

# Relating Medical Students' Knowledge, Attitudes, and Experience to an Interest in Geriatric Medicine

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**Purpose:** This study examined medical students' interest in geriatrics: Are knowledge, positive attitudes, and prior experience with older adults associated with an interest in geriatric medicine?

**Design and Methods:** Entering University of Michigan medical students completed three surveys: the Revised Facts on Aging Quiz, the University of California at Los Angeles Geriatric Attitudes Scale, and the Maxwell-Sullivan Attitudes Scale. The students were also asked questions about their prior experience with older adults and their interest in geriatric medicine.

**Results:** The results indicate that incoming medical students have minimal knowledge about aging, moderately positive attitudes toward older adults, and low interest in geriatric medicine. Having more positive attitudes toward older adults ( $\beta = .28$ ) and having cared for older persons prior to medical school ( $\beta = .14$ ) were associated with greater interest in geriatric medicine. **Implications:** These findings suggest that interventions to increase the number of geriatric-oriented physicians should focus on influencing learners' attitudes through experiences in the care of older adults.

**Key Words:** *Prior experience, Practice preference*

In the coming decades, substantial growth is predicted for the segment of the population aged 65 and older (Administration on Aging, 2001). In addition, this age group will account for more than half of all health care expenditures (Cleary, Lesky, Schultz, & Smith, 2001). For two decades, groups such as the Association of American Medical Colleges (Executive Council-Association of American Medical Colleges, 1983), the Institute of Medicine (1993), the U.S. Health Resource Services Administration (U.S. Department of Health and Human Services, 1995), and the American Geriatrics Society (2000) have advocated for an increase in the number of physicians who are knowledgeable about and specially trained in caring for older adults. Unfortunately, the number of physicians trained and certified as geriatricians during the next 30 years is projected to decrease (Chiang, 1998). Instead, much of the care of older adults will be provided by physicians who may or may not have received training in the primary care, rehabilitation, long-term care, and postoperative needs of older patients (Penn, Smucker, & Logue, 2001; Reuben et al., 1971).

Despite the well-documented demographic imperative and projected health care needs, an increasingly large body of literature suggests that most medical students have little knowledge about aging, mixed attitudes about older adults and their care, and low interest in pursuing geriatric medicine as a career (Coccaro & Miles, 1984; Perrotta, Perkins, Schimpfhauser, & Calkins, 1981). Medical schools and their curricula have to address these issues in the training of physicians; that is, how can curricula be designed to improve the knowledge, attitudes, and skills related to the care of older adults? However, before this question can be answered, a better understanding of the relationships among student knowledge, attitudes, and experience is required. Previous research has shown that providing relevant knowledge alone is not sufficient for changing the attitudes and skills of medical students about older adults and their care.

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Instead, it is suggested that appropriate socialization—by means of training in multiple sites, varied experiences with well elderly as well as ill elderly adults, mentoring, and other innovative curriculum methods—is the more critical factor underlying improved knowledge, attitudes, and skills, and, in turn, greater interest in geriatric medicine (Adelman, Fields, & Jutagir, 1992; Deary, Smith, Mitchell, & MacLennan, 1993; Gold, Hadda, Taylor, Tideiksaar, & Mulvihill, 1995; Hartley, Bentz, & Ellis, 1995; Intrieri, Kelly, Brown, & Castilla, 1993; Knight, Knight, Gellula, & Holman, 1992; Linn & Zeppa, 1987; McAlpine, Gilhooly, Murray, Lennox, & Caird, 1995; Penn et al., 2001; Reuben, Fullerton, Tschann, & Croughan-Minihane, 1995; Sheffler, 1998; Ten Haken, Woolliscroft, Smith, Wolf, & Calhoun, 1995; Woolliscroft, Calhoun, Maxim, & Wolf, 1984).

Using baseline knowledge and attitudes of University of Michigan Medical School (UMMS) students who enrolled in 2001, this study examined the relationships among students' knowledge about older adults and aging, their attitudes toward older adults, their prior care experience, and their interest in geriatric medicine as a career upon entering medical school. Analyses were driven by two research questions: First, do the aging-related knowledge and attitudes of entering first-year medical students differ by prior care experience with older adults, age group they anticipate preferring to work with as physicians, or interest in geriatric medicine as a career? Second, are greater knowledge, more positive attitudes, and greater prior experience with older adults associated with a greater interest in caring for older adults or in a career in geriatric medicine?

On the basis of previous research on medical students and geriatrics, we expected to find that students would possess minimal knowledge and neutral attitudes about aging and older adults as well as little interest in geriatric medicine. We hypothesized, however, that increased aging-related knowledge and attitudes would be associated with greater prior contact with older adults and interest in geriatric medicine by the students.

## Design and Methods

### *Subjects*

In August 2001, 174 entering medical school students were introduced by medical school staff to the school's online examination system and asked to access a Web site and complete three aging-related knowledge and attitudes surveys as a computer exercise. The majority (89%) of the students completed all three online surveys, and nearly all (98%) completed at least one of the surveys.

The student respondents ( $n = 171$ ) were relatively evenly split between men and women (47% women and 53% men). The majority of the students identified themselves as Caucasian (60%), followed

by African Americans (10%), Chinese (9%), Indian-Pakistani (8%), Other Asian (5%), Hispanic (4%), Native American (1%), and Missing (4%). The average age of these incoming students was 23 ( $SD = 3$ ) years old, with a range from 20 to 40 years old.

### *Survey Instruments*

The students completed the Revised Facts on Aging Quiz 1 (FAQ1), a 25-item multiple-choice test of knowledge of aging (Palmore, 1998). For this study, the percentage correct score on the FAQ1 was used as the measure of student knowledge of aging and older adults. The students also responded to the University of California at Los Angeles (UCLA) Geriatric Attitudes Scale, a 14-item questionnaire on attitudes toward older adults and their care (Reuben et al., 1998). For these UMMS students, the scale was a reliable measure of their attitudes (Cronbach's  $\alpha = .69$ ). Finally, the Maxwell-Sullivan Attitudes Scale (MSAS) is a 27-item questionnaire that includes subscales on general attitude, cost-effectiveness, time and energy, therapeutic potential, and educational preparation attitudes toward medical care of older adults (Maxwell & Sullivan, 1980). In this study, the General Attitude subscale was used as a second measure of medical student attitudes. The MSAS subscale had a moderate level of reliability (Cronbach's  $\alpha = .56$ ) in this group of students. For both attitude scales, student attitudes toward aging were measured by using their responses on 5-point Likert-like scales that ranged from most positive to most negative attitudes.

The UCLA Geriatric Attitudes Scale and the MSAS General Attitude subscale were used to measure different dimensions of student attitudes about older adults. The UCLA Geriatric Attitudes Scale is a more global measure of an individual's attitude toward older adults and the care of older adults. The MSAS General Attitude subscale is a measure that focuses on the individual's attitude toward his or her provision of care to older adults.

In addition to completing the three surveys, the students were asked background questions about their relationships with older adults (both family and nonfamily members), experience caring for older adults, the age group they anticipate they will prefer to work with as physicians, and their overall interest in geriatric medicine as a career at this early point in their medical education. These questions were adapted from Wilderom and colleagues (1990).

### *Statistical Analysis*

*T* tests were used to determine differences in knowledge and attitudes by gender. An analysis of variance (*F* ratio  $p < .05$ ) and Tukey's honestly significant difference (global  $\alpha = .05$ ) were used to determine differences in knowledge and attitudes by ethnicity (using only categories with 10 or more

Table 1. Knowledge and Attitude Scores by Prior Experience Caring for Older Individuals

Measure	Prior Experience Caring for Older Individuals					<i>p</i> <sup>a</sup>
	None	A Little	Somewhat	A Lot	A Great Deal	
Facts on Aging Quiz (% correct)	36.5 ± 10.9 (34)	37.5 ± 15.5 (70)	37.7 ± 13.8 (29)	41.0 ± 6.7 (8)	40.0 ± 19.5 (9)	.92
UCLA Geriatric Attitudes Scale (range 1–5; 5=most positive)	3.7 ± 0.4 (34)	3.8 ± 0.3 (69)	3.7 ± 0.4 (29)	3.9 ± 0.3 (8)	4.0 ± 0.3 (9)	.11
MSAS General Attitude subscale (range 1–5; 1=most positive)	2.2 ± 0.5 (34)	2.0 ± 0.4 (70)	2.1 ± 0.4 (28)	1.7 ± 0.6 (8)	1.7 ± 0.3 (9)	.01 <sup>b</sup>

Note: Values shown are means ± standard deviations; subsample numbers are given parenthetically. UCLA = University of California at Los Angeles; MSAS = Maxwell–Sullivan Attitude Scale.

<sup>a</sup>One-way analysis of variance.

<sup>b</sup>The Tukey–Kramer honestly significant difference test indicated significant score differences between the students having “a lot” and “a great deal” of prior care experience and the students who have “none,” “a little,” and “somewhat” prior care experience.

students), prior care experience with older adults, patient age group preferred, and interest level in geriatric medicine. Because of the small number of students that indicated a preference to work with older adults, the “older adults” category and the “adults” category were combined for this and subsequent analyses. Similarly, only one student had a “very strong” interest in geriatric medicine; this response was included with the “strong” interest category for this and subsequent analyses. Pearson correlations were used to examine the relationships among the knowledge scores and the two attitude scales.

An ordinal regression analysis examined the relationship of gender, knowledge of older adults and aging, attitudes toward older adults, important past relationships with older adults, and prior care experience with older adults to predict age group preferred as a physician (an ordinal-level dependent variable).

Finally, a least squares regression analysis tested the relationship of gender, knowledge of older adults and aging, attitudes toward older adults, important past relationships with older adults, and prior care experience with older adults to predict level of interest in geriatric medicine as a career. Standardized regression coefficients (or standardized  $\beta$ s) were calculated to allow direct comparison of the association of the independent variables to the dependent variables.

## Results

### Experience With Older Adults

The majority of the student responders indicated that they had important relationships with older adults: 61% felt “close” or “very close” to their grandparents and 22% felt “somewhat close.” In addition, 69% reported that they had an important relationship with an older person who was not a relative. However, care experience with adults aged 65 and older was limited. More than two of

three respondents (70%) reported that they had “little” or no experience in caring for older adults.

### Career Preferences

Although most entering students indicated an interest in working with adult patients, only 2% preferred patients aged 65 and older, 16% preferred 19-to 24-year-old patients, and 46% preferred 25- to 64-year-olds. Further, only 4% expressed a strong or very strong interest in geriatrics as a career, and 30% indicated a moderate interest in geriatrics. The majority of the students indicated slight (44%) or no (21%) interest in geriatric medicine as a career.

### Knowledge About Aging and Older Adults

The scores on the FAQ1 indicated that the students were correct on only 37% ( $SD = 13.8$ ) of the statements that were presented to them. Correct responses ranged widely across items. For example, few (7%) of the incoming medical students knew that, of people over the age of 65, only 5% reside in long-stay institutions at any point in time. In contrast, 92% were correct that physical strength tends to decline with age. Students selected the item response “don’t know” an average of seven times ( $SD = 6$ ) in the 25-item quiz.

The students’ knowledge scores did not differ significantly by gender, ethnicity, prior care experiences with older adults (Table 1), age group preference (Table 2), or interest in geriatric medicine (Table 3).

### Attitudes Toward Older Adults

Students held moderately positive attitudes about older adults, as indicated by the scores from the two attitude scales. The students averaged a score of  $3.7 \pm 0.4$  on the UCLA Geriatric Attitudes Scale, which ranges from 1 to 5 with higher scores signifying more

Table 2. Knowledge and Attitude Scores by Age Group Preferred in Physician Practice

Measure	Age Group Preferred in Physician Practice				<i>p</i> <sup>a</sup>
	Children	Adolescents	Young Adults	Adults	
Facts on Aging Quiz (% correct)	37.9 ± 13.5 (35)	40.9 ± 16.8 (18)	38.0 ± 14.3 (24)	36.6 ± 13.7 (72)	.70
UCLA Geriatric Attitudes Scale (range 1–5; 5=most positive)	3.7 ± 0.3 (35)	3.7 ± 0.5 (18)	3.7 ± 0.4 (24)	3.8 ± 0.3 (71)	.27
MSAS General Attitude subscale (range 1–5; 1=most positive)	2.1 ± 0.4 (34)	2.2 ± 0.4 (18)	2.0 ± 0.6 (24)	2.0 ± 0.4 (72)	.17

*Note:* Values shown are means ± standard deviations; subsample numbers are given parenthetically. Age groups are defined as follows: children = 0–12 years; adolescents = 13–18 years; young adults = 19–24 years; adults = 25+ years. UCLA = University of California at Los Angeles; MSAS = Maxwell–Sullivan Attitude Scale.

<sup>a</sup>One-way analysis of variance.

positive attitudes toward aging. A significant difference was identified by gender, whereby women had a more positive attitude than men ( $3.8 \pm 0.3$  vs.  $3.7 \pm 0.4$ ,  $p = .007$ ). No differences in attitude were indicated by ethnicity, prior care experience with older adults (Table 1), or age group preference (Table 2). However, students with at least a moderate interest in geriatrics as a career held more positive attitudes than did students who had no or little interest in geriatrics (Table 3).

The MSAS General Attitude subscale is scaled in reverse; that is, lower scores on the range from 1 to 5 signified more positive attitudes. For this subscale, the average score of  $2.0 \pm 0.4$  indicated a moderately positive general attitude toward the medical care of older adults. As with the findings from the UCLA Geriatric Attitude Scale, students who were moderately interested in geriatrics as a career reported significantly more positive attitudes than did students with little or no interest in geriatrics (Table 3). There were no significant differences by gender, ethnicity, prior care experience with older adults (Table 1), or age group preference (Table 2).

### Correlation Between Knowledge and Attitudes

The scores on the FAQ1 were not significantly correlated with the UCLA Geriatric Attitude Scale ( $r = -.04$ ) or the MSAS General Attitude subscale

( $r = -.04$ ). The UCLA Geriatric Attitude scale and the MSAS General Attitude subscale were moderately correlated ( $r = -.60$ ), suggesting that although they measure overlapping attitudinal dimensions they also tap somewhat different concepts, thus justifying our use of both scales to measure attitudes.

### Correlates of Age Group Preferred in Physician Practice

As shown in Table 4, only one model variable (gender) was significantly associated with patient age group preference. The ordinal regression results indicate that women are more likely than men to prefer the older age group. However, the model's  $R^2$  of .03 ( $p = .10$ ) indicates that these measures explain little of the variance in student preferences.

### Correlates of Interest in Geriatric Medicine

The UCLA Geriatric Attitude Scale score was the most important correlate ( $\beta = .28$ ) of student interest in geriatric medicine (Table 5). More positive attitudes toward older adults were correlated with increased interest in a geriatric medicine career. Prior care experience ( $\beta = .14$ ) was the next most important variable (although of marginal significance,  $p = .10$ ); more experience in caring for older adults was associated with a greater

Table 3. Knowledge and Attitude Scores by Interest in a Geriatric Medicine Career

Measure	Interest in a Geriatric Medicine Career				<i>p</i> <sup>a</sup>
	None	Slight	Moderate	Strong & Very Strong	
Facts on Aging Quiz (% correct)	37.3 ± 16.6 (32)	36.8 ± 12.4 (66)	38.6 ± 14.0 (45)	41.3 ± 19.5 (6)	.84
UCLA Geriatric Attitudes Scale (range 1–5; 5=most positive)	3.6 ± 0.3 (32)	3.7 ± 0.4 (65)	3.9 ± 0.3 (45)	3.9 ± 0.2 (6)	<.01 <sup>b</sup>
MSAS General Attitude subscale (range 1–5; 1=most positive)	2.1 ± 0.4 (32)	2.1 ± 0.4 (66)	1.8 ± 0.4 (44)	1.8 ± 0.4 (6)	<.01 <sup>b</sup>

*Note:* Values shown are means ± standard deviations; subsample numbers are given parenthetically. UCLA = University of California at Los Angeles; MSAS = Maxwell–Sullivan Attitude Scale.

<sup>a</sup>One-way analysis of variance.

<sup>b</sup>The Tukey–Kramer honestly significant difference test indicated a significant score difference between the students with a “moderate” interest level and the students who had “none” or a “slight” interest level.

**Table 4. Relationship of Age Group Preferred in Practice to Gender, Attitudes, Knowledge, Older Relationships, and Care Experience**

Variable	Estimate	$\chi^2$	$p$	95% CI
Gender (woman = 1)	0.84	6.54	.01	0.20, 1.50
Facts on Aging Quiz (% correct)	0.01	0.74	.39	-0.01, 0.03
UCLA Geriatric Attitudes Scale	-0.58	1.19	.28	-1.64, 0.45
MSAS General Attitude subscale	0.63	1.84	.18	-0.27, 1.53
Important relationship (1-0) <sup>a</sup>	0.07	0.48	.89	-0.89, 0.80
Important relationship (2-1) <sup>a</sup>	0.11	0.35	.75	-0.57, 1.05
Prior care experience <sup>b</sup>	0.07	0.17	.68	-0.26, 0.40

Note: For this table,  $n = 147$ . The dependent variable was the age group preferred in physician practice;  $R^2(u) = .03$  and  $p = .10$ . CI = confidence interval; UCLA = University of California at Los Angeles; MSAS = Maxwell-Sullivan Attitude Scale.

<sup>a</sup>This variable was scored as an ordinal variable in the following manner: 2 if the student had a close or very close relationship with his or her grandparents *and* had an important relationship with a person over the age of 65 years, excluding parents or grandparents; 1 if the student had either one; and 0 if he or she had neither.

<sup>b</sup>The scoring for this variable ranged from 0 (none) to 4 (a great deal).

interest in geriatrics. The least squares regression model's  $R^2$  of .16 ( $p = .0009$ ) indicates that the variables of gender, knowledge, attitudes, and prior care experience account for a modest amount of the variance in student interest in geriatric medicine.

## Discussion

These baseline findings offer preliminary insights into the relationships among knowledge of, attitudes toward, prior contact with, and interest in the care of older adults by medical students entering the UMMS in 2001. The findings indicate that incoming medical students exhibit minimal knowledge about aging, moderately positive attitudes toward older adults, and low interest in geriatric medicine. Caring for older persons prior to medical school was associated with more positive attitudes toward older adults, which in turn were associated with intentions to enter geriatrics as a career, but not to preferentially care for older patients. Unfortunately, our instrument provided only a global measure of the students' prior experience in "caring for older adults" and did not delineate the many facets and nuances of care. In subsequent studies, a more detailed assessment of such care experiences will be needed to distinguish and measure the components of such activities. Further, knowledge about older adults was not associated with prior experience or career intentions to care for older adults.

These findings support the view that the most effective interventions to increase the number of

**Table 5. Relationship of Interest in Geriatric Medicine to Gender, Attitudes, Knowledge, Older Relationships, and Care Experience**

Variable	Estimate	Standardized $\beta$	$t$	$p$
Intercept	-1.15	0.00	-1.04	.30
Gender (woman = 1)	0.04	0.03	0.34	.73
Facts on Aging Quiz (% correct)	0.00	0.06	0.74	.46
UCLA Geriatric Attitudes Scale	0.61	0.28	2.83	<.01
MSAS General Attitude subscale	-0.15	-0.08	-0.79	.43
Important relationship (1-0) <sup>a</sup>	-0.01	0.00	-0.06	.95
Important relationship (2-1) <sup>a</sup>	0.08	0.05	0.59	.56
Prior care experience <sup>b</sup>	0.10	0.14	1.64	.10

Note: For this table,  $n = 147$ . The dependent variable was interest in medicine;  $R^2 = .16$  and  $p = .0009$ . UCLA = University of California at Los Angeles; MSAS = Maxwell-Sullivan Attitude Scale.

<sup>a</sup>This variable was scored as an ordinal variable in the following manner: 2 if the student had a close or very close relationship with his or her grandparents *and* had an important relationship with a person over the age of 65 years, excluding parents or grandparents; 1 if the student had either one; and 0 if he or she had neither.

<sup>b</sup>The scoring for this variable ranged from 0 (none) to 4 (a great deal).

geriatricians and physicians skilled in caring for older adults will focus on positively influencing learners' attitudes before and during medical school through meaningful experiences in caring for older adults. Perhaps one method of increasing the number of physicians who have a more positive attitude toward and a greater interest in the care of older patients is through the admissions process. Schools could proactively seek students with this type of experience or require incoming students to have experience with both community-dwelling elders and nursing home residents. Another approach is to provide such experiences during medical school.

These results supported previous findings that medical students have limited knowledge about aging and older adults. The multiple-choice format of the FAQ1 that was used for this study has been shown to be a more reliable test of knowledge than the prior true-false format used in other studies (Palmore, 1998). Although this more difficult format likely contributed to the low scores of entering UMMS students (37%), their scores were lower than the 55% correct for medical residents reported by Kramer and colleagues (Kramer, Damron-Rodriguez, Lee, & Wong, 2001). Because these are entering medical students, one would not expect them to know much about aging and older adults. Nonetheless, it does not appear that knowledge is associated with interest in geriatrics as a career. In a related manner, the knowledge level of these students was not significantly associated with their attitudes or their preferred patient age.

Both the UCLA and MSAS attitude scales suggest that the UMMS students entered medical school with relatively positive attitudes toward older adults—they were more positive than those reported for other health care providers. For example, the mean score of these students on the UCLA Geriatric Attitude scale was more positive toward aging than those of the first-year internal medicine and family practice residents described by Reuben and colleagues (1998). Similarly, the mean score on the MSAS General Attitude subscale was more positive than the mean score of first-year family practice residents reported by Maxwell and Sullivan (1980).

What is more important, however, is that their interest in geriatric medicine increased as their attitudes (as measured by both scales) became more positive. These baseline data cannot assess whether better attitudes increase interest, greater interest improves attitudes, or other factors influence both attitude and interest; nor can these data assess whether or how attitudes and interest will change over the course of students' medical education. Recent studies that have suggested that positive attitudes toward older adults and interest in geriatrics might actually decrease during medical school offer speculations but no conclusions on why these interests might deteriorate (Alford, Miles, Palmer, & Espino, 2001).

These findings have implications for medical curricula that aim to improve their students' knowledge, attitudes, and skills related to the care of older adults. In 2001 the UMMS implemented a comprehensive program funded by a Donald W. Reynolds Foundation grant that is aimed at expanding and enhancing the medical school's geriatrics education activities. The overall goal is to ensure that every medical student who completes her or his training at UMMS has meaningful educational experiences in geriatrics and has demonstrated competence in providing care for older adults. Although the goal is ambitious, it recognizes the fact that physicians in all specialties (with some exceptions, such as pediatrics) will increasingly care for older patients during the course of their careers. The medical school curriculum is being revised to include greater geriatrics content across all 4 years with required components in both preclinical and clinical phases of medical school education. The results from this study suggest that hands-on clinical experience is an essential element in this program and that additional efforts should focus on increasing students' direct contact with older patients.

Although the study's cross-sectional design and descriptive statistics limit our ability to offer firm conclusions at this early stage, the study's findings combined with the students' limited knowledge about aging but relatively positive attitudes about aging are signs that enhanced training in geriatric medicine is needed. Certainly, the limited strong interest by the majority of students in the care of

older adults contrasts sharply with the patient mix that most are likely to see in their future practices. However, the findings that most students (64%) indicate a preference for adult patients of any age and that a large minority (34%) report at least a moderate interest in geriatric medicine are promising. Future evaluations of the ongoing UMMS program will address the effects of the varied curriculum interventions aimed at increasing knowledge, improving attitudes, and enhancing skills of UMMS students in caring for their future older adult patients.

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