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Service Learning in Medical Education: Project Description and Evaluation

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Although medical education has long recognized the importance of community service, most medical schools have not formally nor fully incorporated service learning into their curricula. To address this problem, we describe the initial design, development, implementation, and evaluation of a service-learning project within a first-year medical school course. Medical students (eight women, eight men) screened clients of a community agency for high blood pressure and educated them about the effects of hypertension on health. Results of the project indicated significant increases in students' attitudes, knowledge, and skills related to community health, resources, and service. Infusing medical education with service-learning activities can both meet community needs and enhance student education about the health of the public. The present findings support continued development and evaluation of service-learning projects within medical school training programs.

Service rests at the core of the medical profession, which aspires to train physicians committed to improving the health of the community and serving the public (AAMC, 1998). Medical students often identify medicine's service orientation as a primary reason for choosing a career in medicine (Wagoner & Bridwell, 1989). Medical education is part of the higher education continuum, and, while service learning has long-standing pedagogical roots in K-12 and higher education, the integration of service learning into medical education has occurred in roughly the last decade. Generated by community-based higher educational initiatives, service learning in medical education has contributed to restructuring clinical education components of the curriculum as well as building partnerships between medical schools and the communities they serve.

Despite the benefits of service learning in health professions education (Seifer, 1998), the hidden curriculum effects of medical school training programs – in which students learn implicit rules, roles, and modes of conduct not taught in the formal curriculum – may, and often do, devalue students' orientation or commitment to service (Hafferty, 1998; Remen & Rabow, 2005). Hidden curriculum effects typically foster insensitivity, hardening, and numbing relative to patient care among medical students as they progress in the curriculum (Lowenstein, 2002). Additionally, although medical education has long recognized the importance of community service, most medical schools have not formally nor fully incorporated service learning into their curricula (Brush, Markert, & Lazarus, 2006; Burrows, Chauvin, Lazarus, & Chehardy, 1999). This further limits realizing the goal of helping medical students to fully appreciate and embody the very service ethic that underlies their chosen profession. To begin to address this problem, this paper describes the initial design, development,

implementation, and evaluation of a service-learning project within a first-year medical school course.

Service learning has been linked to developing attributes of altruism and dutifulness in medical students (Burrows et al., 1999). Participating in service learning also relates to more favorable academic outcomes such that students willing to participate in service learning are more likely to rank among the middle quartiles of their class (Brush et al., 2006). A strong service orientation may also predict student selection of a primary care specialty (Brush et al., 2006). This has implications for responding to the declining numbers of graduating medical students who enter primary care specialties (Newton & Grayson, 2003). Service learning has been shown to have benefits for students, such as increased interpersonal and communication skills, improved clinical skills, and heightened understanding of community issues (Burrows et al., 1999).

In recent years, the medical education literature has increasingly focused on community-based education (Seifer, 1998), community service (Elam et al., 2004), and service learning (Elam, Musick, Sauer, & Skelton, 2002). While service learning is considered a form of community-based education (Seifer, 1998), it extends traditional community service objectives by providing structured learning experiences with specific learning objectives related directly to student coursework. Medical education has long recognized the importance of medical students serving the community. However, service learning has not been formally nor fully acknowledged as part of the curriculum at most medical schools (Brush et al., 2006; Burrows et al., 1999).

Service learning has tremendous potential to enhance medical education because it allows students to apply the information they learn in the classroom to real-world settings and provide an important venue for

self-reflection. Service learning has the added potential benefit of addressing community-based problems in the context of the medical student's educational experience (Seifer, 1998) and may provide a mechanism for improving relations between medical schools and their surrounding communities. Students learn about the communities where their patients live by participating in service-learning activities and through this may gain a better understanding of community resources for their patients.

The implementation of service learning can take on different meanings and forms at medical schools across the country with varying priority levels and curricular emphases. Some medical schools have begun to revise their curricula to include a required service-learning component (Brush et al., 2006; Burrows et al., 1999). Other schools have begun to offer service-learning electives (Elam et al., 2002) or have a service-learning experience as an integral part of the curriculum (Seifer, 1998). This paper seeks to contribute to the growing body of literature that deals with service learning in medical education. Toward this end, we describe the initial design, development, implementation, and evaluation of a service-learning component within a medical school course. In line with evaluating the service-learning activity and determining outcomes at the beginning and at the end of the experience, we sought to explore the following overarching questions: Did participation in the service learning experience result in a change in the student's knowledge and understanding of health care and the community? Their attitudes and beliefs about service and health care? Their skills and future plans as physicians? We also identify future directions for integrating service learning into the medical school curriculum.

Project Description and Evaluation

Concurrent with the shift to ambulatory- and community-based medical practice in the United States, medical schools have recognized increasingly the value of including clinical- and community-based experiences early on in students' training. These experiential activities endeavor to demonstrate and underscore linkages between basic science principles and clinical medicine practices. To realize these goals, a service-learning pilot project was implemented into an existing community-based, field experience course for first-year students at a medical school in the midwest. Entitled "Ambulatory Care Experience" (ACE), this course was first instituted in the medical school's curriculum in 2000 as a practical, community-based field experience (Hartung & Magoon, 2000). Seven day-long experiences provided learning opportunities for first-year students to enter the human side of medicine, experience diverse dimensions and contexts of human

development, enrich the links between basic science courses and clinical medicine, and explore career opportunities in medicine and the personal meaning of a life career as a physician. A fundamental tenet and goal of the ACE course was that first-year medical students would develop a keen understanding of, and direct appreciation for, the vital work that community agencies and programs perform and how students will, as physicians, partner with these agencies to care for patients. Since its inception, service has resided at the heart of ACE. In 2003, we formally instituted a service-learning component into the course.

As part of the original ACE course, groups of first-year medical students spent six hours helping to prepare and serve food to clients at community-based agencies. These agencies provided services, including daily free hot meals and emergency food supplies, to needy and underserved populations. The course objectives for these sites were designed for students to understand the backgrounds and values of the individuals served, the nature of the staff and services provided, client behavioral responses to the staff and students, and students' personal reactions to the experience. Student evaluations of their experiences at these sites indicated their need for more active involvement and engagement as medical students who could provide rudimentary clinical services. In response, the course directors agreed that the sites provided a valuable learning experience for students that could be significantly enhanced by engaging students in more active learning. A service-learning component of the ACE course, supported in part by a grant from the Center for Healthy Communities, was therefore developed to both enhance students' experiences and better serve the clientele of the community agencies.

Applying Service Learning to the Curriculum

Given that the clientele at the community agencies do not receive routine medical care, a blood pressure screening component was developed and implemented as the service-learning component of the course. It is important from a medical education and training perspective that medical students learn how to take blood pressures. Service-learning opportunities provide the context for students to learn a skill and apply it in real world settings. Students' limited skill and knowledge levels necessitated training them in taking and interpreting blood pressure readings. Students learned how to measure blood pressure and how to provide appropriate education and follow-up care information to patients about hypertension. A faculty nurse preceptor on site instructed the students about how to take blood pressures and supervised the project.

The students alternated between two agencies on days when the ACE course was held. Students were

asked to reflect on their service learning by answering questions about their experiences and completing evaluation forms. With funds made available through the grant, the school purchased blood pressure cuffs, stethoscopes for students, and a teaching stethoscope, which allowed the preceptor and student to listen simultaneously. Additional teaching materials for the students included a primer on hypertension and educational brochures produced by the American Heart Association to be distributed to people with high blood pressure.

Students participated in this service-learning project for one year, with two to four medical students on site at the agencies four times during the 2003-2004 academic year. The students took clients' blood pressure readings, educated them about high blood pressure, and provided them with information about follow-up care. Students continued to perform their already assigned duties at the site, such as serving hot meals, in addition to having designated time for blood pressure screenings and education.

Students learn about high blood pressure as a health problem and learn about the human body in many aspects of their basic science courses. This service-learning component of the ACE course was expected to have additive value for students' education because they could meet a patient who has high blood pressure or is at risk for hypertension. It would allow the student to better understand the patient's perspective and ways in which the community impacts patient care. Because students interact with real patients, it was also expected that the service learning would help students to improve their communication skills, which are essential for quality patient care (AAMC, 1999). The objectives for the ACE course were consequently expanded to include the following objectives specific to service-learning.

Service-Learning Goals and Objectives

Learning Need 1: First-year medical students need clinical experience taking blood pressures.

Service Rationale 1: Disenfranchised groups of individuals who come to these agencies for a hot meal are unlikely to be receiving routine medical care and could, therefore, benefit from being screened for high blood pressure.

Objective 1: First-year medical students will screen the community agency clientele for high blood pressure.

Learning Need 2: As part of their first year medical school courses, students are taught communication skills. First-year medical students need to practice and develop their patient-communication skills.

Service Rationale 2: Clientele of the agencies can increase their knowledge about the risks of

hypertension by communicating with medical students. The interaction through communication can help facilitate access to medical care.

Objective 2: First-year medical students will use the communication skills they developed when interacting with clients.

The learning needs identified above are important to medical education. Medical students must learn specific skills, such as taking blood pressures, that are routinely part of the history and physical examination portion of office visits. While opportunities to learn and practice this skill are part of the traditional medical school curriculum, the addition of a service-learning component would allow students to work with individuals at risk for high blood pressure and who likely represent their future patients. The students would learn firsthand how disenfranchised groups of people may struggle with accessing medical care and the difficulties associated with managing chronic illnesses such as hypertension. The secondary gain expected for students through their service-learning component was the ability to practice and improve their communication skills. First-year medical students are taught the basics of medical interviewing typically with standardized patient actors and in academic rather than real-world settings. While the fundamental tenets of the ACE course sought to enhance student learning in the community context, these experiences did not always allow for patient contact and, specifically, for students to practice skills with an actual patient. The service-learning component was designed to address this problem.

Establishing a Service-Learning Component

The social service agencies involved in this project had been ACE sites for a number of years, and a formal link had been successfully established between the agencies' managers and the ACE coordinator. The agencies were knowledgeable about the objectives of ACE, skill levels and time availability of students, and evaluation expectations for student performance. These managers and the coordinator met to review the service-learning component for these ACE sites and to develop a schedule that reflected the integration of the service-learning component into the existing site activities.

Participants and Measure

A total of 16 first-year medical students (eight women, eight men) with a mean age of 21.6 years participated in the service-learning activity as part of the ACE course. Of these students, 11 were Caucasian and 5 were Asian. These students conducted blood pressure screenings on 107 individuals (51 males, 56 females). Sixty percent (60%) of clients screened

evidenced elevated blood pressure readings. To evaluate the activity and determine outcomes at the beginning and at the end of the experience, students responded to a pre- and post-test 32-item questionnaire developed by the granting agency. Likert scale responses ranged from 1 (*strongly agree*) to 7 (*strongly disagree*) for the first 15 questions, which comprised statements about students' attitudes and beliefs relative to the medical profession, health care, service to their patients and the community, and their future plans as physicians. For example, these statements asked about such things as providing care to people from different cultures, volunteering and community service, working on multidisciplinary teams, patients' health care beliefs/practices, etc. These statements afforded the opportunity for students to reflect critically on their experiences. As a central tenet of service learning, reflection provides a mechanism for students to make sense of their observations and experiences. Responses to the next set of eight questions with Likert scale responses ranging from 1 (*very willing*) to 7 (*very unwilling*) pertained to potential practice situations in which students would be willing to work after graduating (e.g., rural, urban or suburban setting, hospital, community clinic, and private practice). The remaining nine questions assessed students' knowledge and understanding of health care and the community before and after participating in the service-learning experience using a Likert scale from 1 (*no knowledge or understanding*) to 5 (*extensive knowledge or understanding*). Topics addressed by these statements included knowledge/understanding about barriers to health care, community resources, role of professionals on multidisciplinary teams, and health care needs of the community. Analyses were conducted using t-tests to compare students' responses before and after participating in the service-learning experience. The t-test allowed us to determine if significant differences existed between the students' pre- and post-test responses to the 32-item questionnaire. Significance levels were set at $\alpha = .05$.

Results

Responses to items on the questionnaire were tabulated using a frequency analysis. Nearly 75% of students, after completing their service-learning experiences, indicated that they felt prepared to practice in a community similar to that of their project site. All 16 students indicated that they felt comfortable providing services to patients who were ethnically different from themselves. Approximately 87% of the students indicated that students should volunteer their time to the indigent, and 50% indicated that they would like to work in a setting where health professionals were underrepresented. Over 80% of the students

wanted to work with patients who represented a variety of cultural backgrounds, and about half of the students wanted to work as members of interdisciplinary teams. Pre- and post-survey results indicated that students, after participating in the service-learning experience, were slightly less likely to agree with the statement that health professionals should always try to incorporate the patient's health beliefs/practices when planning treatment ($M_{pre} = 1.81$, $M_{post} = 2.06$, $t = -2.24$, $p = .041$). No other significant differences were noted for statements about students' attitudes and beliefs relative to the medical profession, health care, service to their patients and the community, and their future plans as physicians.

Significant increases in knowledge or understanding were noted across eight of nine areas surveyed at pre- and post-testing (see Table 1). These eight areas included types of available community resources, impact of health-care delivery systems on working in the community, health-care needs of assigned communities, barriers to receiving health care, impact of socioeconomic status on health and illness, community perceptions of the site, methods of working with patients of varying levels of knowledge about health care, and meaning of the terms "community resources" and "community service." No significant increase resulted in knowledge or understanding about the responsibilities of other professionals in a multidisciplinary team. These findings suggest that participating in the service-learning experience resulted in an increase in knowledge and understanding in the majority of areas.

Students were asked about potential practice situations in which they would be willing to work after graduating. Options for their responses included working on a multidisciplinary team; in a community health clinic in a rural, urban, or suburban setting; in a private practice or hospital; or community service volunteering. Pre- and post-survey results were similar, therefore suggesting that the students' service-learning experiences did not significantly influence where they would be willing to work after graduating. Responses indicated that students would be more willing to work in a hospital and somewhat willing to work in a suburban setting before and after their service-learning experience.

To further evaluate the project outcomes, students responded to two qualitative questions as part of the questionnaire. With regard to the question, "Do you feel you acquired new skills or enhanced existing skills as a result of this experience?," of the 13 students who responded, two students indicated that they did not acquire new skills and commented, "It was basically the same as all the other community service work that I have been doing since the ninth grade" and "I had previously used these skills effectively." The remaining

TABLE 1
Comparison of Pre-Test and Post-Test Mean Scores

	Pre-Test		Post-Test		<i>t</i>	<i>p</i>
	Mean	SD	Mean	SD		
Community resources	2.44	.727	3.38	.500	-4.86*	.000
Impact of health care delivery system on working in the community	2.63	.719	3.00	.966	-3.00*	.009
Health care needs of communities	2.25	.683	3.38	.885	-6.26*	.000
Barriers to receiving health care	2.81	.750	3.38	1.03	-3.09*	.007
Impact of socioeconomic status on health and illness	3.25	.856	3.94	.854	-4.57*	.000
Community perceptions of site	2.06	1.18	3.06	1.24	-3.04*	.008
Working with patients of varying levels of knowledge about health care	2.94	1.06	3.63	.806	-2.91*	.011
Meaning of terms "community resources" and "community service"	3.31	1.02	3.75	.856	-2.78*	.014
Responsibilities of other professionals in a multidisciplinary team	2.44	.964	2.63	1.03	-1.86	.083

* $p < .05$.

11 students indicated that the experience helped them to improve their blood pressure assessment skills. Replies from students included comments about learning to take blood pressures, such as, "...the actual measuring taught me the technique," and also about additional benefits of their experience, such as, "I got better at working with people and taking blood pressures," and, "I learned to take blood pressures and better understand the health-care needs of the medically indigent."

With regard to the question, "Do you think that you gained unique knowledge from this clinical/training experience?," three of the 11 students who responded said "no." The remaining eight said "yes," and a few students elaborated with such comments as the following: "It gives a real-life perspective on aging and health care," of "...dealing with actual people...getting comfortable talking to them," and, "Every time I practice a medical skill I feel like I learned much more than simply sitting in class." Additional replies included, "Learning is always better for me with a clinical training experience, because you integrate book knowledge, practical applications, and communication," and, "It is much easier to learn this type of activity by doing, not by having someone tell you how to do it." The following comment was also made: "[An] applied component helps to crystallize knowledge. It is hard to tell if I learned much unique knowledge because I had a good understanding of this type of site before."

Discussion

The majority of students who participated in the initial implementation of a medical school service-learning project reported benefits. The service-learning objectives were achieved. The integration of a service-learning component into a medical school course embodied the basic principles of service learning by addressing a community concern and involving the community partners in addressing the need. Service learning also enhanced students' learning by extending what they learn in the classroom to real-world situations and to understand better the context and situations of their future patients.

Students' knowledge and understanding were broadened, and increases were noted in the areas relevant to patient care and to community resources and services. Additionally, students' comments pertained to the value of service learning, such as the importance of practical applications of clinical training and learning skills in real world settings compared to classroom learning. Changes in students' attitudes and skills relating to health care and the community were also noted upon completion of their service-learning experience. The vast majority of students indicated that they had acquired a new skill as a result of their service-learning experience or that the experience helped them to improve their skills at taking blood pressures. As students reflected on their service-

learning experience, their comments indicated that they felt prepared to practice in communities similar to their project site and recognized the importance of working with patients from diverse backgrounds. The students indicated that volunteering their time to the indigent was important. The design of this study, unfortunately, does not allow us to determine to what extent the students' service-learning experiences contributed to their views on volunteerism. Further investigations in this area are needed.

Overall, the results of this project indicated that the service-learning experience seemed more likely to impact students' knowledge and understanding rather than attitudes and behaviors or future practice plans. Given that the service-learning experience was approximately one day in length, it is possible that knowledge and understanding can be increased during that time period. Longer and possibly repeated exposure to sites may be required to impact the more deeply ingrained attitudes and behaviors of students. The same may be true regarding students' plans after graduation. The service-learning experience did not appear to influence students' preferences for where to practice in the future. Given the brevity of their service-learning experience, this is not surprising. Students may need extended and varied exposure to service learning for it to be able to significantly impact their decisions about their future practice of medicine. Given that these were first-year medical students, it is possible that further in their training (i.e., during the second or third year of medical school) these service learning experiences could differently impact their thoughts on working in different environments. Future studies in this area may want to explore the impact of level of training on service-learning outcomes. Additionally, length and repeated exposure of a service-learning experience should also be studied as it relates to outcomes.

Few medical educators probably doubt the importance or benefit of service learning for medical students or the schools' community partners. Medical schools are faced, however, with the challenge of determining how to integrate service learning into an already densely packed curriculum. Given that it is unlikely that there is room in the curriculum for additional courses, it seems more reasonable for schools to consider options for integrating service learning into pre-existing courses. In this light, service learning can be viewed as an extension of a course and possibly offer a more complete learning experience for the students. Opportunities for service learning experiences in medical schools are plentiful regardless of whether they are elective or required components of the curriculum.

With regard to future directions for service learning at our institution, the major initiative in which our medical school embarked to transform its medical

education program yielded an "Integrated Steps" curricular model structured around "five Cs" of medicine: Communication, Competence, Caring, Character, and Community. The innovated model entailed a basic shift from separate, disciplinary-based courses to integrated, interdisciplinary-based courses delivered in five blocks over four years with bridges linking each step. Central to this curriculum is a longitudinal, four-year-long course entitled "Doctoring" that includes a service component. Service is one of the themes of the course with the explicit goal that students will embody an ethic of service to society and to their profession. The service theme focuses on helping the medical students answer the question, "How can I serve?" Each student is expected to complete four hours of service commitment per month during each academic year throughout the five-step curriculum. For the purposes of this course, this service is defined as *work that aims to benefit needy, underserved, and/or vulnerable people or populations*. Students are free to choose any service opportunity within this definition. Medical school staff and faculty will work with students to identify service-learning objectives specific to their site. Student and site evaluations will be conducted.

As many medical schools position themselves to reinvigorate and transform their curricula, service learning seems to offer a viable component for inclusion. Although constrained by a very small sample size which may limit generalizability, the present findings suggest that service-learning requirements should be formally implemented into the curriculum. Although a "gold standard" for service learning in medical schools has not yet been established, it is hoped that progress will be made as medical schools work to better prepare students for the practice of medicine.

As medical education continues to contribute to the higher education of individuals bound for the service professions, medical schools should strive to find ways to align their institutional missions with service-learning initiatives. Institutions of higher education outside of medicine have paved the way for service learning to be an integral part of the education of their students, and it is time for medical schools to follow suit.

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