Coverage of adolescent substance use prevention in state frameworks for health education.

By: Christopher M. Seitz, David L. Wyrick, Muhsin M. Orsini, Jeffrey J. Milroy, Melodie Fearnow-Kenney

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Abstract:

BACKGROUND: The use of alcohol, tobacco, and other drugs (ATOD) by adolescents is a national health issue. One way in which the United States approaches the prevention of substance use among adolescents is by teaching high school students about ATOD at school. The curriculum for health education courses is based upon each state's framework. The purpose of this study was to conduct a 10-year follow-up to a study that analyzed state frameworks for key mediators of adolescent substance use.

METHODS: Researchers performed an extensive content analysis of all 50 states' curriculum frameworks for high school health education to identify if, and to what degree, key mediators of adolescent substance use were included in each state's curriculum framework. After training, inter-rater agreement was greater than 95%.

RESULTS: Mediators identified most often in the 50-state curriculum frameworks for high school health education were beliefs about consequences, decision making, social skills, assistance skills, and goal setting. Twenty-two of 50-state curriculum frameworks for high school health education had dedicated sections for ATOD.

CONCLUSION: There were modest improvements since 2001 in the inclusion of mediators of adolescent substance use within state curriculum frameworks. There still exists many opportunities to more effectively use curriculum frameworks to improve classroom health instruction.

Keywords: child and adolescent health | alcohol | drugs | health educators | smoking and tobacco | school health instruction

Article:

The use of alcohol, tobacco, and other drugs (ATOD) is 1 of 6 risk factors identified by the Centers for Disease Control and Prevention (CDC) that are contributing to the decline of adolescent health.1 According to the national Youth Risk Behavior Survey, roughly 42% of the nation's high school students are current alcohol users, 20% are current cigarette users, and 21% are current marijuana users.2 The use of substances by high school students is a concern for health professionals, as adolescent substance use is associated with several problems, including motor vehicle crashes,3 suicide,4 risky sexual behaviors,5,6 conduct issues with police and school authorities,7 and negative academic achievement.8–11 In addition, acute and chronic substance use during adolescence is related to future use12 and substance disorders13 during adulthood.

One way in which the United States approaches the prevention of substance use among adolescents is by teaching high school students about ATOD at school.14 The curriculum for health education courses is based upon each state's curriculum framework, a document that serves as a blueprint for administrators responsible for writing local health education curricula. Frameworks act as an outline on how subject matter is to be articulated across grades. Ideally, a state health education curriculum framework provides a guide to recommended instructional and assessment strategies including an analysis of how those strategies address state and national health standards. Because curriculum frameworks vary from state to state, health topics, including ATOD, and the scope in which they are taught may also vary across states.15

Assessing the effectiveness of health programming aimed at lowering adolescent substance use can be conducted by the meditational method.16 According to this method, prevention programming indirectly affects the final behavioral outcome, such as substance use, by changing key precursors, also known as risk factors, protective factors, or mediators. According to the meditational method, attempts to affect adolescent substance use will only be successful by changing certain mediators that have been shown to have an influence on substance use.17,18 In 1992, Hansen analyzed 41 school-based prevention programs for adolescent substance use and identified 12 key mediators that were addressed throughout the programs. These basic mediators included (1) normative beliefs about substance use prevalence and acceptability, (2) lifestyle incongruence, (3) beliefs about consequences, (4) commitment to not using substances, (5) social pressure resistance skills, (6) stress management skills, (7) self-esteem, (8) alternatives to substance use, (9) decision-making skills, (10) goal-setting skills, (11) social skills of assertiveness, communication, and interpersonal problem solving, and (12) assistance skills (Table 1).19

Table 1. Mediators of Adolescent Substance Use

Mediator	Definition	Postulated Effects of Drug Use
Normative beliefs	Focuses on students' perceptions of acceptability and rates of drug and alcohol use. Adolescents tend to overestimate prevalence and acceptability of use and availability of drugs within their peer groups	Expectations are lowered regarding prevalence and acceptability of use and availability of drugs in peer-oriented social settings
Lifestyle incongruence	Demonstrates to adolescents that their ideal future is incongruent with drug use	Individuals make decisions based on their idealized future and see that drug use is incompatible with the goals they hope to achieve
Commitment	Emphasizes moral reasons for living drug free. Adolescents are encouraged to make commitments to live drug-free	Development of strong personal commitments to live drug-free discourages substance use
Consequence beliefs	Focuses on the consequences of using or abusing drugs and the likelihood of experiencing social and/or physical harm from drug use. Multiple consequences are emphasized such as long-term and short-term physical, psychological, and social results of drug use	Adolescents' knowledge about the harmful consequences of drug use and their perceived susceptibility to those harmful consequences is increased
Resistance skills	Teaches skills to identify and assertively resist pressure to use drugs from peers, siblings, parents, adults, and the media	Development of personal skills and an increased perceived self-efficacy allows adolescents to refuse offers to use drugs
Goal setting	Promotes the development of skills necessary for setting and attaining goals	Increased motivation to strive for achievement and the ability to set and achieve goals emphasizes the incongruence between drug use and attaining personal goals
Decision making	Teaches rational decision making for identifying problems, creating solutions	The development of decision-making skills assists adolescents in

Mediator	Definition	Postulated Effects of Drug Use
	and making choices among alternatives	making rational decisions concerning substance use
Activities/alternatives	Emphasizes participation in programs and activities that offer alternatives to drug use	Exposure to at-risk situations is reduced and involvement in activities that run counter to drug use is increased
Self-esteem	Focuses on developing individual feelings of value and self-worth. Appreciation of uniqueness and individual talents is emphasized with the aim to increase self-esteem	Improved self-esteem will mediate the onset of drug use
Stress management	Teaches skills that help adolescents cope with and manage psychologically difficult situations. Alternatives for dealing with stressful situations are emphasized	A reduction in perceived stress will mediate the development of drug use
Social skills	Provides social skills training including communication skills, human relations skills, and skills for solving interpersonal conflict	Focusing on social skills will reduce substance use by helping adolescents improve their ability to communicate effectively, helping them to gain social acceptance, and resolve interpersonal conflict peacefully
Assistance skills	Teaches adolescents the skills necessary for getting help for themselves or others in the case of substance abuse and educates adolescents on what services are available for those who need help	Provide social support to at-risk individuals and educates adolescents on where and how to seek help

Hansen, McNeal, and Fearnow-Kenney would later test these 12 mediators in a longitudinal study to further determine their strength in predicting adolescent substance use. In their study, more than 4000 students in grades 6 through 12 were surveyed annually for 5 years, revealing that 4 of the 12 mediators (normative beliefs, commitment to not use substances, beliefs about consequences, and lifestyle incongruence) were especially strong longitudinal predictors of ATOD use.20,21 In addition, these four mediators were most related to the onset of drug use, as

non-users in eighth and ninth grade did not deteriorate in the 4 mediators' strength as compared to those who did initiate in ATOD use.20

In 2001, Wyrick et al15 investigated the presence of Hansen's 12 mediators within a random sample of 10 state curriculum frameworks. The study was conducted to determine if evidence-based research on adolescent substance use was being applied to the creation of state health education curriculum frameworks. Findings suggest that the 4 strongest mediators were identified least often within the frameworks. Moreover, the study found that many state curriculum frameworks did not specifically address ATOD use (Figures 1 and 2). In the end, Wyrick et al15 recommended that frameworks be improved to offer detailed suggestions for incorporating evidence-based prevention strategies into the classroom.

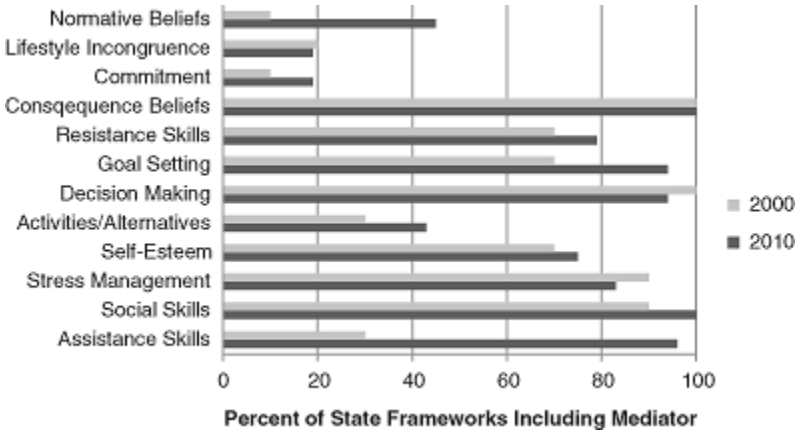

Figure 1. Percent of States With Hansen's 12 Mediators Within State Curriculum Frameworks for Health Education: 2000 and 2010

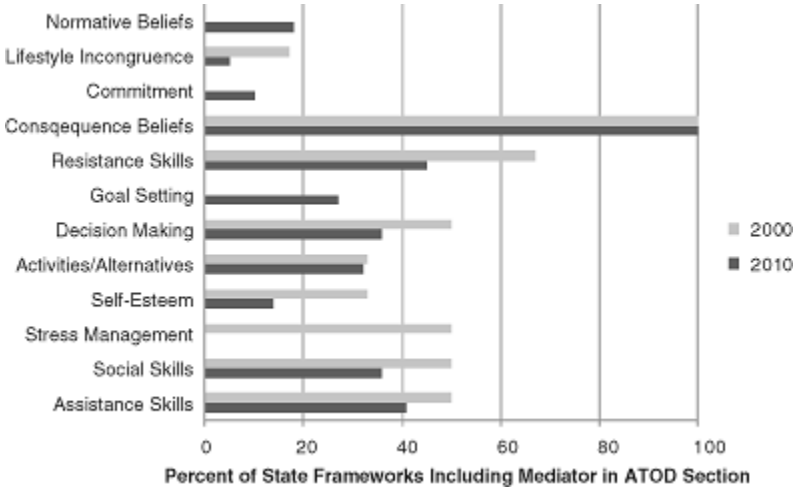

Figure 2. Hansen's 12 Mediators Within ATOD Sections of State Frameworks for Health Education: 2000 and 2010

The purpose of this study was to conduct a 10-year follow-up to Wyrick et al's original research. Our goal was to replicate the 2001 study to identify if improvements have been made to state curriculum framework curriculums regarding the key mediators of adolescent substance use.

METHODS

Review of State Curriculum Frameworks

Researchers performed a content analysis of all 50 states' curriculum frameworks for high school health education in order to (1) identify if, and to what degree, the 12 mediators were included in each state's curriculum framework, (2) to determine if state curriculum frameworks included sections that specifically addressed ATOD and to what extent the 12 mediators were present within that section, (3) to identify the extent to which the 4 strongest prevention mediators identified by Hansen and colleagues (normative beliefs, manifest commitment to avoid drug use, beliefs about consequences, and lifestyle incongruence) were found in the state curriculum frameworks and in the specific ATOD sections, and (4) compare these findings to Wyrick et al's original 2001 study.

Framework Selection

During June and July 2010, researchers contacted each state's Department of Education by telephone to request a copy of the high school curriculum framework for health education. Representatives from each state's Department of Education instructed the researchers how to acquire the framework directly from their Department of Education's official Web site. However, when the Web sites were difficult to navigate, staff delivered the framework to the researchers via e-mail.

Data Analysis

To determine the extent to which the 12 prevention mediators were present, the state curriculum frameworks were reviewed for the presence or absence of each mediator. A 2-level categorization scheme of inclusion for each mediator was used. The 2 categories characterized the presence or absence of each mediator by assigning 1 of the following labels: Clearly Identified or Not Identified. To ensure reliable results, 2 project members independently reviewed each state curriculum framework. Reviewers were instructed by the project director on the definition and use of prevention mediators as used in school curricula. The reviewers were further trained by independently identifying the mediators, under the direct supervision of the project director, that were contained in 3 state frameworks. Inter-rater agreement was measured at greater than 95% after training and after data collection procedures. Content discrepancies among the reviewers were examined by the project director who made final decisions regarding the presence or absence of the mediator.

Each of the state curriculum frameworks for secondary health education was reviewed extensively. The review included all standards, objectives, and any additional or supplementary information provided to assist in curriculum development. Mediators did not have to be specifically listed to be classified as “Clearly Identified.” For instance, frameworks that described objectives related to the definition of mediators were included. It was assumed that the mediators may be referred to differently by different groups but that the definitions of the mediators should closely resemble each other. For example, lifestyle incongruence is also referred to as values incongruence and social skills are sometimes referred to as life skills. Although names of the mediators vary, definitions of those mediators and how they are thought to mediate adolescent substance use are the same. Essentially, reviewers determined if the state curriculum framework offered some indication that a mediator should be part of the health education/substance use prevention process.

State curriculum frameworks were examined in a 4-step procedure. First, each of the 50 frameworks was examined in their entirety for the presence of the 12 prevention mediators. Second, the frameworks were reviewed to determine if a specific section for ATOD was included. Third, each framework with an ATOD section was re-examined to determine the presence or absence of each of the 12 prevention mediators within the ATOD section. Finally, mediators were rank ordered according to those most commonly identified across all 50 states' curriculum frameworks. These rankings were compared to the 4 mediators shown by Hansen and colleagues to be most highly predictive of adolescent substance use.

RESULTS

The research team identified and collected 47 state health education curriculum frameworks for high school. There were 3 states that did not provide frameworks for high school health education.

Inclusion of Prevention Strategies in State Frameworks

Mediators identified most often in the 50-state curriculum frameworks for secondary health education (Table 2) were beliefs about consequences (47 state frameworks), decision making (44 frameworks), social skills (47 state frameworks), assistance skills (45 state frameworks), and goal setting (44 state frameworks). Of the 4 mediators most predictive of adolescent substance use (Hansen), beliefs about consequences was well represented in the state frameworks, commitment was identified in 9 frameworks, lifestyle incongruence in 9 frameworks, and normative beliefs in 22 frameworks.

Table 2. Hansen's 12 Mediators Within State Curriculum Frameworks for Health Education

State	NB	LI	C	CB	Subtotal (N of 4)	RS	GS	DM	AA	SE	SM	SS	AS	Total (N of 12)
Alabama	•			•	2	•		•		•	•	•	•	8
Alaska				•	1			•				•		3
Arizona	•	•		•	3	•	•	•	•		•	•	•	10
Arkansas				•	1	•	•	•		•	•	•	•	8
California	•	•	•	•	4	•	•	•	•	•	•	•	•	12
Colorado	•			•	2	•	•	•		•	•	•	•	9
Connecticut				•	1	•	•	•			•	•	•	7
Delaware	•	•	•	•	4	•	•	•	•	•		•	•	11
Florida	•			•	2	•	•	•	•		•	•	•	9
Georgia	•			•	2	•	•	•	•	•	•	•	•	10
Hawaii				•	1		•	•		•	•	•	•	7
Idaho	•	•		•	3	•	•	•	•	•	•	•	•	11
Illinois	•			•	2	•	•	•		•	•	•	•	9
Indiana	•	•	•	•	4	•	•	•	•	•	•	•	•	12

State	NB	LI	C	CB	Subtotal (N of 4)	RS	GS	DM	AA	SE	SM	SS	AS	Total (N of 12)
Iowa	•			•	2		•	•	•	•	•	•	•	9
Kansas			•	•	2		•				•		•	5
Kentucky				•	1	•	•	•		•	•	•	•	8
Louisiana	•	•	•	•	4	•	•	•		•	•	•	•	11
Maine	•			•	2	•	•	•	•	•	•	•	•	10
Maryland				•	1	•	•	•		•	•	•	•	8
Massachusetts			•	•	2	•	•	•	•	•	•	•	•	10
Michigan				•	1	•	•	•		•	•	•	•	8
Minnesota				•	1	•	•	•		•	•	•	•	8
Mississippi		•		•	2		•	•		•	•	•	•	8
Missouri				•	1	•	•	•	•	•	•	•	•	9
Montana				•	1	•	•	•		•	•	•	•	8
Nebraska				•	1	•	•	•	•	•	•	•	•	9
Nevada	•			•	2	•	•	•				•	•	6
New Hampshire	•		•	•	3	•	•	•	•	•	•	•	•	11
New Jersey		•		•	2	•	•	•	•	•	•	•	•	10
New Mexico				•	1	•	•	•	•	•	•	•	•	9
New York				•	1		•	•		•	•	•	•	7
North Carolina	•			•	2	•	•	•	•	•	•	•	•	10

State	NB	LI	C	CB	Subtotal (N of 4)	RS	GS	DM	AA	SE	SM	SS	AS	Total (N of 12)
North Dakota	•		•	•	3	•	•	•	•		•	•	•	10
Ohio			•		1							•		2
Oklahoma				•	1	•	•	•				•	•	6
Oregon	•			•	2	•	•	•	•	•		•	•	9
Pennsylvania				•	1		•	•		•	•	•		6
Rhode Island				•	1	•	•	•			•	•	•	7
South Carolina*					0									0
South Dakota				•	1					•		•	•	4
Tennessee*					0									0
Texas				•	1	•	•	•	•	•	•	•	•	9
Utah	•	•		•	3	•	•	•		•	•	•	•	10
Vermont	•			•	2	•	•	•		•	•	•	•	9
Virginia				•	1		•	•			•	•	•	6
Washington	•			•	2	•	•				•	•	•	7
West Virginia	•			•	2	•	•	•	•	•	•	•	•	10
Wisconsin				•	1		•	•		•		•	•	6
Wyoming				•	1	•	•	•				•	•	6
Total	22	9	9	47	NA	37	44	44	20	35	39	47	45	NA

NB, normative beliefs; LI, lifestyle incongruence; C, commitment; CB, consequence beliefs; RS, refusal skills; GS, goal setting; DM, decision making; AA, activities/alternatives; SE, self-esteem; SM, stress management; SS, social skills; AS, assistance skills.

*Health education not required for high school students.

Consistent with previous findings, the state of California continues to provide a comprehensive state health education curriculum framework by targeting all 12 of the identified mediators. This study revealed that Indiana matches California by targeting each of the 12 mediators. In addition, 13 other states target at least 10 of the 12 mediators: Arizona, Delaware, Georgia, Idaho, Louisiana, Maine, Massachusetts, New Hampshire, New Jersey, North Carolina, North Dakota, Utah, and West Virginia (Table 2).

Inclusion of Prevention Strategies in ATOD Sections

Twenty-two of 50 state curriculum frameworks for secondary health education had dedicated sections for ATOD. Mediators identified most often in the ATOD sections of the state frameworks (Table 3) were beliefs about consequences (22 ATOD sections), resistance skills (10 ATOD sections), and assistance skills (9 ATOD sections). Of the 4 mediators most predictive of adolescent substance use, beliefs about consequences was represented in all 22 ATOD sections, commitment was identified in 2 ATOD sections, lifestyle incongruence in 1 ATOD section, and normative beliefs in 5 ATOD sections.

Table 3. Hansen's 12 Mediators Within ATOD Sections of State Frameworks for Health Education

State	NB	LI	C	CB	Subtotal (N of 4)	RS	GS	DM	AA	SE	SM	SS	AS	Total (N of 12)
Alabama				•	1									1
Arkansas				•	1									1
California	•			•	2	•			•			•	•	6
Colorado	•		•	•	3	•	•	•	•			•		8
Delaware		•		•	2	•	•	•	•			•	•	8
Idaho				•	1									1
Kansas				•	1									1

State	NB	LI	C	CB	Subtotal (N of 4)	RS	GS	DM	AA	SE	SM	SS	AS	Total (N of 12)
Maine				•	1									1
Maryland				•	1	•	•						•	4
Massachusetts				•	1	•		•	•					4
Missouri				•	1				•					2
Nevada				•	1			•				•		3
New Hampshire	•		•	•	3	•	•	•	•			•	•	9
New Jersey				•	1			•		•			•	4
New Mexico				•	1	•	•	•	•	•		•	•	8
North Carolina				•	1	•								2
North Dakota				•	1									1
Ohio				•	1									1
Pennsylvania				•	1									1
Utah				•	1	•						•	•	4
Vermont	•			•	2	•	•	•		•		•	•	8
Washington	•			•	2								•	3
Total	5	1	2	22	NA	10	6	8	7	3	0	8	9	NA

NB, normative beliefs; LI, lifestyle incongruence; C, commitment; CB, consequence beliefs; RS, refusal skills; GS, goal setting; DM, decision making; AA, activities/alternatives; SE, self-esteem; SM, stress management; SS, social skills; AS, assistance skill

Changes in State Framework Prevention Strategies From 2000 to 2010

The results of this follow-up study are similar in comparison to Wyrick et al's original study that was conducted in 2000. With the exception of normative beliefs and assistance skills, the percent of mediators included in the overall state frameworks are fairly similar between 2000 and 2010 (Figure 1). The inclusion of normative beliefs increased from 10% of frameworks in 2000 to 44% of frameworks in 2010. Likewise, the inclusion of assistance skills increased from 30% of frameworks in 2000 to 90% of frameworks in 2010.

The results of the follow-up study are also similar to the original 2000 study in terms of the inclusion of ATOD sections and ATOD mediators in state frameworks. In both 2000 and 2010, roughly half of the state frameworks included ATOD sections. Again, the percent of mediators included in state frameworks with ATOD sections are fairly similar between 2000 and 2010 (Figure 2); however, the inclusion of normative beliefs increased from 0% of ATOD sections in 2000 to 18% of frameworks in 2010. Also, the inclusion of goal setting increased from 0% of ATOD sections in 2000 to 27% of frameworks in 2010. The inclusion of stress management decreased from 50% of ATOD sections in 2000 to 0% of frameworks in 2010.

DISCUSSION

School health education continues to be one of the more efficient venues for addressing adolescent substance abuse. For instance, 39 states and the District of Columbia require a course in health/physical education as a graduation requirement.22 State curriculum frameworks for high school health education are essential for providing guidance to school districts and health teachers for delivering evidence-based and state-of-the-art health instruction with the goal of enabling students to become healthy and capable of academic success. A good state health education curriculum framework not only details what students should know but also what they should be able to do (ie, health behavior and skills).22

Although knowledge is an essential component of school health education, it is not sufficient. Development of health-related skills and protective attitudes within school health education is just as essential. Targeting skills and attitudes focuses health instruction on methods for communicating, reasoning, and investigating which are essential for achieving lifelong health. State health education curriculum frameworks can be an effective means to organize health knowledge, skills, and attitudes into curricula at the local levels.

In this study, we focused our review on how well state health education curriculum frameworks recommended and described evidence-based instructional strategies to target health-related knowledge, skills, and attitudes to prevent ATOD use among high school students. The 12 mediators outlined by Hansen and others reflect the best practice (evidence-based strategies) for preventing ATOD use among adolescents.

The major findings from this study are similar to Wyrick et al's original content analysis. First, the most represented mediator in the state frameworks and ATOD sections was beliefs about consequences, which is one of the most recommended mediators of adolescent substance use. Second, the remaining essential mediators (commitment, lifestyle incongruence, and normative beliefs) were the least represented among state curriculum frameworks and ATOD sections. Finally, as with Wyrick et al's first study, roughly half of all state curriculum frameworks for health education do not include a specific ATOD section.

Interestingly, trend analysis for inclusion of the four recommended mediators revealed only slight improvement for both the whole framework analysis and the specific ATOD section analysis. Why has little improvement been made in the past 10 years in terms of including key mediators in state frameworks for health education? We speculate the findings are a reflection of the current gap that exists between public health research and practice.23–25 It has been estimated that only 14% of original research actually gets put into practice by health professionals, and that it typically takes 17 years to do so from the time of publication to utilization in the health care setting.25 Major factors that contribute to the delay of utilizing research findings often include a range of historical, political, social, economic, scientific, cultural, and organizational issues.23 In the case of state frameworks for health education, the authors hypothesize that each state's Department of Education varies in terms of economic/organizational support and scientific training of staff members. As such, it is logical that each state is different in terms of staff members who are available and able to access research regarding the key mediators of adolescent substance use and place the findings into frameworks for health education. Moreover, the authors believe that state Department of Education staff members who craft the frameworks for health education may rely upon the CDC's National Health Educations Standards as a guide, which do not include recommendations specifically toward ATOD use.26

Limitations

We acknowledge a major limitation to this study. The findings from this content analysis only reflect the contents of high school curriculum frameworks for health education at the state level. Since frameworks serve only as blueprints for health curriculum, health instruction is likely to vary between and within districts, schools, and classrooms. However, the purpose of this article is not to assess classroom health instruction but to rather investigate whether states are recommending evidence-based strategies for preventing ATOD use among high school students.

Other minor weaknesses include the risk of varying terminology across states and inconsistency of the level of detail offered across frameworks (eg, full text versus bulleted lists and succinctly stated objectives). Although terminology and level of detail varies across states, reviewers did not require that mediators to be specifically listed to be classified as “clearly identified.” For instance, frameworks that described objectives related to the definition of mediators were included. It was assumed that the mediators may be referred to differently by different groups but

that the definitions of the mediators should closely resemble each other. For example, lifestyle incongruence is also referred to as values clarification and social skills are sometimes referred to as life skills. Although names of the mediators vary, definitions of those mediators and how they are thought to mediate adolescent substance use are the same. Essentially, reviewers determined if the state curriculum framework offered some indication that a mediator should be part of the health education/substance use prevention process.

CONCLUSION

This research has the potential to contribute to the health and wellness of more than 16 million high school students in the United States. One primary contribution to the field of prevention science is identification of the sometimes shocking gap between research and practice. That is, whereas we documented modest improvement in the recommendation of best practice for ATOD prevention within state curriculum frameworks, there still exists many opportunities to more effectively use curriculum frameworks to improve classroom health instruction. Most importantly, identifying and describing effective prevention strategies within curriculum frameworks provides health teachers with the level of information they need to incorporate best practices into their lesson plans.

IMPLICATIONS FOR PROFESSIONAL PRACTICE

This study has several implications for school health professionals. First, whereas this study does not assess the level of detail provided regarding the targeted mediators or the degree of emphasis, clear observations and distinctions were made across states. It is not much of a leap to assume that those states that provide more emphasis and detail within their frameworks are promoting more consistent use of best practice within health classrooms.

Second, this approach to reviewing state curriculum frameworks can be expanded to other areas of health education such as family life, safety and accident prevention, and mental and emotional health. The challenge will be to identify whether promising research findings are being used in developing curriculum frameworks for school health education.

Finally, those reading this article who are responsible for crafting state curriculum frameworks for health education should consider including a specific section for ATOD that addresses each of mediators identified by Hansen et al of adolescent substance use, especially the four strongest mediators. However, it is expected that not everyone responsible for creating frameworks will read this article; consequently, how can school health educators or other health professionals improve their state's framework for health education in terms of dedicated sections and mediators for ATOD prevention? We recommend that school administrators, health professionals, and educators advocate that their state's Department of Education include ATOD sections to the framework for health education and include each key mediator of substance use. We also suggest that advocacy efforts include locating, via Internet or telephone, the proper representatives responsible for creating health education frameworks and recommending that specific mediators

and ATOD sections be included in the framework. Those advocating may want to use this paper and Wyrick et al's original study as references to inform policymakers about the importance of including the mediators and ATOD sections in the framework.

Human Subjects Approval Statement

This study was deemed exempt by the institutional review board at the University of North Carolina at Greensboro.

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