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Impact of Service Learning on Physical Therapist Students' Knowledge of and Attitudes Toward Older Adults and on Their Critical Thinking Ability

Beling, Janna

INTRODUCTION

As the number and proportion of elderly people rapidly increase in the next few decades, there will be increased demands for physical therapists to work with older clients. Although the availability of physical therapists to work with elderly people will be determined, in part, by their personal preferences,¹ most physical therapists will be routinely required to work with elderly clients and clients' aging family members.² In order to provide effective services, it is imperative that physical therapist students possess adequate knowledge about the aging process and recognize the individuality of older clients, as well as their capacity for growth.

Service learning is a pedagogical method that combines community service with explicit academic learning objectives, preparation, and reflection.³ One of the primary goals of service learning is to provide service to the community. Another goal of service learning is for students to apply what they have learned to real-life settings and to use these community-based experiences during classroom discussions. Another key component of the service-learning experience is to provide opportunities for students to reflect upon their service activities and to learn from these experiences.

Critical thinking is an outcome expected of all physical therapist graduates.^{4,5} Watson and Glaser defined critical thinking as a compilation of attitudes, knowledge, and skill that encompasses five areas: inferences, assumptions, conclusions, interpretations, and arguments.⁶ Physical therapist educators are faced with the task of promoting educational strategies to develop the abilities of physical therapist students to think critically in all health care settings.

The purpose of this study was to determine the impact of service learning on physical therapist students' knowledge and attitudes about the older adult and on their critical thinking ability.

The following hypotheses were generated:

1. Physical therapist students' knowledge, misconceptions, and bias regarding aging will be improved following a service-learning experience in a geriatric rehabilitation course.
2. Physical therapist students' critical thinking skills will be improved following a service-learning experience in a geriatric rehabilitation course.

This study was implemented to determine the importance of service learning on possibly increasing both physical therapist students' knowledge of and attitudes toward elderly people and their critical thinking skills. As America ages, the future demand for physical therapists working with the geriatric population will increase.⁷ The development of critical thinking (the ability to solve problems by assessing evidence using valid inferences, abstractions, and generalizations) is one of the global goals advocated in both the Evaluative Criteria for Accreditation of Education Programs for the Preparation of Physical Therapists⁴ and A Normative Model of Physical Therapist Professional Education.⁵ No available studies have examined the impact of service learning on physical therapist students' knowledge and attitudes about elderly people or its impact on the development of critical thinking.

REVIEW OF THE LITERATURE

Demographics

In 2000, approximately 35 million American citizens, or 12.4% of the total population, were over 65 years of age.⁷ By the year 2030, it is predicted that 70.3 million people, or approximately 20% of the total population, will be in this age group.⁷ This is an increase of more than twice their number from today's figures.

As individuals age, they frequently experience illness and utilize health care services. For example, most older people have at least one chronic condition, and many have multiple conditions.⁷ People aged 65 years and over use health care at a rate more than three times higher than that of younger cohorts.⁷ Elderly people use more of the acute care hospital beds and the nation's nursing home beds than any other population group. They also use 68.7% of home health care services.⁷

Knowledge of and Attitudes Toward Elderly People

Continuing demographic changes increase the need for physical therapists to work with older people. The accuracy and completeness of one's knowledge about aging affects a caregiver's ability to provide effective care or services to aging clients.⁸⁻¹⁰ Despite the importance of knowledge, several studies have suggested that knowledge deficiencies exist among nurses, social workers, and students preparing to enter these professions. Barresi and Brubaker¹¹ reported that social work professionals correctly answered 68% of the questions on the Facts on Aging Quiz I (FAQ). The reported correct scores of 62% for nurses¹² and 69% for nursing students¹³ are similar to those for social workers.

Health care professionals must be properly educated and motivated to care for the growing health care needs of elderly people. The literature provides evidence that the attitude of health care professionals toward the geriatric population affects the quality of care they receive.¹⁴⁻¹⁶ Researchers¹⁷⁻²¹ have found that health care workers, in general, have negative attitudes toward elderly people. Many physical therapists are not interested in working with older people.^{1,22-24}

A number of studies^{21,25-29} have been conducted to assess the impact of educational programs on knowledge and attitudes about aging. The most common format of these programs includes didactic presentations about aging combined with encounters with older adults. Greater knowledge of older adults and the aging process is associated with a more positive attitude toward that population.^{25,26} In addition to classroom theory, clinical experiences have been tried as a means of improving student attitudes, with mixed results.^{21,27-29}

Researchers^{20,30-33} have been measuring knowledge of aging and attitudes toward older adults for more than 4 decades. Palmore³² designed the FAQ to assess knowledge of physical, psychological, social, and economic factors and to measure misconceptions regarding elderly people. The FAQ is held by its developer to have several advantages over other tests or scales. First, the quiz consists of only 25 items, which Palmore cited as an advantage over longer tests requiring several printed pages. Second, the quiz consists of only factual items—an advantage over tests that confuse factual with attitudinal statements. Palmore^{32,34} proposed that the FAQ could be used for four purposes: to educate, to measure learning, to test knowledge, and to measure attitudes. The test has been used in more than 1,200 studies.³⁴ Palmore collected data from studies that had used the instrument and found that multiple groups of subjects with similar levels of education had similar mean scores. Therefore, Palmore³⁵ contended that the FAQ has face validity. Another support of validity of the FAQ is the association between training in gerontology and higher FAQ scores.³⁵ In terms of test item reliability, the coefficient alpha has been reported as .28 (P & L⁰¹).³⁶

Service Learning

One development in higher education in recent years, and in health care education in particular, is the emergence of service learning.³ Service learning is a teaching methodology that combines community service with explicit learning objectives, preparation, and reflection.³⁷ At the heart of the service learning movement is the belief that both the student and the community benefit when students engage in volunteer service as part of their academic curriculum.

Students participating in service-learning activities are expected not only to provide direct community service, but also to learn about the context in which the service is provided and to understand the connection between the service and their academic course work.³

Integrating a service-learning focus within the curriculum encourages a sense of proactive civic duty and, at the same time, helps students recognize how academic training relates to the real world and the mission of a university.³⁸ Importantly, this central theme of learning is based on the community's identified needs, issues, and problems, and not those defined by the students or university.

An integral part of service learning is the requirement for reflection on what is happening.³⁷ Service learning, at its best, is a cyclical process of providing service, reflecting upon that experience, linking outside experience to course content through classroom discussion, and translating experience into new understanding that improves the services provided and lead to continued learning.³⁹ A service-learning model has been shown to improve students' knowledge of and attitudes toward elderly people as measured by the FAQ.⁴⁰

Critical Thinking

The importance of developing critical inquiry and clinical decision making among physical therapist graduates is emphasized in the accreditation evaluative criteria for physical therapist education.⁴ The physical therapist curriculum, taken as a whole, is expected to contribute to critical thinking ability.⁵ Service learning can enrich physical therapist educational outcomes such as advocacy, citizenship, and social responsibility through participation and consultation with community and human service organizations. According to Watson and Glaser:

Critical thinking is a composite of attitudes, knowledge, and skills. This composite includes: (1) attitudes of inquiry that involve an ability to recognize the existence of problems and an acceptance of the general need for evidence in support of what is asserted to be true; (2) knowledge of the nature of valid inferences, abstractions, and generalizations in which the weight or accuracy of different kinds of evidence are logically determined; and (3) skills in employing and applying the above attitudes and knowledge.^{6(p1)}

The definition proposed by Watson and Glaser appears to be the most useful for physical therapy because of the practice focus of physical therapy.

Watson and Glaser developed the Watson-Glaser Critical Thinking Appraisal (WOCTA), first published in the early 1940s and the predominant tool used to assess critical thinking ability.⁴¹ One use of the WOCTA postulated by its developers is "to measure gains in critical thinking abilities resulting from instructional programs in schools, colleges and business and industrial settings."^{6(p9)} Watson and Glaser reported on the content validity of the WGCTA.^{6(pp10-11)} According to the developers, the instrument measured a sample of objectives determined by educators to be critical thinking indicators. Construct validity of the instrument also was established by Watson and Glaser, who compared WGCTA scores between students who were exposed to a program designed to stimulate critical thinking and students who were not exposed to the program.^{6(p11)} Split-half reliability coefficients ranged from .69 to .85.^{6(p11)}

We are preparing students for an increasingly turbulent society, which requires adaptability, sophisticated knowledge, lifelong learning, and critical thinking skills.⁴² The ability to function in the face of uncertainty requires critical thinking abilities more advanced than those typically attained by American college students,⁴³ and there is reason to think that the challenges provided by service learning may facilitate this development.^{44,45} Service learning, which allows students to confront issues and problems in complex community contexts, appears to be ideally suited to help students develop a deeper understanding of subject matter, a practical knowledge of how community decision-making processes work, and strategies for transferring knowledge and problem-solving skills to new situations.

METHODS

Subjects

The sample consisted of a cohort of 40 students enrolled in a course on geriatric rehabilitation that was offered in the physical therapy department of a large, public, southern California university. Subjects were in the last semester of a 3-year graduate physical therapist program. The respondents ranged from 23 to 59 years of age, with the mean age being 29.6 years (SD=7.1). Subjects older than the mean age were not found to be outliers with respect to their understanding of older adults. For this study, the class was divided into an experimental group (service learning) and a control group (no service learning). The group assignments were based on a preexisting division of the class into lab sections. Table 1 describes the number, age, and sex of the subjects in each group. Although the distribution of subjects by sex was not even between the experimental and control groups, no significant relationship has been reported between test scores and sex.^{36,46} One control group subject's posttest scores were not included in the data analysis because she did not take the pretest. Another control group subject's scores were not included in the data analysis because she was unavailable for the posttest. The university's committee for the protection of human subjects approved the study. Participation in the study was voluntary, and all participants gave informed consent to participate.

Instrumentation

Knowledge of and attitudes toward elderly people. Palmore's FAQ is a one-page, 25-item, true-false quiz that assesses knowledge of basic physical, mental, and social facts about aging, commonly held misconceptions about aging, and bias toward older people.³² The wording in the last item was changed from "2000" to "2020" so that the question read: "The health and socioeconomic status of older people (compared to younger people) in the year 2020 will probably be about the same as now."

Sixteen questions represented negative bias when answered incorrectly, 5 items were considered "pro-aged" when answered incorrectly, and 4 of the 25 items were neutral.³⁴ Knowledge of elderly people is determined by calculating the percentage of correct responses. A net age bias score is computed by subtracting the mean of the percentage of errors on the negative bias items from the mean of the percentage of errors on the positive bias items.

Critical thinking. Forms A and B of the WGCTA were used during the pretest and posttest, respectively.⁶ Each test consists of 80 items that include realistic problems, statements, arguments, and interpretations similar to those encountered in everyday situations. Each test consists of 5 subtests, with 16 items each, which measure separate facets of critical thinking. The subtests are as follows⁶(p2):

1. Inference. Discriminating among degrees of truth or falsity of inferences drawn from given data.
2. Recognition of assumptions. Recognizing unstated assumptions or presuppositions in given statements or assertions.
3. Deduction. Determining whether certain conclusions necessarily follow from information in given statements or premises.
4. Interpretation. Weighing evidence and deciding if generalizations or conclusions based on the given data are warranted.
5. Evaluation of arguments. Distinguishing between arguments that are strong and relevant and those that are weak or irrelevant to a particular question at issue.

Procedure

The FAQ and WGCTA were administered during the first and last class meetings of the 16-week semester. The FAQ was completed in 15 minutes. The WGCTA was administered with the standard written instructions and standard format. It was administered with a 40-minute time restriction.

The experimental group participated in a service-learning course in geriatric rehabilitation, which was a structured learning experience that combined 32 hours of community service with preparation and reflection. In addition to an in-depth investigation of selected topics in geriatric rehabilitation, the students were to select a faculty-approved community agency with which to partner. Students, working in groups of four, completed a needs assessment with the community partner and developed a program for them. Students spent on average 2 hours per week with elderly people at their chosen facility in the development and implementation of their project. Students kept a journal reflecting on their experiences and linked their outside experiences through classroom discussion (Appendix 1). Students presented their programs at the end of the semester to their community partner. Students were exposed to a wide spectrum of elderly people, such as basically healthy older individuals participating in senior center programs, as well as more frail older individuals requiring skilled nursing care. The projects developed and implemented were the following: a walking program for residents in an assisted-living facility, a balance program for clients in a retirement community, an osteoporosis screening for people at a senior center, a balance program for patients in a skilled nursing facility, and a group exercise program for patients in a transitional care unit.

The control group participated in a genuine rehabilitation course, which was designed to promote an in-depth investigation of the same selected topics in geriatric rehabilitation as the experimental group, but without a service-learning component. Therefore, neither community service nor reflection was required. Students in the control group also worked in groups of four on program projects that they selected at the beginning of the semester and presented to their classmates at the end of the semester. The following are the comprehensive training programs to improve one of the following problems related to aging that were developed by the control group: osteoporosis and related postural abnormalities, ambulation dysfunction and the need for lower-extremity orthotic devices, chronic dermal wounds, health promotion and wellness, urinary incontinence and pelvic-floor dysfunction, and arthritis with joint pain and stiffness (Appendix 2).

Data Analysis

Two-way analyses of variance (ANOVAs) for repeated measures were computed by the General Linear Models procedure using the SPSS program* to adjust for unequal numbers of students. Box plots were graphed using the SPSS program to identify potential outliers. Groups of students (experimental and control) and time (pretest and posttest) were independent variables. Total number of correct items on the FAQ, incorrect negative bias items ("anti-aged" bias scores) on the FAQ, incorrect positive bias items ("pro-aged" bias scores) on the FAQ, the net bias score on the FAQ, and total number of correct items on the WGCTA were the dependent variables. Alpha was set at .05.

RESULTS

The two-way ANOVA for repeated measures for total number of items answered correctly on the FAQ as the dependent variable yielded a significant main effect for time ($F_{1,36} = 22.817, P.05$) (Table 2).

The FAQ can be used to identify the most frequent misconceptions about aging by students. Items on the FAQ that at least half of the students answered incorrectly are reported below. High negative bias was most dominant for item 7, "At least one tenth of the aged are living in long-stay institutions (eg, nursing homes, mental hospitals, homes for the aged)," with 89% believing that at least 10% of elderly people are institutionalized. Strong negative bias was shown on item 21, "The majority of older people have incomes below the poverty level (as defined by the federal government)." A high percentage of students agreed with that statement (74%). Students showed negative bias on item 24, "The majority of old people are seldom irritated or angry." Fifty-eight percent of the students believed that older people do get angry more often. High negative bias was also observed on item 8, "Aged drivers have fewer accidents per person than drivers under age 65," and on item 16, "The majority of old people are seldom bored." Fifty-five percent of the students believed that older people have more accidents and are bored a lot of the time. On the posttest, 58% of the students continued to have negative bias on item 21. No "pro-aged" items reached the criterion of more than 50% of students marking it as incorrect on either the pretest or the posttest (Table 3).

The two-way ANOVA for repeated measures for negative bias items answered incorrectly on the MQ as the dependent variable yielded a significant interaction between service learning and time ($F_{1,36} = 18.657, P < .05$). The two groups of students responded differently. Students in the service-learning condition decreased their "anti-aged" bias from 32.74% to 17.86%, whereas those in the control condition had increased their "anti-aged" bias by the end of the semester from 15.81% to 25.37% (Table 2).

The two-way ANOVAs for repeated measures for positive bias items answered incorrectly on the FAQ, the net age bias score on the FAQ, or total number of correct items on the WGCTA as the dependent variables yielded no significant result ($P > .05$) (Table 2).

DISCUSSION

Physical therapist students in the service-learning and control groups correctly answered 68% of the questions on Palmore's FAQ. These results are comparable to those obtained by Palmore³⁴ for people untrained in gerontology (67%), undergraduate nursing students (68.72%¹³ and 70.2%⁴⁷), and graduate nursing and social work students (67.6%).⁹ Overall, the scores obtained in my study suggest that many future physical therapists experience deficits in their knowledge about aging prior to taking a geriatric rehabilitation course.

The MQ is used most often to measure changes in knowledge resulting from some type of educational intervention.³⁴ The study reported here demonstrates that physical therapist students' knowledge about elderly people improved regardless of the teaching strategy used in a geriatric rehabilitation course. The mean score of all students (78%) on the FAQ at the end of the semester is not as high as that reported by Palmore³⁴ for people with some training in gerontology (84%), but the students in the service-learning course approached that value (81%). Initially, the physical therapist students in the service-learning and control groups categorized elderly people as angry, bored, and highly vulnerable to driving accidents. These are misconceptions that may influence the care of providers. Similarly, the physical therapist students held some misconceptions concerning the social aspects of aging, especially the ability to live independently and the financial status of elderly people. These misconceptions create the image of elderly people as having low incomes and not getting proper benefits.

The physical therapist students held both negative and positive aged bias about aging, but they held a higher negative bias as demonstrated by the negative net bias score. The results also show that an increase in knowledge about elderly people does not necessarily lead to changes in attitudes and may have negative effects. These findings among physical therapist students are similar to those reported in some studies of nursing and medical students.^{13,48,49} The practical implication of these findings is that academic programs should focus on the achievement of specific goals such as an increase in knowledge. An increase in knowledge or the mere exposure to gerontology, however, may not lead directly to changes in attitudes and may even bring about more negative attitudes.¹³

The cooperative nature of service learning makes it more time-consuming for students than traditional classroom-based instruction.⁵⁰ Students in the experimental group spent more time on their projects than the control group because of both the service and reflective components. This may be one reason that service learning imparted an improvement in attitude toward aging to students in the experimental group. A national study on service-learning programs revealed that the greater the time devoted to the service-learning experiences and the reflection on those experiences, the more likely the program would lead to learning in the academic and affective areas.⁵¹ Perhaps the most important aspect of the service-learning process and the key to the "learning" in service learning is reflection. By taking the time to reflect before, during, and after the service learning, students are afforded a chance to internalize and broaden their learning.⁵² These data support exposing students to an experiential component within the geriatric curriculum in order to improve both knowledge about aging and attitudes toward older adults. All physical therapist students in the study had a mean score of 55.34 on the test of critical thinking skills, the WGCTA, at the end of their physical therapist curriculum. This is comparable to a mean of 56.4 as reported by Watson and Glaser⁶ for a preprofessional group of nursing students. Although it was expected that there would be a significant increase in WGCTA scores among service-learning participants, this was not the case. Various reasons have been postulated to account for such a lack of

improvement in critical thinking after educational intervention.⁵³ First, there is the possibility that the WGCTA is not a valid measure of physical therapist student ability, as was suggested in Wilson's review of evaluative properties of critical thinking tests.⁵⁴ Wilson⁵⁴ stated that the WGCTA is a broad-based measure of critical thinking designed for the general population. However, physical therapy is a science and as such may be more accurately tested with a tool developed with that discipline in mind, it is possible that the physical therapist students in the experimental group were being taught critical thinking skills, but a tool to measure these skills specifically in the physical therapy environment has not been developed.

Second, Thompson and Rebeschi⁵⁵ postulated that possibly students in their last semester of a challenging curriculum will not push themselves to high performance on a test that carries no academic credit. Student motivation is an intangible, but influential, factor.

Third, the expectation of a gain in critical thinking scores, as the result of students completing one geriatric rehabilitation course, may be erroneous. Arand and Harding⁵⁶ reported that only one course in a physical therapist curriculum, designed as an introduction to problem solving, was significantly related to changes in WGCTA scores. Their reported changes were not evident until the completion of the year-long program. Critical thinking may take longer than one semester to develop. According to Brigham,⁵⁷ reflecting on one's thoughts, a component of service learning, is vital to the development of critical thinking skills. It is possible that one intervention in a semester does not lend itself to deep analysis of content and thus does not allow sufficient time for development.

Although service learning did not demonstrate an improvement in critical thinking skills, there were other positive outcomes that were not measured by the WGCTA. For example, although the experimental group protested about the workload and expressed concern regarding finding the time needed for service learning, students affirmed that their participation in the service-learning project related well to the course. Faculty responses to student service-learning participants were overwhelmingly positive. Supervisors agreed that students more than adequately fulfilled their duties and indicated that they gladly would accept students again for future service-learning projects. Many of the comments made about students referred to them as dependable, hardworking, professional, and motivated. They made no negative comments about the service-learning students and gave only glowing commentary on how capable and competent the students were.

While the findings of the study endorse service learning as a useful pedagogical tool for physical therapist students, caution should be used in generalizing the results, due to the small size of the control and experimental groups. Additional research is needed in the area of service learning, especially in physical therapy. Additional empirical data are needed in order to more fully understand the impact of this instructional intervention, such as benefits to physical therapist students' ultimate career choices and behaviors toward elderly patients.

CONCLUSION

The goal of physical therapist educators is to graduate physical therapists who have a broad knowledge base and the ability to competently meet the needs of their clients. Therefore, physical therapist educators must keep pace with the forces that are changing the face of health care in the United States today. As the population ages, educators in physical therapy will be challenged to respond by refocusing the content and structure of the curricula and settings used to train students. One method is through service learning, which is an educational method that meets academic objectives concurrently with real community needs. Service learning imparts better learning and attitudes toward aging for the student.

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