

MULTIDISCIPLINARY/INTERDISCIPLINARY EDUCATION

## **Evaluation of a Required Statewide Interdisciplinary Rural Health Education Program: Student Attitudes, Career Intents and Perceived Quality**

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**ABSTRACT** **Introduction:** *A shortage of healthcare providers in West Virginia led to the creation of a statewide, community-based program with a required three-month rural experience for most state-sponsored health professions students. Project Description:* Initiated using funding from the W. K. Kellogg Foundation and expanded using both state funds and Area Health Education Center support, the West Virginia Rural Health Education Partnerships (WVRHEP) program impacts institutions of higher learning, 50 counties, and 332 training sites, and all students in state-funded health professions schools. A longitudinal database has been constructed to study program effects on students' reported attitudes, service orientation, and career intents.

**Methods:** *Baseline data are collected from medical students, and students in all disciplines provide feedback on rotations and information about career intents, social responsibility, and attitudes towards rural practice.*

**Results:** *Data indicate an association between perceived quality of the rural experience and increased interest in rural health, social responsibility and confidence in becoming part of the community. Medical students may tend to rate social responsibility higher after completion of the first rural rotation. Students who anticipate practice in smaller towns also tend to rate the quality of the rotation higher, to anticipate careers in primary care, and to acknowledge social responsibility.*

**Conclusion:** *As WVRHEP program graduates who have completed these surveys enter practice, both personal and community-specific program characteristics may be identified which strengthen interest in rural practice. The predictive validity of intermediate outcomes of attitudes and career intents in forecasting the ultimate outcomes of recruitment and retention may be studied.*

**KEYWORDS** *Program evaluation, rural curriculum, rural health education, rural recruitment, social responsibility, student careers intentions.*

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## Introduction

The national shortage of healthcare providers in rural areas has been persistent despite the growing number of physicians. Rural areas are generally underserved with only 9% of physicians available to serve almost 20% of the US population (Jolly & Hudley, 1998). The size of the future rural physician workforce may be further compromised, because medical students tend to develop less favorable views of primary care as they progress through medical school (Zinn, 2001) and increasingly choose non-generalist specialties (American Academy of Family Physicians, 2004). Many educators and policy-makers believe that major curricular reforms emphasizing primary care (Campos-Outcalt *et al.*, 1995; Tippets & Westpheling, 1996) and community-based training will be efficacious in bolstering the number of physicians serving in rural areas (Richards & Henry, 1993; Pathman, 1996; Richards, 2001).

Some factors cited in the literature as being predictors of physician selection of rural practice include: having grown up in a rural/underserved area; having a strong interest in rural practice when beginning medical school; being male; and choosing a senior year rural family practice preceptorship (Xu *et al.*, 1997; Rabinowitz *et al.*, 2001). A rural educational experience has been reported to increase students' favorable attitudes toward rural affiliations (Woloschuk, 2002). A tendency for student perception of increased social responsibility (not statistically significant) has been reported after a rural community clerkship (Potts, 1994). While not predicting specifically for rural practice, a service orientation or perception of social responsibility of medical students predicts for the generalist careers (Kassebaum & Szenas, 1994; Madison, 1994; Martini *et al.*, 1994; Ellsbury *et al.*, 1996; Kassebaum *et al.*, 1996; Schubot *et al.*, 1996) that can lead to rural practice.

A variety of educational initiatives have been devised to address the chronic shortage of rural healthcare workers. These initiatives have primarily been rural training experiences for trainees, with some programs offering a special admissions process and/or a separate rural track (Bland *et al.*, 1995; Rosenthal *et al.*, 1998; Blackman, 2001). The literature supports the presumption that long-term, intensive, multi-faceted curricula in primary care, rural and underserved settings will be found effective (Pathman & Riggins, 1996), but most studies have had little accounting for pre-existing characteristics and interests, and little is known about educational factors affecting career choices (Campos-Outcalt *et al.*, 1995; Pathman, 1996). A longitudinal tracking system has been reported that involves several medical schools and has the potential to track practice sites and to correlate this information with student and program characteristics (Rabinowitz *et al.*, 1999).

There is some evidence that community-based training with medically underserved populations and primary care role models living and practicing in underserved communities can reinforce and guide students' interests to serve rural communities (Tippets & Westpheling, 1996). In order to promote this

attitude that practicing in a medically underserved area could be rewarding, Pathman & Riggins (1996) suggest that favorable attitudes toward underserved area practice may be enhanced when students spend more time in these areas.

The lack of physicians in rural areas is a critical concern for West Virginia (WV), and could have a negative impact on the health of its population. Approximately 23.6% of West Virginians live in primary care Health Professional Shortage Areas, compared with 17.3% nationally, and the physician/population ratio is lower (180 vs. 198 per 100 000) (National Center for Health Workforce Information and Analysis, 2001). WV has an increased prevalence of many diseases and a higher rate of patients who state that they have difficulty seeing a provider due to cost (West Virginia County Health Profiles, 2000). A community-based rural curriculum for healthcare discipline students was thought to be of value in orienting trainees to future rural practice and to increasing the availability of health care in rural WV. The West Virginia Rural Health Education Partnership (WVRHEP) was designed to address these concerns (Carlton & Weston, 1997). This article describes the statewide WVRHEP training program and its structure for collecting student feedback regarding rural clinical experiences; correlation of selected outcomes with other variables for healthcare discipline students; and pre-post testing of selected outcomes for medical students.

## **Project Description**

In 1991, the WV legislature addressed health professional shortages and rural health disparities by building a community-based rural health training system. Under the Rural Health Initiative Act, the state chose to expand the rural training initiated in the state through the Kellogg Community Partnerships Initiative and, in 1995, formally integrated this expansion with the Kellogg Initiative to form WVRHEP. Financial support from the WK Kellogg Foundation and the state legislature was used to build a statewide infrastructure of community-based training sites in rural communities, and to make changes within the academic institutions to emphasize rural primary care and inter-disciplinary clinical training at the community level. In 2001, when WV received its Area Health Education Center (AHEC) grant, it entered into a partnership with WVRHEP. WVRHEP shares AHEC's commitment to serve the healthcare needs of underserved populations, seeking to increase the numbers of health professionals in rural communities and linking health professions education to dynamic community-based recruitment and retention activities.

Students from seven state institutions of higher education (public and private) and 10 health profession disciplines (clinical psychology, dentistry, dental hygiene, medicine, nursing, pharmacy, occupational therapy, physical therapy, physician assistant and social work) participate in the WVRHEP and AHEC

programs through partnerships with rural organizations and community leaders. These rural organizations provide faculty/preceptors, learning resources and technical support for the students. Today, WVRHEP's infrastructure serves rural areas in 50 of WV's counties through 12 regional partnerships, each with its own board. The joint effort of the WVRHEP and AHEC programs will soon enable WV to offer training opportunities in medically underserved communities in all 55 counties. Within these 12 consortia, 332 training sites serve as partners, 215 of which are located in communities with a federal designation as an underserved area or serve primarily underserved populations. In addition to private physician offices, these training sites include 28 community health centers, 32 federally qualified health centers, 29 rural health clinics, 30 small rural hospitals, 25 dental offices, 37 pharmacies, 12 county health departments, 20 physical therapy agencies or rehabilitation centers in underserved areas, and 17 county boards of education or school systems.

Since 1996, most of WV's state-supported health professions students have been *required* to spend at least 12 weeks in a rural setting. The exceptions include dental and dental hygiene students who spend 6 weeks in a rural setting and students in medical technology and occupational therapy programs that are still in the process of identifying appropriate rural sites and preceptors. As part of their rural training, students spend 20% of their time in community service and interdisciplinary activities. Community service includes participation in activities such as tobacco cessation, diabetes support groups, nutrition and life style education, and health fairs. Interdisciplinary activities primarily consist of an interdisciplinary seminar held 2–4 times per month at the rural site.

An evaluation of the multi-faceted WVRHEP effort is complex. The effects of WVRHEP on provider recruitment and retention in rural WV are the ultimate outcome for program evaluation, and data collection allows measurement of recruitment and retention. State databases regarding practice location of graduates indicate that since 1991, 142 physicians who have graduated from the program have entered rural WV practice (West Virginia Higher Education Policy Commission, 2003). However, additional data are needed to help us to understand the extent to which specific individual characteristics or programmatic factors influence choice of practice location, and to evaluate the predictive validity (Renger & Meadows, 1994) of individual characteristics and reported experiences in forecasting intent for rural practice. Since 2001, we have used an accumulating online database to assess intermediate outcomes of students' reported attitudes, service orientation, and career intents in a longitudinal fashion, and to study correlates of these intermediate outcomes.

## Methods

The data analyzed for this report covered the period from initiation of online questionnaires in January 2001 to February 2004. Baseline data questionnaires

(BDQ) were completed by 907 medical students, usually during their second year, from the state's three medical schools (two allopathic and one osteopathic). At the time of initiation of the evaluation in 2001, third- and fourth-year medical students also had an opportunity to complete the BDQ, regardless of their WVRHEP experience. A post-rotation questionnaire, the student evaluation of rural field experience (SERFE), was completed by 1360 students in 10 disciplines from seven institutions of higher learning. Of the 907 medical students who completed a BDQ, 620 had also completed a SERFE.

The questionnaires queried student attitudes on curricular components, overall rotation quality, clinical experiences, career intents, community activities and social obligation. In addition, the medical student BDQ queried perceived "rural hometown". Selected entries were regarded as intermediate outcomes: interest in rural health, confidence in becoming an active part of the community, importance of meeting the unique needs of the poor, and anticipated population category of practice town. Attitudinal responses were quantified on ordinal scales with three to six possible choices. Response to each questionnaire item was voluntary and not all students answered all queries. The questionnaire responses were accumulated in an electronic database and combined with additional demographic information available for the students.

With the accumulated database, it was possible to study correlations of outcomes with selected demographic and attitudinal factors. Correlation analyses were performed by use of ordinal logistic regression and significant predictors of an outcome response were arranged in summary tables. Fewer than ten responses were present for four disciplines; due to the low number of responses, these were eliminated for correlation analyses where discipline was entered as a possible predictor of a response. Due to the longitudinal nature of the database, it was also possible to study trends in student attitudes and intents over time, for example medical student pre-post testing as is presented in this article. Of the 620 medical students who had completed both a BDQ and SERFE, 279 had no previous record of WVRHEP rotation experience and had completed the BDQ at least 28 days prior to completion of the SERFE. Pre-post analyses were performed on these data by use of the Wilcoxon signed rank test. The level of significance for statistical testing was 0.05. The JMP statistical software package (SAS Institute Inc., 2001) was used for data analyses.

## **Results**

The response rate for the SERFE was 73% (1360 of 1872). Seventy-two percent of respondents from various disciplines rated the overall quality of the rotation as "very good" or "excellent".

After their rotations, respondent students replied to, "Did your rural rotation increase, decrease, or leave unchanged your interest in rural health?".

Table 1 shows a summary of results of significant correlation, found by ordinal logistic regression procedures, with this item for 568 medical students. Rating for increased interest in rural health was positively associated with higher rating for each of the ordinal variables: overall quality of the rural rotation, planning to live in WV, planning to practice in a smaller town, and planning to have a practice accessible to the indigent. The student's medical school was also a predictor of this interest, with a variation from 30–49% for a response of increased interest among the three medical schools. An indication of increased interest in rural health also positively correlated with the indication on the BDQ that the student had a “rural” hometown.

Table 2 shows the correlates for 549 medical students for “anticipated practice in a smaller town”. Among the three medical schools, students showed a variation from 2–4% in choosing the lowest population category, “less than 2500” and a variation from 11–23% choosing the highest, “greater than 100 000”. Students who rated smaller town practice highly were more likely to say they had a rural hometown and to anticipate primary care practice. There

**Table 1.** Summary table of analyses for significant factors found to be predictive of reported medical student ‘increased interest in rural health’ after the first rotation

Factor	<i>p</i> -value
Higher rating for overall quality of rotation	<0.01
Plan to live in WV	0.02
Anticipated practice in a smaller town	<0.01
Higher anticipated accessibility of practice to the indigent	0.03
Specific WV medical school	0.01
“Rural” home town	0.04

**Table 2.** Summary table of analyses for significant factors found to be predictive of reported medical student ratings on ‘anticipated practice in a smaller town’ after the first rotation

Factor	<i>p</i> -value
Specific WV medical school	<0.01
“Rural” home town	<0.01
Anticipated primary care career choice	<0.01
Higher rating for overall quality of rotation	0.04
Plan to live in WV	<0.01
Higher anticipated accessibility of practice to the indigent	<0.01
Increased interest in rural health	<0.01

were positive correlations of numerical ratings between intent for smaller town practice and ratings for each of the listed ordinal factors (Table 2).

Table 3 shows correlates for the outcome of “confidence in becoming an active part of the community” for 1314 students of various disciplines after the first rotation. Confidence ratings correlated positively with ratings for the overall quality of the rotation and with plans to practice in a smaller town. The “confidence” rating varied significantly by discipline, with nurse practitioner students most likely (66%) to give the highest rating of “very confident”.

Table 4 shows correlates for “importance in meeting the unique needs of the poor” given by various disciplines after the first rural rotation. Females tended to give a higher rating to this importance. There was a difference among disciplines in rating of this importance, with nurse practitioners most likely (98%) to give the highest rating. There was a positive association of rating of this importance and the indication of increased interest in rural health after the rotation.

Longitudinal testing (BDQ vs. SERFE) was done for the intermediate outcomes. One outcome, the perceived importance of meeting the unique needs of the poor, was statistically significantly changed for the group of 279 medical students who met the criteria for pre-post testing ( $p < 0.05$ ). There was an overall trend toward an increase in the rating of this variable after a rural rotation, in comparison with the rating given on the BDQ.

**Table 3.** Summary table of analyses for significant factors found to be predictive of reported healthcare discipline student “confidence in becoming an active part of the community” after the first rotation

Factor	<i>p</i> -value
Higher rating for overall quality of the rotation	<0.01
Anticipated practice in a smaller town	<0.01
Discipline	<0.01

**Table 4.** Summary table of analyses for significant factors found to be predictive of healthcare discipline student rating on “importance of meeting unique needs of the poor” after the first rotation

Factor	<i>p</i> -value
Female gender	<0.03
Discipline	<0.03
Increased interest in rural health	<0.01

## Discussion and Conclusions

The WVRHEP program substantially changed health professions education in WV and developed an infrastructure for community-based education of physicians and other healthcare providers, with the ultimate goal of enhancing recruitment and retention in rural WV. At present, it is possible to identify some individual or program characteristics correlating with selected intermediate outcomes that may predict for rural practice. This report adds to the body of literature on rural health professions training by describing a required statewide program and evaluation project for longitudinally tracking multidisciplinary attitudes, career intents, and career paths.

One of the preliminary program findings, a statistically significant increase in students' reported perceptions of a social responsibility parameter after a rural rotation, also makes a contribution in adding to the small body of literature on this subject. The programmatic value of this statistical finding is not yet known. Consistent with prior reports (Tippets & Westpheling, 1993; Schubot *et al.*, 1996), female gender was a predictor for increased perceptions of social responsibility. The increased interest in service to the indigent population seen between the BDQ and SERFE data may indicate that rural experiences can have an impact on students' understanding of the importance of serving this segment of the population. It may be speculated that increased awareness of social responsibility, correlated with primary-care career selection, can help to counter the trend away from primary-care specialization found during medical student matriculation. The finding of an association between perceived quality of the rural experience and increased interest in rural health supports the importance of providing an educationally rewarding experience.

The finding of an association between a "rural" hometown and interest in rural health supports earlier research. WVRHEP data indicate an association of perceived quality of the rural experience with increased interest in rural health and rural practice. One selected indicator for perceived social responsibility, anticipated accessibility of the practice to the indigent, was also associated with increased interest in rural health, and with intent for practice in smaller towns.

The current study is limited to self-reported attitudes and values. Program evaluations have contributed toward changes in the rural curriculum. The WVRHEP program will continue to track student reported attitudes and career intents as they progress through their various curricula, allowing longitudinal analyses of these data. Later, tracking of practice location of program graduates will be possible and these combined data will allow an assessment of WVRHEP effects on recruitment and retention, the correlation of stated intents and attitudes with ultimate outcomes and the efficacy of using intermediate outcomes in prediction of rural recruitment and retention.

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