

Body Mechanics, Adaptive Gardening Tools, and Physical Benefits of Gardening

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This project, submitted by Josh Flake, has been approved and accepted in partial fulfillment of the requirements for the degree of Master of Occupational Therapy from the University of Puget Sound.

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Disclaimer

The information on this website is not to replace the advice of your occupational therapist or your physician. Therefore, consult with an occupational therapist if you have any questions about what appropriate exercises, adaptive equipment, or proper body mechanics to use in order to prevent injuries or to keep any past injuries from worsening. The content consists only of suggestions that may not be appropriate for everyone.

Abstract

The purpose of this project was to provide an educational website where members of the Proctor Community Garden Program (PCGP) could learn about the physical benefits of gardening, proper body mechanics principles, and adaptive tools to use in gardening with the goal of preventing bodily injury. A website was used in one of two parts of an in-service; the first part consisted of educating PCGP members about the physical benefits of gardening, proper body mechanics principles, and adaptive gardening tools. During the second part of the in-service the PCGP members physically practiced what was learned in the first part of the in-service at the University of Puget Sound Garden. Prior to the in-service, a pretest was given, and a posttest was given afterwards. The pre/post test scores overall revealed no significant differences, however, some posttest scores were greater than pretest scores in the areas of proper body mechanics and adaptive gardening tools. This may suggest that the educational website used in the in-service increased their knowledge in those areas.

Purpose Statement

The purpose of this project was to provide an educational website where members of the Proctor Community Garden Program can learn about the physical benefits of gardening, proper body mechanics principles, and adaptive tools to use in gardening with the goal of preventing bodily injury.

Context of Problem

Health promotion is one of the major goals of occupational therapy, and is imperative for maintaining overall health (American Occupational Therapy Association [AOTA], 2008).

Purposeful activity promotes health by engaging one's mind and body to participate in a meaningful activity in which skills are developed to benefit overall health. Gardening promotes multiple physical health benefits (Leake, Adam-Bradford, & Rigby, 2009). For example, Haub, Park, and Shoemaker (2009) found that community gardening offers two physical benefits, which are increasing grip strength and pinch force in one's hands and fingers. Kingsley, Townsend, and Henderson-Wilson (2009) had several respondents who stated that gardening improved their physical conditioning and strength.

Another goal of occupational therapy is to prevent injuries (American Occupational Therapy Association, 2008). Although community gardening is a low risk activity, since so many people participate there is a high occurrence of injury (Powell, Heath, Kresnow, Sacks, & Branche, 1998). Some of these injuries stem from poor body mechanics, which may lead to muscular injury resulting in arm, back, or shoulder pain. Repetitive motion such as digging may also lead to repetitive strain injury (RSI) and carpal tunnel syndrome (Canadian Federation of Agriculture, 2008; American Society of Hand Therapists, 2012). Baxter (2008) provided solutions to this problem: suitable gardening equipment and proper body positioning. This may

decrease the risk of bodily injury for gardeners and help facilitate the completion of gardening tasks.

Although gardening has physical benefits, gardeners may be unaware of them and the potential risk of bodily injury involved in gardening (Atwood, 2004). A member of the Proctor Community Garden Program (PCGP), Randy Cabe, felt that other members in PCGP may be unaware of the risks of bodily injury involved in gardening. He thought that creating awareness about the health benefits was important as well as using proper body mechanics, especially for those in PCGP who are inexperienced in gardening. He also stated that adaptive tools such as a kneeling pad or a small hand implement could be of good service for frail elderly members (R. Cabe, personal communication, August 23, 2011). Another member, Rebecca Kuglitsch, felt the same as Randy; however, she thought that she should be more aware of the potential risk of bodily injury involved in gardening. She felt that creating an awareness of proper body mechanics in PCGP would be good because it prevents injuries, which would allow her and other gardeners to continue gardening (R. Kuglitsch, personal communication, August 19, 2011).

Overview of Project

This website and in-service was created to educate members of the PCGP on the physical benefits associated with community gardening as well as on the use of proper body mechanics and adaptive tools; with the goal of increasing knowledge and reducing the risk of injury. The website consisted of eight sections: about this website (First section), about this student therapist and occupational therapy (Second section), adaptive gardening tools (Third section), tips to avoid injury (Fourth section), physical benefits of gardening (Fifth section), principles of proper body mechanics (Sixth section), references (Seventh section), and glossary (Eighth section). The first section was a summary of what the website was about and explains different

sections the user could access on the website. The second section explains who the website creator was and defines occupational therapy and what services occupational therapists' provide. The third section discussed adaptive tools that could be used to facilitate gardening tasks with the goal of reducing injury. Adaptive tools such as a small stool could be used when planting seeds, in order to reduce the degree of bending (Baxter, 2008). The fourth section consists of nine stretching exercises, use of three appropriate garden supplies, and one common method of avoiding an injury. The fifth section explained eight physical benefits of gardening. The sixth section explained the proper body mechanics to use in gardening with the goal of reducing injury. Body mechanics deals mainly with proper body movement, for example, flexing your knees while lifting, ensuring your back is straight while sitting (Baxter, 2008). The seventh section shows 19 references used for the website. The eighth section provides definitions of 15 medical and biomechanical terms.

Targeted Population

The PCGP is one of the many programs that Metro Parks Tacoma (MPT), an independent government agency, sponsors (MPT, 2011). One of the goals of PCGP is to promote a proactive lifestyle for members, and to draw in future gardeners to continue building up a healthy community (MPT, 2011). In order to better serve the PCGP members in this community, a website accompanied by an in-service was provided to increase awareness of the physical benefits of gardening. The website and in-service will also provide information about proper body mechanics principles and adaptive tools to use with the goal of preventing injuries.

PCGP's mission statement is "creating healthy opportunities to play, learn, and grow" (MTP, 2011). Two main key players interviewed were Rebecca Kuglitsch and Randy Cabe. They are both active members of PCGP.

Background Literature Review

Community gardening in the U.S. According to Hou, Johnson, and Lawson (2009), community gardens have a “long history in the United States, which can be traced back to the 1890s” (p. 13). During the urban development of the U.S., various public gardening organizations and movements surfaced between 1893 and the 1930s to include: “the vacant lot cultivation associations during 1893 to 1897 depression, the children’s school garden movement from 1890 to 1920, civic gardening campaigns, World War I gardens, relief and subsistence garden programs during the 1930’s depression, and World War II victory gardens” (p. 13). Community garden programs and campaigns during those periods existed to address health, social, and economic issues.

According to Hou et al. (2009), as late as the 1960s many educators, reformers, and civic leaders in the U.S. promoted community garden programs as a means to serving the general population. Schools, garden clubs, women’s clubs, and associations obtained land for the purpose of gardening, and hired people to manage the gardens and seek out others to participate in community gardening. Furthermore, the educators and community leaders focused on creating community garden programs for underprivileged populations, such as the urban poor and new immigrants. This was in hope of addressing their health, nutrition, and social interaction needs (Hou, et al., 2009).

Currently in the U.S., community gardens are still prevalent. According to the American Community Garden Association (1999), there were an abundance of gardens in large cities such as New York (1,906 gardens), Newark (1,318 gardens), Philadelphia (1,135 gardens), Boston (148 gardens), Seattle (44 gardens). American Community Garden Association also found by survey that there has been a constant increase in the number of gardens in the U.S. over the last

five years (p. 16). This trend may be due to increased awareness of the benefits associated with community gardens: environmental, physical, and social (American Community Garden Association, 1999). This knowledge may have also sparked interest in other cities to have community gardens.

Community gardening in Tacoma. In 2008, the Tacoma-Pierce county Action Communities for Health Innovation and Environmental Change (ACHIEVE) coalition was started to address childhood obesity in Pierce County (Grow Local, 2007). A grant was given to ACHIEVE by the Center for Disease Control and the YMCA of the USA (Grow Local, 2007). This grant was to help ACHIEVE fulfill four goals: “increase the number of community gardens in Tacoma and Pierce County, strengthen existing gardens, build and maintain a coordinated network of individuals and organizations, and increase social capital” (Community Garden Plan, 2010, para. 2).

In 2010 the Mayor of Tacoma, Marilyn Strickland, spoke at a Pierce community garden summit and told a crowd of 150 Tacoma residents, “I would like Tacoma to be known nationally as the city with the most community gardens per capita in the United States” (Urban Farm Hub, 2010). During the summit, Mayor Strickland announced to the residents that the City of Tacoma would create an additional seven new community gardens. The objective of this summit was to link new gardeners to resources, provide healthy foods for Tacoma residents, and make plans for new community gardens (Urban Farm Hub, 2010).

Physical benefits of gardening. There are multiple benefits of gardening ranging from nutritional to psychological such as the promotion of relaxation (Hou et al., 2009). For the purpose of this paper, however, the focus will be on the physical benefits of gardening. Rebecca Kuglitsch, PCGP member, mentioned that she herself receives physical benefits from gardening

such as physical conditioning and building upper body strength. She feels that this information on the physical benefits of gardening is something other members would want to know. Multiple studies have been conducted on the physical benefits of gardening. According to Haub et al. (2009), gardening promotes “grip strength, pinch force, and overall physical health” (p. 206). In a qualitative study conducted by Kingsley et al. (2009), several respondents stated that gardening improves their physical health and physical conditioning by requiring them to “bend up and down.” They also reported gardening helps them to develop muscles with the motion of digging (p. 213). In addition, an anonymous elderly respondent stated gardening enabled him or her to participate and perform better in the gym (Kingsley et al., 2009). Overall, these health promotional studies serve to affirm the physical benefits of community gardening. As mentioned previously, however, as popularity increases and more people participate in this leisure activity, so does the potential for gardeners to become injured.

Potential risks with gardening. According to Baxter (2008), there is little research on injury rates for gardeners. Powell et al. (1998) suggested, “There is a relatively low risk of injury in gardening” (p. 1247). However, due to the “high participation rate, the absolute number of injuries is high” (Powell et al., 1998, p. 1248). Due to the popularity of gardening, safety in gardening is a valid goal. The same study found that younger gardeners aged 18 to 44 years were more prone to injury in the course of gardening than older gardeners from ages 45 years and up. This difference may simply be due to the lack of experience by younger gardeners in the area of using proper body mechanics. Gardening associated injuries included muscle pain in the arms, back and shoulders due to poor body mechanics (Baxter, 2008). The Canadian Federation of Agriculture (2008) found that up to 40% of farmers also reported experiencing muscle pain to the arms, shoulders or neck, hands, and wrists, some of it perhaps being Repetitive Strain Injury

(RSI). An educational guideline on how to perform proper body mechanics was proposed to help in the prevention of RSI (Canadian Federation of Agriculture, 2008). We can extrapolate that the use of proper body mechanics education could also help to reduce the rate of injury for common gardeners such as the PCGP members.

Importance of proper body mechanics. There have been multiple studies done on the importance of body mechanics training to increase proper body mechanics knowledge with the goal of injury prevention. The studies in this literature review focus mainly on health care providers and agricultural workers, however, their findings pertain to gardeners due to the similar repetitive movements used and the risk for injury if proper body mechanics is not utilized. We will start with a review of studies examining criteria for an effective body mechanics training program, then specific body mechanic principles.

According to McCannon, Miller, Elfessi (2004), “Due to the high prevalence and cost of injuries within the health care profession, an educational injury prevention program may be indicated” (p. 105). McCannon et al. (2004) conducted a study comparing the effectiveness of job specific training (JST) to basic body mechanic training (BBMT). The study found JST, in which body mechanics training was offered in a more tailored format incorporating the specific needs of the job, was more effective than BBMT. On demonstrating the use of proper body mechanics to lift a patient up in bed, subjects who received JST scored significantly higher (mean of 10.12), than subjects who received BBMT (mean of 5.57) (p. 108). Hartvigsen, Lauritzen, Lings, and Lauritzen (2005) concluded that longer intense body mechanics training with weekly sessions offered no more benefits than that of a shorter three-hour instructional meeting. These two studies suggest that job specific training, whether it is long or short has been shown to increase knowledge regarding proper body mechanics. From these studies it can be

inferred that body mechanics training just for gardeners might serve as an important tool to increase knowledge and promote safe techniques with the goal of injury prevention for PCGP members. It can also be inferred that a one-time instructional session may be just as beneficial as multiple, lengthier training sessions. The following section will introduce studies on the effectiveness of various body mechanics training and some of the body mechanic principles used.

Holmes, Lam, Elkind, and Pitts (2008) found body mechanics education training to be an effective tool to promote proper body mechanics for lifting and increasing knowledge for fruit warehouse workers (p. 466). The principles of proper body mechanics utilized in this study included maintaining good spinal alignment, bending knees while lifting, and keeping the object “close to the center of gravity” (p. 465). Post scores after the educational training program, increased to 6.6 from 3.8 in lifting performance (p. 466). Lieber, Rudy, and Boston (2000) found that a body mechanics training program was effective in improving the lifting performance of patients with chronic back pain. The results of the study indicated that body mechanics training improved “static strength, dynamic endurance, and lifting speed” in patients with low back pain (p. 174). The principles of proper body mechanics used in this study included maintaining good “spinal alignment,” being in direct line of contact with the object to prevent twisting, using a “wide base of support,” and keeping the object “close to the center of gravity” (p. 167).

According to Berrios-Lopez, Cadiz-Blackman, Velez-Hernandez, Venegas, and Ortiz (2009), application of body mechanics principles in a back school program was an effective intervention that encouraged “short-term” changes in the body mechanics of back-injured working adults in Puerto Rico (p. 48). Overall, there were no data to directly link proper body mechanics training to a direct reduction in gardening and work-related injuries. These studies did identify the use of

proper body mechanics training as a significant factor to increase proper body mechanics knowledge with the goal of preventing injury. The studies also provided information that was helpful in designing an educational body mechanics training program for the PCGP members and specific principles of body mechanics to address in the program.

Conclusion

In conclusion, people are more aware of the benefits associated with gardening (Kingsley et al., 2009). There has been a corresponding increase in the popularity of community gardens, which also raises the potential for injury. One of the major risks in gardening is RSI (Health Canada, 2011). A contributing factor to RSI is suggested to be the use of improper body mechanics (Canadian Federation of Agriculture, 2008). As suggested by multiple studies, an educational body mechanics training session serves to increase the knowledge of proper body mechanics in participants. In the majority of these studies, the use of proper body mechanics was used as a goal to reduce injury (Hartvigsen et al., 2005; McCannon et al., 2004). These studies did provide helpful information about designing an educational body mechanics training program for the PCGP members and specific principles of body mechanics to address. Based on the research and keeping in mind the limited time and resources available, a one-time instructional body mechanics session tailored to the needs of PCGP gardeners, focusing on key body mechanics principles was employed. Key body mechanic principles addressed were maintaining good “spinal alignment,” flexing knees while lifting and keeping the object “close to the center of gravity” (Lieber et al., 2000, p. 167).

List of Skills and Knowledge

Possess	Skills and knowledge
✓	Need to know how to apply proper body mechanics principles in gardening.
✓	Need to know what appropriate adaptive tools to present to PCGP members.
✓	Need to be familiar with the names and uses of different adaptive gardening tools
✓	Need to know how to create a website
✓	Need to know physical benefits of gardening

Procedures

1. Interviewed R. Kuglitsch for a needs assessment (R. Kuglitsch, personal communication, August 3, 2011) – a member of PCGP.
2. Interviewed R. Kuglitsch for a needs assessment (R. Kuglitsch, personal communication, August 19, 2011) – a member of PCGP.
3. Interviewed R. Cabe for a needs assessment (R. Cabe, personal communication, August 23, 2011) – a member of PCGP.
4. Gained knowledge through general and literature research about the physical benefits of gardening, proper body mechanics principles, and adaptive gardening tools.
5. Decided that the PCGP members needed access to an educational website and an in-service about physical benefits of gardening, proper body mechanics principles, and adaptive gardening tools.
6. Contacted an educational technologist, Lauren Nicandri, to get advice about creating a website.
7. Used the free website builder, Weebly.com, as advised by the educational technologist and went through six steps to create a website. First, created a personal account on Weebly.com. Second, learned how to create a Weebly website by watching the Weebly

tutorial video on Weebly.com. Third, chose a website “design” or “theme.” Fourth, chose “elements” (picture, title text, video, etc.) and dragged and dropped them onto the webpage. Five, uploaded photos and wrote information in text boxes. Six, clicked “publish” to start the process of activating the website.

8. First, decided to prepare what gardening tools to use for the in-service based from interviews of PCGP members as well as through observation at PCGP. Second, used the idea of incorporating adaptive gardening tools in the in-service from course instructor, Tatiana Kaminsky. Third, decided to use the idea of incorporating the human spine model and proper body mechanics principles in the in-service from Chair, George Tomlin. Fourth, created in-service flyers and e-mailed them to the agency to then be sent to PCGP members. Fifth, contacted Collins Memorial Library to reserve the presentation room (room 020) for the first part of the in-service. Sixth, contacted Assistant Director of Student Activities, Sarah Comstock, to ask for permission to use the garden as the second part of the in-service at the University of Puget Sound Garden. Seventh, purchased adaptive gardening tools and collected regular gardening tools from parents. Eighth, collected miscellaneous supplies for in-service and purchased necessary refreshments for the in-service.

Description of Products

Outcome of website. Creating a Weebly website was fairly simple, as one just had to drag and drop various templates (paragraph with title, picture, title) onto a webpage and type the information of text in the text boxes. Color, contrast, font style, and font size were very important, as one had to match those features with the theme or design of the website to his or her satisfaction, which took the majority of time spent on the website. However, the process of

collecting information and photos for this website was more time-consuming than creating the website itself. The process of collecting information and photos for this website took three to four weeks. The photos were all works of the student, which was done to avoid copyright infringement.

Outcome of in-service. The in-service took place in Collins Memorial Library and the University of Puget Sound Garden, for a total of two hours. Eight of 34 PCGP members attended the in-service. The first part of the in-service included an overview of how to use the website, and a posttest was given afterward. During the first part of the in-service the PCGP members physically practiced what was learned in the second part of the in-service. The original time for the in-service was scheduled for one hour and 45 minutes; however, time was an issue due to PCGP members arriving late and the student not managing time well in the second part of the in-service. For this in-service to be successful, items such as the adaptive gardening tools and refreshments were purchased, and regular gardening tools were borrowed. A free drawing of gardening supplies was done at the end of the second part of the in-service.

The Website Content

The website included the following 8 sections:

1. About this website – This section is a summary of what the website is about and explains different sections the user can access on the website.
2. About this student therapist and occupational therapy – This section explains who the website creator is and defines occupational therapy and what services occupational therapist provide.

3. Adaptive gardening tools – This section explains about adaptive gardening tools to use that may help individuals with a medical condition garden, prevent injuries, or to keep any past injuries from worsening.
4. Tips to avoid injury –This section consist of nine stretching exercises, use of three appropriate garden supplies, and one common method of avoiding an injury (taking a break).
5. Physical benefits of gardening – This section explains eight physical benefits of gardening.
6. Principles of proper body mechanics – This section explains the nine principles of proper body mechanics.
7. References – This section shows 19 references used for the website.
8. Glossary – This section defines 15 medical and biomechanical terms.

Materials/Supplies/Equipment Needed and Anticipated Costs

Cost	Materials/Supplies/Equipment
No cost	Computer (Will e-mail pre/posttest)
No cost	Digital camera
\$5.00	Cost of Printing Flyers for in-service
\$15.00	Provide snacks and refreshments during in-service
\$71.00	Gardening tools and supplies
\$87.97	Register fee for website

Goals and Objectives

Goal 1:

After reading sections of this website and attending the in-service class, PCGP members will have increased knowledge of proper body mechanics and the use of various equipment with the goal of promoting safety and reducing bodily injury.

Objective 1:

After reading a specific section of this website and attending the in-service class, PCGP members will be able to identify at least three principles of proper body mechanics to allow them to practice safe gardening.

Objective 2:

After reading a specific section of this website and attending the in-service class, PCGP members will be able to identify at least two adaptive tools that will assist them in practicing safe gardening.

Goal 2:

Upon reading a specific section of this website and attending the in-service class, PCGP members will have increased knowledge about the physical benefits of gardening.

Objective 1:

In reading a specific section of this website, PCGP members will be able to identify at least two physical benefits of gardening.

Objective 2:

In attending the in-service class, PCGP members will be able to identify at least one musculoskeletal benefit of gardening that is important to them and why.

Desired Outcomes

The desired outcome was to increase PCGP members' knowledge of proper body mechanics, adaptive gardening tools, and the physical benefits of gardening and promote gardening safety for PCGP. An in-service was held for PCGP members on how to use adaptive gardening tools, and an overview of the website was provided for additional reinforcement.

In order to measure the success of the website and in-service, a pretest and posttest (see pre/post test questions in appendix) was given to evaluate PCGP member's knowledge of physical benefits and the use of proper body mechanics and adaptive gardening tools.

Outcomes Met

Eight out of 34 PCGP members completed the Proctor community garden in-service pre/posttests. The results from question one of the posttest showed that the PCGP members increased their knowledge of proper body mechanics principles, as six of eight answers were correct in the posttest compared to three of eight answers correct in the pretest. Therefore, goal one was met in this aspect of body mechanics knowledge. In question two of the posttest, the results revealed that the in-service did not increase PCGP members' knowledge of the values of using proper body mechanics, as five of eight answers were correct in the posttest compared to seven of eight in the pretest. Therefore, goal one was not met in this aspect of body mechanics knowledge. Because question three of the posttest was not comparable to any pretest question, the results of this question were used to measure whether or not the PCGP members met objective one of goal one. Objective one of goal one was met; almost 50% of the participants identified three principles of proper body mechanics used in gardening on the posttest. Question three of the pretest was removed, as it was very similar to question five of the pretest. The results of question four of the posttest compared to question four of the pretest showed that the website

and in-service increased PCGP members' knowledge of various gardening tools, evidenced by an increase of correct answers on the posttest compared to that of the pretest. Five of eight members listed two correct adaptive gardening tools on the posttest, which was a marked improvement from the pretest results as three participants did not know what adaptive gardening tools were and only one of eight members listed a correct answer for pretest question four. This indicates that PCGP members were able to identify adaptive gardening tools to use when gardening. Therefore, objective two of goal one was met. Question five of the pretest was comparable to question six of the posttest. Therefore, the results from these two questions were compared. The results from question six of the posttest showed that the website and in-service did not increase PCGP members' knowledge of physical benefits of gardening, as three of eight answers were correct in the posttest compared to five of eight answers correct in the pretest. Therefore, objective one of goal two was not met. Question six of the pretest was not comparable to any question of the posttest. Therefore, question six was removed from the pretest analysis. The results of question seven of the posttest revealed that the website and in-service may have not increased PCGP members' knowledge of musculoskeletal benefits, as two of eight answers were correct in the posttest compared to six of eight answers correct in the pretest. Therefore, objective two of goal two was not met.

Implications for Occupational Therapy

In occupational therapy, safety and health promotion are major components to living healthy and risk free (James, 2009; Letts, 2009). In this project, aspects of safety included using proper body mechanics and adaptive tools to prevent bodily injury, as well as understanding the advantages of community gardening. Gardening is a meaningful occupation to people, especially to those at the PCPG in Tacoma. Body mechanics training and adaptive tools would allow PCPG

members who may or may not have injuries, to safely perform gardening tasks with ease (Atwood, 2004; Baxter, 2008). This ensures that injured PCGP members do not exacerbate any past injuries, and non-injured PCGP members prevent themselves from getting injured. One of the users of this community garden stated she received physical benefits from gardening such as physical conditioning and building upper body strength (R. Kuglitsch, personal communication, August 3, 2011). As the member mentioned and as research indicates, there are many physical benefits to having a community garden (Hou et al., 2009; Kingsley et al., 2009). Therefore, a website and in-service was provided to the members of the Proctor program to increase awareness of safety and physical benefits involved with gardening.

The Person Environment Occupational Performance Model

The Person Environment Occupational Performance (PEOP) model describes the complex relationship among three important components: person, environment, and occupation (Christiansen & Baum, 2008). All three components come together, which in turn influences occupational performance and participation. A person is a being comprised of intrinsic factors. Such factors are psychological, physiological, spiritual, cognitive, and neurobehavioral (Christiansen & Baum, 2008). The person calls upon their innate or learned skills, so that he or she can complete activities within context, in order to achieve successful occupational performance (Law et al., 1996). There are different types of environments. According to the PEOP model, physical environment is described as the concrete structure of the environment. Social environment consist of the personal relationships one has with family, friends, and co-workers. Cultural environment includes one's personal experiences and it helps to shape one's values and belief system (Brown, 2009). Aspects of an individual's cultural background include ethnic background, professional identity, and religious preference. These elements are important

because they take into consideration the PCGP individual's values and personal beliefs, which ultimately impact their occupational performance. Therefore, the PEOP model will help occupational therapists provide a more customized treatment program focused on meeting the needs of the PCGP participants. The physical environment is also significant to the overall occupational performance of a client, as it has the ability to act as an advantage or a barrier, which can hinder or facilitate the client's performance. Occupation is an activity that a person is engaged in, over an extended time, to meet a need. According to the PEOP model, the person and environment interact with occupation; the result is occupational performance and successful occupational performance then fosters participation (Brown, 2009).

Application of Theoretical Model

I decided to utilize the Person Environment Occupation Performance (PEOP) model because it has a direct influence on occupational performance. The PEOP suggests that person, environment, and occupation interact with each other, which in turn influences occupational performance. Within the PEOP model it is important to consider the dynamic interaction among person, environment, and occupation. This is important because if all three components do not mesh well, the result may be poor occupational performance (Law et al., 1996). Therefore, the abilities of a person should be taken into consideration as well as what adaptations, if needed, are to be made for the occupation and environment to ensure satisfactory occupation performance (Law et al., 1996).

For purposes of this project, I focused on three components, person (PCGP members) environment (PCGP premises) and occupation (gardening). I focused on the person or participants of PCGP with the use of proper body mechanics, environmental factors that affect occupational performance of PCGP members, and the occupation of gardening with adaptive

tools. PCGP participants have access to a website and in-service on proper body mechanics and use of adaptive tools, with the desired outcome of preventing gardening associated injuries and ensuring satisfactory occupation performance.

Application of the OT Practice Framework

The Occupational Therapy Practice Framework (OTPF) is a delineation of interrelated constructs that guides the therapist in practice (AOTA, 2008). It consists of areas of occupations such as activities of daily living, instrumental activities of daily living, rest and sleep, education, work, social participation, and health management and maintenance (AOTA, 2008). These areas of occupation are influenced by performance skills, context and environment, and activity demands. Performance skills are the “abilities clients demonstrate in the action they perform” (AOTA, 2008, p. 640). Context or environment “refers to a variety of interrelated conditions within and surrounding the client that influence performance” (AOTA, 2008, p. 645). Activity demands, “refer to the specific features of an activity that influence the type and amount of effort required to perform the activity” (AOTA, 2008, p. 638). In relationship to the PCGP, this paper will focus on health management and maintenance.

This project addresses health management and maintenance, which supports health through “physical fitness” and “decreasing health risk behaviors” (AOTA, 2008, p. 631). The purpose of the website is to encourage PCGP members to be aware of the physical benefits and injury prevention when gardening through the use of proper body mechanics and the use of adaptive tools. One component of the framework to consider for management and maintenance of PCGP members is performance skills; performance skills consist of motor and praxis skills (AOTA, 2008). Motor skills are “actions or behaviors a client uses to move and physically interact with tasks, objects, contexts, and environments,” and praxis skills are “skilled purposeful

movements” (Fisher, 2006, p. 640 as cited by AOTA; Heilman & Rothi, 1993, p. 640 as cited by AOTA). Performance skills is applicable to this project as gardening requires “bending” to reach for a garden tool or plant, “coordinating body movements” when digging in soil or harvesting, and “maintaining balance while walking on uneven” soil (AOTA, 2008). Therefore, a website provided instructions on the use of proper body mechanics to prevent bodily injury. It described adaptive tools to use to facilitate bodily movement while gardening, and described the physical benefits of community gardening. Through this website, users of the Proctor community garden will be well informed of the risks as well as the physical health benefits when gardening to ensure successful occupational performance and prevention of injury.

Special Circumstances or Considerations for the Project

In creating this project, it was important to consider the use of simple words in order to describe anatomical and health related terms to PCGP members. This made certain that members with little understanding of anatomy, medical syndromes, medical symptoms, and medical terminology could easily comprehend the meaning of medical terms.

Limitations

One of the limitations of this project was not using completely comparable pre/post test questions. For example, question two of the posttest asks for two reasons why a gardener should use proper body mechanics, whereas question two of the pretest does not ask for two answers about the importance of using proper body mechanics. Therefore, the greater level of difficulty in posttest question two compared to pretest question two may have ultimately affected the test scores. This may have also been a major factor of why the posttest scores were low in questions six and seven, as these questions asked for more specific answers to the in-service which may have made the test more difficult. Question three of the posttest did not have a comparable

pretest question to examine whether or not PCGP members had increased their knowledge of proper body mechanics. Another limitation was that question seven of the pretest was only answered by six of the eight PCGP members. This was due to the fact that the pretest was e-mailed, a second time, with an added question (question seven) a day before the in-service to the PCGP members. Because two of the eight members did not answer question seven of the pretest, the results of this question may not be accurate. One solution to correcting limitations in this project would be to administer the pre/post tests in a mock trial in-service to friends, classmates, or family, and use their results and feedback to gauge the level difficulty of each question. Then match comparable pre/post test questions in order to structure a fair test. Another limitation to correct would be to make sure needed pretest questions were created in a timely manner.

Future Steps/Sustainability

In order for this project to be sustainable for the next 2 years, the student will manage the website by updating its contents. During those 2 years, the student will keep in close contact with the Metro Parks agency, in order to potentially pass on the project to this agency.

Meaningful Recommendations for Future Projects with this Agency

Make sure to know the availability of certain individuals that work within this agency, so that you are able to obtain the information you need from them in a timely manner. Also, keep in close contact with them, so that you are able to collaborate with the agency and meet the deadlines of your project. Always be respectful and kind to all staff of this agency. This will make for a comfortable and speedy process of completing your project.

Appendix

Pretest:

1. Describe two examples of using proper body mechanics
2. What is the importance of using proper body mechanics?
3. What is one physical benefit of gardening that is important to you and why?
4. Give examples of three adaptive tools you can use when gardening.
5. List two physical benefits of gardening.
6. To the best of your knowledge, describe the four natural curves of the spine.
7. List one musculoskeletal benefit of gardening.

Posttest:

1. Give one example of using proper body mechanics when using a long handled hoe or rake.
2. Give two reasons why a gardener should use proper body mechanics.
3. Identify three principles of proper body mechanics you could use while gardening.
4. List two adaptive gardening tools that will reduce strain on your back.
5. Why is it important to maintain the cervical and lumbar curves of the spine when gardening?
6. List two physical benefits you learned from the in-service.
7. List one musculoskeletal benefit of gardening that you learned from the in-service and give one reason why it is important to you?

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