Self-directed Community Health Assessment Projects in a Required Family Medicine Clerkship: An Effective Way to Teach Community-oriented Primary Care

Kathryn Bonafede, MD; Virginia A. Reed, PhD; Catherine Florio Pipas, MD

Background and Objectives: *Community-oriented primary care (COPC) is a key teaching objective of many medical school family medicine clerkships. Though many programs are in place, little is published evaluating the effectiveness of curricula.* Methods: *Within the family medicine clerkship at Dartmouth Medical School, students complete community health assessments. To assess the degree to which the student projects were meeting the goals and expectations of the clerkship assignment and COPC, project papers for 1 year were reviewed and coded using content analysis.* Results: *Virtually all students fulfilled the stated goals of the project. The majority of students also demonstrated new skills, such as use of a database or creation of an improvement in the community. Students frequently covered populations such as homeless, children, or Native Americans, and selected topics not covered elsewhere in the medical school curriculum, such as oral health, effect of the environment, and educating providers.* Conclusions: *Students developed a variety of self-selected community health projects and public health interventions. Completing these projects in a core family medicine clerkship encouraged students to expand their views of health beyond the clinic and into the community.*

(Fam Med 2009;41(10):701-7.)

Community-oriented primary care (COPC) is an approach to primary care that incorporates epidemiology, preventive medicine, and health promotion.[1] In its definition of COPC, the Institute of Medicine[2] noted that implementation of COPC requires an iterative process consisting of four main steps: (1) defining a community, (2) identifying a specific health issue or problem, (3) modifying care to address that problem, and (4) monitoring the effectiveness of that change.[3] The hope is that by incorporating COPC into practice, major health problems of a target population can be systematically identified and addressed.[4]

The specific teaching of the COPC approach is not a new concept. In 1994, Foreman suggested that part of the academic health center's social obligation toward public health improvement could be fulfilled by having medical students work in the community setting.[5] Foreman argued that development of a group of community-based mentors would provide students with an integrated behavioral and population-based education while supporting the efforts of community-based physicians outside of the medical center.

The 1999 Strategic Planning Working Group of the Academic Family Medicine Organizations and the Association of Family Medicine Residency Directors recommended competencies related to COPC that should be acquired by family medicine residents as part of their training.[1] These competencies include the capacity to recognize health needs in the community, the ability to develop interventions designed to meet those needs, and the skills to assess the outcomes and effects of the intervention.

While the concept of COPC is well-accepted as important to the study of family medicine and to improving health care, determining the most effective way to teach these broad subjects is not clear.[1] Recent reviews of COPC in residency[6] and in general[7] indicate the evaluation of the outcomes of COPC curricula is not rigorous. This lack of clarity and rigor extends to

From the Department of Community and Family Medicine, Dartmouth Medical School, Lebanon, NH.

the assessment of COPC in undergraduate medical education, as well.

Variations of COPC teaching have been in place in many different medical schools since the 1960s, but the concept of offering this type of learning within a required clinical rotation is not common.[8-13] COPC is most often presented as content in preclinical lectures or an elective type of experience during clinical clerkships. For the few clinical clerkships identified as having a required COPC curriculum, there is little published information about the effectiveness of the program of study. Unverzagt and his colleagues[12] at the University of New Mexico School of Medicine reported on a population health experience implemented as part of the required family medicine clerkship. Over a period of years, iterative cycles of design, evaluation, and redesign have resulted in an experience that meets short-term goals and that students and faculty view in an increasingly positive light. Another required family medicine community field activity was described by Cronholm and his colleagues[14] at the University of Pennsylvania. Their qualitative study of student attitudes found that negative attitudes and attributions presented significant barriers to the goals of the learning experience.

Third-year students at Dartmouth Medical School (DMS) complete a 7-week core clerkship in family medicine. One component of the clerkship is completion of a community health assessment with the overall aims of (1) appreciating the complexity and potential of a "community" approach to primary care, (2) understanding the principles of COPC, (3) being able to perform a rudimentary community health needs assessment, and (4) knowing their practice community in some depth. Through achieving these aims, faculty expect that students will gain an understanding of the potential role of physicians in improving community health, develop the ability to identify population groups with characteristic health and social risks/needs, understand roles of and work with other community providers, and appreciate non-medical factors that contribute to the determination of health status.

This study evaluated the extent to which the community health assessment met its stated aims and any additional benefit for students taking the course. The primary objective of this study was to assess the learning demonstrated by students through evaluation of their projects from the 2005–2006 academic year.

Methods

Curriculum

The COPC curriculum for DMS's core family medicine clerkship incorporates community health assessment within the context of the required clinical rotation as a self-directed project. Students are provided with information about how to conduct the community health assessment in four steps.

The first step is to identify a community health problem. This may be done based on a student's particular interest, the interest of her/his preceptor, or a problem identified through patient encounters in the care setting or through available data.

The second step is to develop a picture of the community. Students are encouraged to tour their community and to identify areas where people live, work, recreate, and congregate. They are asked to characterize the population in terms of age, ethnicity, socioeconomic status, and general health. Students are instructed to write a narrative that "allows a reader to picture the community in his or her mind's eye."

The third step is to perform a community interview. Students are instructed to contact one or more community resources, key informants, or opinion leaders in their community. They are to use these conversations to verify the importance of the problem they have identified and to understand how members of the community view the issue.

The fourth step is to discuss the community health problem by preparing a report in which students analyze their information and findings. Do others in the community view the issue as a problem? Are there data to support this? Do culture, ethnicity, or race play a role? What interventions, if any, have been tried to address the problem? Have they been successful? Why or why not? What does the student propose as an intervention?

The curriculum begins with a lecture describing the community project to be completed during the 7-week session. Students are presented with information on examining data trends and diverse ways to look at data from biomedical, epidemiological, psychosocial, and health and society viewpoints. Additionally, faculty review the importance of socioeconomic status and the roles of culture and ethnic disparities in health care. Guidelines for the project are provided to students in a packet. Students complete their clinical work at community-based practices under the supervision of family physicians. Time is made available for the completion of the project within the time allotted to the outpatient clerkships.

At the completion of the clerkship, students present their reports to a faculty member and to their classmates. While completing the four steps of the assessment as described is sufficient for students to fulfill the requirements of the project, students who exceed the steps by participating in an existing community health intervention, developing a new intervention, or developing a tool for data collection and collecting data, earn a higher grade on the project.

Evaluation

For the current study, project papers from the 2005–2006 school year were collected and reviewed.

The Dartmouth College Committee for the Protection of Human Subjects approved the evaluation protocol.

Content analysis was performed using the computer program NVIVO, for computer-assisted analysis of text-based data (version 1.2.142, QRS International). Content analysis is a technique to analyze documents by identifying sections of text through their context, underlying meaning, pattern, and processes to understand the relevance, significance, and meaning.[15]

One researcher systematically examined student papers to identify and group major topics. The NVIVO program was used to highlight and separate sections of text, seen as meaningful units, based on content and coded by subject or idea. Meaningful units were defined as information that demonstrated knowledge of a topic gained, use of a skill, information obtained, or fulfillment of specific goals of the project.

At this point, the coding scheme was reviewed by five objective researchers and organized into categories based on recurring themes and characteristics. Categorization continued until defined themes were verified, and redundancy was achieved.[16] The categories were then compared back to the original text to ensure accuracy in interpretation. Analysis and critique of the emergent themes was done both in a group and individually to check for discordance among major topics. Additionally, students who originally participated in the community health assessments were asked to evaluate the emerging themes and conclusions, helping to ensure accuracy of data. This member check, as well as review with objective researchers, provided multiple perspectives to help reduce researcher bias and draw conclusions accurately representing the data.

NVIVO was used to structure the findings by coding and sorting the data and helping to manage, enumerate, and assemble the subject matter as coded by the researcher. Ten major themes were identified, with three of those themes broken down into sub-themes. Quotes from each of these categories were assembled, and the data were compared back to the original texts to insure interpretation validity. The themes were then analyzed to determine the presence of each topic within each document.

Results

Data were available from the entire population of students that completed the family medicine clerkship in 2005–2006 (n=55). Because students working in the same location during the same time period were allowed to work together on a project, 47 distinct project papers were created. Findings are reported here based on the number of projects. Major themes were grouped into three overriding categories: populations, topics, and skills.

Table 1 lists the major themes identified through content analysis. Thirty-eight categories were created as themes. As seen in the table, some themes were further clarified to describe what the topic encompassed. These topics included both defined goals of the project, such as "discussion of the greater impact on public health" and categories that arose through the analysis of the papers, such as "created a tool."

The categories created by the content analysis were not mutually exclusive. For example, a student could have studied oral health in a poor, underserved, Native American population; therefore, the percentages do not total 100%.

Students based their community health assessments around a variety of populations. While students applied their own definitions of "poor" and "underserved" to populations, some of the populations would qualify as medically underserved ("groups of persons who face economic, cultural or linguistic barriers to health care") as defined by the Health Resources and Services Administration (HRSA).[17]

Table 1 includes information on the populations of focus and quantifies the topics that students selected. Of note are topics on which students focused their assessments that are not covered by traditional courses. Examples are access to care, oral health, housing issues, and literacy. More than half of the projects involved patient education, and more than a quarter specifically provided education for health care providers.

Though acquisition of new skills was not a defined goal of the community assessment, many students demonstrated use of such skills in their projects, as shown in Table 1. For example, one project involved improving immunization rates among children in a clinic in Maine. Although the computerized charting system indicated that more than 90% of children had full coverage of immunizations, a student-performed chart review showed current coverage at only 60%. The student was able to point out gaps in the computer triggering system and by presenting the findings to clinic physicians and working with clinic staff was able to take quality improvement steps aimed at increasing vaccination rates.

Some skills were very tangible, such as the creation of an implementation tool. For example, one pair of students working in the Florida Keys noted that many vacationers did not know which medications or dosages they were taking when presenting to a family physician in the area. These students contacted local tourism offices and created a credit card-sized card on which vacationers could write their medications before traveling. The card would be sent with tourism information packets.

Discussion

Teaching students the intricacies of the family physician's role within the community and the interrelationship between health and community within

Table 1

Themes From Content Analysis: Populations, Topics, and Skills Utilized

Code		*Clarification*	*# (%) of Projects (n=47)*	*Representative Quotes*
Population studied	Children		12 (26%)	• "I recorded and reported the well-child checks attended based on the standard set by the American Academy of Pediatrics, stating that well-child checks should occur at 1, 2, 6, 9, 12, 15, 18, 24, 36, and 48 months."
	Elderly	Age 65 or >	5 (11%)	• "We spoke first about the issue and she agreed that she had seen many elderly spouses (again, mostly women) really struggle with taking care of their disabled partners."
	Homeless	Self-defined as homeless	3 (6%)	• "The near-perfect compliance needed for successful treatment of HIV is difficult enough to attain for those patients with stable housing. Instead, Dr W. writes a "prescription" for emergency housing. He hopes to be able to secure JT a one-bedroom unit at an affordable housing facility owned and operated by AIDS Help, Inc."
	Native American		8 (17%)	• "As of the 2000 census, the population was 8,225, with Native Americans making up 92% of the population."
	Poor	As public health topic	25 (53%)	• "South County Community Action is one of eight statewide Community Action Agencies which work together in Rhode Island to provide social services to the poor. They have been working since 1967 to 'strengthen families, open doors to self sufficiency, and improve communities.'"
	Refuge/ immigrant	Student defined		• "New Hampshire Department of Health and Human Services (NHDHHS) has developed lead testing guidelines to screen and monitor refugee children. These include 1) Capillary blood lead testing for refugee children aged 6 months–15 years within 3 months after arrival in New Hampshire…"
	Under-served	Student-defined	19 (40%)	• "Furthermore, the hardships of being homeless, coupled with the lack of regular access to health care, places individuals living on the streets at higher risk for developing a new disability or exacerbating an existing one."
Topics studied	Access to care		4 (9%)	• "Any intervention that could help this disenfranchised group gain easier access to disability benefits could potentially have a dramatic effect on not only the general health and well-being of those individuals directly involved but on the public health as a whole."
	Childhood obesity		3 (6%)	• "I went to ask one of the LPNs if there was any information available for the family regarding how to safely lose weight as a child. There was none, and the idea for my project was born."
	Domestic violence		1 (2%)	• "I have encountered several victims of domestic and sexual violence during my rotation… they all seemed to have one reverberating theme: the lack of resources for women (and men) seeking to take the steps towards recovery in the community."
	Effect of disease on extended community		3 (6%)	• "Childhood vaccinations are important because they provide partial or complete protection for the individual against consequences of diseases, and they provide the societal benefits of creation or maintenance of herd immunity, prevention of disease outbreaks, and reduction in health care costs."
	Environ-mental		3 (6%)	• "In children with elevated BLL, additional measures are supposed to be taken (although, as mentioned, some of the funding has been cut due to resistance from immigrants). A BLL >15mcg/dL should warrant a home visit and questioning about potential lead sources and children's practices…"
	Functional status of the elderly		1 (2%)	• "We spoke first about the issue and she agreed that she had seen many elderly spouses (again, mostly women) really struggle with taking care of their disabled partners. She believed that the biggest problem was just getting the caregivers to admit that they needed a hand. Often they don't know where to ask, but more importantly, they don't know how to ask."
	Literacy		1 (2%)	• "Dr F believed that there was a huge need to encourage reading. He indicated that the head librarian was full of enthusiasm and might have ideas about how we could help."
	Medication adherence		1 (2%)	• "He had been unable to find employment and has been living off his savings for the past two months. He now has only 10 days of his meds remaining and cannot afford to pay the monthly cast of both his rent and medications."
	Mental health issues	Focus either on the issue or affected population	2 (4%)	• "It is my opinion then that the answer to this problem does not lie in shipping more patients with dementia off to extended care facilities. There are obvious gaps in this solution (such as when there are no spouses or relatives to administer care) but in an ideal world, most patients with dementia will be cared for in the home."

(continued on next page)

Table 1

(continued)

Code		*Clarification*	*# (%) of Projects (n=47)*	*Representative Quotes*
	Nutrition		4 (9%)	• "Following the observation, a one-page informational handout was distributed to all students in the cafeteria for them to look through over lunchtime and for them to read at home. The handout discussed recommended nutritional and exercise guidelines for adolescents."
	Oral health		3 (6%)	• "Alaska native children experience tooth decay at a rate 2.5 times greater than the general US population…[one] cultural practice is premastication of food by caregivers for babies and young children, promotes the transfer of S. mutans, a cariogenic bacteria."
	Patient education		25 (53%)	• "To help with smoking cessation counseling I found a great pamphlet produced by Concord Hospital that provides…information including reasons to quit, benefits received by quitting, methods to aid in quitting…"
	Prevention of disease		22 (47%)	• "The hospital even has an entire staff devoted to its Health Promotion/Disease Prevention (HP/DP) Program."
	Provider education		14 (30%)	• "A two-page pamphlet produced by AAFP. This pamphlet presented clear, pertinent information in a concise manner. I supplied my preceptors with this pamphlet and an eight-page award-winning pamphlet produced by the VA in Minneapolis."
	Risk for disease in underserved		2 (4%)	• "Since the tragic death of a 2-year-old Sudanese child from lead paint ingestion in Manchester 5 years ago, there has been more awareness about lead intoxication, especially in low-income and immigrant populations. With the recent influx of refugees to Concord, NH, this has become a more prominent health concern than previously."
	Screening for disease		1 (2%)	• "The American Cancer Society (ACS) recommends routine screening via PSA and digital rectal exam (DRE) yearly, beginning at age 50, to men who have at least a 10-year life expectancy."
	Sexual education		3 (6%)	• "We assisted the AIDS Help members in their HIV prevention campaign by helping provide safe sex education, distributing of condoms, encouraging condom use, and providing medical counseling on HIV-related health questions."
	Smoking cessation and secondhand exposure		3 (6%)	• "Smoking is associated with a lower level of education. 42.4% of people in the state of New Hampshire in 2002 who had not completed high school or received a GED smoked, while only 10.4% of college graduates smoked. As a community where 88.6% of citizens completed high school compared to a national average of 80.4%, smoking should be lower in Concord than the rest of the country."
	Specific disease		7 (15%)	• "I worked with four different family physicians during my clerkship, and 100% of their male patients aged 50 and over were receiving annual PSA screening… All four preceptors mentioned that they needed to do a better job of helping their patients make an informed decision when it came to PSA screening. I decided to make that the focus of my community project."
	Substance abuse		8 (17%)	• "We began with a quick survey to assess (1) the exposure that these children had to the substances that we were going to discuss and (2) the attitudes that they held about the use of alcohol, marijuana, and methamphetamine."
	Vaccination status		4 (9%)	• According to the last CDC audit, 80% of children under five were up to date on all vaccinations, and 82% of children under two were up to date on all vaccinations. This is in line with the national average… but not in line with the goals set in "Healthy People 2010."
Skills utilized	Database	Explicitly reported use of a database for information	40 (85%)	• "As of the census of 2000, there were 25,478 people residing in Key West. Key West is 55% male, compared to 49.1% of all Americans. Over 15% of Key West residents (versus 11% US residents) are foreign born and about 25% (versus 18%) speak a language other than English at home. The median income per household was $43,021 and the per capita income for the city was $26,316, both comparable but slightly better than the US averages..."
	Public health rec-omendations	Current recommen-dations for selected area of study	12 (26%)	• "I recorded and reported the well-child checks attended based on the standard set by the American Academy of Pediatrics, stating that well-child checks should occur at 1, 2, 6, 9, 12, 15, 18, 24, 36, and 48 months. Additionally, vaccination compliance rates were calculated following CDC recommendations."
	Created study tool	Survey, question-naire, etc.	8 (17%)	• "I performed a survey of patients asking whether they have been without health insurance in the last 3 years, and if so, what factors contributed to their not having insurance." • "We began with a quick survey to assess (1) the exposure that these children had to the substances that we were going to discuss and (2) the attitudes that they held about the use of alcohol, marijuana, and methamphetamine"

(continued on next page)

Table 1

(continued)

Code		*Clarification*	*# (%) of Projects (n=47)*	*Representative Quotes*
	Created implementation tool	Presentation, pamphlet, etc.	13 (28%)	"I decided to focus my efforts on adults, particularly new parents and parents of adolescents to enlist their services in helping combat obesity to focus the entire family in staying lean and trim. I gathered as much recent data on prevalence of obesity in various racial/ethnic groups living in the US…and made a four-page pamphlet specifically guided at parents of Native American children and adolescents. I arranged the pamphlet in a question and answer format and used the statistics and risks of obesity to grab the attention of my audience before guiding them to the real purpose, what to do if you suspect your child is overweight or obese. Some simple suggestions were offered for improving eating habits, guidance on exercise, and where to get additional help if needed."
	Discussion of quality improvement		38 (81%)	• "I decided to observe the habits of those ninth through 12th grade students who ate lunch prepared by the school. Following the observation, a one-page informational handout was distributed to all students in the cafeteria for them to look through over lunchtime and for them to read at home. The handout discussed recommended nutritional and exercise guidelines for adolescents. I followed this intervention with a follow-up observation approximately 1 week later to determine if minor interventions during lunchtime could meaningfully impact the selection of fruits, vegetables, and dairy products by students."
	Discussion of public health/ ways to improve		46 (98%)	• "In speaking with the people involved with lead, housing, refugee populations, and health care in NH, as more African immigrants need housing in Manchester, Concord, and surrounding areas, especially those with malnutrition, lead intoxication will continue to be an issue that needs addressing. The recent articles in JAMA/MMWR and CDC all testify that lead poisoning in children, especially those of refugee origin, needs attention."
	Implementation of improvement after researching the issue		22 (47%)	• "the Just Move It 5K run and 3K walk was scheduled in Tuba City in a week. The HPDP was anticipating over 300 runners to participate, young and old alike. I arranged to set up a table near the registration tent and aimed at attracting as many participants as I could. My strategy to ensure a good turnout was to measure participants' height and weight and calculate BMIs on the spot. I created a "how to calculate my BMI" pamphlet and provided various handouts from the office of the Surgeon General on obesity/weight loss and suggestion on how to supplement a diet with more fruit and vegetables."
	Resources identified	Existing resources within the community	33 (70%)	• "Many of the city's public health facilities and outreach programs are based with the community health center, homeless shelter, the Department of Health, and a food pantry all within walking distance of one another. This is by design … as most of the families and individuals rely on the Health Center for health care live locally, and many don't have access to reliable transportation."

the confines of a third-year clerkship is a daunting task. Though the mission is sometimes undertaken, little has been written about the effectiveness of these curricula. At DMS, students completed a community health assessment project, concluding with a presentation and paper. This study demonstrated that virtually all students completed the core aims of the project. It also demonstrated that students could complete many of the steps in the implementation of COPC as defined by the IOM.[18] Each of the community health assessment projects fulfilled at least the first two steps (defining a community and identifying a specific health issue or problem), and more than half accomplished the third step (modifying care to address that problem) through an implementation. No projects were able to extend their scope to evaluation or monitoring of the change (the fourth step).

The study also shows that within the confines of a 7-week core family medicine clerkship, students can attain a more thorough understanding of COPC. It is worth noting that while students were free to choose their own topic and population, the majority of students chose to work with populations they described as poor and/or underserved, with more than half assessing communities of low socioeconomic status. Project topics, though diverse, often had a component of education, focusing on either patient or provider. A vast majority of the projects focused on quality improvement, most students demonstrated use of a database, and more than half carried a project far enough to implement an improvement in the community they studied.

COPC has been described as "an investment in the community and in a practice that restores the social contract between medicine and society."[19] This notion of responsibility for improving the health of populations as well as individuals is increasingly a focus of medical education.[20] This study describes some specific experiences, knowledge, and skills that students might gain

in a COPC project that could be useful in their future practice. Researchers have found that physicians who attended medical schools with a focus on COPC gain skills and perform better in practice on a number of parameters, including continuity of care,[21] professionalism, and communication skills.[22]

As with any study, there are limitations inherent in the design of this study. Because research subjectivity could be an issue and the papers were reviewed by only one researcher, emergent themes were assessed by multiple reviewers. For each emergent theme, criteria were set minimizing the room for subjective interpretation. Additionally the number of papers reviewed spanned only 1 year's worth of projects. A more lengthy review could help eliminate the influence of characteristics unique to this one class.

Based on the findings of this study, the family medicine clerkship has initiated some steps to further understand and specify the purpose and effects of the community health assessment assignment. Content analysis of student papers from the 2007–2008 academic year is now underway. This process is being expanded to map student topics to the goals of Healthy People 2010,[23] with an eye to understanding how closely student interest is related to national priorities.

Also, as previously noted, although acquisition of new skills was not a defined goal of the community assessment, many students demonstrated use of such skills in their projects—particularly quality improvement skills. Given that they accomplished this without explicit goals or curricular information about the best and most appropriate ways to do so, there is inconsistency in project design and implementation. Consideration of these findings may result in an expansion of goals, guidelines, and curriculum to shape student project choices, yet still allow for self-directed learning.

Conclusions

This study found that community health assessments provide a practical way for students to gain more than just the explicit goals of learning but also a greater conceptual meaning of COPC through self-directed projects. This methodology can be an effective model for education of an expansive topic such as COPC in a relatively short time span.

Acknowledgments: The authors thank Russell Jones, MD; Karen Schifferdecker, PhD; and M. Scottie Eliassen, MS, for their assistance in reviewing the coding scheme.

This study was previously presented at the Society of Teachers of Family Medicine 2007 Northeast Regional Meeting, Pittsburgh, Pa.

Corresponding Author: Address correspondence to Dr Pipas, Dartmouth Medical School, Department of Community and Family Medicine, 1 Medical Center Drive, Lebanon, NH 03756. 603-650-4141. Fax: 603-650-4090. Catherine.F.Pipas@Dartmouth.edu.

References

1. Longlett SK, Kruse JE, Wesley RM. Community-oriented primary care: historical perspective. J Am Board Fam Pract 2001;14:54-63.
2. Connor E, Mullan F. Community-oriented primary care: new directions for health services delivery. Washington, DC: National Academy Press, 1983.
3. Nutting PA, Wood M, Conner EM. Community-oriented primary care in the United States. A status report. JAMA 1985;253:1763-6.
4. Nutting PA. Community-oriented primary care: a promising innovation in primary care. Public Health Rep 1985;100:3-4.
5. Foreman S. Social responsibility and the academic medical center: building community-based systems for the nation's health. Acad Med 1994;69:97-102.
6. Dobbie A, Kelly P, Sylvia E, Freeman J. Evaluating family medicine residency COPC programs: meeting the challenge. Fam Med 2006;38:399-407.
7. Gavagan T. A systematic review of COPC: evidence of effectiveness. J Health Care Poor Underserve 2008;19:963-80.
8. Carufel-Wert DA, Younkin S, Foertsch J, et al. LOCUS: immunizing medical students against the loss of professional values. Fam Med 2007;39:320-5.
9. Elam CL, Sauer MJ, Stratton TD, Skelton J, Crocker D, Musick DW. Service learning in the medical curriculum: developing and evaluating an elective experience. Teach Learn Med 2003;15:194-203.
10. Hunsaker ML, Glasser ML, Nielsen KM, Lipsky MS. Medical students' assessments of skill development in rural primary care clinics. Rural Remote Health 2006;6:616.
11. Paul TJ, Mitchell A, Lagrenade J, McCaw-Binns A, Falloon D, Williams-Green P. More questions than answers? Expanding students' reflections from a community health experience. Educ Health (Abingdon) 2006;19:244-50.
12. Unverzagt M, Wallerstein N, Benson JA, Tomedi A, Palley TB. Integrating population health into a family medicine clerkship: 7 years of evolution. Fam Med 2003;35(1):45-51.
13. Wolff M, Young S, Maurana C. A senior elective: promoting health in underserved communities. Fam Med 2001;33(9):732-3.
14. Cronholm PF, Margo K, Bazelon G, Bream K, Bennett IM, Barg FK. Student attitudes: potential barriers to implementing a community medicine field activity. Fam Med 2009;41(1):22-7.
15. Altheide D, Gray B, Janisch R, et al. News construction of fear and victim: an exploration through triangulated qualitative document analysis. Qualitative Inquiry 2001;7:304-22.
16. Crabtree B, Miller W. Doing qualitative research: research methods for primary care, volume 3. Thousand Oaks, Calif: Sage Publications, 1992.
17. Shortage designation: HPSAs, MUAs, and MUPs. 2008. htp://bhpr.hrsa.gov/shortage/index.htm. Accessed March 11, 2009.
18. Connor E. Community-oriented primary care: new directions for health services delivery. Washington, DC: National Academy Press, 1983.
19. Boumbulian P, Smith D, Anderson RJ, Hedl JJ. Community-oriented primary care: an emerging health promotion strategy. J Allied Health 1991;20:145-51.
20. McCurdy L, Goode LD, Inui TS, et al. Fulfilling the social contract between medical schools and the public. Acad Med 1997;72:1063-70.
21. Tamblyn R, Abrahamowicz M, Dauphinee D, et al. Effect of a community-oriented problem based learning curriculum on quality of primary care delivered by graduates: historical cohort comparison study. BMJ 2005;331:1002.
22. Zuniga ML, Sidelinger DE, Blaschke GS, et al. Evaluation of residency training in the delivery of culturally effective care. Med Educ 2006;40:1192-200.
23. Healthy People 2010: understanding and improving health. In: Services USDoHaH, second edition. Washington, DC: US Government Publishing Office, 2000.