, showed a decrease of 32% in cognitive knowledge in which it was asked whether sensorineural hearing loss was caused by cerumen (wax) impactions (Table 2). While the etiology of the two types of hearing losses were explained separately, ambiguity in the presentation may have existed to have revealed a 32% decrease in knowledge.

Participants who have had previous working experiences with older adults (N=41) compared with those who have not (N=31) were shown to have gained an increase cognitive knowledge primarily in the questions regarding changes in the lens of the eye, 66% and 55%, pupil size changes, 49% and 58% and changes regarding taste buds, 61% and 81% respectively. Ninety-five percent of those who have had previous work experience with older adults had previous knowledge regarding olfactory nerves versus 64.5% of those with no working experience (Table 3).

Those who have lived with older adults (N=27) compared with those who have not (N=45), also showed a similar pattern of increased cognitive knowledge regarding changes of the

lens of the eye 56% and 64%, pupil size changes, 52% and 53% and taste bud changes, 78% and 64% respectively (Table 4).

Pre and post- test knowledge was also compared in those who have had previous geriatric sensitivity training (N=9) to those who have had none (N=63). All of the participants who have had previous geriatric sensitivity training had answered correctly the question regarding distinguishing between shades of blue and green as well being able to better understand the lower tone of men's voices compared to women's voices. The greatest increase in knowledge was shown regarding changes in the lens of the eye (67%) and taste bud change (78%). Those who have not had previous geriatric sensitivity training (N=63) showed the greatest amount of increased knowledge in the areas of change in the lens of the eye (60%), pupil size change (59%) and taste bud change (68%). Those with no previous geriatric sensitivity training showed a 1% decrease regarding taste related changes of bitter and sour. Both groups had similar decreases in knowledge regarding sensorineural hearing loss, 33% and 32% respectively (Table 5).

The groups being compared were based on working experience, living experience and previous geriatric training. Five of the six groups showed *p* values of less than a 0.1% chance that the results would have occurred by chance alone. Those with previous geriatric sensitivity training of older adults showed less than a 1% chance (Table 6).

Overwhelmingly, there was an increase in affective knowledge by all participants. The four themes identified were student experience, the anticipated feelings of older adults as experienced by the students, changes in participants' feelings towards older adults after the experience and influence on participants for future practice with older adults. For experiences, the students found it interesting and were surprised to be shown how drastic sensory changes were with the aging process. After undergoing this experience, students anticipated older adults

to feel pleased that younger people actually had a chance to experience sensory changes through this simulation in order to have a better understanding of what they are going through. Students also expressed older adults to feel afraid, frustrated, let down by their bodies and more dependent on others as a result of these changes. Changes in participants' feelings toward older adults were expressed as being more empathetic, sympathetic and understanding, and having a greater respect for older adults. This experience also had a great influence on the participants for future practice. The students stated that they will need to present information to older adults in different ways, take time explaining information and improve their communication skills with them.

A sense of empathy and understanding was gained by the students as they experienced the daily frustrations of older adults through the simulation activity. Students expressed being both "shocked" and "surprised" at the how drastic these changes were and the impact on every day activities. As future nurses, they also identified the need to improve their communication skills in order to better care for older adults, maintain their dignity, and keep this population safe.

Chapter 5

Discussion and Conclusions

Discussion of Findings

Like Wood's (2002) study, the students found that actively engaging in a low fidelity simulation of aging increased their cognitive knowledge. In the overall sample population (N=72), the pre-test Mean ± SD was 58.06±12.29 and the post-test Mean ± SD was 80.97± 9.06 with a P* <0.0001. Low fidelity simulation provided anecdotal evidence in increasing affective knowledge towards older adults (Van Son & Fitzgerald, 2012; Heise, 2012; Van Son, 2005; Wood, 2002). The students provided a plethora of testimonies regarding their deeper understanding of the inevitable sensory changes that occur with the aging process (Appendix L).

Application to Experiential Learning Theory

According to Kolb (1984), all learners enter a particular educational situation with a variety of ideas about the presented topic. The process of learning is endless, rooted in life experiences with the four modes of experiential learning comprised of concrete experience, reflective observation, abstract conceptualization and active experimentation. In order to acquire new knowledge and skills, these four modes of experiential learning must encounter one another (Kolb, 1984). The phases of Kolb's Learning Theory can be viewed as continuum and include reflective observation (watching), abstract conceptualization (thinking), active experimentation (doing) and concrete experience (feeling). The acquisition of cognitive and affective knowledge was demonstrated through the use of all phases of Kolb's theory which include watching, doing, feeling and reflecting. The participants expressed their experiences and increase in affective knowledge as follows:

"…allowed me to feel like an elderly person"

"…simulations really showed how much your senses change as you grow older"

"…great job of putting us in the shoes of an elderly person"

"…the experiment helped me feel what an older adult feels with aging. It can help me better understand elderly patient's pain"

"…an educational experience" "learned a lot more about older patients that I had no idea about before"

"…helped me understand how older people feel as they age" "It doesn't seem like a pleasant experience"

"…gave me an actual look into their lives and daily struggles"

"…an educational experience"

"…learned a lot more about older patients that I had no idea about before"

Relation to Other Evidence

Yurick's (1979) study supported the use of lecture-simulation method over lecture-discussion method for teaching environmental modifications required for older adults experiencing sensory changes. While this capstone study did not compare two methods of teaching, it was strongly suggested that the use of low fidelity simulation did make an impact on the participants.

Wood (2002) had used experiential learning to teach undergraduate students about the functional changes that occur with the aging process. Like Wood's study, this project has shown an increase in affective knowledge by the student participants. Students have expressed this learning experience as positive and having gained a level of understanding that helped them appreciate how older people feel as they age. In Wood's study, a student was able to correlate why her grandfather was irritable because of his changes in vision and the pain experienced

regarding arthritic changes (2002). Students in this capstone study have also expressed having gained an understanding of the pain and frustration experienced by older adults and how it made a profound effect of putting them "in the shoes of an elderly person." It was also noted in Wood's study that the experiential learning experience was a far more effective way in gaining an understanding of the functional losses than reading it out of a book.

Karasik (2012) has stated by fully engaging students in the content of what is being presented, active participation must take place. An overall increase in cognitive knowledge as well as anecdotal evidence by the participants demonstrated the profound effect active participation had on their learning (Appendix L).

Findings from this study are consistent with the work of Heise et al. (2012) in that students acquired a deeper understanding of healthy aging through experiences in geriatric simulation using Van Son's sensory kit. Furthermore, it has been proposed by Van Son et al.(2012) that the use of the sensory kit may allow students to have an improved understanding of the sensory and functional changes that occur with aging, thus allowing students to become more proficient in their geriatric assessment skills (2012). The students in this study have shown an increase in cognitive and affective knowledge regarding age associated sensory changes.

Limitations

The sample size was a convenience sample of freshman and sophomore nursing students at a small, private Catholic university. Limitations to this pilot study included the researcher - developed pre-posttest true and false quiz, the four queries and the PowerPoint© presentation (Appendix F) all of which have not been tested for validity or reliability. Only anecdotal evidence exists in the use of the Sensory Kit which added to another limitation in the study. The pre and posttest was administered before the program and immediately at the conclusion of the

program in the time frame of an hour. Therefore, this may not have truly reflected whether an actual increase in cognitive knowledge had occurred. Since only anecdotal evidence was gathered in similar educational offerings, tools to gather data were developed by the researcher. This study provided further anecdotal evidence regarding the experiences of the participants. Due to the limitations and availability of classroom space on campus, data was collected in three different classroom settings. Audio sound did vary between the three classrooms. The number of subjects in the 1st year/fall semester group was 49, compared to the average size of five in each of the 2nd year/fall semester group class settings. A large sample size in one setting may have contributed to decreased attention of the participants. Only 22 of the 68 registered sophomore students participated in the study. The main reason included conflicts of schedules between the researcher and sophomore nursing students. Data was collected during the freshman FYS class which further contributed to the convenience of the population.

The small sample size (N=9) of the subgroup with previous geriatric sensitivity training (Table 5) , may not have shown a reliable estimated percentage due to the small number in this subgroup; however, it has demonstrated a similar trend to those who have not had previous geriatric sensitivity training.

Implications

Low fidelity simulation tools are most often used to collect anecdotal evidence to teach geriatric sensitivity training in various disciplines. The increase in the aging population has made it necessary for future nurses to be cognizant of these sensory changes in order to maintain safety, dignity and independence in all healthcare settings as well as the home environment. While sensory and functional changes are incorporated in geriatric lectures and textbooks, experiential learning allows this content to come to life (Wood, 2002). Many of the participants

in this study have expressed that they were unaware that such changes occur with older adults and have also stated an increase in empathy. Through this simulation exercise, the participants have gained a great degree of knowledge to enhance their assessment skills to incorporate appropriate interventions to promote patient safety and understanding.

There is a need to further integrate gerontological content in nursing curricula (Baumbaush, et al., 2012; Cline, et al., 2012; Miller, et al., 2010; Plowfield, et al., 2006; Green, et al., 2005; Kelly, et al., 2005). However, the literature is limited in geriatric simulation with nursing students compared to other specialties.

Recommendations for practice and for further study

A more heterogeneous sample population can be obtained by expanding the study to other BSN programs across the study region. The ten question pre and post-test questionnaire along with the four open ended queries can be further tested for validity to determine if it consistently measures an increase in cognitive and affective knowledge after participating in the experiential learning program. Reliability can be further tested to determine whether the questionnaires can be interpreted consistently across a multitude of offerings (Field, 2009).

It was noted that there was a 32% decrease in cognitive knowledge in the post-test on question #9 in the student population being studied. This finding should be reexamined in order to modify the outline and presentation of hearing loss information in the PowerPoint©. The combination of sensorineural and conductive hearing loss in the same PowerPoint© slide may have contributed to the misunderstanding of this material.

The study can also be conducted across various undergraduate disciplines since not only nursing students, but all students are bound to either work with or interact with older adults during their daily lives. After spring 2015, the university will be eliminating the Concepts of

Gerontology course in its curriculum; therefore, nursing students will not be exposed to this specific content in their program of study over a 16 week course. Undergraduate nursing faculty will now be incorporating this content throughout its nursing courses.

A yearly educational presentation during the Freshman Year Seminar Class has been suggested to the course facilitators in experiential geriatric sensitivity training. It has also been suggested to expand the program to the social work and respiratory care students in a simulation environment. This program can also be incorporated into summer workshops offered by the university for high school students interested in health related fields. Another area which can be explored would be to assess the attitudes, feelings and perceptions of the subjects towards older adults' pre and post the experiential learning program to determine whether there was an increase in affective knowledge resulting from the experience.

Regardless of one's discipline of study, sensitivity training of the common and inevitable sensory changes of aging is essential to create a sense of empathy in young adults who will unavoidably be working with this population in some capacity. Experiential learning allows young adults to "walk in the shoes" of older adults, thus allowing them to carefully plan their care to keep OAs safe and maintain dignity.

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Appendix A

PowerPoint Presentation on Sensory Changes of Aging

SENSORY CHANGES OF AGING

A LESSON IN EXPERIENTIAL LEARNING

Angela Kelly, MSN, RN
Carlow University

THE AGING PROCESS

- Increase in the number of elderly persons
- Need for a sufficient number of professionals to understand these changes
- Multitude of sensory changes accompanies this aging process

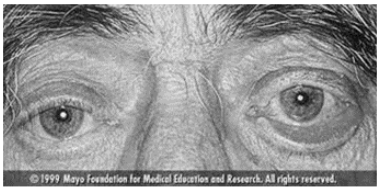
NORMAL AGE RELATED SENSORY CHANGES

- Vision
- Hearing
- Taste
- Smell
- Tactile

CHANGES OF VISION

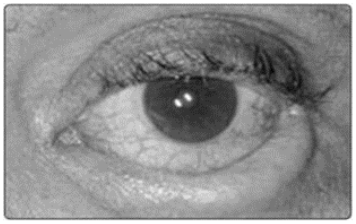
- Decrease in musculature in eyelids
- Increase in lens density or thickness
- Decrease in lens elasticity
- Lens becomes slightly yellowed
- Pupil size decreases
- Increase in the fibrosis of the eye
- Decrease reading and color discrimination ability-more difficult to differentiate between greens and blue than between yellows and reds

ECTROPION:
Bottom eyelid sags outward



(google images)

ENTROPION:
Bottom lid turns inward



(google images)

HEARING LOSS IN OLDER ADULTS

- **Presbycusis: sensory hearing loss associated with the aging process**
- **Normal hearing loss in older adults begins with the inability to hear higher frequencies- f, g, s ,z, t, sh, ch.**
- **Tend to understand men's voices better than women's**
- **. Hard time understanding ordinary conversation because of background**

CHANGES OF HEARING

- Conductive hearing loss
  - Problems in external or middle ear
- Sensorineural hearing loss
  - Problems in the inner ear

(Sight and Hearing Association, 2007)

(Google images)

CONDUCTIVE HEARING LOSS

- **SOUND WAVE CANNOT EFFECTIVELY REACH THE INNER EAR**
- **CAUSES:**
- **EAR INFECTIONS**
- **PUNCTURED TYMPANIC MEMBRANE**
- **BROKEN BONES IN THE EAR(MALLEUS, INCUS, STAPES)**
- **SCARRRED EARDRUM**
- **FLUID IN THE MIDDLE EAR, IMPACTED CERUMEN**

SENSORINEURAL HEARING LOSS

- Impairments of cochlea and auditory nerve
- Difficulty distinguishing soft pitched sounds: *f, g, s, t, sh, ch*

CHANGES IN TASTE AND SMELL

- Decrease in taste receptors rather than number of taste buds
- Olfactory nerves are also thought to have fewer cells
- Senses of smell and taste sharply decrease in 6th and 7th decade of life

CHANGES IN TACTILE SENSATION

- Peripheral sensation changes
- Reductions in touch receptors
- Neuropathic changes from chronic diseases

(VanSon, 2012)

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Appendix B

Contents of Sensory Simulation Kit

-Plastic sandwich bag

-Pair of vinyl gloves

-Piece of yellow cellophane

-Piece of newspaper clipping

-Small button

-Needle and thread

-Piece of sandpaper

-Handful of split peas

-Pieces of white, light yellow, blue and green paper

-Piece of chocolate or hard candy

(Permission granted for use of Sensory Kit by Catherine Van Son, PhD, RN)

Appendix C

Permission from Catherine Van Son, PhD, RN

Van Son, Catherine [vansonc@wsu.edu]

Sent: Sunday, September 23, 2012 9:09 PM

To: M
Angela G. Kelly

Attachments: Sensory Changes.pdfMB 2) ()Open as Web Page[; Introduction to Gerontolog~1.pdfKB 60) ()Open as Web Page[

From: Van Son, Catherine
Sent: Monday, September 17, 2012 1:34 PM
To: Angela G. Kelly
Subject: RE: sensory kit

Here you go. You have my permission to use the Kit in your DNP project provided I can have a copy of your completed project when done. Keep me posted. Dr. Van Son
Catherine R. Van Son PhD, RN | JAHF/Atlantic Philanthropies Claire M. Fagin Fellow
Assistant Professor| Nurse Gerontologist
Washington State University College of Nursing
P.O. Box 1495 | Spokane, WA 99210-1495
ph 509-324-7254| vansonc@wsu.edu
nursing.wsu.edu
From: Angela G. Kelly [mailto:agkelly@carlow.edu]
Sent: Monday, September 17, 2012 8:16 AM
To: Van Son, Catherine
Subject: sensory kit
Thank you for your prompt responses to my e-mails. In a previous e-mail, you mentioned about sharing power point slides from the "Sensory Kit" program. Would you be willing to share these with me so I may review the objectives of your course? I also wanted to ask you for permission to use your kit in my DNP project. I am still in the very early stages of my project and am taking Statistics and Nursing Leadership this semester. We are formulating our problem statements, identifying a research question and identifying possible theoretical frameworks that will apply to our projects.

Thank you for your time.

Angela Kelly, MSN, RN
Carlow University
Nursing Skills and Simulation Lab

Appendix D

Permission from Sight and Hearing Association

Kathy Webb | kwebb@sightandhearing.org | Add to Contacts

Monday, Mar 11 08:52 PM | Show Details | View source

- reply-to kwebb@sightandhearing.org
  toagkjjj@verizon.net

RE: Voice message regarding permission

Thanks for the further explanation, Kelly. That is absolutely fine that you use the answer sheet – no need to purchase in bulk, I have attached the form for you to copy and use for your teaching assignment.
Thanks for giving us credit where credit is due and for valuing the Unfair Hearing Test as an eye-opening teaching tool regarding hearing loss. Good luck on your assignment!
Best regards,
Kathy Webb
Kathy Webb, Executive Director
Sight & Hearing Association
1246 University Avenue West, Suite 226
St. Paul, MN 55104-4125
651-645-2546, ext. 11 (direct)
651-645-2742 (fax)
www.sightandhearing.org
Like us on Facebook www.facebook.com/sightandhearing

Founded in 1939, the Sight & Hearing Association is dedicated to enabling lifetime learning by identifying preventable loss of vision and hearing.

From: agkjjj@verizon.net [mailto:agkjjj@verizon.net]
Sent: Monday, March 11, 2013 7:00 PM
To: kwebb@sightandhearing.org
Subject: Re: Voice message regarding permission

Hi Kathy,
I would not be making copies of the CD. I would only be using the copy I purchased to play for my audience to use in a teaching situation in simulating the various hearing losses. Rather than photocopy your column list, I could simply have the students write their answers down on a piece of notebook paper and have them label their answers one through 10. However, is there an option to purchase your answer sheets in bulk to use for the students so that it looks more professional? I can certainly understand your concerns with misuse and infringement and I will certainly abide by your company's policies.

Otherwise, notebook paper for students to write down their answers works for me.
I appreciate your getting back to me and I look forward to hearing from you. If you would like to speak to me, my cell phone number is 412-770-7705.
Thank you,
Angela Kelly
On 03/11/13, Kathy Webb<kwebb@sightandhearing.org> wrote:

Good morning, Angela ~

Thank you for your interest in using our Unfair Hearing Test on an academic project you are working on. A concern we would have is if the CD would be copied and distributed among class members/colleagues, etc. If that is NOT the case, then we have no problem in the Test being used for your project. If you will be making copies of the Test, however, then we would not be able to grant permission. We have had past experiences, unfortunately, with misuse and infringement and that is why we have had to impose conditions of use. Please clarify the intent of your use and I will get an Agreement off to you. You had mentioned in your voicemail that you had sent an email to our office, but I do not see that we had received an email…;

Thank you!

Kathy Webb

Kathy Webb, Executive Director
Sight & Hearing Association
1246 University Avenue West, Suite 226
St. Paul, MN 55104-4125
651-645-2546, ext. 11 (direct)
651-645-2742 (fax)
www.sightandhearing.org

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Founded in 1939, the Sight & Hearing Association is dedicated to enabling lifetime learning by identifying preventable loss of vision and hearing.

Appendix E

CARLOW UNIVERSITY
INSTITUTIONAL REVIEW BOARD

To: Angela Kelly CC:
Michele Upvall

From: Peggy Slota
Co-Chair, Carlow IRB

Date: September 27, 2014

Re: IRB # 14-066-G-201 – An Experiential Learning Exercise Exploring BSN Nursing Students' Cognitive and Affective Knowledge of Age Associated Sensory Changes

The above project was reviewed and approved for continuation by the Co-Chairs of Carlow's Institutional Review Board. The project is approved for a period of up to one year.

Approval Date: September 27, 2014
Expiration Date: September 26, 2015

If any untoward incidents or unanticipated adverse reactions should develop in the course of your research with human subjects, you must notify the Institutional Review Board Office at 578-6349 immediately.

Appendix F

Informed Consent

APPROVED
CARLOW
UNIVERSITY IRB
9-27-2014

An Experiential Learning Exercise Exploring BSN Nursing Students' Cognitive and Affective Knowledge of Age Associated Sensory Changes Angela Gallo Kelly, MSN, RN

Dear Freshmen and Sophomore Carlow University Nursing Students,

I am Angela Kelly and a student in the Doctor of Nursing Practice Program here at Carlow University. I am conducting a study to explore undergraduate college students' cognitive (learning) and affective (attitude) knowledge before and after a program designed to teach you about the normal sensory changes that accompany the aging process. The answering of questions will take approximately 10 minutes and the program itself will take approximately 50 minutes.

The order of the program will be as follows:

-Fill out the Demographic Data Sheet
-Fill out ten true/false questions to assess knowledge base.
-View PowerPoint lecture slides on sensory changes.
-Explore the materials in the sensory kit that simulate sensory changes of aging in vision, touch, taste and smell.
-Listen to the Unfair Hearing Test. This will take approximately 10 minutes
-Fill out the true/false questions again to assess learning that has taken place.
-Answer three questions pertaining to your feelings from the experience.

Your voluntary response to this request constitutes your informed consent to your participation in this activity. You are not required to participate in this study. If you decide not to participate, your decision will not affect your current or future relations with Carlow University. All information from the data which includes a demographic questionnaire, a pre/posttest and three questions describing your experience will be kept as confidential as possible in a locked file cabinet. No identifying information will be revealed in any publications or presentations of the findings of this project. All of your responses will remain anonymous. You will receive a $5.00 gift card to Sincerely Yogurt as a token of appreciation for your participation in the study. If you choose to withdraw from the study at any point, you will still receive the gift card.

Risks from participating in this study include losing balance from the use of dried legumes in your shoes, sticking yourself with a sewing needle when simulating changes in fine motor and tactile sensation and having an adverse reaction to the Hershey chocolate kiss. Benefits include gaining an appreciation and understanding of the sensory changes experienced by elderly persons. Upon completion of the study, results will be shared with you upon request.

This activity has been approved by the Carlow University Institutional Review Board. This Committee administers both the General Assurance of Compliance with the United States Department of Health and Human Services Policy for the protection of Human Subjects and the University Policy covering the protection of human subjects. The Committee may be contacted through the Chairperson by calling 412-578-6349.

I thank you and appreciate your valuable contribution to this research project.

Please note that your signature indicates that you have read all of the information within this consent form and that all of your questions have been adequately answered. Your signature indicates your willingness to participate in this study.

VOLUNTARY CONSENT

The above information has been explained to me and all of my current questions have been answered. I understand that I am encouraged to ask questions about any aspect of this research study during the course of this study, and that such future questions will be answered by a qualified individual or by the investigator(s) at the telephone number(s) given.

By signing this form, I agree to participate in this research study. A copy of this consent form will be given to me.

Participant's Signature	Printed Name of Participant	Date

CERTIFICATION of INFORMED CONSENT

I certify that I have explained the nature and purpose of this research study to the above-named individual(s), and I have discussed the potential benefits and possible risks of study participation. Any questions the individual(s) have about this study have been answered, and we will always be available to address future questions as they arise.

Printed Name of Person Obtaining Consent	Role in Research Study

Signature of Person Obtaining Consent	Date

Appendix G

Demographic Data Sheet

An Experiential Learning Exercise Exploring BSN Nursing Students'

Cognitive and Affective Knowledge of

Age Associated Sensory Changes

Angela G. Kelly, MSN, RN

1. Your age: _____

2. Current semester:

   Please check (√) your academic status in Carlow's nursing program:

   First Year Fall Semester _____

   Second Year Fall Semester _____

   Other (Please indicate) _____

3. Have you ever worked with older adults?

   a. Yes_____
   b. No_____

4. Have you ever lived with older adults (do not include parents)?

   a. Yes_____
   b. No_____

5. Have you ever experienced geriatric sensitivity training in any class or workplace?

   a. Yes_____
   b. No_____

Appendix H

An Experiential Learning Exercise Exploring BSN Nursing Students' Cognitive and Affective Knowledge of Age Associated Sensory Changes

Study Pre and Post Test

1.	All senses are affected by the aging process.	T	F
2.	The lenses of the eye thin with the aging process.	T	F
3.	Older adults can easily distinguish between shades of blues and greens.	T	F
4.	The pupil size of the eye does not change with aging.	T	F
5.	The number of taste buds decreases with aging.	T	F
6.	Older adults are more sensitive to the tastes of bitter and sour than sweet and salty.	T	F
7.	There are fewer olfactory (smell) nerves with aging.	T	F
8.	Older adults can easily distinguish between soft sounds of c's, f's and s's.	T	F
9.	Sensorineural hearing loss is caused by cerumen (wax) impaction.	T	F
10.	Older adults tend to hear the lower tone of men's voices easier than women's.	T	F

Appendix I

Affective Knowledge Questions

Please describe your experience of the age-related sensory changes.

What feelings do you expect the elderly to have after you have undergone this experience of sensory change?

After this simulation exercise, what changes in your feelings towards elderly individuals did you experience?

How do you believe this experience will influence your future practice with older adults?

Appendix J

Unfair Hearing Test Worksheet

A	B	C
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.
6.	6.	6.
7.	7.	7.
8.	8.	8.
9.	9.	9.
10.	10.	10.

Appendix K

Unfair Hearing Test Answers

1. Fill
2. Catch
3. Thumb
4. Heap
5. Wise
6. Wedge
7. Fish
8. Shows
9. Dead
10. Juice

(Permission granted for use by the Speech and Hearing Association)

Appendix L

Qualitative Data Compilation of Quotes

Student Experience

Anticipated feelings of Older Adults by Students	
Comments of Participants	**Number of Those Reporting Comments**
"Feeling Afraid"	1
"Feeling Annoyed"	3
"Feeling Anger"	9
"Feeling Frustrated	23
"Feeling Confused"	4
"Feeling Bothered"	2
"Feeling Bad"	1
"Feeling Discouraged"	1
"Feeling Disappointed"	1
"Feeling Depressed"	2
"Feeling Sad"	6
"Feeling Very Difficult Performing Tasks"	1
"Feelings of Disbelief"	1
"Feeling Scared"	1
"Feeling Like they cannot control their bodies"	1
"Feeling Upset"	2
"Feeling Overwhelmed"	1
"Feeling Let Down by their body"	1
"Feeling Misunderstood"	1
"Feeling Useless"	1
"Feeling Dependent"	1
"Feeling Irritable"	1
"Feeling Hopeless"	1
"Feeling like they wanted to go back to being young again"	1
"Feeling like they are having a lot of troubles dealing with these changes"	2
"Feeling like they will learn to adapt"	1
"Feeling tired"	1
"Feeling like they are having a hard time doing normal things"	1
"Feeling painful"	1

Changes in Feelings towards Older Adults

Comments of Participants	Number of Those Reporting Comments
"Patience"	16
"Cautious	1
"Empathetic"	6
"Understanding"	24
"Compassion"	3
"Considerate"	1
"……Take their advice to never get old"	1
"Sympathetic"	13
"Respectful"	1
"Appreciative"	2
"Sensitive"	1
"Feel Bad"	14
"Awareness"	1
"Talk in a Lower Pitch"	1
"Feel sad and want to be more helpful"	1
"Made me think and wonder to myself how it would be to live like that every day"	1
"Give them credit for Dealing with these obstacles"	1
"Respect them so much more"	1
"Greater respect for elderly individuals just completing daily activities"	1

Anticipated Feelings of Older Adults towards Students after the Experience

"Feel Better knowing others know their problems"
"Feel happier knowing others are beginning to understand their problems"
"Feel glad knowing others got to experience the simulation"
"Feel better knowing younger people experienced how they feel"
"Feelings of gratitude and relief that young people finally understand what they go through every day"
"Feel better knowing us young people could understand them better"
"Respect that younger people now understand what they go through"
"An appreciation knowing young people went through this experiment"
"Now younger people understand what we are going through that they did this experiment"
"Would now feel like younger people could understand them"
"Appreciate our ability to relate/understand their disabilities that come with age"
"Happy knowing younger people will understand their changes after experiencing the simulation"
"Older adults will feel like that younger people have a better understanding for what they undergo every day"
"Glad that others now understand their experiences"
"may appreciate that a younger person 'took a walk in their shoes'"
"Be more at ease because of my increased knowledge"
"Expect them to know that I have more knowledge of their sensory changes"

Influence on Future Practice
"Will explain everything in a way they understand"
"Be more understanding and compassionate"
"Better understanding of what they go through"
"Be more understanding and patient"
"I may now want to work with older adults because I have a better understanding"
"More empathetic and patient"
"Understand their changes and can better care for them"
"I can think of what I experienced, so I can better help them"
"Be more understanding"
"Let's me know what they go through on a daily basis"
"Feel more sympathy"
"More patience and understanding"
"Helps me to understand how they feel and I can assist them accordingly"
"More affectionate, more understanding"
"Better understanding so I can help them better"
"More patient and understanding"
"Better understanding and more empathetic"
"More patience"
"More tolerant and patient"
"Helps me to understand them and how I can better help them"
"More cautious with them"
"Better understanding"
"Will spend more time with them and be more sympathetic"
"Look more into the issues that could influence them and their type of care"
"More easier and understanding and patient with them"
"Be more patient"
"Will be a better nurse because of this experience"
"Better understanding of what they are going through, will provide better care"
"Will be more understanding"
"Understand their behaviors better"
"Be more patient with them and help them as much as possible"
"Will take time explaining things to them"
"Will be more patient and caring"
"Will be more sympathetic, will need to present information to them in different ways"
"Will be more patient and understanding and helpful"
"Will be more patient with them"
"Will not use color to describe how to take medications"
"Will be more empathetic"
"Better understanding and know how to better help them"
"Better understanding them and made me want to work with them more"
"Will be more understanding when I could become frustrated'
"More insight on how to handle or understand what they are going through"
"Be more patient and understanding"
"More understanding and accepting"

"Will be better able to communicate with them"
"Make me more understanding"
"Make me more aware and try to communicate more effectively"
"More understanding of their feelings and how to better help them"
"More cautious and aware"
"Increased awareness and meet their needs"
"I may consider working with them now that I understand them better"
"Better understanding of these changes"
"More aware of how older adults feel and take that into consideration"
"Will be more caring"
"To have more patience"
"A better understanding on how to effectively work with them"
"Better understanding"
"Give them more time and understanding"
"Be more understanding"
"Better ways to learn their medications and not by colors"
"Try to assist them in as many ways as possible"
"Will be more patient and understanding"
"More aware of how I should communicate"
"Allow me to have more patience with them"
"More patient and understanding"