Abstract

**Background:** COPD remains the third leading cause of death, which supports the crucial need for increases in prevention and early intervention efforts. Respiratory Therapists (RTs) play a pertinent role in COPD prevention and management, however, anticipated role expansions will impact the education and expected competencies of future therapists. Although service-learning has been found to have positive educational impact on students and the community in related health fields, there is limited research regarding service-learning in RT. **Method:** The purpose of this study was to explore the educational needs of the Hilltop community and describe the impact of a needs-specific pulmonary service-learning experience on community participants. Furthermore, this study aimed to describe the impact of service-learning on students studying respiratory therapy. Based on a needs assessment, four second-year RT students designed and implemented a service-learning event at two Hilltop dining centers. Twenty-two first-year RT students facilitated the event. All students completed pre/post surveys and post reflections. Community participants completed evaluations. **Results:** All community participants stated they enjoyed the event and would recommend it to others. A total of 73.6% of participants stated they would make a change because of what they learned. As a group, the RT students had increases on all pre to post mean scores and paired t-tests revealed statistically significant (p≤.05) individual changes on 12 of the 19 items, including those regarding civic engagement, leadership, education and literacy, and poverty. Inductive
analysis revealed four emerging themes from student reflections. Themes identified were: cultural competence, health communication, professional skill development, and value to RT education. All students recommend the continued use of service-learning in RT curriculum. **Conclusions:** There is a strong need in the Hilltop community for pulmonary health education. The positive impact of service-learning on the personal and professional growth of both first and second-year RT students makes it exceptionally valuable to RT education and future role expansion. Furthermore, feedback from community participants suggests it may be a useful tool for patient pulmonary education and COPD prevention and early intervention efforts. **Key Words:** service-learning, respiratory therapy education
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Publications


Fields of Study

Major Field: School of Health and Rehabilitation Sciences
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Chapter 1: Introduction

Chronic Obstructive Pulmonary Disease (COPD), which includes chronic bronchitis and emphysema, is a debilitating lung disease that causes patients to experience “cough, mucus production, wheezing, and breathlessness” (Akinbami & Liu, 2011). According to the Centers for Disease Control (CDC), COPD became the third leading cause of death in the United States in 2008 (Heron, 2012) and preliminary data for 2011 indicate its status has remained unchanged (Hoyert & Xu, 2012). The American Lung Association (2012) recently reported that, in addition to the 12 million already diagnosed, 12 million more Americans currently live with COPD, but are unaware. Of all those with COPD, the incidence is highest among those who are over 55 years of age and those who live in poverty (Akinbami & Liu, 2011). Although there is no known cure for COPD (Akinbami & Liu, 2011), it “can be prevented and is treatable” (American Lung Association, 2012).

Due to its high prevalence and mortality rates, educating the community about COPD is crucial. A national survey of 573 patients with COPD and 203 physicians reported that “76% of patients and 69% of doctors agree there is “strong need” for better patient education about their condition and treatment” (Schulman, Ronca, & Bucuvalas, Inc, 2000, p. 18). Multiple studies have indicated that educational interventions can positively impact those with COPD (Labrecque et al., 2011; Mousing & Lomborg, 2012; Tan et al., 2012). For example, Labrecque et al. (2011) reported that COPD education resulted in improved quality of life, decreased hospitalizations, and increased overall
knowledge of the disease. Although there is an abundance of evidence supporting COPD educational interventions, the educators involved and strategies used, continue to vary.

Respiratory therapists (RTs) play an active role in the diagnosis, treatment, and management of COPD. As the American Association for Respiratory Care (AARC) expressed in their Position Statement, in addition to their clinical responsibilities, respiratory therapists are expected “to take a leadership role in pulmonary disease teaching, smoking cessation programs, second-hand smoke awareness, pulmonary screening for the public” and other aspects of community outreach (AARC, 2011). Anticipated expansions in “Disease Management, Health Coaching, Case Management, Clinical Consulting, Patient Education, COPD Education and Asthma Education” will have a profound effect on the education of future therapists (American Association for Respiratory Care, 2011). Projections suggest that in 2015 and beyond, there will be even higher expectations for graduating therapists to excel in these advanced level competencies (Barnes, Gale, Kacmarek, & Kageler, 2010). Therefore, educational programs need to expand their training in order to assure their graduates’ professional success (Barnes et al., 2011).

There is a clear need for improvements in the education of both COPD patients and respiratory therapy students. There are many possible methods and strategies to meet this need, such as service-learning. Service-learning is “a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities” (National Service-Learning Clearinghouse, 2012). It is often used to combine patient, community, and student education. Current literature describes positive outcomes for students and
community participants following service-learning experiences and, therefore, supports its use as an educational method (Fusner & Staib, 2004; Krout et al., 2010; Reising et al., 2008; Reising, Allen, & Hall, 2006). Although there is an abundance of service-learning literature in other health fields, there are limited articles in respiratory therapy. Other than one published abstract, no published research was found concerning the effects of service-learning on students, patients, and/or the community with regard to any aspect of respiratory therapy education.

**Problem Statement**

Considering the documented positive effects of COPD education, the problem is that, within the field of respiratory therapy, it is currently unknown how respiratory therapy students impact the community when participating in a pulmonary service-learning experience. It is also unknown how a pulmonary service-learning experience impacts participating respiratory therapy students.

**Purpose & Research Questions**

The purpose of this study was to explore the educational needs of the Hilltop community and describe the impact of a needs-specific pulmonary service-learning experience on community participants. Furthermore, this study aimed to describe the impact of service-learning on students studying respiratory therapy. The following research questions were addressed in this study:

1. What are the educational needs of the community with respect to their breathing?
2. What are the community members' perceived benefits of pulmonary education, when presented through a service-learning experience?

3. What impact does service-learning have on both junior and senior level students enrolled in a baccalaureate Respiratory Therapy program with regard to the development of:
   a. Personal and professional attributes
   b. Leadership and problem solving competencies

Limitations of the Study

There were multiple limitations related to this study. The students involved in the study were enrolled in The Ohio State University’s Respiratory Therapy Program and were not randomly selected. Also, community participation was completely voluntary. These factors limited the generalizability of the findings to participating individuals only. Therefore, results may not have been representative of the target population. The study was also limited by the time availability of the students and community site. This affected the amount of time available for data collection. In addition, the allotted amount of time between data collection points may have impacted the findings of this study.

Basic Assumptions

This study was conducted based on the assumption that the Hilltop community, a diverse and socioeconomically challenged area, had a need for COPD education. This assumption was based on reports that the incidence of COPD is highest in those who live in poverty (Akinbami & Liu, 2011). It was also based on reports that areas of low
socioeconomic status are associated with increased tobacco use (U.S. Department of Health and Human Services, 2008). Another major assumption was that all participants would answer honestly and truthfully on all surveys, questionnaires and/or interviews. The integrity of the findings was heavily based on this assumption.

**Significance of the Study**

This study was a necessary contribution to the limited literature on service-learning in the field of respiratory therapy. The study offered RT educators insight into a teaching method that may help meet the increasingly high expectations set for graduating therapists due to anticipated role expansion. As reported by the AARC (2011), expanded roles are anticipated in both disease management and patient education. Service-learning may contribute to the personal and professional growth of RT students, thereby allowing them to step into these roles with experience and the necessary competencies.

This study also contributed to COPD literature by exploring an educational method which may be useful in the management of COPD and further expand the scope of disease prevention and management. Based on its success in other health fields, service-learning may also be a helpful strategy for improving disease knowledge and initiating behavior change within the community with regards to COPD. By doing so, service-learning may aid in the national campaign to increase COPD awareness and decrease its incidence.
Chapter 2: Review of Literature

This review consists of current literature regarding Chronic Obstructive Pulmonary Disease (COPD) patient education, as well as both student and community outcomes related to the educational method termed service-learning. Pubmed, CINAHL, and ERIC were used in this search of current literature. The following key words were used for this literature review: [Service AND Learning], [Service Learning], [COPD Education], [Service Learning AND Patient Education], [Effects of Service Learning], and [COPD AND Service Learning].

COPD and Patient Education

As the third leading cause of death in the United States (Hoyert & Xu, 2012), COPD continues to be a major health concern and has, therefore, been subject to research in a variety of areas. Not only have the disease's physical effects been studied, the impacts on an individual’s quality of life have also been explored. A study done by Nishimura et al. (2009) examined 156 patients with COPD over a period of six months to determine if the presence of acute exacerbation caused a more rapid decline in health status than in patients who did not experience acute exacerbation. Acute exacerbations of COPD occurred at least once during the six month period in forty-eight of the 156 patients (Nishimura et al., 2009). Following pre- and post-study health status questionnaires of all patients, the researcher found the patients who experienced at least one acute exacerbation during the six-month time period had a statistically
significant decrease in health status with relation to symptoms, fatigue, and mastery; whereas the patients with no acute exacerbations did not. Patients with at least two exacerbations in the six-month time period showed additional decreases in health status with regard to activity, impacts, and emotion. The researchers concluded that "it is therefore necessary to prevent recurrent exacerbations in order to minimize deteriorations in health status" (Nishimura et al., 2009).

Methods of prevention have also been explored through research. Multiple studies have focused on how patient education effects exacerbations, hospital admissions and quality of life. One study, by Labrecque et al. (2011), assessed the effectiveness of a COPD self-management education program on quality of life and hospitalizations due to exacerbation. The treatment group (57 patients) received education through a four-week self-management program, while the control group (45 patients) received regular care. All patients were evaluated at day one, three months, and one year after the program using the St George’s Respiratory Questionnaire (SGRQ), COPD Knowledge Questionnaire, and number of recorded COPD exacerbations. The researchers found the treatment group had significant improvements in health-related quality of life at both three and 12 months, while the control group had decreases in their quality of life at each time interval. Also, while the control group showed no significant change in number of hospitalizations for COPD, the treatment group had significantly fewer hospitalizations one year after the program compared to the previous year. The treatment group also scored significantly higher on the COPD Knowledge Questionnaire than the control group at both three and 12 months.
Another study described the effects of an eight-week group education program on patients’ ability to perform “self-care” in relation to their COPD (Mousing & Lomborg, 2012). Self-care was defined by the researchers “as the patients' own resources and ability to live a healthy life in agreement with their own preferences and wishes” (Mousing & Lomborg, 2012, p. 20). The researchers interviewed the patients three months after the intervention, "which included physical training and educational elements" (Mousing & Lomborg, 2012, p. 20). Results of the interviews illustrated that almost all the patients felt their knowledge about their disease had increased, felt a sense of community in meeting others with COPD, and felt their daily lives had improved after completing the program. This supports the notion that COPD community education can be beneficial to community participants.

A meta-analysis on the impact of COPD education programs yielded similar results. The analysis included 12 studies which were conducted in multiple countries (Tan et al., 2012). Nine studies used the SGRQ to explore effects on quality of life. All nine reported that scores were either equal or improved for the intervention group when compared to the scores of the control group. Three of the four studies that explored ED visits reported that visits were significantly lower following a COPD education program. The four studies that reported hospital admissions related to COPD showed a significant decrease in admission rates in patients who participated in COPD education programs compared to those who did not participate. Also, the results of the four studies that explored knowledge testing reported that COPD education programs improved disease specific knowledge of all participating patients. The analysis concluded that, “the
evidence indicates that education programs are potentially useful interventions for COPD patients” (Tan et al., 2012, p.15).

**Service-learning Theory**

Learning through experience has been a part of educational theory since Dewey introduced the idea that people learn by doing (Dewey, 1938). This type of learning has been viewed as a cycle which includes the process of reflection (Kolb, 1984). Some theorists feel that learning from an experience cannot take place without critically reflecting upon that experience (Boud, Cohen, & Walker, 1993). These theories continue to exist today through the notion of ”service-learning”. As defined by the National Service-Learning Clearinghouse (2012), service-learning is “a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities”.

Over the years, service-learning has increased in popularity among students in higher education, faculty, and academic institutions (Elyer & Giles, 1999). However, to ensure that each service-learning experience is most effective for all who are involved, it is suggested that service-learning practice should encompass four essential components (Geleta & Gilliam, 2003). These components, or phases, which are illustrated in Figure 1, include Preparation, Action, Evaluation, and Reflection (Geleta & Gilliam, 2003). The Preparation phase, allows students to identify the needs of the community, learn course content that will enable them to serve those needs, and reflect upon how community needs will be met (Geleta & Gilliam, 2003). After adequate preparation, the Action phase is initiated during which decisions regarding the type of service and community
partnership are made, the service experience is completed and students have time to reflect upon the experience (Geleta & Gilliam, 2003). The evaluation phase then allows students and faculty to further reflect on the service-learning experience as well as the associated impacts on both students and the community, report the outcomes of the experience, and share the results with the community (Geleta & Gilliam, 2003). As Figure 1 illustrates, reflection is central to service-learning and should be continued through each phases of a service-learning experience (Geleta & Gilliam, 2003).

**Figure 1. Service-learning Components**

![Service-learning Components Diagram]

Service-learning Outcomes

Patient education is clearly a crucial component in COPD management. Health care providers and health educators continue to use a variety of methods and techniques to provide this critical education to patients and communities, including service-learning. Service-learning is often used to combine patient, community, and student education. Although there is an abundance of service-learning literature in other health fields, there are limited articles in the respiratory therapy literature. In fact, the only study found during this search was a published abstract by Hillsborough Community College. The College’s respiratory therapy program participated in a service-learning activity in which they provided education about asthma to employees and parents at a local daycare (Martinasek, 2006). The researcher concluded that, through the service-learning experience, students developed a sense of civic engagement (Martinasek, 2006). The impact on the community was not directly studied. No other published research was found concerning the effects of service-learning on students, patients, and/or the community with regard to COPD education or any other aspect of respiratory therapy education.

Research on service-learning has been conducted in many other health fields including nursing, dentistry, physical therapy, and occupational therapy. However, a large portion of this literature described only student outcomes associated with service-learning. One study done by Gazsi and Oriel (2010), explored the impact of a service-learning experience on physical therapy students. Students were asked to assess Spanish-speaking adults for their risk of falling. Following the experience, students completed a reflection assignment, which revealed a perceived increase in cultural sensitivity and
awareness. The students also felt they learned about the need for communication and were more motivated to improve their skills after participating in the service-learning activity.

Another study, which reported only student outcomes, involved nursing students who participated in community assessment and the development of educational programs (Amerson, 2010). The students completed pre- and post- tests using the Transcultural Self-Efficacy Tool (TSET), which was used to assess their “self-perceived cultural competence” (Amerson, 2010, p. 18). The results of the study showed a significant rise in overall test scores as well as in all sub-categories (cognitive, practical, and affective) following the service-learning experience. Through these results, the researcher concluded service-learning can effectively increase cultural competence in nursing students.

Also from the nursing literature, service-learning has been studied to determine its impact on leadership and social justice (Groh, Stallwood, & Daniels, 2011). Over a six year time period, a total of 306 nursing students experienced service-learning and completed a pre- and post- Service-Learning Self-Evaluation Tool (SLSET) (Groh et al., 2011). The tool consisted of ten questions on leadership and seven questions on social justice. Following the service-learning experiences, there were significant increases in the scores for all of the test questions except for one. This question dealt with healing and it received lower ratings on the post-test than on the pre-test. The researchers concluded that “service-learning is an important and valued component of nursing education” (Groh et al., 2011, p. 405).
A study in the field of dentistry assessed the impact of service-learning on students, as well as the participating community sites after students provided dental hygiene to their patients with special needs (Keselyak, Simmer-Beck, Bray, & Gadbury-Amyot, 2006). After participating in the experience, students completed reflection journals and course evaluations, while community site coordinators were interviewed over the phone about their experiences (Keselyak et al., 2006). From the student reflection responses, the researchers concluded the experience helped students develop awareness, professionalism, and higher order thinking. The phone interviews with community site coordinators revealed they were happy with the experience and many of them wished to continue the experiences in the future.

A number of articles have, to some degree, studied the impact of service-learning on the community in addition to studying student outcomes. A study completed with nursing students and senior citizens was conducted during a service-learning experience in which students took blood pressure, interviewed, and educated senior citizens on safety in the home, as well as nutrition (Fusner & Staib, 2004). To evaluate the activities, the researchers had students complete a survey and journal entries and had faculty interview the senior citizens regarding their experience. Results of the survey and journal entries indicated the majority of students felt it was a positive experience and many felt their perception of senior citizens had changed for the better. The results of the senior citizen interviews indicated the participants viewed the experience as a positive one and “enjoyed talking with the students” (Fusner & Staib, 2004, p. 44).

Another study that was based on the involvement of the elderly population was conducted by Krout et al. (2010). It incorporated several service-learning experiences in
the fields of “gerontology, psychology, occupational therapy, and health promotion and physical education” (Krout et al., 2010, p. 59). Pre/post attitude questionnaires were given to the students and satisfaction surveys were completed by both students and participants. Results revealed that both students and elders were very satisfied with the experiences. Ninety-six percent of the students felt the service-learning experience “increased their understanding of and ability to work and communicate with elders” and “almost 9 in 10 said that they had more positive attitudes towards elders” following the experience (Krout et al., 2010, p. 67). With regard to the elders who participated in the study, 96% conveyed it was a personally valuable experience.

Further research has explored student and community outcomes utilizing pre- and post- knowledge tests for community participants and on-line satisfaction surveys for the participating nursing students (Reising et al., 2008). Prior to student-led educational sessions, participants were asked to take a knowledge test regarding either heart disease or diabetes. The post-test data revealed statistically significant increases in knowledge and reported that as a result of the service-learning experience, 62% intended to make a health behavior change. The student survey indicated that students were satisfied with the experience and felt it had helped them build a sense of “professional and civic responsibility” (Reising et al., 2008, p. 13).

Further support of service-learning’s impact on professional development was seen in a two-part study in which both student (part 1) and community (part 2) outcomes were measured following a nursing service-learning experience (Reising, Allen, & Hall, 2005). After participating in blood pressure screenings and health counseling with the university community, students completed questionnaires and a reflection assignment
(Reising et al., 2005). The results illustrated that students felt the experience allowed them to develop their clinical skills, as well as professional and civic responsibility. Overall, the students enjoyed the experience and expressed the importance of giving back to their community. In part two of the study, the researchers looked at community outcomes by surveying participants about their health behaviors weeks after their service-learning experience. The data revealed that following their screening and counseling session, “clients initiated a variety of actions, including diet change, weight loss, exercise, and scheduling an appointment with their health care practitioner” (Reising et al., 2005, p. 517). In addition, 20 of the 51 participants who attended counseling had physiological responses such as lower blood pressure.

**Summary**

COPD is the third leading cause of death in the United States (Hoyert & Xu, 2012) and has continued to be a major health concern. Acute exacerbations can lead to a more rapid decline in health status in COPD patients and should, therefore, be prevented (Nishimura et al., 2009). One method of prevention can be patient education. Educational interventions regarding COPD have been found to improve quality of life, decreased hospitalizations, and increase overall knowledge of the disease (Labrecque et al., 2011). Health care providers continue to use a variety of methods and techniques to provide education to patients, communities, and students, including the educational strategy termed ‘service-learning’.

Service-learning has been found to be a positive experience for both students and the community. Multiple studies have illustrated that service-learning can help develop
cultural sensitivity and leadership skills in students and increased knowledge and health behavior change in community participants (Gazsi & Oriel, 2010; Groh et al., 2011; Reising et al., 2008; Reising et al., 2005). Although service-learning has been shown to be effective in many health fields, there is extremely limited research regarding its use in the field of respiratory therapy. Other than one abstract, no other published research was found concerning the effects of service-learning on students, patients, and/or the community with regard to COPD education or any other aspect of respiratory therapy education.
Chapter 3: Methodology

Problem Statement

Considering the documented positive effects of COPD education, the problem is that, within the field of respiratory therapy, it is currently unknown how respiratory therapy students impact the community when participating in a pulmonary service-learning experience. It is also unknown how a pulmonary service-learning experience impacts participating respiratory therapy students.

Purpose of the Study

The purpose of this study was to explore the educational needs of the Hilltop community and describe the impact of a needs-specific pulmonary service-learning experience on community participants. Furthermore, this study aimed to describe the impact of service-learning on students studying respiratory therapy.

Research Questions

The following research questions were addressed in this study:

1. What are the educational needs of the community with respect to their breathing?

2. What are the community members' perceived benefits of pulmonary education, when presented through a service-learning experience?
3. What impact does service-learning have on both junior and senior level students enrolled in a baccalaureate Respiratory Therapy program with regard to the development of:

   a. Personal and professional attributes
   b. Leadership and problem solving competencies

Research Design

This was a descriptive study that utilized a mixed methods approach to execute the purpose of the study and answer the research questions. This study was approved by the Institutional Review Board (Appendix M). The study used a combination of pre- and post- surveys and reflection assignments to assess the impact on students. For community assessment and perceived benefits, this study used a COPD screener, as well as a post-experience survey. All obtained information was anonymous for both students and community participants.

Population and Sampling

The studied population consisted of both Hilltop community members and undergraduate respiratory therapy students. Community members from the Hilltop area were invited to participate in the pulmonary service-learning experience through local dining centers. The Hilltop area was chosen for this study because of its diverse and socioeconomically challenged population. In addition, the RT department at The Ohio State University has an established relationship with a community partner in the area. At
the time of the study, students who were enrolled in their junior or senior year of the respiratory therapy program at The Ohio State University were asked to participate in this study. Community participation and senior RT student involvement was voluntary, while junior RT student participation was a requirement as part of the RT 4500 course.

Instrumentation

To assess the needs of the community with respect to their breathing, a Community Needs Assessment Questionnaire was used (Appendix A). The questionnaire allowed the community members to identify their personal educational needs regarding their breathing. Instrument face validity was established by a panel of experts prior to utilization.

To assess community participants’ risk for COPD, The COPD Population Screener was used (Appendix B). This instrument has been found to be both valid and reliable with a test-retest correlation of 0.91 (Martinez et al., 2008) and was recommended by the COPD Foundation as an effective tool for risk assessment (www.copdfoundation.org). As determined by the original screener, a high risk for COPD was considered for those whose scores are 5-10, while those whose scores range 0-4 were considered to be at a low risk for COPD.

To assess the impact of service-learning on community participants, a post-experience survey was administered to all who participated (Appendix C). The instrument allowed participants to comment on their experience and share their perceived impact. The survey was reviewed by a panel of experts and field-tested with community members prior to utilization.
To assess the impact of service-learning on student participants, a pre/post survey was administered. This instrument was a revised version of the "Great Cities Great Service College Student Survey" (Appendix D). The survey was used by the Great Cities - Great Service Consortium, a program that reaches 14 Ohio campuses and involves students and communities in volunteer and service-learning experiences. During a multi-year study the program used this pre/post survey instrument to explore students' "appreciation of diversity, civic competencies, problem-solving skills, and cross-cultural competencies" (Great Cities - Great Service Consortium, 2009, p. 1). The instrument was reported to be reliable and question congruent compatibility was examined by the Consortium (value not reported in the original source) (Great Cities - Great Service Consortium, 2009). Permission for use of the survey was received by the leader of the Great Cities- Great Service project (Appendix H). For the purposes of this study, the College Student Survey (CSS) was shortened and was used to measure civic engagement, problem-solving skills, leadership skills, and social justice. The survey used a 5-point Likert Scale for each of the 23 questions.

As recommended by Eyler and Giles (1999), reflection is an essential component of the service-learning experience. Therefore, in addition to the CSS, students were asked to complete a reflection assignment. As part of their RT 4500 course (Appendix E), junior respiratory therapy students completed a 2-3 page written reflection regarding their experience at the pulmonary service-learning event. Senior respiratory therapy students also completed a reflection assignment (Appendix F). However, their assignment differed slightly based on past service-learning experiences and their type of
involvement in the service-learning event. Both reflection assignments were reviewed by a panel of experts prior to utilization to assure content validity.

Data Collection Procedures

Prior to the development of the pulmonary service-learning event, the involved senior and junior respiratory therapy students at The Ohio State University completed a pre-CSS. In order to assure the development of a needs-specific educational event, senior respiratory therapy students then obtained completed Community Needs Assessment Questionnaires from two dining centers in the Hilltop area. Based on questionnaire results, these senior students developed the educational materials that were used during the service-learning event, which also took place at the dining centers. The questionnaire results also determined the type of participation incentive for the event.

At the pulmonary service-learning event, both the junior and senior students interacted with community participants by assisting them with paperwork, educating them on lung health, and answering any questions they had. Community participants were asked to complete a pulmonary health screening form (Appendix G) and the COPD Population Screener upon arrival to the event. The community participants were then educated by the respiratory therapy students. This education was in the form of poster presentations and hands-on participation. After completing the education, community participants were asked to complete the Post-Experience Survey. After all materials had been collected, they received their participation incentive. Immediately following the event, both junior and senior students were asked to complete the post-CSS and, in the weeks following the event, they completed the reflection assignments.
Data Analysis Procedures

The statistical data that was obtained from the COPD Population Screener and the CAT was scored in accordance with each instrument's standards and descriptive statistics were utilized as appropriate. For the CSS, pre- and post- tests were administered, SPSS was used for analysis, and paired t-tests were performed on all items to determine statistically significant changes in individuals' pre and post scores for each question. The alpha level was set a priori at $p \leq .05$. Qualitative data received from the post experience survey and the student reflection assignments were recorded and evaluated for related themes.

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Instrumentation</th>
<th>Statistical Test</th>
</tr>
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<tbody>
<tr>
<td>1. What are the educational needs of the community with respect to COPD?</td>
<td>-COPD Needs Assessment Questionnaire</td>
<td>-Descriptive -Qualitative</td>
</tr>
<tr>
<td>2. What are the community's perceived benefits of COPD education, when presented through a service-learning experience?</td>
<td>-Post-experience Survey</td>
<td>-Qualitative</td>
</tr>
<tr>
<td>3. What impact does service-learning have on both junior and senior level students enrolled in a baccalaureate Respiratory Therapy program with regard to the development of: a. Personal attributes b. Professional development</td>
<td>-Pre/Post CSS -Junior service-learning reflection -Senior service-learning reflection</td>
<td>-t-test -Qualitative -Qualitative</td>
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Research Question 1: What are the educational needs of the community with respect to their breathing?

In order to design a needs-specific pulmonary education event for the Hilltop Community, the participating senior RT students collected needs assessment questionnaires (Appendix A) from a total of 40 people at two dining centers in the Hilltop area. Of the 40 participants, 12 (30%) had never smoked, 15 (37.5%) were former smokers, and 13 (32.5%) identified as current smokers. Only nine of the 40 had been diagnosed with COPD and of those nine, five felt their COPD was not well controlled. When participants were asked what they wanted to learn more about related to their breathing, the top rated educational topics included how the lungs work, weather and your lungs, what to do when short of breath, and what is COPD (Table 1).

<table>
<thead>
<tr>
<th>Educational Topic</th>
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<tbody>
<tr>
<td>How the Lungs Work</td>
<td>25</td>
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<tr>
<td>Weather and Your Lungs</td>
<td>24</td>
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<tr>
<td>What to do When Short of Breath</td>
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<td>What is COPD</td>
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<td>Second-hand Smoke</td>
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<td>Doing Daily Activities</td>
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<td>Quit Smoking</td>
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<td>Medications</td>
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<td>Using Oxygen</td>
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<tr>
<td>Exercising with COPD</td>
<td>10</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 1. Participants’ Educational Topic Selections (n=40)
Of the 13 current smokers, 10 (76.9%) indicated they wanted to learn more about quitting smoking. Of the nine diagnosed with COPD, six (66.7%) wanted to learn what COPD is and five wanted to learn what to do when short of breath. Also, 18 (64.3%) of the 28 current or former smokers wanted to learn what COPD is. A notable 76.9% of current smokers and 53% of former smokers wanted to learn what to do when short of breath. Three participants indicated they wanted to learn about a topic not on the list of choices. These topics were dialysis, airway clearance, and effects of smoking with HIV medications. Participants were asked what would motivate them to come back for the event and were given the following options: a chance to win a kindle, gas gift card, restaurant gift card, nicotine replacement therapy, or other. With a total of 15 votes, the restaurant gift card was the top rated incentive for participation.

**Research Question 2: What are the community members' perceived benefits of pulmonary education, when presented through a service-learning experience?**

Based on the results of the community needs assessment, the senior RT students created a service-learning event that covered topics regarding COPD management, general lung health, and smoking. The event was held at the same two Hilltop dining centers where the needs assessment was performed. A Bob Evan’s gift card in the amount of $15.00 was used as the incentive to participate and was given to the first 20 participants at each event site.

A total of 53 community members, 22 males and 31 females, participated in the event. Participants’ ages ranged from 26 to 90, with an average age of 69. The majority
of participants were Caucasian (62.3%), while 30.2% were African American, and 5.7% were Asian. One participant chose not to report their age and another chose not to provide their race. With regard to highest completed education level, only six participants (11.3%) had obtained a four-year degree, 4 (7.5%) had completed a two-year degree, 9 (17%) had some college education, 17 (32.1%) had obtained a high school diploma or GED, 13 (24.5%) had only completed some of their high school education, and the remaining 4 (7.5%) indicated another form of education, such as partial Master's degree, special education, and technical school education.

As Tables 2-5 below indicate, over half of the participants indicated they were current or former smokers. A notable 87.5% of the current smokers had thought about quitting. A total of 13.2% of participants admitted to having COPD, which included only 2 of the 8 current smokers and 4 of the 21 former smokers. However, the COPD Population screener determined that 5 of the current smokers and 12 of the former smokers were at high risk for COPD.

<table>
<thead>
<tr>
<th>Smoking Status</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never Smoked</td>
<td>24</td>
<td>45.3%</td>
</tr>
<tr>
<td>Former Smoker</td>
<td>21</td>
<td>39.6%</td>
</tr>
<tr>
<td>Current Smoker</td>
<td>8</td>
<td>15.1%</td>
</tr>
</tbody>
</table>

Table 2. Participant Smoking Status (n=53)

<table>
<thead>
<tr>
<th>Pulmonary Disease</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Bronchitis</td>
<td>8</td>
<td>15.1%</td>
</tr>
<tr>
<td>Emphysema</td>
<td>4</td>
<td>7.5%</td>
</tr>
<tr>
<td>COPD</td>
<td>7</td>
<td>13.2%</td>
</tr>
</tbody>
</table>

Table 3. Participant Pulmonary Disease Status (n=53)
<table>
<thead>
<tr>
<th>Smoking Status</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Smoker</td>
<td>2</td>
<td>28.6%</td>
</tr>
<tr>
<td>Former Smoker</td>
<td>4</td>
<td>57.1%</td>
</tr>
<tr>
<td>Non-Smoker</td>
<td>1</td>
<td>14.3%</td>
</tr>
</tbody>
</table>

Table 4. Smoking Status of Participants Diagnosed with COPD (n=7)

<table>
<thead>
<tr>
<th></th>
<th>High Risk</th>
<th>Low Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Smoker</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Former Smoker</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Non-Smoker</td>
<td>2</td>
<td>22</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>19</strong></td>
<td><strong>33</strong></td>
</tr>
</tbody>
</table>

Table 5. COPD Population Screener (*n=52)

(*one participant’s COPD Population Screener was excluded because he did not meet the screener’s 35-year old age requirement. Note: this participant identified as a current smoker)

Results of the participant post-experience survey (Appendix C) were very positive overall. All but one of the 53 participants felt they learned what they wanted to learn at the pulmonary event. All (100%) of participants enjoyed their experience with the RT students and would recommend the event to others. The participant comments regarding their interactions with the students were all positive. They commented on their high level of knowledge, their great attitudes, and how nice it was to interact with young adults.

A total of 39 (73.6%) participants stated they would do something different because of what they learned at the event. Six participants said they would talk to others about quitting smoking and an additional six said they wanted to try to quit smoking themselves. Five participants said they were going to improve their cough etiquette and six said they wanted to teach others about what they had learned. Other answers included using a spacer with medications, talking to their doctor about COPD, and staying away from second-hand smoke. When asked about the most important thing they learned at the event, 18 participants felt that learning about the dangers of smoking and importance of
refraining from smoking was most important. Others felt topics such as second-hand smoke, how the lungs work, cough technique, and how to quit smoking were most important. Multiple participants stated they would like to see the event at more dining sites. One participant in particular stated, "Good program. Good for people that cannot afford a doctor". Another said, "Everyone is very knowledgeable. Come back next year".

**Research Question 3:** What impact does service-learning have on both junior and senior level students enrolled in a baccalaureate Respiratory Therapy program with regard to the development of:

a. Personal and professional attributes

b. Leadership and problem solving competencies

All students (n=24) completed both pre and post College Student Surveys (CSS). Tables 6 and 7 display the results of the analysis for both junior and senior RT students. As an entire group, the RT students had increases on all pre to post mean scores with statistically significant individual changes on 12 of the 19 questions, which included the following constructs: civic engagement skills, problem solving skills, leadership skills, health issues, education and literacy, as well as poverty.

Although the junior RT students' (n=20) CSS questions displayed increases from pre to post mean scores on all of the questions, individual changes from pre to post scores were statistically significant on 9 of the 19 questions. These included questions regarding civic engagement skills, leadership skills, health issues, neighborhood/local issues, education and literacy, as well as poverty. An additional three questions approached
statistical significance with p-values ranging from .055 to .069. Although 13 of the 19 senior RT students' (n=4) CSS questions revealed increases from pre to post mean scores, none of the questions revealed statistically significant individual changes. No change in mean score was found on 2 questions and a decrease from pre to post mean score was found on a total of 4 questions. However, the largest increases in scores were seen in questions regarding the following constructs: problem solving skills, leadership skills, analyzing ideas, applying principals from courses to different situations, and poverty. It is important to note the senior students had higher pre mean scores than the juniors on all but six of the questions. Higher senior post mean scores were also found, as compared to junior post mean scores, on 12 of the 19 questions.
<table>
<thead>
<tr>
<th>Construct</th>
<th>Question</th>
<th>Pre Mean</th>
<th>Post Mean</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Junior</td>
<td>Senior</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Civic Engagement Skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Championing or Campaigning for a good cause</td>
<td>3.15</td>
<td>3.50</td>
<td>.002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.10</td>
<td>4.25</td>
<td>.319</td>
</tr>
<tr>
<td></td>
<td>Planning effective service projects</td>
<td>2.95</td>
<td>3.75</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.75</td>
<td>4.00</td>
<td>.718</td>
</tr>
<tr>
<td></td>
<td>Recognizing both rights and responsibilities as citizens</td>
<td>3.80</td>
<td>3.50</td>
<td>.058</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.25</td>
<td>4.25</td>
<td>.444</td>
</tr>
<tr>
<td></td>
<td>Fostering a commitment to lifelong service</td>
<td>3.55</td>
<td>3.75</td>
<td>.104</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.95</td>
<td>4.25</td>
<td>.182</td>
</tr>
<tr>
<td></td>
<td>Responding to real community needs</td>
<td>3.30</td>
<td>3.75</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.00</td>
<td>4.50</td>
<td>.215</td>
</tr>
<tr>
<td></td>
<td>Problem - Solving Skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Solving challenging problems</td>
<td>3.55</td>
<td>3.75</td>
<td>.055</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.85</td>
<td>4.25</td>
<td>.182</td>
</tr>
<tr>
<td></td>
<td>Comparing different approaches to solving a problem</td>
<td>3.80</td>
<td>4.00</td>
<td>.186</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.95</td>
<td>4.50</td>
<td>.182</td>
</tr>
<tr>
<td></td>
<td>Leadership Skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Using leadership skills</td>
<td>3.80</td>
<td>4.00</td>
<td>.009</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.25</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communicating across cultures</td>
<td>3.60</td>
<td>3.50</td>
<td>.004</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.05</td>
<td>4.25</td>
<td>.215</td>
</tr>
<tr>
<td></td>
<td>Understanding values of people different from you</td>
<td>4.15</td>
<td>4.00</td>
<td>.104</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.35</td>
<td>4.50</td>
<td>.182</td>
</tr>
<tr>
<td></td>
<td>Working as part of a team</td>
<td>4.25</td>
<td>4.25</td>
<td>.069</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.60</td>
<td>4.25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other Academic Skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expressing ideas, opinions, and facts in writing</td>
<td>3.70</td>
<td>3.80</td>
<td>.577</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.80</td>
<td>4.25</td>
<td>.718</td>
</tr>
<tr>
<td></td>
<td>My ability to analyze ideas</td>
<td>3.95</td>
<td>4.15</td>
<td>.330</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.15</td>
<td>4.75</td>
<td>.182</td>
</tr>
<tr>
<td></td>
<td>Applying principals from courses to different situations</td>
<td>3.95</td>
<td>4.00</td>
<td>.359</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.15</td>
<td>4.50</td>
<td>.182</td>
</tr>
</tbody>
</table>

Table 6. CSS Section 1 Results (Senior n=4  Junior n=20) (1=Very low, 5=Very High)
Results of Student Reflections

All junior and senior RT students completed a reflection assignment containing guided questions regarding their experiences at the service-learning event. However, the seniors' guided questions (Appendix F) differed slightly from the juniors' (Appendix E) because of their specific responsibilities regarding the event. The senior RT students (n=4) were responsible for collecting the community needs assessment, analyzing the results to determine appropriate educational topics, designing the educational materials, and orienting the juniors to their role in the service-learning event. The seniors held a leadership role at the event and were responsible for set-up, answering the questions of both the juniors and the community participants, and solving any problems that surfaced. The junior RT students (n=20) were paired and given specific educational topics to present. At the event, the junior RT students educated all 53 participating community participants.
members on their topics using posters, interactive educational materials, and additional handouts. The researcher and a panel of experts applied inductive analysis and ultimately reached consensus on four emerging themes from their reflections.

**Cultural Competence**

*Senior Reflection*

All of the senior RT students reflected on aspects of cultural competence and the impact on their development of the educational materials. They felt they had learned the importance of considering cultural competence, and more specifically health literacy, when planning service-learning events. During the needs assessment, many of the seniors expressed how surprised they were about the low health literacy level in the Hilltop area. One student expressed, "I learned that we assume other people know way more about lung health than they actually know." Another student stated, "As RT students, we use vocabulary and phrases that people have never heard about. We have to think of ways to help them understand what we know and are trying to teach." The senior students felt the needs assessment gave them the knowledge and perspective necessary to create a meaningful event. As one student said, "It helped me to figure out how to gear information towards a certain population." Many of the students mentioned their thought process during the development of the educational materials.

"I had to be a bit creative when it came to making the posters and interactive materials because I had to find the fine line between being engaging and treating grown adults too much like children. It was also challenging to decide how in-depth my information should be, since the level of education we worked with fell on the lower end of the spectrum."
Overall, the senior students felt the service-learning experience positively impacted their own cultural competence. They expressed their desire to have a positive impact the lives of those living in the Hilltop community.

"People that live in lower-income/lower-education areas are not exposed to the same kind of information about the dangers of smoking. They don't have anyone warning them or talking to them. We have the ability to teach these people and relate the information to their lives."

_Junior Reflection_

Cultural competence was also represented heavily throughout the reflections of the junior RT students. Many of the junior students expressed how the service-learning event helped them see other cultures more clearly, particularly on the topics of education and literacy. "One thing that was a real surprise to me was the education level of the residents. It is hard for me to imagine being illiterate, but this experience opened my eyes to the reality that some people don't have the ability to read or interpret medically related things." In fact, one of the students assisting with the pre-experience questionnaires stated, "…I noticed that only two people out of all the community members actually completed the questionnaire without me reading it to them." Literacy was not the only communication barrier presented at the event. As one student describes, the service learning experience was the first time many of them had interacted professionally with those who spoke a different language.

"This was the first time I tried to educate a person about how to quit smoking when they spoke a different language." A fellow student "was helping to translate and I did the best I could to speak to the patient and allow her to simply interpret." I think that small experience is so important and we should have as many experiences with different demographics as possible."
Many of the junior students also expressed their misconceptions of lower income communities and how the service-learning experience helped to change them, especially concerning health literacy, attitudes, and race.

"The service learning assignment, however, allowed me to experience first hand differences in health literacy levels. Before the assignment I did believe that the individuals were largely responsible for their own lower health literacy level. After talking to the community however, I have found this not to entirely be the case. Many of them were willing to listen and learn. From what I witnessed at the café, the difference stems from the people of the community not able to access things such as healthcare, healthcare information, or education due to a low income."

"Before the event, I had believed that most people would be in bad health and would have a negative attitude towards their health." "However, some people had many positive comments about how they learned facts they had never knew before, especially about smoking cessation. These people also said that they would like to make changes in their lives or in others because of what they had learned."

"My perception of cultural competence was that Caucasians have a willingness to learn and aren't very wary of strangers and chances to learn new things, while African Americans tend to be a bit wary of situations involving learning and strangers. After this service-learning event, my perception has been changed. It seemed that the African Americans that were in the area were just as eager to learn as their Caucasian counterparts and were not shy about strangers coming in and teaching them about these subjects."

Multiple students expressed how the service-learning event helped mold their opinions on culture as well as how to interact with those of a different cultural background than their own.

"...I realized that your culture can be so much more than simply your nationality. Through interacting with the people at the service learning event I found that everyone has a slightly varying culture even if you are from the same general place. Because everyone has their own cultural background, it's really important to try to just treat everyone in a respectful manner..."

"I can't just approach or look at people and stereotype them...Everyone is different and has their own circumstances and deserve the opportunity to teach you about themselves; so you can in return help provide them with the best care or direction that best fits their needs and what they are accustomed to, not what you are."
Health Communication

Senior Reflection

Communicating health information in a way that would be most beneficial to the Hilltop community was mentioned in all of the seniors' reflections. Many seniors commented on their experience designing the lung health education materials. For example, one student stated, "In developing the material for the service event, I was able to learn how to create materials that were specific for the community in regards to knowledge level." Many of the seniors shared what they felt were the best ways to communicate their message to the Hilltop community. They felt "the same method of teaching will not work for everyone" and the material being conveyed must be "interactive or relatable so that they want to know about it and can learn at the same time." One student mentioned, "For this specific population, visuals and hands-on activities really worked for their educational needs."

While commenting on the entire service-learning experience, one of the senior RT students said, "…this experience has given me more tools for participating in community education with a greater understanding of what approaches are most effective." Another student felt that "events like these help me improve my ability to explain things in a way people understand.

Junior Reflection

Many of the students referred to the obstacles they encountered while communicating their pulmonary topics to the community members. As one student described, "The thing that stood out to me was that the low-income communities really
had a roadblock in overall education…This just gave us as teachers an obstacle we had to overcome in a communication aspect." Some of the junior students were very surprised by the education level of community members they met. "I realized that some of these adults lacked knowledge in healthcare terminology. It’s so easy to assume these people have the same knowledge as me just because they are older and have more experience than I do."

The junior students also reflected on what they found to be the best ways to communicate with the Hilltop community members. One student mentioned, "I had to simplify concepts that I take for common knowledge, which helped me to reach them on a level they could understand." Another student said, "the experience had us alter our presentation to the person based on their individual understanding and background to help them best comprehend the information we were teaching them." Other students found that it was "best to ask open-ended questions" or noticed that community members "learn really well by seeing demonstrations or seeing pictures. They didn't however seem to like the handouts or any reading material as a form of learning."

A couple of students compared their approach to health communication to that of the individual's doctor; specifically discussing the impact that intimidation has on communicating health related information.

"I think when their doctors tell them about their lung disease they get intimidated…so, in the end they do not ask any of the necessary questions. However, when they came to me they were asking all sorts of things….They were a lot more comfortable talking to us."

"It gave us a chance to personally interact with the population in a non-intimidating manner. Our casual dress and relaxed conversation style helped to make us more approachable. They could tell we were professionals by the way we talked, but we looked just like them, which put them at ease."
Professional Skill Development

*Senior Reflection*

The development of leadership skills was mentioned to some degree in all of the senior RT students' reflections. Two students specifically mentioned how their leadership skills improved by having to direct the juniors and make sure they were doing what they needed to do.

"As a leader, I grew in my ability to teach others how to teach without giving them word-for-word instructions. I also found myself coaxing the junior students to fully engage all people at their station, as many seemed to focus on one person and neglect the rest. This improved a lot after the first few people arrived."

Problem solving was also mentioned as a skill that was developed through the service learning experience. The seniors expressed their personal processes of determining how to most effectively communicate their topics to this specific population. Also, while at the event they were required to think on their feet and solve unexpected problems. One student felt that, "participating in the actual event forced me to do some problem solving to accommodate for our guests, some of whom were very active while others needed to sit and had hearing or visual impairments." Another student reflected on an experience at the event in which they had to overcome a language barrier.

"...I had two community members come to my table that did not speak English very well. I was supposed to be asking them questions about the event as a whole and I did not know how to verbalize the questions in a way they could understand. In the end I attempted to make their answers somewhat responses to the questions but I had a difficult time with it."

*Junior Reflection*

An overwhelming number of junior RT students felt the service-learning experience increased their confidence. One student said, "I believe this experience
increased my confidence tremendously." Another felt, "the experience forced us to step out of our comfort zones and making it through these situations is where we build confidence." One student specifically mentioned how the experience increased their confidence with regards to their personal leadership skills.

"You could tell that many of the people who came through the stations didn't really want to be there listening to the information we were trying to give, but having to push past that and try to get their attention to tell them about COPD really improved my confidence in leadership."

Some of the students discussed how apprehensive they felt when talking to others about their health issues and how the service-learning experience directly impacted their feelings. "Before this experience I was somewhat nervous talking to people about their health issues…this experience helped me with talking about health matters and giving advice..."

Many students directly related their experience to their profession and future interactions with patients in the clinical setting. "It was nice to hear the kinds of questions the residents asked. I think it has given me a better feel for what these types of patients will be concerned about if they are admitted for care." One student specifically discussed what they learned about patient communication during their service-learning experience.

"Talking with those adults at the Hilltop made me realize that a bunch of my patients do not understand a lot of what I am saying. I realize that I have to explain in a way they can understand better. Because of this trip, I have learned how to talk to the older community and my patients. Overall, this trip has definitely increased my confidence talking with patients."
Value of Service-Learning to RT Education

Senior Reflection

All of the senior RT student felt service-learning should continue to be a part of RT curriculum. One student felt service-learning allowed students to learn how to "engage patients and sympathize with them in ways that you can't learn in a classroom." Another described it as an experience "where all parties gain new knowledge." Many of the seniors expressed how service-learning not only benefits the students, but also the community. "As students, we can continue to learn the material as we teach it. It reinforces everything we learn. Also, it gives us a chance to educate the public and help them." Other students explained that, "Students benefit from talking one-on-one with people of different races and socioeconomic circumstances" while the community benefits because they "are the majority of patients we see at the hospital and educating them is a preventative measure that needs to be continued."

Some of the senior students reflected on the importance of service-learning to the RT profession. One student felt, "the skills developed during service-learning…helps create well-rounded Respiratory Therapists who can work in any setting." Another student stated, "The patient population we serve is very diverse and the level of education and health literacy varies greatly. I think that immersing students in an environment that challenges them to adapt to a different way of thinking builds much stronger, better prepared health care providers." One student specifically mentions how "it is easy to see someone in a hospital gown and separate that person from the life they lead outside hospital walls, so the chance to see people representative of a major patient population as individuals rather than patients is invaluable to the education process."
Junior Reflection

All of the junior RT students also felt service-learning should continue to be part of RT curriculum. One junior student described service-learning as "a way for us to see the world from a different perspective." Another felt service-learning should be continued in the future because "the students will get just as much out as the community." Multiple junior students compared learning through service-learning to learning in the classroom environment. One student felt, "Learning about smoking cessation in class was informative, but actually going out in the real world and talking to people about it gave me a better perspective." Another student described the experience has being "more practical and more engaging" than learning in the classroom and, through the service-learning experience, had come to the realization "that when you are told to teach others about something, this is when you become an expert on the subject."

Other junior students mentioned the direct impact service-learning has on their future as respiratory therapists. One student described the service-learning event as "an effective step in molding students into higher caliber respiratory therapists", while another student explained, "A lot of your job as a Respiratory Therapist is to educate people on their disease...and this experience did just that. I believe this type of experience should be a part of the curriculum; it was a great way to get outside of the box and really take the things we've learned to a new level."
Discussion & Conclusions

The purpose of this study was to explore the educational needs of the Hilltop community and describe the impact of a needs-specific pulmonary service-learning experience on community participants. Furthermore, this study aims to describe the impact of service-learning on students who are studying respiratory therapy. Based on data obtained from the RT students through the CSS and qualitative reflections, as well as from the community through the Needs Assessment, Pulmonary Screener, COPD Screener, and Post-experience Survey, multiple conclusions have been determined and are listed below.

1. **The findings from this study indicate there is a need within the Hilltop community for pulmonary health education. Furthermore, service-learning has a positive impact on the community and is a beneficial method of delivering pulmonary education within this community.**

   As the third leading cause of death (Hoyert & Xu, 2012), COPD continues to be a major pulmonary health concern in the United States. According to the American Lung Association (2012), in addition to the 12 million already diagnosed, 12 million more Americans currently live with COPD, but are unaware. Furthermore, approximately 75% of COPD cases are attributed to cigarette smoking (Centers for Disease Control and Prevention, 2008). This study revealed an alarmingly small number of participants who self-identified as having COPD as compared to the number of those who self-identified as current or former smokers. In addition, a large number of event participants were
identified as being at high risk for COPD and over half of the needs assessment participants were unaware of its meaning. This data coincides with current statistics regarding the prevalence and awareness of COPD. Results of this study indicate that members of the Hilltop community may be a part of the 12 million unaware of their disease. Service-learning and other “education programs are potentially useful interventions for COPD patients” (Tan et al., 2012, p.15). As seen in this study, service-learning may be used as a method to reach the 12 million undiagnosed by increasing awareness of COPD and providing resources to those at high risk; therefore encouraging and initiating early interventions.

Undiagnosed, and therefore uncontrolled, COPD increases the incidence of COPD exacerbations and studies show that increases in the number of COPD exacerbations have been associated with significant deteriorations in overall health status (Nishimura et al., 2009). Therefore, if 12 million Americans with COPD continue to go undiagnosed and untreated, their health will deteriorate over time causing a need for costly medical interventions, for which they may, or may not, be able to pay. This will ultimately place an astounding financial burden on the healthcare system in general. According to the U.S Department of Health and Human Services (2009), COPD was expected to cost a remarkable 49 billion in medical expenses in 2010. Current literature suggests that educational interventions can decrease the number of COPD associated hospitalizations, thus reducing these costs significantly (Labrecque et al., 2011). When used as a form of prevention and early intervention, health information delivered through a service-learning experience may effectively decrease the costs associated with undiagnosed, untreated, and/or uncontrolled COPD. For example, many of this study’s
participants stated they planned to make positive changes in their lives, including quitting smoking or initiating communication with their doctor, because of what they learned at the pulmonary service-learning event. Early interventions leading to these types of individual changes can have a huge impact on disease progression and future COPD associated spending.

Nearly all participants in this study who were identified as being at high risk for COPD self-identified as current or former smokers. With the incidence of COPD strongly associated with smoking tobacco, tobacco education is a necessary component of any pulmonary education event. Remarkably, "more than 70 percent of the 45 million smokers in the United States report that they want to quit" (USDHHS, 2008). This statistic coincides with the results of this study in that almost all of the current smokers had thought about quitting in the past and nearly 77% of them were interested in learning more about smoking cessation. However, a problem for many of them, especially those in low socioeconomic areas, is a lack of knowledge of, and/or access to, the resources that have proven to significantly impact successful cessation efforts, including pharmacotherapy and cessation counseling (USDHHS, 2008). Service-learning can provide the community access to knowledgeable respiratory therapy students who have been trained in tobacco cessation. Early interventions, such as tobacco education and the use of motivational interviewing techniques can help move individuals toward quitting and are the key to disease prevention or slower progression of COPD. These interventions will ultimately decrease associated medical costs and mortality rates.

Early interventions, such as those involving health promotion and disease prevention, can take place in many locations including doctors’ offices and hospitals.
However, service-learning uniquely allows this education to take place within an individual’s community. The safety, convenience, and comfort this provides participants allow them to be more open to receive health information and feel more comfortable asking questions. The community environment also allows for adequate time to be spent on individualized educational sessions without the threat of busy schedules or future appointments, which often distract health care professionals from providing such services in healthcare environments. Furthermore, the RT students in this study reflected that participants felt more at ease asking the students questions about their health.

2. The results of this study indicate that RT students at both the junior and senior level benefit from service-learning with regard to their personal and professional attributes and competencies. Therefore, service-learning can be used as a teaching and learning strategy that would expand the role of future respiratory therapists.

The impact of service-learning on participating students in this study is congruent with the results of current literature in other health fields including nursing, dentistry, physical therapy, and occupational therapy. In addition to studying the overall student impact, this study also compared the type of effect seen among those with and without previous service-learning experience. Results indicate that service-learning is beneficial to the personal and professional growth of students regardless of previous experiences, but in slightly different ways.
When experienced for the first time, service-learning can help increase an individual’s civic engagement and leadership skills, cultural competence, health communication skills, and confidence. It can also positively impact an individual’s view on health issues, neighborhood/local issues, education and literacy, as well as poverty. Those with previous service-learning experience continue to build upon that experience by improving their leadership and problem solving skills, which allows them to advance personally and professionally. In this study, those with service-learning experience had higher pre scores on almost all survey questions when compared to the novice group, indicating the long-term impact of service-learning on students. It is clear the education received through service-learning continues to be uniquely beneficial every time it is experienced. By allowing students to build upon previous experiences, service-learning can be used as an effective educational method by RT educators throughout a student’s RT education.

The personal and professional skills developed by students during service-learning are crucial attributes for current and future respiratory therapists. In addition to their clinical responsibilities, respiratory therapists are expected “to take a leadership role in pulmonary disease teaching, smoking cessation programs, second-hand smoke awareness, pulmonary screening for the public” and other aspects of community outreach (AARC, 2011). Anticipated expansions in areas such as COPD management, health coaching, and patient education will ultimately impact the education of future therapists (AARC, 2011). Projections suggest that in 2015 and beyond, there will be even higher expectations for graduating therapists to excel in these expanded competencies (Barnes, Gale, Kacmarek, & Kageler, 2010).
Educational programs need to prepare current and future RTs for successful integration of these advanced roles. One way this can be done is by rethinking how RT education is delivered. Skills such as leadership, civic engagement, problem solving, and effective communication, cannot simply be learned from a textbook. Service-learning allows learning to extend past classroom walls, giving students the opportunity to develop these skills through experiential learning in the community setting. Not only is education through service-learning imperative to the skill-set required by future therapists, current RT students welcome the change. As mentioned in their reflections, all participating students in this study enjoyed the learning experience. One student stated, "the skills developed during service-learning…helps create well-rounded Respiratory Therapists who can work in any setting", while another felt “immersing students in an environment that challenges them to adapt to a different way of thinking builds much stronger, better prepared health care providers.”

3. **The findings from this study indicate that by creating an engaging, experiential learning experience for current millennial RT students, service-learning has exceptional value in respiratory therapy education.**

Current literature describes positive outcomes for students and community participants following service-learning experiences and, therefore, supports its use as an educational method (Fusner & Staib, 2004; Krout et al., 2010; Reising et al., 2008; Reising, Allen, & Hall, 2006). RT educators should blend service-learning with the more traditional methods they are used to in order to appeal to the learning style of current RT
students. These students represent the millennial generation and, therefore, are accustomed to learning differently than past generations. Research has shown that “Millennials prefer active and engaging activities, such as simulations and group work, not learning by lecture or the teacher-centered approaches that faculty tend to favor” (Pardue & Morgan, 2008). They also have a strong focus on “volunteerism and community efforts” (Sandfort & Haworth, 2006). Service-learning allows students to work together in an engaging, active environment while providing a valuable service to the community.

The results of this study reflect current literature regarding the learning preferences of millennial students. Not only did every student feel service-learning should continue to be a part of RT curriculum, many commented on its use as an education method in their reflections. Multiple students mentioned they preferred this type of experiential learning over traditional education in the classroom. They regarded service-learning as a “more practical and more engaging” learning experience, through which they can gain more perspective than in the classroom setting. Other students commented on the value of incorporating service activities into the curriculum by saying, “it gives us a chance to educate the public and help them” and “the community benefits because they are the majority of patients we see at the hospital and educating them is a preventative measure that needs to be continued.”

Experiential learning is a powerful learning method for millennial students. However, its impact is most effectively recognized by students when reflection is incorporated into the experiences. The use of reflection in this study allowed students to realize the impact service-learning had on them personally. As Figure 1 illustrates (pg 46...
10), reflection is central to service-learning and should be continued through each phases of a service-learning experience (Geleta & Gilliam, 2003). It allows students to determine their own personal growth and development throughout the experience. For example, in this study, many of the students realized how much their leadership and communication skills developed through completing their reflection assignments. Taking the time to think about their experience and express the impact on their learning and professional growth enriches the service-learning experience significantly. RT educators who are considering the use of service-learning in their curriculum must make reflection a priority throughout the experience in order for their students to fully benefit.

Conclusions and Implications

The results of the study contribute to current literature regarding service-learning in allied health education as well as to the limited literature regarding service-learning in RT education. Although the results were positive and congruent with current literature, future research is needed regarding the long-term impact of the service-learning experience on RT students and the community. An outcomes study on the long-term health behavior change of community participants after experiencing service-learning would contribute to literature regarding the impact of service-learning on the community. Also, future studies should include larger number of RT students and look at the impact of multi-visit service-learning experiences. Meanwhile, RT educators should consider service-learning as an educational method that contributes to the personal and professional growth of RT students by reinforcing classroom material and introducing new educational subjects that are better learned outside the classroom environment.
Chapter 5: Article

Abstract

**Background:** COPD remains the third leading cause of death, which supports the crucial need for increases in prevention and early intervention efforts. Respiratory Therapists (RTs) play a pertinent role in COPD prevention and management, however, anticipated role expansions will impact the education and expected competencies of future therapists. Although service-learning has been found to have positive educational impact on students and the community in related health fields, there is limited research regarding service-learning in RT. **Method:** The purpose of this study was to determine the impact of service-learning on RT students and community participants. Based on a needs assessment, four second-year RT students designed and implemented a service-learning event at two Hilltop dining centers. Twenty-two first-year RT students facilitated the event. All students completed pre/post surveys and post reflections. Community participants completed evaluations. **Results:** All community participants stated they enjoyed the event and would recommend it to others. A total of 73.6% of participants stated they would make a change because of what they learned. As a group, the RT students had increases on all pre to post mean scores and paired t-tests revealed statistically significant (p≤.05) individual changes on 12 of the 19 items, including those regarding civic engagement, leadership, education and literacy, and poverty. Inductive analysis revealed four emerging themes from student reflections. Themes identified
were: cultural competence, health communication, professional skill development, and value to RT education. All students recommend the continued use of service-learning in RT curriculum. **Conclusions:** The positive impact of service-learning on the personal and professional growth of both first and second-year RT students makes it exceptionally valuable to RT education and future role expansion. Furthermore, feedback from community participants suggests it may be a useful tool for patient pulmonary education and COPD prevention and early intervention efforts. **Key Words:** service-learning, respiratory therapy education
Introduction

Chronic Obstructive Pulmonary Disease (COPD), became the third leading cause of death in the United States in 2008 (Heron, 2012) and preliminary data for 2011 indicate its status has remained unchanged (Hoyert & Xu, 2012). The American Lung Association (2012) recently reported that, in addition to the 12 million already diagnosed, 12 million more Americans currently live with COPD, but are unaware. Of all those with COPD, the incidence is highest among those who are over 55 years of age and those who live in poverty (Akinbami & Liu, 2011). Due to its high prevalence and mortality rates, educating the community about COPD is crucial. It has been reported that “76% of COPD patients and 69% of doctors agree there is “strong need” for better patient education about their condition and treatment” (Schulman, Ronca, & Bucuvalas, Inc, 2000, p. 18). Multiple studies have indicated that educational interventions can have positive impacts on those with COPD including improved quality of life, decreased hospitalizations, and increased overall knowledge of the disease. (Labrecque et al., 2011; Mousing & Lomborg, 2012; Tan et al., 2012).

Respiratory therapists (RTs) play an active role in the diagnosis, treatment, and management of COPD. As the American Association for Respiratory Care (AARC) expressed in their Position Statement, in addition to their clinical responsibilities, respiratory therapists are expected “to take a leadership role in pulmonary disease teaching, smoking cessation programs, second-hand smoke awareness, pulmonary screening for the public” and other aspects of community outreach (AARC, 2011). Anticipated expansions in “Disease Management, Health Coaching, Case Management,
Clinical Consulting, Patient Education, COPD Education and Asthma Education” will have a profound effect on the education of future therapists (American Association for Respiratory Care, 2011). Projections suggest that in 2015 and beyond, there will be even higher expectations for graduating therapists to excel in these expanded professional roles (Barnes, Gale, Kacmarek, & Kageler, 2010). Therefore, educational programs need to expand their training in order to assure their graduates’ professional success (Barnes et al., 2011).

There is a clear need for improvements in the education of both COPD patients and respiratory therapy students. There are many possible methods and strategies to meet this need, such as service-learning. Service-learning is “a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities” (National Service-Learning Clearinghouse, 2012). It is often used to combine patient, community, and student education. Current literature describes positive outcomes for students and community participants following service-learning experiences and, therefore, supports its use as an educational method (Fusner & Staib, 2004; Krout et al., 2010; Reising et al., 2008; Reising, Allen, & Hall, 2006). Although there is an abundance of service-learning literature in other health fields, including nursing, physical therapy, and occupational therapy, there are limited articles in respiratory therapy. Other than one published abstract, no published research was found concerning the effects of service-learning on students, patients, and/or the community with regard to any aspect of respiratory therapy education. The purpose of this study was to determine the impact of service-learning on RT students and community participants.
Methods

Research Design

This was a descriptive study that utilized a mixed methods approach. This study was approved by the Institutional Review Board. The studied population consisted of both members of a low socioeconomic community and undergraduate respiratory therapy students. Community members from the low socioeconomic area were invited to participate in the pulmonary service-learning experience through local dining centers. The community area was chosen for this study because of its diverse and socioeconomically challenged population. In addition, the RT department at The Ohio State University has an established relationship with a community partner in the area. At the time of the study, 22 students who were enrolled in their first-year and 4 students enrolled in their second-year of the respiratory therapy program at The Ohio State University were asked to participate in this study. Community participation and second-year RT student involvement was voluntary, while first-year RT student participation was a requirement as part of the RT 4500 course. All obtained information was anonymous for both students and community participants. The 4 second-year students involved in the study conducted a needs assessment at the selected dining centers before designing and implementing the pulmonary service-learning event. The 22 first-year students received an event orientation prior to participating in the service-learning experience. Eleven first-year and two second-year students were assigned to each participating dining center. At the event students were expected to interact with community participants by
assisting them with paperwork, educating them on lung health, and answering any questions they had.

**Instrumentation**

To assess the needs of the community with respect to their breathing, a Community Needs Assessment Questionnaire was used. Instrument face validity was established by a panel of experts prior to utilization. To assess community participants’ risk for COPD, The COPD Population Screener was used. This instrument has been found to be both valid and reliable with a test-retest correlation of 0.91 (Martinez et al., 2008) and was recommended by the COPD Foundation as an effective tool for risk assessment (www.copdfoundation.org). As determined by the original screener, a high risk for COPD was considered for those whose scores are 5-10, while those whose scores range 0-4 were considered to be at a low risk for COPD. To assess the impact of service-learning on community participants, a post-experience survey was administered to all who participated. The instrument allowed participants to comment on their experience and share their perceived impact. The survey was reviewed by a panel of experts and field-tested with community members prior to utilization.

To assess the impact of service-learning on student participants, a pre/post survey was administered. This instrument was a revised version of the "Great Cities Great Service College Student Survey". The survey was used by the Great Cities - Great Service Consortium, a program that reaches 14 Ohio campuses and involves students and communities in volunteer and service-learning experiences. The instrument was reported to be reliable and question congruent compatibility was examined by the Consortium.
(value not reported in the original source) (Great Cities - Great Service Consortium, 2009). Permission for use of the survey was received by the leader of the Great Cities-Great Service project. The survey used a 5-point Likert Scale for each of the 23 questions. In addition to the College Student Survey (CSS), students were asked to complete a reflection assignment. Using guided questions, the assignments required a 2-3 page written reflection regarding their experience and differed slightly between first and second-year students based on their type of involvement. Both reflection assignments were reviewed by a panel of experts prior to utilization to assure content validity.

Data Analysis Procedures

The statistical data that was obtained from the COPD Population Screener and the CAT was scored in accordance with each instrument's standards and descriptive statistics were utilized as appropriate. Pre and post CSS data were analyzed using SPSS by conducting paired t-tests to determine statistically significant (p≤.05) individual changes. Qualitative data received from the post experience survey and the student reflection assignments were recorded and evaluated for related themes.

Results

Based on the results of the community needs assessment, the second-year RT students created a service-learning event that covered topics regarding COPD management, general lung health, and smoking. A total of 53 community members, 22 males and 31 females, participated in the event. Participants’ ages ranged from 26 to 90, with an average age of 69. With regard to highest completed education level, only six
participants (11.3%) had obtained a four-year degree, while 9 (17%) had some college education and 17 (32.1%) had obtained a high school diploma or GED. Over half of the participants indicated they were current or former smokers. A notable 87.5% of the current smokers had thought about quitting. A total of 13.2% of participants admitted to having COPD, which included only 2 of the 8 current smokers and 4 of the 21 former smokers. However, the COPD Population Screener determined that 5 of the current smokers and 12 of the former smokers were at high risk for COPD.

All but one of the 53 participants felt they learned what they wanted to learn at the pulmonary event. All (100%) of participants enjoyed their experience with the RT students and would recommend the event to others. The participant comments regarding their interactions with the students were all positive. They commented on their high level of knowledge, their great attitudes, and how nice it was to interact with young adults. A total of 39 (73.6%) participants stated they would do something different because of what they learned at the event including try to quit smoking, improve their cough etiquette, teach others about what they had learned, use a spacer with medications, talk to their doctor about COPD, and stay away from second-hand smoke.

All students (n=24) completed both pre and post College Student Surveys (CSS). Tables 8 and 9 display the results of data analysis. As an entire group, the RT students had increases on all pre to post mean scores with statistically significant individual changes on 12 of the 19 questions, which included the following constructs: civic engagement skills, problem solving skills, leadership skills, health issues, education and literacy, as well as poverty. Although the first-year RT students’ (n=20) CSS questions displayed increases from pre to post mean scores on all of the questions, individual
changes from pre to post scores were statistically significant on 9 of the 19 questions. These included questions regarding civic engagement skills, leadership skills, health issues, neighborhood/local issues, education and literacy, as well as poverty. Although 13 of the 19 second-year RT students' (n=4) CSS questions revealed increases from pre to post mean scores, none of the questions revealed statistically significant individual changes. However, the largest increases in scores were seen in questions regarding the following constructs: problem solving skills, leadership skills, analyzing ideas, applying principals from courses to different situations, and poverty. It is important to note the senior students had higher pre mean scores than the juniors on all but six of the questions. Higher senior post mean scores were also found, as compared to junior post mean scores, on 12 of the 19 questions.
<table>
<thead>
<tr>
<th>Construct</th>
<th>Question</th>
<th>Pre Mean</th>
<th>Post Mean</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civic Engagement Skills</td>
<td>Championing or Campaigning for a good cause</td>
<td>Junior</td>
<td>3.15</td>
<td>4.10</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>3.50</td>
<td>4.25</td>
<td>.319</td>
</tr>
<tr>
<td></td>
<td>Planning effective service projects</td>
<td>Junior</td>
<td>2.95</td>
<td>3.75</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>3.75</td>
<td>4.00</td>
<td>.718</td>
</tr>
<tr>
<td></td>
<td>Recognizing both rights and responsibilities as citizens</td>
<td>Junior</td>
<td>3.80</td>
<td>4.25</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>3.50</td>
<td>4.25</td>
<td>.444</td>
</tr>
<tr>
<td></td>
<td>Fostering a commitment to lifelong service</td>
<td>Junior</td>
<td>3.55</td>
<td>3.95</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>3.75</td>
<td>4.25</td>
<td>.182</td>
</tr>
<tr>
<td></td>
<td>Responding to real community needs</td>
<td>Junior</td>
<td>3.30</td>
<td>4.00</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>3.75</td>
<td>4.50</td>
<td>.215</td>
</tr>
<tr>
<td>Problem - Solving Skills</td>
<td>Solving challenging problems</td>
<td>Junior</td>
<td>3.55</td>
<td>3.85</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>3.75</td>
<td>4.25</td>
<td>.182</td>
</tr>
<tr>
<td></td>
<td>Comparing different approaches to solving a problem</td>
<td>Junior</td>
<td>3.80</td>
<td>3.95</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>4.00</td>
<td>4.50</td>
<td>.182</td>
</tr>
<tr>
<td>Leadership Skills</td>
<td>Using leadership skills</td>
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<td>3.80</td>
<td>4.25</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>4.00</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communicating across cultures</td>
<td>Junior</td>
<td>3.60</td>
<td>4.05</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>3.50</td>
<td>4.25</td>
<td>.215</td>
</tr>
<tr>
<td></td>
<td>Understanding values of people different from you</td>
<td>Junior</td>
<td>4.15</td>
<td>4.35</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>4.00</td>
<td>4.50</td>
<td>.182</td>
</tr>
<tr>
<td></td>
<td>Working as part of a team</td>
<td>Junior</td>
<td>4.25</td>
<td>4.60</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>4.25</td>
<td>4.25</td>
<td></td>
</tr>
<tr>
<td>Other Academic Skills</td>
<td>Expressing ideas, opinions, and facts in writing</td>
<td>Junior</td>
<td>3.70</td>
<td>3.80</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>4.50</td>
<td>4.25</td>
<td>.718</td>
</tr>
<tr>
<td></td>
<td>My ability to analyze ideas</td>
<td>Junior</td>
<td>3.95</td>
<td>4.15</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>4.25</td>
<td>4.75</td>
<td>.182</td>
</tr>
<tr>
<td></td>
<td>Applying principals from courses to different situations</td>
<td>Junior</td>
<td>3.95</td>
<td>4.15</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>4.00</td>
<td>4.50</td>
<td>.182</td>
</tr>
</tbody>
</table>

Table 8. CSS Section 1 Results (Senior n=4  Junior n=20) (1=Very low, 5=Very High)
<table>
<thead>
<tr>
<th>Question</th>
<th>Pre Mean</th>
<th>Post Mean</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Junior</td>
<td>Senior</td>
<td></td>
</tr>
<tr>
<td>Neighborhood/Local Issues</td>
<td>2.85</td>
<td>3.40</td>
<td>.045</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td>2.50</td>
<td>.495</td>
</tr>
<tr>
<td>Environmental Issues</td>
<td>2.70</td>
<td>3.00</td>
<td>.186</td>
</tr>
<tr>
<td></td>
<td>2.50</td>
<td>1.75</td>
<td>.215</td>
</tr>
<tr>
<td>Education and Literacy</td>
<td>2.95</td>
<td>3.80</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>2.25</td>
<td>2.75</td>
<td>.604</td>
</tr>
<tr>
<td>Poverty</td>
<td>2.70</td>
<td>3.45</td>
<td>&lt;.001</td>
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<td>2.75</td>
<td>1.75</td>
<td>.092</td>
</tr>
<tr>
<td>Health Issues</td>
<td>3.65</td>
<td>4.20</td>
<td>.017</td>
</tr>
<tr>
<td></td>
<td>4.25</td>
<td>4.50</td>
<td>.391</td>
</tr>
</tbody>
</table>

Table 9. CSS Section 2 Results (Senior n=4  Junior n=20) (0=Not an Issue, 1=Think, 5=Act)

All first and second-year RT students completed a reflection assignment containing guided questions regarding their experiences at the service-learning event. The researcher and a panel of experts applied inductive analysis and ultimately reached consensus on four emerging themes from their reflections: Cultural Competence, Health Communication, Professional Skill Development, and Value to RT Education.

**Cultural Competence**

Cultural competence was represented heavily throughout the reflections of the RT students. The students felt they had learned the importance of considering cultural competence, and more specifically health literacy, when planning service-learning events. Multiple students also expressed how the service-learning event helped mold their opinions on culture as well as how to interact with those of a different cultural background than their own.
"I had to be a bit creative when it came to making the posters and interactive materials because I had to find the fine line between being engaging and treating grown adults too much like children. It was also challenging to decide how in-depth my information should be, since the level of education we worked with fell on the lower end of the spectrum."

"This was the first time I tried to educate a person about how to quit smoking when they spoke a different language." A fellow student "was helping to translate and I did the best I could to speak to the patient and allow her to simply interpret." I think that small experience is so important and we should have as many experiences with different demographics as possible." 

"...I realized that your culture can be so much more than simply your nationality. Through interacting with the people at the service learning event I found that everyone has a slightly varying culture even if you are from the same general place. Because everyone has their own cultural background, it's really important to try to just treat everyone in a respectful manner..."

Health Communication

Communicating health information in a way that would be most beneficial to the Hilltop community was mentioned in a majority of the reflections. Many students shared what they felt were the best ways to communicate their message to the Hilltop community. They learned that "the same method of teaching will not work for everyone."

Also, many of the students referred to the obstacles they encountered while communicating their pulmonary topics to the community members.

"In developing the material for the service event, I was able to learn how to create materials that were specific for the community in regards to knowledge level."

"...this experience has given me more tools for participating in community education with a greater understanding of what approaches are most effective."

"The experience had us alter our presentation to the person based on their individual understanding and background to help them best comprehend the information we were teaching them."
A couple students compared their approach to health communication to that of the individual's doctor; specifically discussing the impact that intimidation has on communicating health related information.

"I think when their doctors tell them about their lung disease they get intimidated…so, in the end they do not ask any of the necessary questions. However, when they came to me they were asking all sorts of things….They were a lot more comfortable talking to us."

**Professional Skill Development**

The development of leadership skills was mentioned in many of the RT students' reflections.

"As a leader, I grew in my ability to teach others how to teach without giving them word-for-word instructions. I also found myself coaxing the junior students to fully engage all people at their station, as many seemed to focus on one person and neglect the rest. This improved a lot after the first few people arrived."

Some of the students discussed how apprehensive they felt when talking to others about their health issues and how the service-learning experience directly impacted their feelings. "Before this experience I was somewhat nervous talking to people about their health issues…this experience helped me with talking about health matters and giving advice..." Many students directly related their experience to their profession and future interactions with patients in the clinical setting.

"It was nice to hear the kinds of questions the residents asked. I think it has given me a better feel for what these types of patients will be concerned about if they are admitted for care."

"Talking with those adults at the Hilltop made me realize that a bunch of my patients do not understand a lot of what I am saying. I realize that I have to explain in a way they can understand better. Because of this trip, I have learned how to talk to the older community and my patients. Overall, this trip has definitely increased my confidence talking with patients."
Value of Service-Learning to RT Education

All of the RT student felt service-learning should continue to be a part of RT curriculum. One student described service-learning as "a way for us to see the world from a different perspective." Some of the students reflected on the importance of service-learning to the RT profession, while others compared learning through service-learning to learning in the classroom environment.

"Learning about smoking cessation in class was informative, but actually going out in the real world and talking to people about it gave me a better perspective."

"More practical and more engaging" than learning in the classroom

"A lot of your job as a Respiratory Therapist is to educate people on their disease...and this experience did just that. I believe this type of experience should be a part of the curriculum; it was a great way to get outside of the box and really take the things we've learned to a new level."

Conclusions

This data coincides with current statistics regarding the prevalence and awareness of COPD. Results of this study indicate that members of the Hilltop community may be a part of the 12 million unaware of their disease. As seen in this study, service-learning may be used as a method to reach the 12 million undiagnosed by increasing awareness of COPD and providing resources to those at high risk; therefore encouraging and initiating early interventions. Undiagnosed, and therefore uncontrolled, COPD increases the incidence of COPD exacerbations, causing a need for costly medical interventions. As current literature suggests, educational interventions can decrease the number of COPD associated hospitalizations, thus reducing theses costs significantly (Labrecque et al., 2011). Many participants in this study stated they planned to make significant changes
because of the education they received through service-learning. When used as a form of prevention and early intervention, health information delivered through a service-learning experience may effectively decrease the costs associated with undiagnosed, untreated, and/or uncontrolled COPD.

Nearly all participants in this study who were identified as being at high risk for COPD self-identified as current or former smokers. The incidence of COPD is strongly associated with smoking tobacco, therefore tobacco education is a necessary component of any pulmonary education event. Service-learning can provide the community access to knowledgeable respiratory therapy students who have been trained in tobacco cessation. Early interventions, such as tobacco education and the use of motivational interviewing techniques can help move individuals toward quitting and are the key to disease prevention or slower progression of COPD. These interventions may ultimately decrease associated medical costs and mortality rates.

Early interventions, such as those involving health promotion and disease prevention, can take place in many locations including doctors’ offices and hospitals. However, service-learning uniquely allows this education to take place within an individual’s community. The safety, convenience, and comfort this provides participants allow them to be more open to receive health information and feel more comfortable asking questions. The community environment also allows for adequate time to be spent on individualized educational sessions without the threat of busy schedules or future appointments, which often distract health care professionals from providing such services in healthcare environments. Furthermore, the RT students in this study reflected that participants felt more at ease asking the students questions about their health.
The impact of service-learning on participating students in this study is congruent with the results of current literature in other health fields. The results of this study indicate that RT students in both their first and second-year benefit from service-learning with regard to their personal and professional attributes and competencies. This study illustrated the type of positive impact varies between those with service-learning experience and novices. It is clear the education received through service-learning has a long-term impact on students and continues to be uniquely beneficial every time it is experienced. Therefore, service-learning can be used as an effective educational method by RT educators throughout a student’s RT education.

Service-learning can be used as a teaching and learning strategy that would expand the role of future respiratory therapists. The personal and professional skills developed by students during service-learning are crucial attributes for current and future respiratory therapists. Anticipated role expansions will lead to higher expectations for graduating therapists (Barnes, Gale, Kacmarek, & Kageler, 2010). Educational programs need to prepare current and future RTs for successful integration of these expanded roles. One way this can be done is by rethinking how RT education is delivered. Skills such as leadership, civic engagement, problem solving, and effective communication, cannot simply be learned from a textbook. Service-learning allows learning to extend past classroom walls, giving students the opportunity to develop these skills through experiential learning in the community setting. Not only is education through service-learning imperative to the skill-set required by future therapists, current RT students welcome the change.
The findings from this study indicate that by creating an engaging, experiential learning experience for current millennial RT students, service-learning has exceptional value in respiratory therapy education. RT educators should blend service-learning with the more traditional methods they are used to in order to appeal to the learning style of current RT students. These students represent the millennial and, therefore, “prefer active and engaging activities, such as simulations and group work, not learning by lecture or the teacher-centered approaches that faculty tend to favor” (Pardue & Morgan, 2008). Service-learning allows students to work together in an engaging, active environment, while providing a valuable service to the community. Not only did every student in this study feel service-learning should continue to be a part of RT curriculum, many of them mentioned they preferred this type of experiential learning over traditional education in the classroom.

**Conclusions and Implications**

The results of the study contribute to current literature regarding service-learning in allied health education as well as to the limited literature regarding service-learning in RT education. Although the results were positive and congruent with current literature, future research is needed regarding the long-term impact of the service-learning experience on RT students and the community. An outcomes study on the long-term health behavior change of community participants after experiencing service-learning would contribute to literature regarding the impact of service-learning on the community. Also, future studies should include larger number of RT students and look at the impact of multi-visit service-learning experiences. Meanwhile, RT educators should consider service-learning as an educational method that contributes to the personal and
professional growth of RT students by reinforcing classroom material and introducing new educational subjects that are better learned outside the classroom environment.
References


Appendix A: Community Needs Assessment Questionnaire

Community Needs Assessment Questionnaire

Please complete this short survey about your breathing. Your answers will be used to design a local event to educate the community about lung health. Your answers are important to us and your honesty is appreciated. Thank you!

1. Have you ever been diagnosed with COPD? Yes No
   a. If yes, do you feel it is well controlled? Yes No

2. Are you a current or former smoker? Current Former Never Smoked

3. What do you want to know about your breathing? Select as many as you would like.
   Weather and your lungs What to do when short of breath What is COPD?
   Medications Exercising with COPD Using oxygen How the lungs work
   Quitting Smoking Second-hand smoke Doing daily activities
   Other topics or questions:
   ______________________________________________________________________
   ______________________________________________________________________
   ______________________________________________________________________

4. What would motivate you the most to come to a COPD education event?
   a. Chance to win a Kindle Fire
   b. Gas Gift Card
   c. Restaurant Gift Card
   d. Free Nicotine replacement items (Patch, Gum, ect.)
   e. Other:
Appendix B: COPD Population Screener

This survey asks questions about you, your breathing and what you are able to do. To complete the survey, mark an X in the box that best describes your answer for each question below.

1. During the past 4 weeks, how much of the time did you feel short of breath?
   - None of the time
   - A little of the time
   - Some of the time
   - Most of the time
   - All of the time

2. Do you ever cough up any "stuff," such as mucus or phlegm?
   - No, never
   - Only with occasional colds or chest infections
   - Yes, a few days a month
   - Yes, most days a week
   - Yes, every day

3. Please select the answer that best describes you in the past 12 months.
   I do less than I used to because of my breathing problems.
   - Strongly disagree
   - Disagree
   - Unsure
   - Agree
   - Strongly agree

4. Have you smoked at least 100 cigarettes in your ENTIRE LIFE?
   - No
   - Yes
   - Don't know

5. How old are you?
   - Age 35 to 49
   - Age 50 to 59
   - Age 60 to 69
   - Age 70+

How to Score Your Screener: In the spaces below, write the number that is next to your answer for each of the questions. Add the number to get the total score. The total score can range from 0 to 10.

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Don't know</td>
</tr>
<tr>
<td>4</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>5</td>
<td>Strongly agree</td>
</tr>
</tbody>
</table>

If your total score is 5 or more, this means your breathing problems may be caused by chronic obstructive pulmonary disease (COPD). The higher your score, the more likely you are to have COPD. COPD is often referred to as chronic bronchitis and/or emphysema and is a serious lung disease that slowly gets worse over time. While COPD cannot be cured, it is treatable, so please share your answers to the five-question screener with your healthcare professional (HCP).

If your total score is between 0 and 4, and you are experiencing problems with your breathing, please share your answers to the five-question screener with your HCP.

Only your HCP can decide if you have COPD. Your HCP can help evaluate your breathing problems by performing a breathing test, also known as spirometry. Don't wait. Call your HCP today to make an appointment to see if you may be at risk for COPD. Remember, when speaking to your HCP, be honest and open in describing your symptoms and explain how your breathing problems affect your activity level on a daily basis.
Appendix C: Post-Experience Survey

Post-Experience Survey

Please answer the following questions about your experience today. Your honest thoughts are valued.

1. What did you want to learn about COPD today?

2. Do you feel you learned what you wanted to learn? Yes No

3. Did you enjoy your experience with the students? Yes No
   • Any Comments?

4. Would you recommend this event to others? Yes No

5. Will you do anything different because of what you learned today? (Example: Quit Smoking, talk to your doctor, ect.) Yes No
   • If yes, what? _____________________________________________________________________________

6. What is the most important thing you learned today?

7. Other comments:

Thank you!
Appendix D: College Student Survey (CSS)

Great Cities Great Service College Student Survey

Revised for use at The Ohio State University

Last 4 digits of phone: _____________________  
Please circle one: Junior Senior

Section 1: Please indicate your level of competency in each of the following areas:

<table>
<thead>
<tr>
<th>Competency/Skill</th>
<th>Very Low 1</th>
<th>Low 2</th>
<th>Average 3</th>
<th>High 4</th>
<th>Very High 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Civic Engagement Skills</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Championing or campaigning for a good cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning effective service projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recognizing both rights and responsibilities as citizens</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fostering a commitment to lifelong service</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Responding to real community needs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Problem-Solving Skills</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solving challenging problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparing different approaches to solving a problem</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Leadership Skills</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using leadership skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicating across cultures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Understanding values of people different from you</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Section 2: For each of the following issues, please CIRCLE the number that corresponds to where you are on a continuum from thinking about how an issue affects the community to acting on it. If the specific issue is not a concern for you, circle 0.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Not an Issue</th>
<th>Think</th>
<th>Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Issues</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Neighborhood/Local Issues</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Environmental Issues</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Education and Literacy</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Poverty</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
Appendix E: Junior Service-Learning Reflection Assignment

Junior Service-Learning Reflection Assignment

Using the following guided questions, write a 2-3 page, double spaced paper regarding your experience at the event. Please turn in your reflection by the date listed on the course syllabus. Please put the last 4 digits of your phone number at the top of your assignment.

1) Through this experience, what did you learn about:
   a) The Hilltop community
   b) The COPD population
   c) Educating adults

2) Do you feel this experience helped increase your confidence in leadership and communicating with patients? Why?

3) What were your previous perceptions of health literacy, cultural competence, and low income communities? Did these perceptions change in any way after participating in the COPD event?

4) Do you feel this type of experience should continue to be a part of course curriculum? Why or why not?
Senior Service-Learning Reflection Assignment

Using the following guided questions, write a 1-2 page, double spaced paper regarding your experience at the event. Please turn in your reflection by the date listed on the course syllabus. **Please put the last 4 digits of your phone number at the top of your assignment.**

1. Through conducting the community needs assessment, what did you learn about the community and their knowledge of lung health?

2. How did creating the pulmonary educational materials and participating in the event enhance the following:
   a. Your problem-solving skills
   b. Your leadership and communication skills
   c. Your preparation for present and future roles in patient education

3. Do you feel this type of experience should continue to be a part of course curriculum? Why or why not?
Appendix G: Pulmonary Health Screener

Pulmonary Health Screener

BACKGROUND INFORMATION:

Age: __________  Sex: __________  Race: __________________________

Highest Completed Education:  Some High School _____  GED/HS Diploma _____

_____ Some College _____  2-year Degree _____  4-year Degree or beyond _____

Other: ________________________________

SMOKING HISTORY:

Please check the appropriate answer:

_____ I was never a smoker

_____ I used to smoke, but not any more

_____ I currently smoke

If you have a history of smoking or currently smoke, please answer the following question:

Have you ever thought about quitting?  Yes  No
PULMONARY HISTORY:

Have you ever been diagnosed with any of the following? (Check all that apply)

_____ Chronic Bronchitis
_____ Emphysema
_____ COPD
Appendix H: Survey Permission

Re: Service-Learning Survey Permission

Yes! You have my permission to use the Great Cities survey. Where did you find the instrument? Is it online somewhere?

Good luck with your research. I’d love to hear about your results.

~ Melissa

___________________________________________

Dr. Melissa Kesler Gilbert
Associate Dean
Experiential Learning and Community Engagement
Center for Community Engagement
Otterbein University
1 South Grove St.
Westerville, OH 43081
Tele: 614.823.1251
Fax: 614.823.2174
Email: mgilbert@otterbein.edu
www.otterbein.edu/cce

On Fri, Sep 14, 2012 at 10:23 AM, Liddil, Jessica <Jessica.Liddil@osumc.edu> wrote:

Hi Melissa,

My name is Jessica Liddil and I am a graduate student at The Ohio State University. For my Thesis, I am planning a service-learning experience for respiratory therapy students in the Columbus area. I found the Great Cities Great Service College Student Survey and was hoping to use the instrument in my study. I was told that you lead the Great Cities Great Service Project. Can I have your permission to use the survey? If there is anyone else I need ask permission of please let me know.

Thank you for your time,
Jessica Liddil, BS, RRT, RCP
Appendix I: Event Flyer

Have questions about your breathing?

Get answers at a FREE pulmonary education event!
(COPD Screenings, lung education, and prizes)

Location: Carrie’s Café or The Hilltop Senior Village
Time: Wednesday January 23rd 11:00am

Offered by: Respiratory Therapy Students from The Ohio State University
Appendix J: Participation Letter

School of Health & Rehabilitation Sciences
Respiratory Therapy Division
431 Arwell Hall
453 West Tenth Avenue
Columbus, OH 43210-1234

Phone: 614-292-8445
FAX: 614-292-0210
http://shr.osu.edu/RT

October 31, 2012

Dear participant,

Faculty and students in The Ohio State University's Respiratory Therapy Division would like to invite you to participate in a research study on service-learning, an educational technique in which students and the community participate in an education experience. The purpose of this study is to explore the impact of a needs-specific pulmonary service-learning event on respiratory therapy students and Hilltop community participants.

Participation is voluntary. If you agree to participate, you will be asked to complete a COPD screening questionnaire, provide some information about your lung health, and interact with respiratory therapy students. If you are considered at-risk for developing COPD, we will provide information on making an appointment with the OSUMC pulmonary clinic as well as information about programs that can help you quit smoking. The students will talk with you about your lung health and answer any questions you may have regarding your breathing. The information you provide will be kept confidential and only the researchers will have access to it.

If you have any questions, please ask one of the faculty present at today's event, or contact us using the information below. Thank you for your time and consideration.

Sincerely,

Georgianna Sergakis, PhD, RRT
Jessica Liddil, BS, RRT, RCP

614-292-8445
Sergakis.3@osu.edu
Appendix K: Informed Consent Verbal Script

Verbal Script for Obtaining Informed Consent

“Hello, my name is [Student’s name]. I am a Respiratory Therapy student at The Ohio State University. I would like to invite you to participate in a research study. The study involves participation in a pulmonary education event. Participation is voluntary. If you agree to participate, you will be asked to complete a COPD screening questionnaire, provide some information about your lung health, and interact with respiratory therapy students. The event will take approximately one hour of your time. The information you provide is confidential and will not be asked to provide your name or other personal, identifying information.

If you decide not to participate, there will be no penalty. You can, of course, decline to answer any question, as well as to stop participating at any time, without any penalty.

(The respondent will be given a cover letter containing name, institutional affiliation, and contact information.)

“Do you have any questions about this research? Do you agree to participate?”

If yes, “Let’s begin…."

If no, “Thank you for your time.”
Site Conformation

From: Sandi Taylor [staylor@LifeCareAlliance.org]
Sent: Tuesday, October 16, 2012 10:43 AM
To: Liddil, Jessica
Cc: Molly E. Haroz; Jennifer Fralic
Subject: RE: Educational Opportunity at the Hilltop Senior Village

Good morning Jessica,

I have you scheduled at Hilltop Senior Village, November 19, 2012 from 11:00 - 1:00. The address is 375 Alberty Trail, Columbus Ohio 43228. The coordinator at the Hilltop dining site is Eloise Norris and she can be reached at the dining site M-W-F by calling 614.279.1199. If you have questions or need additional information, please feel free to contact me at 614.437.2899.

Sandi
Sandi Taylor
Community Program Coordinator
LifeCare Alliance
670 Harmon Ave.
Columbus, OH 43223
p: 614.437.2899
f: 614.278.3143
staylor@lifecarealliance.org
www.lifecarealliance.org
Nourishing the Human Spirit.

From: Molly E. Haroz [mharoz@LifeCareAlliance.org]
Sent: Friday, October 12, 2012 12:45 PM
To: Liddil, Jessica
Cc: Sandi Taylor
Subject: RE: Service-Learning Opportunity

Sandi will work with you, as far as Hilltop is concerned, but either 11/26 or 11/28 would work for them to come to Carrie's.

Thanks!
Molly
Actually, your contact on 11/28 will be Ernestine Kendrick - our receptionist.

And, yes it is fine for you to arrive at 10:30.

Thanks!
Molly
Appendix M: IRB Approval Letter

Office of Research
Office of Responsible Research Practices

Protocol Title: THE IMPACT OF A SERVICE-LEARNING EXPERIENCE ON RESPIRATORY THERAPY STUDENTS AND THE COMMUNITY

Protocol Number: 2012E0652
Principal Investigator: Georgia Sergakis
Date of Determination: 11/15/2012
Qualifying Category: 1,2
Attachments: None

Dear Investigators,
The Office of Responsible Research Practices has determined the above referenced project exempt from IRB review.

Please note the following:

• Retain a copy of this correspondence for your records.

• Only the OSU staff and students named on the application are approved as OSU investigators and/or key personnel for this study.

• No changes may be made to exempt research (e.g., personnel, recruitment procedures, advertisements, instruments, etc.). If changes are need, a new application for exemption must be submitted for review and approval prior to implementing the changes.

• Per university requirements, all research-related records (e.g., application materials, letters of support, signed consent forms, etc.) must be retained and available for audit for a period of at least three years after the research has ended.

• It is the responsibility of the investigators to promptly report events that may represent unanticipated problems involving risks to subjects or others.

This determination is issued under The Ohio State University’s OHRP Federalwide Assurance #00006378. All forms and procedures can be found on the ORRP website: www.orrp.osu.edu.

Please feel free to contact the Office of Responsible Research Practices with any questions or concerns.
Thanks,
Tani

Tani Prestage, MA, MPH, CIP | Quality Improvement Specialist | Office of Responsible Research Practices | The Ohio State University
1960 Kenny Road, Columbus, OH 43210 | prestage.2@osu.edu | 614-292-0214