Medical Students' Attention to Multiple Risk Behaviors: A Standardized Patient Examination

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BACKGROUND: Risk behaviors tend to cluster, particularly among smokers, with negative health effects. To optimize patients' health and wellbeing, health care providers ideally would assess and intervene upon the multiple risks with which patients may present.
OBJECTIVE: This study examined medical students' skills in assessing and treating multiple risk behaviors.
DESIGN: Using a randomized experimental design, medical students' counseling interactions were evaluated with a standardized patient presenting with sexual health concerns and current tobacco use with varied problematic drinking status (alcohol-positive or alcohol-negative).
PARTICIPANTS: One hundred and fifty-six third-year medical students.
MAIN MEASURES: Student and standardized patient completed measures evaluated student knowledge, attitudes, and clinical performance.
KEY RESULTS: Overall, most students assessed tobacco use (85%); fewer assessed alcohol use (54%). Relative to the alcohol-negative case, students seeing the alcohol-positive case were less likely to assess sexually transmitted disease history (80% vs. 91%, p=0.042), or patients' readiness to quit smoking (41% vs. 60%, p=0.025), and endorsed greater attitudinal barriers to tobacco treatment (p=0.030). Patient satisfaction was significantly lower for the alcohol-positive than the alcohol-negative case; clinical performance ratings moderated this relationship.
CONCLUSIONS: When presented with a case of multiple risks, medical students performed less effectively and received lower patient satisfaction ratings. Findings were moderated by students' overall clinical performance. Paradigm shifts are needed in medical education that emphasize assessment of multiple risks, new models of conceptualizing behavior change as a generalized process, and treatment of the whole patient for optimizing health outcomes.

KEY WORDS: multiple risk behaviors; medical education; training; standardized patients; alcohol; tobacco; sexual health.
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Risk behaviors, such as tobacco, alcohol misuse, and unsafe sexual practices often co-occur. Smokers, in particular, have poor behavioral profiles with about 90% engaging in multiple risks,[1–4] and among individuals with alcohol problems, an estimated 56% also use tobacco.[5] Both binge drinking and tobacco use during early adolescence predict higher levels of sexual risk taking into late adolescence, including early sexual intercourse, infrequent condom use, and sexually transmitted disease (STD) risk.[6]

Multiple risk behaviors have an additive or synergistic negative influence on health. With tobacco and alcohol use, the risk of head and neck cancers is multiplied.[7,8] Smoking increases the risk of adverse cardiovascular events in women treated with combined hormonal contraceptives.[9] Tobacco use also increases the risk of cervical cancer, infertility, painful and irregular menses, and early menopause.[10]

Health care providers are an important resource for health promotion. Physician advice doubles the likelihood of patients quitting smoking[11], reduces problematic drinking[12], and decreases the number of days that heavy drinking and unprotected sex occur[13]. Excess risks lead to excess costs, and effectively treating two behaviors in an individual reduces medical costs by about $2000 per year[14]. To optimize the health and wellbeing of patients, health care providers ideally would assess and intervene upon the multiple risks with which patients present. With alcohol and tobacco, observational studies have documented that continued smoking is associated with worse alcohol treatment outcomes[15], while quitting smoking predicts improved sobriety[16–19]. Counter to clinical concerns that intervening on smoking may compromise sobriety, a meta-analysis of 19 randomized controlled trials with clients in addictions treatment or recovery found tobacco treatment interventions were associated with a 25% increased likelihood of long-term abstinence from alcohol and illicit drugs[20].

Medical student performance provides an indication of how well medical schools are preparing future doctors. We previously found that third-year medical students were skilled at identifying patients' tobacco use and tailored their interventions based on patients' readiness to quit[21]. The current randomized controlled study extends this work to evaluate student performance with a standardized patient with sexual health concerns and current tobacco use that varied on

problematic drinking status (alcohol-positive or alcohol-negative). The patient case was designed to be realistic in the cluster of issues presented and provide an evaluation of the approach to multiple risks. To our knowledge, this is the first study to examine student physician attitudes and behaviors in treating tobacco dependence among smokers presenting with multiple risks.

METHOD

Setting. The study occurred at the University of California, San Francisco (UCSF) School of Medicine. The curriculum covered sexual risk behaviors, tobacco use, and alcohol use in separate training blocks delivered by different faculty groups (Textbox 1).

Textbox 1. Medical School Curriculum Content on Sexual Risk Behaviors, Tobacco, & Alcohol

Sexual Risk Behaviors: covered in the second year "Infection, Immunity, and Inflammation" block with 8 hours of lectures on sexually transmitted infections and additional review in small groups, and in the second year "Life cycle" block with six 1-hour lectures on adolescence, contraceptives, lesbian/gay/bisexual/transgender (LGBT) health, intimate partner violence, and sexual assault.

Tobacco Use and Treatment: covered largely in the fall of the second year during the "Cancer" block using components of the evidence-based *Rx for Change* tobacco treatment curriculum[33] including: a 1-hour didactic classroom instruction on stage-tailored behavioral treatments for tobacco dependence, a 1-hour online individual learning module on pharmacological treatments for tobacco dependence, and a 2-hour small group session during which the students role-play counseling interventions in pairs with a variety of patient cases representing different clinical scenarios, stages of change, and patient demographics.

Alcohol Use and Treatment: covered in the first year in the context of an introductory case that addresses cutoffs for moderate drinking and the role of alcohol treatment programs and co-morbid depression and in the second year "Brain Mind Behavior" block with 3 hours of lecture and small group instruction on substance use.

Procedures. The study was conducted in November/December 2010 during the mini-clinical performance examination (mini-CPX), a required, formative SP assessment conducted mid-way through the third year. SPs can simulate clinical situations realistically and consistently and have been employed in many medical schools to teach and evaluate clinical skills[22,23].

During the mini-CPX, each student saw three SPs in 17-minute encounters and completed a 10-minute online written exercise (interstation exercise) immediately following each encounter. In one case, a 28-year-old woman concerned about a recent pregnancy scare and requesting a prescription for the birth control pill was a current smoker. The case presented the students with an opportunity to offer smoking cessation counseling.

Textbox 2 provides a brief description of the two study case versions. In one version, the patient reported limited alcohol use. In the other, the patient reported heavy alcohol use. If students failed to assess alcohol use, alcohol-positive patients were instructed to reveal their problematic alcohol use to ensure that the case versions were distinct.

Textbox 2. Standardized Patient Case Profile

Tracy Moran is a 28-year-old woman who comes to a primary care clinic because she had a recent pregnancy scare with a failed condom. She is in a monogamous relationship and interested in the birth control pill as well as a general physical. The clinical interview should reveal she smokes 1.5 packs per day. Tracy's boyfriend is a former smoker encouraging her to quit. With the doctor's assistance, Tracy is willing to set a quit date for the next 2 weeks. Tracy's major stressor is her work at an ad agency that recently experienced layoffs.

Non-Alcohol Problem Version of the Case: When asked if she drinks, Tracy says about 1 night a week, and when she drinks, never more than one drink in a night. "It's been so stressful at work, alcohol just makes me tired, so I never have more than 1 glass of wine or a beer in a night."

Alcohol Problem Version of the Case: When asked if she drinks, Tracy says – "I've been going out to drink with my coworkers to blow off steam" and reports drinking 4 to 5 drinks after work about 4 days a week. Tracy reports her mother, who is a recovered alcoholic, encouraged her to attend Alcoholics Anonymous. Tracy has attended 2 meetings in the past week and wants to continue. Her last drink was 6 days ago. She has no symptoms of alcohol withdrawal (tremor, irritability, jitters). To ensure that problematic alcohol use is revealed to the student doctor, when advised to quit smoking, Tracy states, "I've been clean from alcohol for 6 days but I do want to quit smoking. So when do you think I should quit?"

Students were randomly assigned to case version and not informed that two versions were used or that the case addressed smoking cessation. The three female actors portraying the case received 15 hours of training on case presentation, checklist completion, smoking health effects, and tobacco treatment research in patients with substance use problems. All three actors played both case versions on different days.

Sample. Participants were third-year medical students, midway through their core clerkships. During the mini-CPX orientation, the students were informed of the study described as an examination of student performance with disease assessment and prevention. The UCSF Institutional Review Board approved the study. All students were required to complete the SP case and interstation exercise as a routine part of the miniCPX; informed consent to analyze student responses and performance ratings was requested at the interstation exercise following the patient encounter. All measures were computer-administered with no missing data on any of the items.

Standardized Patient Completed Measures. A checklist evaluated student assessment of the patient's *sexual health history* (3-items) and frequency and amount of *alcohol use* (1-item), credited only if the student initiated assessment of the patient's alcohol use. *Tobacco treatment* (5-items), based on the 5-A's framework[24], credited students for: 1) asking about tobacco use and amount; 2) advising about the health benefits of quitting or health risks of smoking on hormonal birth control; 3) assessing readiness to quit smoking; 4) assisting with quitting (i.e., setting a quit date in 2 weeks, recommending cessation pharmacotherapy, encouraging coping strategies other than smoking for dealing with stress, referring to a smoking cessation quitline/program); and 5) arranging a follow-up visit. Tobacco treatment performance was evaluated as the percent correct out of 5 points, internal consistency Cronbach's alpha=0.77.

Clinical performance (11-items) was evaluated using an adaptation of the SEGUE Framework[25]. Using a 3-point rating scale of "strongly agree" (1.00), "agree" (0.75), and "disagree" (0), SPs evaluated students' demonstrated empathy and respect, information gathering, active listening, exploration of the patient's perspective, development of personal rapport, meeting of patient's needs, and involvement of the patient in treatment planning (Cronbach's alpha=0.80 for the total scale score evaluated as the percent credited out of 11 possible points). The items in the SEGUE were designed to be low inference and objective, such that raters would be able to identify whether the behavior was performed or not, thereby eliminating the need for a middle rating of 0.50. The distinction between 0.75 and 1.00 on the scale is meant to capture the minority of students with exceptional performance on the item.

Patient satisfaction (1-item) assessed whether the patient would, based on her level of satisfaction, return to see this student physician again, coded as agree (1) or disagree (0). *Narrative feedback* provided by the SPs was open-ended, brief, and evaluative concerning students' overall performance. This feedback was coded for thematic content by two study authors (KG and JJP) without knowledge of case version.

Student Completed Measures. Three multiple-choice items assessed students' *tobacco treatment knowledge* of unassisted quit attempt success rates, smoking prevalence, and readiness to quit smoking among smokers with substance use problems. A fourth item had the students identify the patient's stage of change. *Attitudes* toward treating tobacco dependence in smokers with addiction problems (four items) were assessed with a 5-point Likert scale ranging from strongly agree (1) to strongly disagree (0) (sample item: patients with alcohol or drug problems should work on their substance use issues before quitting smoking). The knowledge and attitudinal items had demonstrated sensitivity to training effects previously[26].

Analyses. Descriptive analyses summarized survey responses. Differences in student performance were examined by patient case version. Initial analyses tested differences in measured variables by patient actor. When significant, partial correlations and logistic regressions were run to examine associations among the constructs controlling for patient actor, entered as a categorical variable and represented by dummy codes. In logistic regressions, the Wald statistic was used to assess the significance of a single variable or coefficient. Patient satisfaction was examined in relation to patient case version and clinical performance both in univariate analyses and in a mediation analysis. For the mediation analysis, we entered the variables in two separate steps and examined the influence of clinical performance on the change in standardized beta weights of patient case version in predicting patient satisfaction[27].

RESULTS

Sample Descriptives. Of the 168 miniCPX students, 156 agreed to have their data used for the study (93% participation rate). The sample was 55% female, 26% of underrepresented minority, with a mean age of 27.3 years (SD=2.7), and representative of the UCSF third-year medical school class ($p>0.50$ for tests of comparison on measured demographics). Nearly half the sample (n=75, 48%) interviewed the patient with alcohol problems. The three actors were assigned to both case versions equally with no difference in assignment, $\chi2(2)=2.34$, $p=0.310$.

Behavioral Assessment and Interaction. Table 1 summarizes student performance in the counseling interaction overall and by case version. While most students (>80%) assessed the patient's sexual health history and discussed options for birth control, students' assessment of prior STDs (80% vs. 91%) and birth control use (88% vs. 98%) were significantly lower with the alcohol-positive rather than the alcohol-negative case. Just over half (54%) of students assessed alcohol use and amount without prompting by the patient, with no difference by case version.

Most students asked about tobacco use (85%), advised patients to quit (85%), and provided assistance with quitting (71%). Students encountering the alcohol-positive case, however, were significantly less likely to assess patients' readiness to quit smoking than students working with the alcohol-negative case (41% vs. 60%). Controlling for patient actor effects in a logistic regression, case version remained a significant predictor of assessment of readiness to quit (Wald=7.20, df=1, $p=0.007$). Few students arranged follow-up to assess progress with quitting smoking (35%). Students achieved a mean of 53% (SD=0.29) of possible points for tobacco treatment interventions, with no difference by case version.

Student Tobacco Treatment Knowledge. Students averaged 42% correct (SD=0.21; range: 0% to 100%) on the knowledge items. Greater knowledge was significantly correlated with tobacco treatment performance scores, $r=0.17$, $p=0.034$. Overall knowledge scores did not differ by patient case version: (48% [SD=0.20] for the alcohol-positive case vs. 40% [SD=0.21] for alcohol-negative, $p=0.124$). Students seeing the alcohol-positive case, however, were less likely to view smokers with alcohol problems as comparable in readiness to quit to the general population, $\chi2(3)=8.27$, $p=0.041$. Only 24% of students correctly identified the SP's stage of change for quitting smoking as preparation (ready to quit within 30 days); 6% of students staged the patient in contemplation and 49% in precontemplation; 21% stated they did not know or assess

Table 1. Combined and Case-Specific Scoring for Standardized Patient Exam

	Case Version			Group comparison p-value
	Alcohol Negative n=81	Alcohol Positive n=75	Overall N=156	
Assessed history of sexually transmitted diseases	91%	80%	86%	0.042
Assessed history of prior birth control use	98%	88%	93%	0.020
Discussed options for birth control use	89%	81%	85%	0.167
Asked patient about alcohol use and amount	54%	53%	54%	0.902
Asked patient about tobacco use and amount	85%	84%	85%	0.838
Advised patient of health benefits of quitting or the risks of using hormonal birth control while smoking	88%	81%	85%	0.274
Assessed patient's readiness to quit smoking	60%	41%	51%	0.025
Assisted patient with quitting smoking*	75%	67%	71%	0.234
Scheduled a follow up visit to re-evaluate patient's tobacco use or quit attempt	33%	36%	35%	0.726
Tobacco treatment summary score: M (SD)	56% (0.28)	51% (0.30)	53% (0.29)	0.247
Clinical performance summary score: M (SD)	84% (0.11)	81% (0.13)	83% (0.12)	0.173
Would return to see this doctor again	95%	84%	90%	0.023

**Credit for assistance included either setting a quit date within 2 weeks, recommending cessation pharmacotherapy, encouraging alternative coping strategies for stress and anxiety, or referring to a quit smoking program, quitline or other support group*

the patient's stage of change. Fewer students seeing the alcohol-positive case correctly staged the patient in preparation (19%) relative to the alcohol-negative case (30%), but the difference was not statistically significant, $\chi2(1)=2.54$, $p=0.111$; there was no difference by patient actor. Failure to correctly identify patients as in preparation was associated with significantly lower tobacco treatment performance scores, M=48% (SD=0.29) vs. 69% (SD=.23), $F(1,155)=15.77$, $p<0.001$, and lower likelihood of working to set a quit date within 2 weeks, M=18% vs. 34%, $\chi2(1)=4.54$, $p=0.033$, relative to students who correctly staged the patient in preparation.

Student Attitudinal Barriers. The overall mean sum score for the attitudinal barrier items was 1.17 (SD=0.66) out of 4, indicating low levels of agreement. Students encountering the alcohol-positive patient, however, had significantly greater agreement with the barriers to treatment (M=1.29, SD=0.68) than students encountering the alcohol-negative patient (M=1.06, SD=.62), $F(1,155)=4.79$, $p=0.030$. Higher attitudinal barriers were significantly correlated with lower tobacco treatment performance ($r=-0.17$, $p=0.033$) and poorer tobacco treatment knowledge ($r=-0.20$, $p=0.011$).

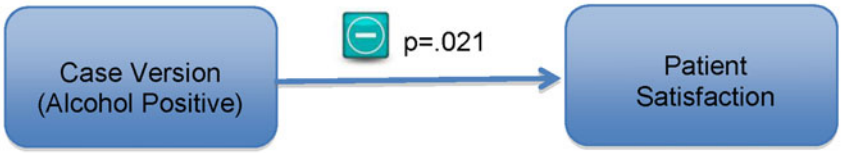
Counseling Interaction. Students averaged 83% (SD=0.11) on the clinical performance score, with highest scores on maintaining a respectful tone (M=89%, SD=0.14) and lowest on reviewing next steps with the patient (M=71%, SD=0.31). Clinical performance scores differed significantly by patient actor, $F(2,155)=67.24$, $p<0.001$. In a partial correlation, controlling for patient actor, clinical performance scores were significantly associated with case version (partial $r=-0.26$, $p<0.001$) and indicated lower scores for the alcohol-positive patient. Clinical performance was not significantly correlated with tobacco treatment attitudes (partial $r=-0.15$, $p=0.068$) or knowledge (partial $r=0.14$, $p=0.080$).

Patient Satisfaction. Patient satisfaction in reported willingness to return to see the student doctor differed significantly by actor, $\chi2(2)=8.47$, $p=0.015$. In a logistic regression, controlling for actor, patient satisfaction was significantly lower for the alcohol-positive than the alcohol-negative case, Wald=5.32, df=1, $p=0.021$. Controlling for patient actor, patient satisfaction also was significantly correlated with attitudinal barriers ($r=-0.19$, $p=0.016$), tobacco treatment scores ($r=0.19$, $p=0.021$), and clinical performance ($r=0.49$, $p<0.001$), but not tobacco treatment knowledge ($r=0.04$, $p=0.667$).

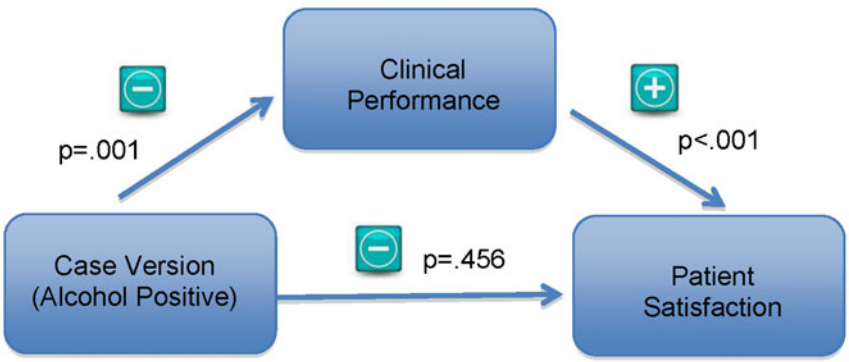
We explored mediators of the relationship between patient case version and patient satisfaction using logistic regression analysis (Fig. 1). The change in significance for case version as a predictor of patient satisfaction (step 1) with the inclusion of the clinical performance score (step 2) indicated a significant mediation effect. Attitudinal barriers and tobacco treatment scores did not add significantly to the mediation model, p-values>0.05.

Narrative Feedback. The actors' narrative feedback from the patient perspective to the students revealed that 38% of students adequately addressed patients' tobacco use. Students who did not adequately address patients' tobacco use failed to demonstrate competency for treating tobacco dependence (9%), discouraged quitting during early alcohol recovery (3%), ran out of time (10%), or failed to address next steps with quitting (41%). Type of feedback provided did not vary by patient actor, $\chi2(8)=8.99$, $p=0.343$. A chi-square test for differences by patient case version, however, was significant, $\chi2(4)=11.57$, $p=0.021$, and indicated that students seeing the alcohol-positive case were more likely to run out of time (18% vs. 3%) and voice concerns about

Step 1. Univariate association between case version and patient satisfaction is significant and indicates poorer satisfaction with the student doctors who treated the alcohol-positive case.



Step 2. Inclusion of the clinical performance score in the model makes the association with case version no longer significant indicating a significant mediation effect. That is, when student performance in the exam was high, patient satisfaction was high, regardless of the complexity of issues with which the patient presented (alcohol-positive or alcohol-negative). Attitudinal barriers and the tobacco treatment score were not significant variables in the model, p-values > 0.05 and for simplicity are not shown in the schematic.



Note: The models controlled for patient actor, which was a significant predictor in both steps, p-values < 0.05.

Figure 1. Test of mediation in patient satisfaction with student physician.

quitting smoking and alcohol simultaneously (6% vs. 0%) relative to students seeing the alcohol-negative case.

DISCUSSION

Health behavior change efforts are viewed as paramount for a sustainable health care system[28]. In an SP evaluation, just over half of our student sample was assessed for problematic alcohol use, far less than the proportion asking about tobacco. Students seeing the alcohol-positive case were less likely to ask about prior birth control and STD history. They also were less likely to identify that smokers with alcohol problems are as ready to quit smoking as the general population, and they endorsed more attitudinal barriers to treating tobacco dependence in smokers with substance use problems. Greater perceived barriers were associated with less attention to tobacco use with the patient. These findings suggest the need for training on assessment and management of the multiple risks with which patients present.

Notably, students' screening rates for multiple risk behaviors were comparable to reports in the literature for surveys with general practitioners and recently trained and experienced family physicians[29,30]. On average, however, students addressed fewer than three of the recommended 5-A's of tobacco treatment. Tobacco treatment training specifically needs to emphasize the identification of patients ready to quit smoking and the provision of active interventions as less than one in four students in our study encouraged the patient to set a quit date. Attention to follow-up planning also is needed.

Although clinical performance ratings for communication were high for all students, patient satisfaction, expressed as willingness to continue treatment with the student doctor,

was significantly lower for the alcohol-positive than the alcohol-negative case. Clinical performance ratings moderated the relationship between patient case version and patient satisfaction. That is, when student performance in the exam was high, patient satisfaction was high, regardless of the complexity of issues with which the patient presented (alcohol-positive or alcohol-negative).

The findings also likely reflect the systems problem of insufficient time to evaluate multiple issues in medical practice. It is noteworthy that 18% of students with the alcohol-positive case ran out of time, compared with only 3% of those with the alcohol-negative case. The miniCPX patient encounter was limited to 15 minutes, which mirrors the standard primary care visit in practice and likely is not adequate for addressing the multiple risks with which patients present. Analysis of 46,250 adult visits to primary care physicians from 1997–2005 in the National Ambulatory Medical Care Survey identified the median visit duration as 15 minutes; visits that provided appropriate behavioral counseling (in this case, for diet and exercise) averaged 2.6 to 4.2 minutes longer per risk behavior addressed.[31] Training on effective time management and agenda setting is critical for facilitating students' attention to multiple risks.

Students who saw the alcohol-positive case also were more likely to voice concerns about quitting smoking and alcohol concurrently than students who saw the alcohol-negative case. Provider training needs to cover the synergistic benefits of treating multiple risks and effective models for supporting, rather than overwhelming, patients with multiple behavior change goals.

The current study is limited to one training site, with a single SP encounter, and may not generalize to other programs. To our knowledge, the amount of curriculum time our medical school dedicated to behavioral risks is likely on average to other medical schools. Schools with a greater emphasis on behavioral health issues may expect better student performance. Tobacco-related knowledge and attitudes were assessed only following the patient encounter to avoid priming the students that the case was tobacco-related. It is possible, though unlikely given the randomized design, that student group differences found by patient case version were pre-existing. Assessment of student knowledge and attitudes for addressing sexual health and alcohol concerns would have been valuable; however, time constraints limited the number of items and areas that could be assessed. Strengths of the study include the 93% student participation rate and use of SPs, which allow for assessment of skills in a clinically realistic, natural learning setting in a standardized manner. Despite intensive training and supervision, patient actor differences were identified and controlled for in tests of associations.

In closing, it is worth noting that the curriculum for students in the current study covered assessment and treatment of sexual health concerns, tobacco, and alcohol in separate modular blocks rather than from an integrative model of health behavior change, and there was minimal communication between faculty leading the different areas. This siloed approach is characteristic of traditional medical training and behavioral research fields more broadly[32]. The study findings support the need for paradigm shifts in medical education, both in didactics and clinical practice opportunities, that emphasize assessment of multiple risks, new models of conceptualizing behavior change as a generalized process, and treatment of the whole patient for optimizing health outcomes.

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