

**Prevention in Practice: Medical Student Attitudes  
Towards Preventive Care Services**

By

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CERTIFICATE OF APPROVAL

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## ABSTRACT

- Purpose:** Although behavioral risk factors such as smoking, lack of exercise, high-fat diet, and alcohol abuse cause tremendous health and economic burdens in the United States, and physicians are powerful motivators for patient behavioral change, practicing physicians do a poor job of providing clinical preventive services. To examine whether physicians are developing the attitudes and skills necessary for health promotion during their medical training, this study investigated medical student beliefs and practices regarding health promotion.
- Methods:** A cross-sectional study was conducted to evaluate attitudes of third- and fourth-year medical students at Oregon Health Sciences University (OHSU) toward health education and health promotion. Data were gathered by means of an anonymous, self-administered questionnaire. Linear regression modeling was used to determine factors that were independently associated with the likelihood of discussing health behavior with patients.
- Results:** While 94% of respondents strongly agreed that health promotion counseling is valuable to patients of all age groups, only 78% of respondents report always asking about smoking behavior, and less than 35% always ask about other behaviors. Women were more likely than men to respond that health behaviors were very important to the health of the average person, to report more confidence that patients would change their behaviors as a result of health education, and to report including discussion of health behavior in routine patient interaction. Other factors associated with the likelihood of discussing health behavior were feeling confident in counseling skills and feeling encouraged by preceptors to ask about behavior.
- Conclusions:** The time to affect physician behavior is during formal medical training. There is a significant gap between how medical students view health behavior and how they perceive their own counseling skills. This illuminates areas in which deficits in training exist. Specifically, what is needed is skills training, including the teaching of health education techniques, provision of actual or simulated counseling experience, feedback from patients regarding the effects of various counseling methods, and increased modeling of skills by preceptors. Provision of appropriate skills to effect changes in patient health behavior and demonstration of the effectiveness of health promotion counseling may lead to a greater emphasis on prevention and health promotion among practicing physicians in the future.



## INTRODUCTION

Deaths in the United States are most commonly due to heart disease, cancer, cerebrovascular disease, microbial infection (particularly pneumonia, influenza, and human immunodeficiency virus or HIV infection), unintentional injuries, chronic lung disease, diabetes mellitus, and chronic liver disease<sup>1</sup>. These are the pathophysiological conditions present at the time of death; they result from a combination of internal and external factors. Internal factors are largely genetic and cannot be easily changed. The external factors contributing to these diseases, on the other hand, all have some behavioral component and are therefore modifiable.

For example, cardiovascular disease is the leading cause of death in the United States, accounting for 41.5% of all deaths in 1995. Behavioral risk factors for cardiovascular disease include physical inactivity, a diet high in fat, being overweight, and smoking<sup>2</sup>. Risk factors for various cancers include smoking, dietary patterns, alcohol intake, and behaviors resulting in microbial infection, such as intravenous drug use (hepatitis B and C) or unprotected sex (HPV). Smoking, alcohol use, and misuse of firearms or motor vehicles can be implicated as external contributors for unintentional injuries<sup>2</sup>.

Analysis of the roles of various external factors reveals that the most prominent contributors to mortality in the United States are smoking, diet and activity patterns, use of alcohol and illicit drugs, microbial agents, sexual behavior, and injuries due to toxic agents, firearms, and motor vehicles<sup>3</sup>. Because these factors are modifiable, the deaths they contribute to are by definition premature. Calculation of the age-adjusted years of potential life lost to death before age 75 reveals the considerable impact of these diseases:

in 1997, 1.5 million years of potential life were lost to cancer, 1.2 million years lost to heart disease, 1.1 million years lost to unintentional injuries<sup>4</sup>.

Further, these deaths are usually preceded by significant morbidity and impaired quality of life, and are associated with considerable cost. The CDC reports that the total direct medical care cost of coronary heart disease, plus lost productivity attributed to it, was approximately \$100 billion in 1997<sup>2</sup>. Estimated medical care costs attributed to smoking alone total \$50 billion per year; a male smoker incurs approximately \$9000 more in medical costs over his lifetime than a male non-smoker, and a female smoker incurs approximately \$10,000 more than a female non-smoker<sup>2</sup>.

There is evidence that changing health behavior can have a dramatic effect on disease patterns. Data from the Nurses Health Study indicates that a combination of a healthy diet, moderate exercise, no smoking, and limited alcohol consumption can lower women's risk of heart disease by as much as 83%, and lower risk of stroke by 75%<sup>5</sup>. The CDC estimates that 35% of cases of coronary heart disease could be eliminated by increased physical activity alone, and that up to 20% more cases can be eliminated by reducing dietary fat by 1% to 3%<sup>2</sup>.

Based on such observations, activities emphasizing disease prevention have been implemented in a variety of settings. The federal government has increasingly emphasized improving national health and controlling costs through primary prevention strategies<sup>6</sup>. Managed care organizations and other physician employers are increasingly using delivery of preventive health services as a marketing tool and a standard by which to assess quality of care<sup>7</sup>. This has led to the development of guidelines for preventive

medical care, in which the physician is expected to deliver appropriate preventive care to all patients.

Data from the National Center for Health Statistics reveals that in a given year, approximately 80% of Americans have seen a physician at least once; 90% of Americans have seen a physician at least once in the past two years<sup>8</sup>. Additionally, data suggest that from the patient's perspective, individual care providers are powerful motivators for behavioral change<sup>9</sup> and should be providing counseling on such topics as nutrition, exercise, smoking cessation, and limiting alcohol and illicit drug consumption<sup>10</sup>.

Thus, physicians are in a strategic position to initiate the patient education process and reinforce public health education messages<sup>11</sup>. However, there is widespread agreement that practicing physicians do a poor job of providing these clinical preventive services<sup>9,12-14</sup>. Data from the National Center for Health Statistics reveals that, during routine medical checkups, only one-half of patients are asked about smoking, physical exercise, or alcohol use, and less than half are asked about diet. Less than one-third are asked about sexual behavior and use of illegal drugs<sup>15</sup>. Physicians themselves do not believe that they are providing adequate levels of preventive care<sup>16</sup>, and describe themselves as ill-prepared to give advice about specific behaviors<sup>17,18</sup>. A recent survey of 4756 physicians (age 45 years and younger) indicates that just 1 in 5 believe that their formal medical education prepared them to help patients modify health-impairing behaviors<sup>19</sup>.

In light of the fact that behavioral risks have become increasingly visible as underlying causes of preventable morbidity and premature death, and that patients expect their physicians to help them modify behavioral risk factors, it is striking that physicians

do not counsel patients on health behavior and consider themselves neither prepared to counsel patients nor effective in helping patients change their behaviors. One theory as to why so few patients are asked about health behavior is that physicians are not developing the attitudes and skills necessary for health promotion during their medical training<sup>6</sup>.

Medical educators agree that students acquire the knowledge, attitudes, and behaviors which shape their future practices during the clinical years of medical training. Information and procedures that are emphasized during these years determine the clinician's career-long approach to patient care<sup>6,20-23</sup>. Data suggests that medical schools are doing a good job of emphasizing certain preventive services, especially those that are procedure-oriented: Graduating medical students generally know immunization schedules, know when to order mammograms, and can perform Pap smears<sup>6</sup>.

However, the role of health promotion counseling during the clerkship is less defined. Little is known about how well medical schools prepare students to encourage health promotion among their patients, about medical students' perceptions of the role of health promotion in practice, or about whether medical students actually engage in health promotion in daily patient interaction. Given the growing importance of preventive health services, the exhortations to emphasize prevention in medical education, and the growing need for physicians to meet employer and consumer expectations by delivering such services, there is a clear need to investigate these attitudes and behaviors.

Thus, the goals of the present study were to (1) determine student beliefs regarding health promotion; (2) determine what proportion of students routinely gathers information on behavioral risk factors and counsels patients regarding risky behaviors; and (3) examine specific correlates between beliefs and actions. Information about

medical student beliefs and practices with respect to clinical preventive services may promote better understanding of the lack of preventive services provided by practicing physicians, and, if applied to curriculum development for medical schools, may provide the means for correcting this lack.

## **MATERIAL AND METHODS**

### **I. Overview**

A cross-sectional study was conducted to evaluate attitudes of third- and fourth-year medical students at Oregon Health Sciences University (OHSU) toward health education and health promotion. Data were gathered by means of an anonymous, self-administered questionnaire, completed by third- and fourth-year students during March, 2000. This distribution period was selected to coincide with a time when all students are scheduled to attend classes on campus (March Colloquia for third-year students, the "Transition to Residency" course for fourth-year students) to facilitate survey participation.

### **II. Study Participants**

The study population was limited to the 190 third- and fourth-year medical students comprising the classes of 2000 and 2001. This group was chosen because the curriculum during the third and fourth years of training is primarily hospital- and clinic-based, and the student's primary responsibility is patient care. Distribution of the survey in March 2000 ensured that each student had completed at least six clinical rotations, affording them the opportunity to begin developing beliefs and practices regarding

patient care. While students in years one and two of the curriculum do have patient contact, this is once-weekly and limited in scope. Thus, these students did not have enough clinical experience to be included in this study.

*a. Ethical issues*

Study participants consented to complete a paper questionnaire, during a time when they were required to be at the administration site for other purposes. Survey questions did not deal with any sensitive topic. Survey results cannot be linked to individual respondents. The research protocol was approved by the OHSU Institutional Review Board and the OHSU School of Medicine Curriculum Committee before administration of the survey, to ensure that the research was ethically acceptable by OHSU standards.

III. Data collection instrument

Students were asked to complete a two-page questionnaire containing four sections (see Appendix A). The first section (section I) included demographic information such as age, gender, career intentions, and previous public health training. In the second section (section II), respondents were asked to state their level of agreement with 6 general statements about health promotion. The third section (section III) consisted of two questions aimed at eliciting factors which would make students more likely to discuss health promotion with patients and identifying beliefs about who is responsible for educating patients about health behaviors. For these questions, each participant was asked to mark all responses that applied to him or her. The fourth section

(section IV) asked participants to indicate on a four-point scale how important they considered certain health behaviors, how often they included discussion of these behaviors in a routine health history, how prepared they felt to counsel patients regarding these behaviors, how confident they felt that patients would actually change their behaviors, and how often they were encouraged by their preceptors to discuss these behaviors.

The questionnaire is based on one developed in 1981 by Henry Wechsler, Ph.D. This questionnaire was selected because it has been used on several occasions to assess beliefs and attitudes of practicing physicians, and could thus provide a context for comparison<sup>17,18,24-26</sup>. The original questionnaire included 23 health behaviors, many of which were overlapping (avoid excess calories, eat a balanced diet, avoid foods high in saturated fats, avoid foods high in cholesterol) or redundant (eliminate cigarette smoking, eliminate cigar smoking, eliminate pipe smoking). To reduce respondent burden in this study, the list of health behaviors was reduced to 11. In addition, because the questionnaire was distributed to students rather than practicing physicians, a question was added regarding behavioral modeling (“How often are you encouraged by your preceptors...?”) to ascertain whether this was a factor in the decision to discuss or not discuss health behavior. The maximum time required to complete the questionnaire was 5 minutes.

The questionnaire was accompanied by a letter of introduction and a \$1 gift certificate redeemable at any of the OHSU Kobos Coffee locations as incentive to participate.

#### IV. Data collection procedure

The study was first announced via electronic mail to OHSU Medical School classes of 2000 and 2001. One week after the initial announcement, study materials were placed in student on-campus mailboxes, and an electronic mail message was sent to all participants alerting them to the arrival of the survey. As most participants were on campus during distribution, daily verbal encouragement was provided (by the principal investigator) to the study population during the first 5 days of the collection period. Reminders were sent by electronic mail two and three weeks after distribution.

Questionnaires were completed anonymously and returned via campus mail or placed in collection envelopes positioned throughout the study site. Total study time from distribution to final collection was 4 weeks; 85% of all completed surveys were returned during the first 5 days.

#### V. Data Management and Analysis

Completed surveys were collected and compiled by the primary investigator. Epi Info 6.04 (Centers for Disease Control and Prevention, Atlanta, GA 1996) was used to develop a data entry screen and database; the data file was subsequently exported to SPSS 10.0 (SPSS Inc., Chicago, IL, 1999) for analysis.

In order to conform with the coding system described by Dr. Wechsler<sup>17</sup>, variables with a four-point response scale were recoded (Table 1). Thus, for purposes of analysis, for section II variables "Value", "Patient Change", "Confident", "Gratifying", "Natural", and "Time-consuming", 1 = strongly agree, 2 = somewhat agree, 3 = somewhat disagree, and 4 = strongly disagree. Section IV variables "Important", "Ask", "Prepared",



“Behavior Change”, and “Encouraged” (Table 1) were also recoded, so that 1 = very important, 2 = somewhat important, 3 = not very important, and 4 = not important at all for “Important”; 1 = always, 2 = sometimes, 3 = rarely, and 4 = never for “Ask”; 1 = very prepared, 2 = somewhat prepared, 3 = not very prepared, and 4 = not prepared at all for “Prepared”; 1 = very confident, 2 = somewhat confident, 3 = not very confident, and 4 = not confident at all for “Behavior Change”; and 1 = always, 2 = sometimes, 3 = rarely, and 4 = never for “Encouraged”.

*Table 1. Variables Recoded to Conform with Dr. Wechsler’s Coding System*

<u>Section II Variables</u>	<u>Section IV Variables</u>
1. Health promotion is of <b>value</b> to patients of all age groups.	1. How <b>important</b> are these behaviors?
2. <b>Patients</b> are likely to <b>change</b> their health behaviors.	2. How often do you <b>ask</b> about these issues?
3. I feel <b>confident</b> in my ability to convey knowledge and skills to patients.	3. How <b>prepared</b> do you feel to counsel patients?
4. Counseling patients is <b>gratifying</b> .	4. How confident are you that counseling patients will <b>change</b> their <b>behavior</b> ?
5. Counseling patients is <b>natural</b> .	5. How often are you <b>encouraged</b> to discuss these issues?
6. Counseling patients is <b>time-consuming</b> .	

\***Bolded words represent shorthand for each variable.**

Distributions of all variables were examined. Certain demographic categories were combined: “career field” was collapsed into “primary care” (including family medicine, internal medicine, pediatrics, and ob/gyn), “specialty”, and “unknown”, and age categories were collapsed into “20-24”, “25-29”, and “30+”.

One-way analysis of variance was performed to ascertain whether there were significant differences in responses to section II and section IV items (see table 1, above) among sub-groups (i.e. between age groups, men and women, those planning careers in primary care and those intending to be specialists, those with previous public health

training and those without). Correlations between all variables were examined using Pearson's correlation coefficient.

Next, using "How often do you ask about \_\_\_\_" as a marker for discussing each health behavior, correlations were explored to determine whether there was a link between attitudes/beliefs and discussion of behavior. To facilitate the correlation and linear regression analysis, summary scores were computed for each question in Section IV. These summary scores were calculated by summing responses for each health behavior, with the resulting scores ranging from eleven (responding "1" for every behavior) to forty-four (responding "4" for every behavior). These sums were then averaged (by dividing overall score by 11 health behaviors). The resulting summary scores ranged from 1 to 4, reflecting the original scale of individual questions. An example of these computations is shown in Table 2.

*Table 2. Derivation of Summary Score for a Hypothetical Respondent, Using "Important" as Sample Variable*

	How important are these behaviors in promoting the health of the average person? 1=very important 2=somewhat important 3=not very important 4=not important at all
Injury prevention	2
Smoking cessation	1
Exercising 3+ times/wk	2
Limiting fat in diet	3
Increasing fiber in diet	3
Limiting alcohol	3
Limiting other drug use	2
Monthly breast self-exam	3
Periodic health exam	2
STD prevention	2
Stress reduction	3
<b>Total score (sum of scores for each behavior)</b>	<b>26</b>
<b>Average score (sum divided by 11 behaviors)</b>	<b>2.36</b>

Correlations between the summary scores for all Section IV variables were explored. Next, using the summary score for the “How often do you ask about \_\_\_\_\_” item as a marker for general discussion of health behavior, correlations were explored to determine whether there was a link between the attitudes and beliefs expressed in Sections I, II, and III of the questionnaire and discussion of the listed health behaviors. Last, because conversion to a summary score created continuous variables, linear regression was used to develop a model to predict a score in answer to the question “how often do you *Ask* about these health behaviors?”.

A linear regression model was constructed using the inclusion variable “how often do you *Ask*” as the dependent variable and “*Gender*”, “health promotion is of *Value*”, “I feel *Confident* in my ability”, “counseling is *Gratifying*”, “counseling is *Natural*”, “behavior is an *Important* part of health”, “I feel *Prepared* to counsel patients”, “patients are likely to *Change* their *Behavior*”, and “I am *Encouraged* by my preceptors” as the independent variables. These independent variables were selected because the bivariate correlation with *Ask* was significant at the 0.05 level ( $p < 0.05$ ). Initially, all selected independent variables were entered simultaneously into the model. Subsequently, the selected independent variables were entered into the model via forward selection and backward elimination techniques. The criteria for entry into and elimination from the model were  $p = 0.05$  and  $p = 0.10$  respectively.

## RESULTS

Of the initial sample of 190 students, 116 completed and returned the survey, for an overall response proportion of 61%. Of those who did not respond, 18 were out of the

country, on leave of absence from medical school, or otherwise unavailable to respond, making the effective response proportion 71%. Respondent characteristics are given in Table 3; the respondent population did not differ significantly from the student body as a whole on any characteristic. Forty-seven percent of the respondents were male, and 53% were female the majority of respondents (66%) were age 25-29 years. Sixty percent of respondents plan a career in a primary care field such as Family Medicine, Internal Medicine, Pediatrics, or Obstetrics/Gynecology; 29% are interested in a specialty, and 10% are undecided. Most respondents plan to practice in an urban environment, serving a mainstream population (64% and 69% respectively). Seventeen respondents (15%) report previous or current training in public health.

With regard to attitudes toward health promotion counseling (Table 4), 94% of respondents strongly agree that health promotion counseling is valuable to patients of all age groups. Seventy-nine percent strongly agree that this is a natural part of the interaction between physician and patient, and 49% strongly agree that counseling is professionally gratifying. Thirty percent strongly agree that they feel confident in their ability to counsel patients, and 16% strongly agree that patients are likely to change their health behavior as a result of counseling.

*Table 3. Demographic Characteristics of Oregon Health Sciences University Medical Students Responding to Self-Administered Survey of Attitudes Towards Preventive Care Services*

<b>Respondent characteristic</b>	<b>Response category</b>	<b>Frequency (Percent)</b>
Age	20-24 years	16 (13.8%)
	25-29 years	77 (66.4%)
	30+ years	23 (19.8%)
Gender	Male	55 (47.4%)
	Female	61 (52.6%)
Intended career field <sup>1</sup>	Primary care (FP, IM, PED, OB)	70 (60.3%)
	Specialty	34 (29.3%)
	Undecided	12 (10.3%)
Intended practice location <sup>2</sup>	Urban	74 (63.8%)
	Rural	29 (25.0%)
	Overseas	4 (3.4%)
	Undecided	9 (7.8%)
Intended practice population <sup>2</sup>	Mainstream	80 (69.0%)
	Underserved	50 (43.1%)
	Uninsured	17 (14.7%)
	Undecided	12 (10.3%)
Past/present public health training	Yes	17 (14.7%)
	No	99 (85.3%)

1. FP = Family Practice, IM = Internal Medicine, PED = Pediatrics, OB = Obstetrics/Gynecology; "Specialty" indicates fields other than those listed above (including Surgery and Surgical subspecialties, Radiology, Emergency Medicine, Dermatology, Ophthalmology, Psychiatry, Neurology, Pathology, Anesthesiology)

2. Total percentages greater than 100 due to survey format; participants were presented with a list and asked to mark all that apply

*Table 4. Attitude of Oregon Health Sciences University Medical Students Regarding Health Promotion Counseling*

<b>Belief</b>	<b>Strongly Agree</b>	<b>Somewhat Agree</b>	<b>Somewhat Disagree</b>	<b>Strongly Disagree</b>
Health promotion counseling is valuable	109 (94%)	7 (6%)	0	0
Health promotion counseling is natural	92 (79.3%)	22 (19.0%)	1 (0.9%)	1 (0.9%)
Patients are likely to change their health behaviors	18 (15.5%)	87 (75.5%)	9 (7.8%)	2 (1.7%)
I feel confident in my ability to counsel patients	35 (30.2%)	77 (66.4%)	4 (3.4%)	0
Health promotion counseling is gratifying	57 (49.1%)	50 (43.1%)	9 (7.8%)	0
Health promotion counseling is time-consuming	44 (37.9%)	58 (50.0%)	12 (10.3%)	2 (1.7%)

Respondents believed that several entities have responsibility for health promotion (Table 5). Ninety-eight of respondents believe that the primary care physician should be responsible for health promotion; 73% hold the specialist physician responsible as well . Ninety percent of respondents believe that the patient himself should bear some responsibility for education about health promotion. Respondents also indicated that public health agencies, national organizations, and schools and workplaces should play some role in promoting health. A smaller proportion responded that the federal government should also take some responsibility for health promotion, and eight respondents report believing that patient families and ancillary staff (nurses, other clinic and hospital staff) should also take part in educating the patient

The 11 listed health behaviors were generally considered by respondents to be very important to the health of the average person (Table 6). Smoking cessation was regarded as the most important overall, with 97% responding that this behavior is very important in promoting the health of the average patient. STD prevention, injury prevention, and limiting other (recreational) drugs were also high on the list. Behaviors rated as less important to the average person’s health were limiting alcohol consumption, increasing fiber in the diet, periodic health examination , and decreasing stress.

*Table 5. Response of Oregon Health Sciences University Medical Students to the Statement “I think the following should be responsible for educating patients about health behaviors...”*

Patient	104 (89.7%)
Primary care physician	114 (98.3%)
Specialist physician	85 (73.3%)
Public health agencies	99 (85.3%)
National organizations	94 (81.0%)
Schools/workplaces	99 (85.3%)
Federal government	59 (50.9%)
Other (patient family, ancillary staff)	8 (6.9%)

Table 6. Oregon Health Sciences University Medical Student Response to the Question “How important is this behavior in promoting the health of the average person?”

Health Behavior	Mean Score (standard deviation)	% Answering 1 = Very Important	% Answering 2 = Somewhat Important	% Answering 3 = Not Very Important	% Answering 4 = Not Important At All
<b>Injury prevention</b>	<b>1.23 (0.46)</b>	<b>78.4</b>	<b>19.8</b>	<b>1.7</b>	<b>0</b>
<b>Smoking cessation</b>	<b>1.04 (0.31)</b>	<b>97.4</b>	<b>1.7</b>	<b>0</b>	<b>0.9</b>
Exercise 3x/wk	1.34 (0.54)	69.0	29.3	0.9	0.9
Limiting fat in diet	1.56 (0.61)	50.0	44.0	6.0	0
Increasing fiber	1.80 (0.66)	33.6	52.6	13.8	0
Limiting alcohol	1.53 (0.61)	52.6	41.4	6.0	0
Limiting other drug	1.28 (0.50)	75.0	22.4	2.6	0
Breast self exam	1.47 (0.62)	60.3	32.8	6.9	0
Periodic exam	1.72 (0.69)	39.7	50.0	8.6	1.7
<b>STD prevention</b>	<b>1.16 (0.46)</b>	<b>86.2</b>	<b>12.1</b>	<b>0.9</b>	<b>0.9</b>
Stress reduction	1.60 (0.62)	46.6	46.6	6.9	0

\*Bolded items are the three with the lowest mean scores, indicating that they are the three behaviors respondents considered to be most important.

Respondents’ reported level of preparedness to counsel patients varied according to health behavior (Table 7). Smoking cessation was the health behavior respondents considered themselves most prepared to discuss – 72% responded that they were very prepared to counsel patients on this topic. Sixty-six percent felt very prepared to counsel patients regarding sexual behavior, and 50% felt very prepared to counsel patients regarding injury prevention. Fifty-four percent of students responded that they feel well prepared to counsel patients on limiting alcohol consumption. Respondents felt least well-prepared to counsel patients regarding stress reduction, increasing fiber, and limiting fat in the diet.

Table 7. Oregon Health Sciences University Medical Student Response to the question "How prepared do you feel to counsel patients on these issues?"

Health Behavior	Mean Score (standard deviation)	% Answering 1 = Very Prepared	% Answering 2 = Somewhat Prepared	% Answering 3 = Not Very Prepared	% Answering 4 = Not Prepared At All
Injury prevention	1.55 (0.59)	50.0	44.8	5.2	0
<b>Smoking cessation</b>	<b>1.28 (0.45)</b>	<b>72.4</b>	<b>27.6</b>	<b>0</b>	<b>0</b>
Exercise 3x/wk	1.46 (0.58)	58.6	37.1	4.3	0
Limiting fat in diet	1.83 (0.69)	33.6	50.0	16.4	0
Increasing fiber	1.91 (0.75)	31.9	45.7	21.6	0.9
Limiting alcohol	1.49 (0.57)	54.3	42.2	3.4	0
Limiting other drug	1.71 (0.71)	43.1	44.0	12.1	0.9
<b>Breast self exam</b>	<b>1.41 (0.63)</b>	<b>65.5</b>	<b>30.2</b>	<b>2.6</b>	<b>1.7</b>
Periodic exam	1.66 (0.65)	42.2	50.0	6.9	0.9
<b>STD prevention</b>	<b>1.41 (0.62)</b>	<b>65.5</b>	<b>27.6</b>	<b>6.9</b>	<b>0</b>
Stress reduction	2.09 (0.78)	21.6	51.7	22.4	4.3

\*Bolted items are the three with the lowest mean scores, indicating that they are the three behaviors respondents considered themselves most prepared to discuss with patients.

Generally, low proportions of participants reported being very confident that patients would change their behavior as a result of health promotion counseling (Table 8).

Breast self-exam is the behavior that respondents felt most optimistic about, with 12% feeling very confident that patients would adopt this behavior as a result of counseling.

Only 6% of medical students report feeling very confident that patients will change their behavior in response to counseling on smoking cessation; 5% are very confident that patients will change their behavior if counseled on sexual behavior, and 7% are very confident that counseling on injury prevention will change patient behavior. 2% report feeling very confident that patients will limit their alcohol intake in response to counseling, and less than 1% of respondents are very confident that patients will respond to counseling on limiting dietary fat or increasing dietary fiber.

In general, few respondents reported that they are always encouraged by their preceptors to counsel patients about the listed health behaviors (Table 9). Smoking



cessation is the behavior respondents are most often encouraged to discuss, with 50% reporting that they are always encouraged to discuss smoking cessation. Sixteen percent are always encouraged to discuss STD prevention, and 4% are always encouraged to discuss injury prevention. Twenty-two percent of respondents reported always being encouraged to discuss alcohol consumption; 3% reported always being encouraged to discuss limiting dietary fat, and less than 1% are always encouraged to increase dietary fiber.

Respondents indicated that they do not always discuss health behavior with patients (Table 10). The behavior most often included in routine history-taking is smoking cessation, with 78% of respondents always asking about smoking behavior. Twenty-one percent always ask about STD prevention, and 4% always ask about injury prevention. Thirty-two percent always ask about alcohol consumption; 5% always ask about dietary fat, and 3% always ask about dietary fiber.

*Table 8. Oregon Health Sciences University Medical Student Response to the Question "How confident are you that counseling patients on these issues will change their behavior?"*

<b>Health Behavior</b>	<b>Mean Score (standard deviation)</b>	<b>% Answering 1 = Very Confident</b>	<b>% Answering 2 = Somewhat Confident</b>	<b>% Answering 3 = Not Very Confident</b>	<b>% Answering 4 = Not Confident At All</b>
<b>Injury prevention</b>	<b>2.34 (0.66)</b>	<b>6.9</b>	<b>56.0</b>	<b>33.6</b>	<b>3.4</b>
Smoking cessation	2.48 (0.70)	6.0	45.7	42.2	6.0
Exercise 3x/wk	2.72 (0.63)	1.7	32.8	57.8	7.8
Limiting fat in diet	2.72 (0.61)	0.9	33.6	57.8	7.8
Increasing fiber	2.77 (0.64)	0.9	31.9	56.9	10.3
Limiting alcohol	2.70 (0.59)	1.7	31.9	61.2	5.2
Limiting other drug	2.84 (0.65)	0.9	27.6	58.6	12.9
<b>Breast self exam</b>	<b>2.12 (0.62)</b>	<b>12.2</b>	<b>65.5</b>	<b>20.7</b>	<b>1.7</b>
Periodic exam	2.37 (0.60)	3.4	58.6	35.3	2.6
<b>STD prevention</b>	<b>2.30 (0.61)</b>	<b>5.2</b>	<b>62.1</b>	<b>30.2</b>	<b>2.6</b>
Stress reduction	2.72 (0.67)	1.7	34.5	53.4	10.3

\***Bolded items are the three with the lowest mean score, indicating that respondents regard them as the three behaviors patients are most likely to change as a result of counseling.**

Table 9. Oregon Health Sciences University Medical Student Response to the Question "How often are you encouraged by your preceptors to discuss these issues with your patients?"

Health Behavior	Mean Score (standard deviation)	% Answering 1 = Always	% Answering 2 = Sometimes	% Answering 3 = Rarely	% Answering 4 = Never
Injury prevention	2.47 (0.78)	8.6	45.7	36.2	9.5
<b>Smoking cessation</b>	<b>1.54 (0.58)</b>	<b>50.0</b>	<b>45.7</b>	<b>4.3</b>	<b>0</b>
Exercise 3x/wk	2.51 (0.77)	6.0	48.3	34.5	11.2
Limiting fat in diet	2.82 (0.73)	3.4	26.7	54.3	15.5
Increasing fiber	3.07 (0.66)	0.9	15.5	59.5	24.1
Limiting alcohol	2.03 (0.71)	22.4	52.6	24.1	0.9
Limiting other drug	2.26 (0.77)	14.7	50.0	30.2	5.2
<b>Breast self exam</b>	<b>2.03 (0.77)</b>	<b>22.4</b>	<b>56.9</b>	<b>15.5</b>	<b>5.2</b>
Periodic exam	2.34 (0.81)	13.8	45.7	32.8	7.8
<b>STD prevention</b>	<b>2.17 (0.76)</b>	<b>16.4</b>	<b>55.2</b>	<b>23.3</b>	<b>5.2</b>
Stress reduction	2.97 (0.67)	1.7	19.0	60.3	19.0

\*Bolted items are the three with the lowest mean score, indicating that they are the three behaviors respondents reported feeling most encouraged by preceptors to discuss.

Table 10. Oregon Health Sciences University Medical Student Response to the Question "How often do you ask about these issues in a routine history?"

Health Behavior	Mean Score (standard deviation)	% Answering 1 = Always	% Answering 2 = Sometimes	% Answering 3 = Rarely	% Answering 4 = Never
Injury prevention	2.49 (0.67)	4.3	47.4	43.1	5.2
<b>Smoking cessation</b>	<b>1.22 (0.44)</b>	<b>78.4</b>	<b>20.7</b>	<b>0.9</b>	<b>0</b>
Exercise 3x/wk	2.21 (0.67)	11.2	59.5	26.7	2.6
Limiting fat in diet	2.67 (0.70)	5.2	30.2	56.9	7.8
Increasing fiber	2.91 (0.73)	2.6	23.3	54.3	19.8
<b>Limiting alcohol</b>	<b>1.84 (0.68)</b>	<b>31.9</b>	<b>53.4</b>	<b>13.8</b>	<b>0.9</b>
<b>Limiting other drug</b>	<b>1.92 (0.81)</b>	<b>32.8</b>	<b>46.6</b>	<b>16.4</b>	<b>4.3</b>
Breast self exam	2.02 (0.83)	27.6	49.1	17.2	6.0
Periodic exam	2.30 (0.87)	17.2	44.8	28.4	9.5
STD prevention	2.09 (0.75)	20.7	53.4	22.4	3.4
Stress reduction	2.72 (0.79)	4.3	36.2	43.1	16.4

\*Bolted items are the three with the lowest mean score, indicating that they are the three behaviors respondents reported most often including in a routine history.

### **Subpopulation Analysis**

Summary scores were examined to determine whether responses to the items regarding importance of behavior in promoting health, preparedness to counsel patients, confidence in patient behavior change, encouragement by preceptors to counsel patients, and inclusion of health promotion in routine history varied according to demographic characteristic, career intentions, or public health training (Table 11).

Overall, the summary scores did not differ significantly by age, intended career field, intended practice location, or intended practice population. Women were more likely than men to respond that the listed health behaviors were very important to the health of the average person ( $p=0.054$ ) and to report more confidence that patients would change their behaviors as a result of health education ( $p=0.006$ ). In addition, female students were somewhat more likely to report including discussion of health behavior in routine patient interaction ( $p=0.064$ ).

Public health training had a marginal effect on level of perceived preparedness, with those having such training feeling somewhat better prepared than those without prior public health experience to counsel patients regarding health behavior ( $p=0.087$ ).

Table 11. Oregon Health Sciences University Medical Student Beliefs About Health Promotion, by Respondent Characteristic (ANOVA)

Respondent Characteristic	Importance in Promoting Health (1=very important, 4=not important) mean (min, max)	Preparedness to Counsel Patients (1=very prepared, 4=not prepared at all) mean (min, max)	Confidence in Patient Behavior Change (1=very confident, 4=not confident at all) mean (min, max)	Encouragement by Preceptors to Discuss With Patients (1=always, 4=never) mean (min, max)	Inclusion in Routine History (1=always, 4=never) mean (min, max)
<b>Age (years)</b> 20-24 25-29 30+	<b>1.55</b> (1.20, 1.89) <b>1.44</b> (1.35, 1.52) <b>1.39</b> (1.29, 1.49) <i>p</i> = 0.535	<b>1.65</b> (1.30, 1.99) <b>1.63</b> (1.54, 1.71) <b>1.59</b> (1.46, 1.73) <i>p</i> = 0.900	<b>2.39</b> (2.12, 2.66) <b>2.57</b> (2.47, 2.67) <b>2.55</b> (2.39, 2.72) <i>p</i> = 0.525	<b>2.32</b> (1.89, 2.74) <b>2.39</b> (2.29, 2.48) <b>2.39</b> (2.23, 2.55) <i>p</i> = 0.902	<b>2.15</b> (1.94, 2.36) <b>2.24</b> (2.14, 2.34) <b>2.18</b> (1.99, 2.36) <i>p</i> = 0.735
<b>Gender</b> female male	<b>1.37</b> (1.30, 1.44) <b>1.49</b> (1.39, 1.61) <i>p</i> = 0.054	<b>1.60</b> (1.51, 1.69) <b>1.64</b> (1.53, 1.76) <i>p</i> = 0.516	<b>2.45</b> (2.35, 2.55) <b>2.67</b> (2.55, 2.79) <i>p</i> = 0.006	<b>2.37</b> (2.26, 2.48) <b>2.40</b> (2.29, 2.51) <i>p</i> = 0.686	<b>2.14</b> (2.04, 2.25) <b>2.30</b> (2.17, 2.43) <i>p</i> = 0.064
<b>Intended Career Field</b> primary care specialty	<b>1.39</b> (1.33, 1.46) <b>1.53</b> (1.36, 1.69) <i>p</i> = 0.156	<b>1.60</b> (1.51, 1.69) <b>1.65</b> (1.51, 1.79) <i>p</i> = 0.852	<b>2.51</b> (2.41, 2.61) <b>2.64</b> (2.49, 2.79) <i>p</i> = 0.346	<b>2.35</b> (2.24, 2.45) <b>2.42</b> (2.27, 2.57) <i>p</i> = 0.457	<b>2.18</b> (2.08, 2.27) <b>2.32</b> (2.14, 2.50) <i>p</i> = 0.249
<b>Intended Practice Location</b> urban rural overseas	<b>1.42</b> (1.33, 1.51) <b>1.47</b> (1.34, 1.59) <b>1.43</b> (1.22, 1.65) <i>p</i> = 0.936	<b>1.66</b> (1.57, 1.76) <b>1.54</b> (1.42, 1.67) <b>1.68</b> (1.09, 2.28) <i>p</i> = 0.272	<b>2.55</b> (2.45, 2.65) <b>2.57</b> (2.38, 2.77) <b>2.73</b> (2.34, 3.12) <i>p</i> = 0.709	<b>2.39</b> (2.29, 2.49) <b>2.30</b> (2.14, 2.46) <b>2.89</b> (2.30, 3.47) <i>p</i> = 0.072	<b>2.20</b> (2.10, 2.30) <b>2.21</b> (2.03, 2.39) <b>2.52</b> (2.00, 3.04) <i>p</i> = 0.570
<b>Intended Practice Population</b> mainstream underserved	<b>1.46</b> (1.37, 1.54) <b>1.37</b> (1.26, 1.47) <i>p</i> = 0.186	<b>1.61</b> (1.53, 1.70) <b>1.63</b> (1.49, 1.77) <i>p</i> = 0.846	<b>2.55</b> (2.47, 2.64) <b>2.55</b> (2.37, 2.72) <i>p</i> = 0.973	<b>2.36</b> (2.27, 2.46) <b>2.42</b> (2.30, 2.56) <i>p</i> = 0.458	<b>2.20</b> (2.20, 2.30) <b>2.26</b> (2.10, 2.30) <i>p</i> = 0.539
<b>Public Health Training</b> yes no	<b>1.34</b> (1.19, 1.50) <b>1.45</b> (1.37, 1.52) <i>p</i> = 0.265	<b>1.47</b> (1.32, 1.62) <b>1.64</b> (1.56, 1.72) <i>p</i> = 0.087	<b>2.41</b> (2.24, 2.57) <b>2.58</b> (2.49, 2.67) <i>p</i> = 0.131	<b>2.49</b> (2.25, 2.73) <b>2.36</b> (2.28, 2.45) <i>p</i> = 0.252	<b>2.12</b> (1.90, 2.33) <b>2.23</b> (2.14, 2.32) <i>p</i> = 0.320

\* Individual respondents were assigned summary scores for each domain (importance, preparedness, confidence, encouragement, inclusion), derived by adding up responses to each question for all health behaviors and dividing by 11; score reported represents mean of these summary scores. See *Data Management and Analysis* in Methods section for description of this procedure.

## **Bivariate Correlation Analysis**

Next, correlations were computed for each Section IV summary score (Tables 12 through 16). The level of importance ascribed to health behavior is correlated with the level of agreement that health promotion counseling is of value to patients, is professionally gratifying, and is a natural part of the physician-patient interaction. In addition, a higher level of importance ascribed to behavior was correlated with a higher level of confidence that counseling patients would change their behavior.

Reported degree of preparedness to counsel patients on the listed health behaviors was correlated with degree of confidence in effective counseling skills. A higher level of reported preparedness was correlated with a higher level of agreement that counseling is valuable to all patients and a natural part of interaction with patients, and a higher level of confidence that patients would change their behavior as a result of counseling.

Magnitude of perceived preparedness to counsel patients and level of perceived encouragement by preceptors to do so were correlated with degree of confidence in patient behavior change. Degree of confidence that counseling could affect patient behavior was correlated with level of agreement that health promotion counseling was gratifying.

Level of perceived encouragement by preceptors was correlated with degree of confidence in counseling abilities and confidence that patients would change. In addition, this was correlated with level of agreement that counseling is professionally gratifying.

Investigation of what attitudes and beliefs were significantly correlated with asking patients about health behavior revealed that the extent to which students felt

encouraged by preceptors and felt prepared to counsel patients were most highly correlated with degree of reported inclusion of health behaviors in a routine history. Magnitude of belief in effectiveness of counseling and level of agreement that counseling is valuable and gratifying were also important. Extent of belief in health behavior as an important determinant of health and degree of confidence in counseling abilities were also correlated with level of reported discussion of health behavior.

*Table 12. Factors Correlated With Reporting Belief in Importance of Health Behavior (p<0.05)*

<b>Factor</b>	<b>Pearson Correlation</b>	<b>p</b>
Counseling is of value	0.25	0.01
Counseling is gratifying	0.20	0.03
Counseling is natural	0.27	0.01
Need more training	0.26	0.01
Belief in patient behavior change	0.19	0.04

*Table 13. Factors Correlated With Reporting Preparedness to Counsel Patients (p<0.05)*

<b>Factor</b>	<b>Pearson Correlation</b>	<b>2-tailed Significance</b>
Counseling is of value	0.19	0.04
Confident in my ability	0.46	<0.001
Counseling is natural	0.26	0.01
Need more training	(-)0.20	0.03
Belief in patient behavior change	0.22	0.02

*Table 14. Factors Correlated With Reporting Confidence in Patient Behavior Change (p<0.05)*

<b>Factor</b>	<b>Pearson Correlation</b>	<b>2-tailed Significance</b>
Female gender	0.26	0.01
Counseling is gratifying	0.31	0.00
Belief in importance of behavior	0.19	0.04
Belief in preparedness	0.22	0.02
Encouragement by preceptor	0.36	<0.001

*Table 15. Factors Correlated With Reporting Feeling Encouraged by Preceptors (p<0.05)*

<b>Factor</b>	<b>Pearson Correlation</b>	<b>2-tailed Significance</b>
Confident in my ability	0.23	0.01
Counseling is gratifying	0.27	0.01
Need more role modeling	(-)0.32	<0.001
Belief in patient behavior change	0.36	<0.001

Table 16. Factors Correlated With Reporting Inclusion of Health Behavior in History ( $p < 0.05$ )

Factor	Pearson Correlation	2-tailed Significance
Counseling is of value	0.22	0.02
Confident in my ability	0.21	0.03
Counseling is gratifying	0.19	0.04
Counseling is natural	0.22	0.02
Belief in importance of behavior	0.21	0.02
Belief in preparedness	0.41	<0.001
Belief in patient behavior change	0.29	0.01
Encouragement by preceptor	0.46	<0.001

### Linear Regression Analysis

To examine which items were independently associated with the frequency of including health promotion in routine patient interaction, linear regression modeling was used. When all factors were entered simultaneously into the model, only “*prepared*” and “*encouraged*” remained significant once inter-variable correlation had been accounted for (Table 17). When the selected factors were entered into the model one by one via forward and backward selection, the result was similar. By forward selection, “*prepared*” and “*encouraged*” were the only variables remaining in the final model; by backward elimination, “*prepared*”, “*encouraged*”, and “*gender*” remained in the final model. (Table 18) Even though “*gender*” did not meet the stricter criteria for inclusion on forward selection, when it was forced into the model containing “*encouraged*” and “*prepared*” to see if it added any value, the adjusted R square went up slightly from 0.311 to 0.325, indicating that including gender explained slightly more of the variance in the model. Thus, “*gender*” was retained in the final model. In the final model, then, the independent variables (“*prepared*”, “*encouraged*”, and female “*gender*”) explained 32.5% of the

variance in the dependent variable (the score representing “how often do you ask about health behavior?”)

*Table 17. Linear Regression Model: “How often do you ask” as Dependent Variable*

<b>Independent Variable</b>	<b>beta</b>	<b>Significance</b>
Counseling is of value to patients	0.15	0.07
I am confident in my ability to counsel patients	0.11	0.21
Health promotion is professionally gratifying	0.07	0.45
Counseling is a natural part of interaction	0.14	0.09
Behavior is an important part of health	0.15	0.08
<b>I am prepared to counsel patients</b>	<b>0.34</b>	<b>&lt;0.001</b>
Patients will change their behavior if counseled	0.14	0.12
<b>I am encouraged by my preceptors</b>	<b>0.40</b>	<b>&lt;0.001</b>
Gender (1=female, 0=mal)	0.11	0.17

*Table 18. Linear Regression: Final Model Predicting Inclusion of Health Behavior in Routine Interaction with Patients, Using “How often do you ask” as Marker for Inclusion*

	<b>Unstandardize d Coefficients</b>		<b>Sig.</b>	<b>Adjusted R Square</b>
<b>Variables contained in model</b>	<b>B</b>	<b>Std. Error</b>		
(Constant)	.426	.240	.079	
I feel <i>prepared</i> to counsel patients	.380	.090	<.001	
I feel <i>encouraged</i> to counsel patients	.419	.082	<.001	without gender 0.311
female <i>gender</i>	.122	.068	.076	with gender 0.325

Finally, responses were examined to determine factors that would influence likelihood of discussing health promotion with patients (Table 19). Factors cited by respondents as likely to increase health promotion activities were more time with patients, more knowledge about where to refer patients, more training on how to counsel patients effectively, more perceived interest on the part of patients, and more role modeling by preceptors. Few respondents cited increased emphasis during medical school or increased belief in importance of health behavior as factors which would increase discussion of health behavior.



*Table 19. Factors cited by Oregon Health Sciences University Medical Students in Response to the Statement “I would be more likely to discuss health promotion with patients if...”*

I had more time with patients	109 (94.0%)
I knew more about where to refer patients	74 (63.8%)
I had more training	59 (50.9%)
More patients asked about it	52 (44.8%)
Financial reimbursement were higher	51 (44.0%)
I saw more of my preceptors do it	43 (37.1%)
There was more emphasis placed on it during medical school	18 (15.5%)
I considered it more important	4 (3.4%)

## DISCUSSION

This cross-sectional study showed that there is a notable gap between how medical students view health behavior and how they perceive their own counseling skills.

Although most respondents strongly agreed that health promotion counseling is valuable to patients, very low proportions report that they always ask about health behaviors during routine history taking. Respondents reported feeling unprepared to counsel patients and pessimistic about their abilities to change patient behavior. These observations indicate that low confidence in their own skills, as well as in patient response, are possible reasons for not discussing health behavior with patients. The former can be addressed through changes in medical school curriculum, such as demonstrating of the effectiveness of health promotion counseling and providing classes that help students develop the skills necessary to help patients change their behavior.

### *Importance of health behavior*

Participants in this survey generally believe in the importance of behavior in promoting health. It is of interest, however, that among the behaviors cited in the literature as most important in reducing cardiovascular disease (healthy diet, moderate exercise, no smoking, and limited alcohol consumption), only smoking cessation is considered very important by more than three-quarters of respondents to this survey. Further, while 72% feel very prepared to counsel patients on smoking cessation, less than 60% feel very prepared to discuss alcohol intake and exercise patterns. Only 33% feel very prepared to counsel patients on nutrition. The relative success of anti-smoking education suggests that medical students are teachable; however, there remain many lost opportunities for counseling patients on risk factors other than smoking.

### *Confidence in skills*

As noted above, medical students generally feel that health promotion counseling is valuable and that listed health behaviors are important influences on the health of the average person; however, very few always include discussion of health behavior in routine patient interaction. There are many possible reasons for this gap between belief and action: limited time with patients, a problem-focused approach to patients, confusion about which patients should receive health promotion counseling. However, the fact that most respondents reported feeling unprepared to counsel patients and pessimistic about their abilities to change patient behavior indicates that a very important reason for the lack of inclusion of health promotion counseling is low confidence – both in their own skills and in patient response. This echoes results of previous surveys<sup>17,18,24,25</sup> and

confirms studies examining predictors of health promotion counseling by physicians, which have shown that the most important factors affecting counseling are importance ascribed to health behavior, level of confidence in one's ability to convey appropriate health information and skills to patients, and level of confidence that patients will actually change their behavior as a result of counseling<sup>11,26</sup>.

#### *Other barriers to behavioral counseling*

Previous studies have noted that a common reason for non-compliance with preventive health care guidelines among practicing physicians is lack of time<sup>27</sup>; the current findings repeat this, with nearly all respondents believing that "health promotion counseling is time-consuming" and most stating that they would be more likely to engage in health education activities if they had more time with patients. Shortage of counseling time with patients thus represents another barrier to health promotion, emphasizing the need for brief and effective intervention strategies that can be easily incorporated into a busy practice. Other barriers cited by respondents in this study are lack of knowledge about resources, lack of training in effective counseling techniques, lack of perceived patient interest in counseling, lack of role-modeling of counseling behavior, and lack of financial reimbursement for time spent counseling.

#### *Role of gender*

Recent studies have shown that female physicians are more likely to engage in preventive services than male physicians and that females spend a significantly greater proportion of the office visit on preventive services than do their male colleagues<sup>28</sup>. Data

from this survey confirms those results, indicating that women are more likely than men to include health promotion in routine patient interaction, independently of role-modeling or encouragement by preceptor. Moreover, the data suggest that this phenomenon is at least partially due to differing attitudes toward health promotion itself and differing beliefs about their own efficacy. While the majority of men believe that health behavior is important, women are significantly more likely than men to believe that health behavior is an important determinant of health and that patients will change their behavior as a result of counseling. The reason for this difference is not entirely clear; however, past studies suggest that women may be more “patient-centered” and “psychosocially oriented”<sup>29</sup>, and that they may enter medical school with more interest than men in preventive health care and health promotion counseling<sup>30</sup>. The difference between health promotion practices between genders may suggest that, in the pre-clinical years of medical school, men and women are at different stages in their readiness to learn about health promotion, requiring that the curriculum proceed in stages to capture men at the level of increasing belief in importance and efficacy of health promotion and women at the level of learning practical skills to apply toward this end.

### *Role of preceptor*

Data from the current survey also suggest that encouragement by preceptors and role-modeling of effective behaviors play an important part in student behavior. Respondents who reported feeling encouraged by their preceptors to do so were more likely to ask patients about health behavior; this was one of the most highly significant variables in the linear regression model. Feeling encouraged was also significantly

correlated with higher confidence in counseling abilities and belief that patients would change their behavior; in addition, these respondents reported stronger belief that counseling was professionally gratifying. More than one-third of respondents reported that they would be more likely to discuss health behavior if they saw more preceptors do this.

The behavior students felt most encouraged to discuss was smoking cessation, followed by limiting alcohol intake and breast self-exam. It is noteworthy, however, that only half were “always” encouraged to discuss smoking cessation, and approximately one-fifth were “always” encouraged to discuss alcohol intake and breast self-exam. This highlights the fact that, in spite of the perceived importance of preceptor encouragement, such support is lacking. Why might this be so? A survey of students and teaching staff in England indicated that teachers were significantly less likely than students to believe that students should learn more about disease prevention and health promotion, and also significantly less likely than students to believe that learning about prevention is as important as learning about diagnosis and treatment<sup>31</sup>. While such a study has not yet been conducted in the United States, and there may well be ideological differences between British physicians and their American counterparts, this information has important implications for the teaching of health promotion in this country. Medical educators frequently cite the need for increased training in preventive medicine, but if clinical faculty do not perceive its worth they will not pass on to future physicians the importance of prevention in clinical practice.

#### *Role of Health Belief Model*

The Health Belief Model was developed in the early 1950's by a group of social psychologists at the U.S. Public Health Service in an attempt to understand the widespread failure of people to accept disease prevention or screening tests for the early detection of disease<sup>32</sup>. The basic components of the Health Belief Model are derived from a well-established body of psychological and behavioral theory whose models hypothesize that behavior depends mainly on two variables: the value placed by an individual on a particular goal, and the individual's estimate of the likelihood that a given action will achieve that goal. The model consists of 4 dimensions: Perceived Seriousness (of threat to health), Perceived Benefits of Taking Action (against threat to health), Perceived Barriers to Taking Action, and Cues to Action.<sup>32</sup>.

Conceptualizing these dimensions in the context of health promotion allows the results of this study to be framed in terms of the Health Belief Model, with Perceived Seriousness equal to perceived importance of health behavior; Perceived Benefits of Taking Action equal to confidence that patients will change their behavior in response to counseling; Perceived Barriers to Taking Action corresponding to time constraints, lack of knowledge about resources, lack of training in effective counseling measures, and lack of confidence in ability to effect patient behavior change; and with Cues to Action from preceptor and patient. Based on this conceptualization, the areas for improvement in physician training fall mainly in the areas of increasing perceived benefits and decreasing perceived barriers to taking action. Increasing cues to action, especially from preceptors, will also play a role.

Thus, this framing system provides dimensions which can be used to influence student behavioral patterns. First, it will be important to increase the perceived benefits of

taking action. Feedback from patients as well as evaluation of the literature could be used to provide data regarding the impact of counseling, as well as information about patient expectations regarding counseling.

Second, it will be important to decrease the perceived barriers to taking action. Specifically, respondents to this survey cite a need for more training on how to counsel patients effectively and more information on where to refer patients for help, as well as more role-modeling of effective strategies to help patients change health behavior. Respondents who felt prepared to discuss health behavior and encouraged to do so by their preceptors were more likely to include such a discussion in patient interaction.

These findings suggest that the most important barrier to inclusion of health promotion activities in patient interaction is not lack of knowledge or belief in importance but rather the difficulty of translating knowledge into practice. Most preventive medicine is taught during the pre-clinical years, and serves to teach the basics of epidemiology and biostatistics as well as raise awareness of health promotion issues. Overall, formal medical education does an adequate job of convincing students of the importance of preventive care services; even though there is a statistically significant difference between men and women with regards to importance of health behavior and likelihood of patient change, the majority of both genders does believe that behavior is important in determining health.

However, acquisition of knowledge does not necessarily ensure its application to the care of patients. What is needed is provision of appropriate skills to effect changes in patient health behavior, and demonstration of the effectiveness of health promotion counseling. Behavioral modeling, role-playing, and interactions with real or standardized

patients have all been shown to be effective methods for skills training; In addition, education about non-physician resources (newsletters, internet sites, support groups, personnel such as dieticians and exercise counselors) would likely be useful, in light of the large number of respondents who would like to know more about where to refer patients for help with health behavior issues.

Finally, it will be important to increase the cues to taking action. Increased involvement by preceptors in preventive behavior would positively influence the behavior of medical students; in addition, education of patients to initiate discussion of health behavior would provide another external stimulus to health promotion counseling.

## **LIMITATIONS**

There are several limitations to this study. Because it was conducted at a single medical school, the study population may not be generalizable to students at other medical schools. However, while the third- and fourth-year curriculum at OHSU is similar to that at other U.S. medical schools, OHSU's curricular emphasis on primary care may lead to increased belief of importance of health behavior/health promotion. Because of this, a study conducted at OHSU may actually overestimate the amount of health promotion occurring in medical school.

Additionally, using "how often do you ask" as a marker for counseling is not optimal, as this does not differentiate between briefly mentioning a health behavior and engaging in a 10-minute counseling session. Also, this outcome variable is self-reported, and there is no independent correlation of behavior. These limitations may lead to



overestimation of health promotion delivery in routine patient interaction, so that low levels of reported health promotion counseling may actually be even lower.

A further limitation of this study is that beliefs about average patient may not indicate belief about relevance for specific patients; that is, students may discuss health promotion when deemed applicable to the specific situation, but not with every patient routinely. However, even an experienced clinician may have trouble divining whether a particular patient is at risk for an STD or suffering from poor nutrition. In addition, all patients can benefit from discussion of such topics as injury prevention, nutrition, and exercise. Therefore, discussing health behavior only when there is a perceived need will lead to many missed opportunities for prevention.

#### **TOPICS OF FUTURE STUDY**

Perhaps the most intriguing finding of this study was that linear regression modeling explained only 32% of the variance in the regression model, indicating that a large number of unknown predictors remain. No research has yet been done regarding such factors as physicians' own health habits, physician's personal or family history of related disease, physician's ethnicity and income, and physician's control of work environment; investigation of how these and other factors influence student/physician attitudes toward preventive care services would improve understanding of counseling practices.

Another topic for further investigation would be a survey of teaching staff in the United States; to establish views regarding the current prevention curriculum and

compare them with student impressions. This would provide important insight necessary to any curriculum development.

## **CONCLUSIONS**

This survey supports many of the observations made in previous studies regarding the attitudes of physicians towards preventive medicine. In addition, it provides new information about views unique to students – particularly with respect to the role of preceptors in encouraging and modeling counseling behavior.

The similarity between beliefs of third- and fourth-year medical students and those of practicing physicians (and the stability of physician beliefs over decades of research) suggests that attitudes regarding health promotion are fairly well fixed by the time of medical school graduation. Thus, the time to affect physician behavior is during formal medical training. The gap between how medical students (and practicing physicians) view health behavior and how they perceive their own counseling skills illuminates areas in which deficits in training exist; these areas can be addressed using the framework of the Health Belief Model.

Increased attention to skills training, including teaching health education techniques, provision of actual or simulated counseling experience, and increased modeling of these skills by preceptors, as well as patient surveys or other indicators of successful behavior change, may lead to a greater emphasis on prevention and health promotion among practicing physicians in the future.

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**APPENDIX A: Data Collection Instrument**

1. My age is \_\_\_\_\_
2. My gender is *male* *female*
3. My intended career field is (surgery, psychiatry, research, etc) \_\_\_\_\_
4. My intended practice location is (urban, rural, overseas, etc) \_\_\_\_\_
5. My intended practice population is (underserved, uninsured, mainstream, etc) \_\_\_\_\_
6. I have had some formal public health training (past or present coursework, job, etc) *yes* *no*

**PLEASE CIRCLE YOUR RESPONSE TO THE FOLLOWING QUESTIONS:**

1. Health promotion counseling (for example, discussion of diet/exercise, smoking, condom use, injury prevention) is of value to patients of all age groups. *Strongly Agree* *Somewhat Agree* *Somewhat Disagree* *Strongly Disagree*
2. Patients are likely to change their personal health behaviors (diet, smoking, drug ingestion, exercise, condom use) if their physicians advise them to do so. *Strongly Agree* *Somewhat Agree* *Somewhat Disagree* *Strongly Disagree*
3. I feel confident in my ability to convey the knowledge and skills patients need to change their health behavior. *Strongly Agree* *Somewhat Agree* *Somewhat Disagree* *Strongly Disagree*
4. Counseling patients about health promotion issues is professionally gratifying. *Strongly Agree* *Somewhat Agree* *Somewhat Disagree* *Strongly Disagree*
5. Counseling patients about health promotion issues is a natural part of physician-patient interaction. *Strongly Agree* *Somewhat Agree* *Somewhat Disagree* *Strongly Disagree*
6. Counseling patients about health promotion issues is time-consuming. *Strongly Agree* *Somewhat Agree* *Somewhat Disagree* *Strongly Disagree*

**PLEASE MARK YOUR RESPONSE TO THE FOLLOWING QUESTIONS:**

7. I would be more likely to discuss health promotion with patients if (please mark all that apply)
  - financial reimbursement were higher
  - I had more training on how to do this effectively
  - more patients asked about it
  - I had more time with patients
  - I saw more of my preceptors do it
  - I knew more about where to refer patients for help
  - there was more emphasis placed on this during medical school
  - I considered it to be more important
  - other (please write in) \_\_\_\_\_
8. I think the following should be responsible for educating patients about health behaviors (please mark all that apply)
  - patient
  - primary care physician
  - specialist physician
  - public health agencies
  - national organizations such as American Heart Association
  - schools and workplaces
  - federal government
  - other (please write in) \_\_\_\_\_



**PLEASE CIRCLE YOUR RESPONSE TO THE FOLLOWING QUESTIONS:**

	How important are these behaviors in promoting the health of the average person?	How often do you ask about these issues in a routine history?	How prepared do you feel to counsel patients on these issues?	How confident are you that counseling patients on these issues will change their behavior?	How often are you encouraged by your preceptors to discuss these issues with patients?
	4 = very important 3 = somewhat important 2 = not very important 1 = not important at all	4 = always 3 = sometimes 2 = rarely 1 = never	4 = very prepared 3 = somewhat prepared 2 = not very prepared 1 = not prepared at all	4 = very confident 3 = somewhat confident 2 = not very confident 1 = not confident at all	4 = always 3 = sometimes 2 = rarely 1 = never
injury prevention (for example, use of seat belt, safe storage of firearms, use of bike helmet)	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
smoking cessation	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
exercising 3+ times per week	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
limiting saturated fats in diet	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
increasing fiber in diet	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
limiting alcohol consumption	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
limiting other recreational drug use	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
monthly breast self-exam	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
periodic health exam	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
std prevention (condom use, avoidance of high-risk behavior)	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
stress reduction	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1

**THANK YOU FOR PARTICIPATING IN THIS SURVEY!! PLEASE PLACE IN COLLECTION BOX IN OL MAIL ROOM OR SEND VIA CAMPUS MAIL TO VEENA SINGH, CB 669**