ABSTRACT

BACKGROUND: This study explores the relationship between instructional strategies and effective health education curricula.

METHODS: A content analysis of 10 health education curricula was conducted to determine if they include common instructional strategies for actively engaging students in acquisition of health skills. To be included, the curricula had to (1) be research-based and proven via empirical testing to positively influence the health behaviors and (2) address 1 of Centers for Disease Control and Prevention’s 6 priority health risk behaviors.

RESULTS: Content analysis revealed 5 active learning strategies incorporated to involve students in acquiring health skills. Role play, group cooperation, and small group discussion were found in all 10 curricula. To a lesser extent, interactive technology and team games were also included.

CONCLUSION: When combined with previous research regarding the characteristics of effective teachers, it becomes clear that effective health education is delivered by teachers who employ a wide repertoire of active learning strategies while devoting substantial instructional time to those specific strategies that involve students in skills practice.

Keywords: professional preparation of school health personnel; school health instruction; teaching techniques; curriculum.

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The ultimate goal of school health education is to empower students by teaching them the life skills they need to sustain healthy choices.1,2 Life skills are defined by the World Health Organization (WHO) as “abilities for adaptive and positive behavior that enable individuals to deal effectively with the demands and challenges of everyday life”3 and involve the use of knowledge to accomplish a mental, verbal, social, and/or physical task. Essential knowledge and skills are incorporated in the National Health Education Standards for grades Pre-K-12.4 Performance indicators are provided for different grade spans under each standard. Together, content standards and indicators provide benchmarks for assessing the skills and knowledge students should acquire from a curriculum.5 Select health skills that were derived from the wording of the 8 National Health Education Standards and their accompanying performance indicators4 are presented in Table 1.

LITERATURE REVIEW

The development of the National Health Education Standards was informed by research on characteristics of effective health education.6 Effective health education curricula (ie, shown through research to influence behavior) have been found to share the following characteristics:6 research-based and theory-driven; focus on specific behaviors; accurate, basic, and developmentally and culturally; learning activities engage students in interactive and experiential ways; students are given opportunities to model and practice skills; social and media influences on behavior are addressed; individual values and group norms...
that support health-enhancing behaviors are strengthened and supported; of sufficient duration to allow students to gain the needed knowledge and skills; and include teacher training that enhances effectiveness. Nation and colleagues identified 9 characteristics consistently associated with effective health education programs. These included comprehensive, varied teaching methods, sufficient dosage, theory-driven, opportunities for positive relationships, appropriately timed, culturally relevant, included outcome evaluation, and delivered by trained teachers. The teaching methods found in effective programs stressed active, skill-based learning for students. Skills, rather than facts, were also found to be the major catalyst for behavior change. In studying sexuality and human immunodeficiency virus (HIV) education programs, Kirby identified 17 characteristics of effective programs. Two of these characteristics include multiple activities to change risk and protective factors, as well as using instructionally sound teaching techniques that involve students. Skills-based curricula that were studied generally included all of these 17 characteristics and were more effective at changing behaviors, whereas fact-based curricula did not include many characteristics and were less effective at achieving behavior change in students.

As a way to help schools analyze health education curricula, the Health Education Curriculum Analysis Tool (HECAT) was created by the Centers for Disease Control and Prevention (CDC). Health Education Curriculum Analysis Tool incorporates the CDC’s characteristics of effective health education curricula, derived from properties of research-based health education curricula as well as suggestions from health education experts and the National Health Education Standards. For HECAT, an effective health education curriculum includes building personal and social competence and self-efficacy by addressing skills, using strategies designed to personalize information and engage students. Professional development/training for teachers designed to help them implement appropriate instructional strategies (hereafter referred to as strategies) is recommended.

Research supports professional development workshops for teachers before implementing a curriculum. For example, the Maine Department of Education evaluated their HIV Prevention Education Program and found that teachers who attended training sessions on effective research-based curricula were significantly more likely than teachers who were not trained to teach skills by using student-centered strategies. The students in the classrooms of teachers who attended trainings were also more likely to report practicing health skills that were taught in school than students of teachers who did not attend training.

A study of perceptions regarding future teacher preparation involving master health education teachers supported the critical need to be able to call upon a variety of strategies. This study also revealed that acquiring command of a range of strategies involving active learning was considered as vital to preparing new health education teachers. Active learning is defined as “anything that involves students in doing things and thinking about what they are doing.” General characteristics of active learning include involving students in more than just listening, less emphasis on facts, more emphasis on developing skills, engaging students in activities, and focusing their attitudes and values.

Another relevant study, not specific to health education, examined the relationship between teacher quality and student achievement. Effective teachers

### Table 1. Skills Subsumed in National Health Education Standards

<table>
<thead>
<tr>
<th>National Health Education Standards</th>
<th>Selected Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Students will comprehend concepts related to health promotion and disease prevention to enhance health.</td>
<td>Stress management, safety and first aid, communicable disease prevention, correlation between health behavior and health states, analyze multiple influences on health, predict personal susceptibility and severity of injury or illness related to unhealthy behavior.</td>
</tr>
<tr>
<td>2 Students will analyze the influence of family, peers, culture, media, technology, and other factors on health behaviors.</td>
<td>Critical analysis of: internal and external influences, perceptions of norms, health risk behaviors, policies and regulations.</td>
</tr>
<tr>
<td>3 Students will demonstrate the ability to access valid information, products, and services to enhance health.</td>
<td>Accessing information, critical analysis, evaluation of information, using resources, determining when to use health services.</td>
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<tr>
<td>4 Students will demonstrate the ability to use interpersonal communication skills to enhance health and avoid or reduce health risks.</td>
<td>Interpersonal communication, demonstrate strategies to enhance health and reduce risks.</td>
</tr>
<tr>
<td>5 Students will demonstrate the ability to use decision-making skills to enhance health.</td>
<td>Decision making, problem solving, examine barriers, generate alternatives, predict short- and long-term impact, defend choices, justify decisions, and determine the value of decision making.</td>
</tr>
<tr>
<td>6 Students will demonstrate the ability to use goal-setting skills to enhance health.</td>
<td>Goal setting, prediction of consequences, implement strategies, monitor progress, and formulate long-term plans.</td>
</tr>
<tr>
<td>7 Students will demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks.</td>
<td>Self-management, avoidance, refusal, analyze responsibility, demonstrate health practices and behaviors.</td>
</tr>
<tr>
<td>8 Students will demonstrate the ability to advocate for personal, family, and community health.</td>
<td>Demonstrate how to influence and support others, use accurate norms, work cooperatively, communication, and adaptation.</td>
</tr>
</tbody>
</table>
used more varied instructional techniques, including more differentiated instruction, and a wider variety of teaching tools such as media to help supplement the curriculum. Effective teachers also understand that no 1 strategy can be used in every situation. Research conducted over the past few decades has shown that students of teachers who use a variety of strategies perform better than students of teachers who rely only on a limited number of methods. Teachers employing a variety of strategies reach students with various learning styles, helping to ensure that information is absorbed and processed effectively.

Ineffective health education teachers do not streamline content, but rather, deliver a curriculum that is crammed with facts. They focus on increasing student knowledge by having them memorize information that is easily assessed via machine-scored quizzes and tests. These curricula tend to be textbook-driven, focus heavily on vocabulary and definitions, and involve little, if any, active learning. As opposed to health skills that have the potential to last a lifetime, most health facts learned in this way quickly fade from memory.

Use of a wide variety of effective strategies requires substantial planning as well as more time and effort in the classroom. With regard to health education, factual content must be streamlined to accommodate active learning strategies involving skills practice. For example, students do not need to know every minute detail about illicit drugs; more importantly, they need to master the refusal skills necessary to escape a risky situation involving drugs.

RESEARCH QUESTION

A common denominator for both effective health education curricula and effective health education teachers is strategies that are interactive, experiential, and involve modeling and practice of health skills. This leads to the supposition that the planned activities used in the classroom mark the crucial difference between knowledge-only instruction and skills-based instruction. A research question that emerges is, “Do evidence-based categorical health education curricula include common instructional strategies for actively engaging students in the practice of health skills?” The purpose, therefore, of this study was to investigate select evidence-based, categorical health curricula to determine if they include common instructional strategies for actively engaging students in acquisition of health skills.

METHODS

Curriculum Selection

The 10 middle and high school curricula included in this study (Table 2) were systematically selected and analyzed to discover which strategies used to teach skills, if any, are common among them. Curricula were initially identified from sources such as the Federal List of Exemplary, Promising, or Effective Programs provided in HECAT and then selected based on the following criteria: (1) school-based; (2) designed for use in middle or high schools (grades 6-12); (3) intended for general population students (eg, not for select minority populations, not for incarcerated youth); (4) research-based and proven via empirical testing to positively influence the health behaviors of participating students when implemented with fidelity (corroborating citations from the professional literature are provided in Table 2); (5) addressed 1 or more of the 6 critical adolescent risk behaviors identified by CDC; and (6) readily available (eg, easily purchased and/or downloaded from a Web site) to middle and high school health educators for a number of years.

Content Analysis

Content analysis is a research method in which a set of procedures are used to make valid interpretations from a text. The content analysis procedures followed in this study involved several steps beginning with a complete reading of every lesson in each of 10 selected curricula, with special attention to strategies, by 2 reviewers with expertise in health education curriculum evaluation and experience with implementing skills-based instruction. Both reviewers agreed upon what constituted “skills,” “active learning teaching strategies,” and “skills-based instruction” before the analysis was conducted. One reviewer conducted the analysis and the second reviewer verified the accuracy and consistency of the results. The few discrepancies that emerged were resolved through discussion and mutual agreement.

The number of lessons included in each curriculum ranged from 6 to 12 with a mean of 10.9 lessons. On the basis of the descriptions provided in the text, strategies associated with any of the skills presented in Table 1 were identified and categorized using commonly understood “titles” (eg, role play). Every skills-focused section of text in each curriculum was further interpreted by analyzing the manner in which strategies were developed and implemented in context.

RESULTS

Table 3 provides a listing of the strategies commonly found across all, most, or some of the 10, along with the health skills each strategy type is used to teach. Three strategies were found in all 10 curricula, and 2 were found in 7 curricula. Following are descriptions of each of the 5 strategies along with limited illustrative examples of their use within the select curricula.

Role play is defined as an instructional method that allows learners to act out the role of individuals in a
Table 2. Select Evidence-Based Curricula With Supporting Documentation

<table>
<thead>
<tr>
<th>Curriculum</th>
<th>Topic</th>
<th>Grade Level</th>
<th>Research Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aggressors, Victims, and Bystanders: Thinking and Acting to Prevent Violence</td>
<td>6-9</td>
<td>Statistically significant decrease in acceptance of violence, intent to engage in violent behavior when faced with conflict, and bystander behavior supporting violence.17 Boys were significantly less likely to initiate sexual activity and demonstrated more knowledge about condoms and HIV than their peers not in the program.18 Multicomponent intervention showed significant increases in fruit, vegetable, and lower fat food consumption among peer-led groups as well as improvement in eating choices among other 2 groups to receive some type of intervention. The control group remained constant.19 Improved discontinuation rates of 1 or more substances among at-risk students, showing 61% higher discontinuation than the control group.20</td>
</tr>
<tr>
<td>2</td>
<td>Draw the Line/Respect the Line</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>TEENS (Teens Eating for Energy and Nutrition at School)</td>
<td>7-8</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Keepin’ It Real—Drug Resistance Strategies</td>
<td>6-9</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Life Skills Training</td>
<td>6-9</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Minnesota Smoking Prevention Program</td>
<td>4-8</td>
<td>Significantly decreased smoking rates among high school students compared to general community.17</td>
</tr>
<tr>
<td>7</td>
<td>Project Alert</td>
<td>7-8</td>
<td>Significantly reduced marijuana, alcohol, and cigarette use, as well as changed beliefs about these substances compared to a control group.117</td>
</tr>
<tr>
<td>8</td>
<td>Project TNT (Towards No Tobacco)</td>
<td>5-8</td>
<td>Significantly decreased weekly cigarette use among intervention group students as compared to the control group students.23</td>
</tr>
<tr>
<td>9</td>
<td>Safer Choices</td>
<td>9-12</td>
<td>Intervention students significantly more likely to avoid unprotected sex than the control students.22 Reduced aggression by up to 51% more among intervention group boys as compared to the control group boys.24</td>
</tr>
<tr>
<td>10</td>
<td>Second Step: A Violence Prevention Program</td>
<td>6-8</td>
<td></td>
</tr>
</tbody>
</table>

HIV, human immunodeficiency virus; STI, sexually transmitted infection.

Table 3. Teaching Strategies Common to Evidence-Based Curricula

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Health Skill</th>
<th>Health Curriculum*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role play</td>
<td>Communication, conflict resolution, avoidance, refusal, problem solving</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 10</td>
</tr>
<tr>
<td>Group cooperation</td>
<td>Communication, advocacy, problem solving</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 10</td>
</tr>
<tr>
<td>Interactive technology</td>
<td>Evaluation, advocacy, problem solving</td>
<td>3, 4, 5, 7, 8, 9, 10</td>
</tr>
<tr>
<td>Team games</td>
<td>Communication, critical analysis</td>
<td>1, 2, 4, 7, 8, 9, 10</td>
</tr>
<tr>
<td>Small-group discussion</td>
<td>Communication, self-management, responsibility, critical analysis</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 10</td>
</tr>
</tbody>
</table>

*Health curriculum key: see numbering in Table 2.

re-creation of a type of situation or event.26 Role play, often based upon real-life situations that are common to adolescents, was used in a variety of ways in all 10 curricula, most commonly for practicing refusal skills with alcohol, tobacco, drugs, and sexuality activity. Role play generally has 3 parts: the situation, the actual acting out of the role play, and the follow-up discussion.26 In a number of these curricula, the role plays were based on scripts without a conclusion and included an open ending. Students are asked to find a way to use their newly learned skills to construct a conclusion to the role play that supports healthy behavior. This type of role play is known as a “sociodrama” and involves a group solving a problem on their own with alternative solutions.26

“Freeze Frame” was another role play employed to “stop the action” of the skit and open the classroom up for discussion. “Freeze Frame” uniquely allows the teacher to segment the skit and conduct a discussion of effective strategies and techniques for avoiding risky situations and/or getting out of risky situations. This can be helpful for students in identifying skills that need improvement.

A strategy also common to all 10 curricula is group cooperation, defined as the process of having students of different learning abilities and styles work together toward a common educational goal.26 Cooperation is used to help facilitate and improve student learning in the classroom.27 Johnson and Johnson established 5 basic elements of cooperation: positive independence, individual accountability, face-to-face promote interaction, social skills, and group processing.28
For example, during the first lesson in the Project Alert curriculum, students work together in small groups to create lists stating reasons why people use tobacco, alcohol, and marijuana. They brainstorm together for answers and then rotate to the next list when the teacher signals them to do so. Brainstorming continues until each group rotated through all the lists in a carousel-like manner. This type of activity allows students to share prior knowledge and new ideas with each other.

Small group discussion usually occurs after the presentation of information from the teacher or another source and is another effective teaching strategy that requires planning, clear instructions, and expectations for collaboration among students. Groups that have been found to be most effective contain between 2 to 6 students who meet to share information, ideas, and opinions. This type of strategy has the secondary benefit of helping students to further develop communications and interpersonal skills. In the Minnesota Smoking Prevention Program, students form small discussion groups to brainstorm about the negative consequences of tobacco products and why people start using tobacco in the first place.

Educational games in the classroom can help students learn and review concepts and create a demand for knowledge from the learners. Research has shown that games can also teach cooperation, teamwork, and conflict resolution skills. Dempsey and colleagues found that educational games can lead students to practice newly learned skills on their own. Project Towards No Tobacco (TNT) has an anti-tobacco game that is used in every lesson to review the previous lesson material. Students are divided into teams and compete to finish in first place on the game board by answering questions correctly. Teams can help keep the entire class motivated and involved in the activity.

Along with various other strategies, the use of technology can enhance learning if used appropriately and, in the health classroom, can include any type of media such as videos, slides, music, and Web sites. The most common use of technology in the 10 reviewed curricula was supplemental videos, although other types of technology were also used. For example, instead of video, Teens Eating for Energy and Nutrition at School (TEENS) included a simulated audio only “talk-show” radio program. Project TNT employed a media literacy project to actively engage students in creating and filming a newscast as a culminating lesson that synthesizes concepts learned across multiple lessons. Uniquely, Project Alert used an innovative approach involving short videos with real teen perspectives on substance abuse issues and video clips with actors that are used for role plays. The role-play videos contain situations where actors are offered cigarettes or marijuana. Students viewing the video are asked to step into the roles of the characters they just saw in the video and complete the scene by using effective refusal techniques. This unique combination of role play mixed with technology creates a more interactive and engaging experience.

DISCUSSION

On the basis of this review of 10 health education curricula, it is clear that a mix of strategies is necessary to deliver effective, skills-based instruction. Collectively, these curricula rely on a combination of 3 to 5 active learning strategies for teaching students the skills they need to make and sustain healthy decisions throughout life. Through use of active learning, students actually apply knowledge through practice—the hallmark of true learning. Take away active learning strategies and all learning becomes didactic. That is, in the absence of active learning strategies, students only accumulate knowledge, including facts about skills. Without these strategies, the majority of the other characteristics of effective health education become moot since active learning strategies are the linchpin to effectiveness.

The most prominent strategies in these 10 curricula are cooperative group work, role-play simulations, and small group discussions. These strategies are essential because they focus on the individual student as well as help the student to learn and work with other peers and, thereby, provide important byproducts for the learner. Working in cooperative groups has been shown to result in a number of psychological benefits, with the greatest emphasis on higher self-esteem and self-confidence, and contributes to healthy social development by helping to establish and maintain friendships. Catalano and colleagues found that using student-centered teaching methods helps bond students to school, a phenomenon that has been shown to reduce student violence, gang activity, substance use, delinquency, and dropout rates. Owing to its positive and protective benefits, student bonding plays a major role in academic success across all subjects. For this reason, health teachers can make a major contribution to the mission of a school by regularly employing cooperative group activities that purposefully promote interpersonal and social skills.

One interesting dilemma for the role-play strategy involves the use of the enticing role—a character who tries to lure the other members of the skit into taking a risk or engaging in an unhealthy behavior. A question arises as to whether or not having an adolescent play the role of the enticer of tobacco, alcohol, and other drug use or of sexual advances is advisable or even ethical. Interestingly, Project TNT avoids this dilemma by placing the teacher squarely in the role of the enticer to avoid getting students enamored with the character who offers cigarettes to fellow classmates.
Project Alert goes a step further by embedding the role play in a video during which actors take the role of enticers. Importantly, both of these curricula provide viable options for the effective use of role play while avoiding the dilemma of involving adolescents in the enticer role.

Use of technology in health education is of interest because of the explosion of technological modalities that have potential for use in health education. This content analysis found that the most commonly used form of technology was video, one of the oldest forms of technology that was originally delivered on film, then videotape and, now, on CD/DVD or even Internet Web sites. In other words, these curricula generally rely on the proven technology of video and do not yet incorporate the use of advanced technologies such as software-based interactive gaming and interactive simulations.

**Conclusion**

This content analysis of select effective health education curricula identified 5 active learning strategies employed to teach health skills. When combined with previous research regarding the characteristics of effective teachers, it becomes clear that effective health education teachers are those who employ a wide repertoire of strategies that actively involve students in their learning with substantial instructional time devoted to strategies that involve students in skills practice.

Implications for professional development and teacher preparation were addressed and practical suggestions for equipping current teachers and teacher candidates to use active learning strategies were provided. While professional development of current teachers is essential, it really is a means of compensating for deficiencies in professional practice. The most promising approach for all newly prepared health educators is to have command over a wide variety of effective strategies that they practice during pedagogical courses, employed under supervision when students teach, and, subsequently, to incorporate in their professional practice.

**LIMITATIONS**

This study has several limitations. The 10 research-based curricula analyzed were chosen for reasons previously stated but still constitute a sample of available effective categorical health education curricula. While they cover a variety of health topics, these curricula may not be fully representative of all research-based curricula and, therefore, may not have contained all strategies commonly employed to teach skills. Another possible limitation was that only 2 investigators performed the curricula content analysis. This approach is similar to that of historians and other social scientists who usually conduct content analyses of documents and artifacts in isolation. Due to the length and complexity of the 10 reviewed curriculum documents and related materials, involving a larger panel of reviewers in this study was not deemed feasible.

**IMPLICATIONS FOR SCHOOL HEALTH**

The most important practical implications of this study relate to staff development and teacher preparation. Commonly recommended professional development events for teachers focus on the use of instructional techniques that actively involve students in the classroom and teaching skills. Ideal staff development events would involve teachers working through a curriculum and teaching each other in small groups. A common approach is to involve teachers in selected skills-based lessons as a “learner” so that they come to appreciate these lessons from the perspective of their middle or high school students. This allows every teacher to become familiar with the content, skills, and, most importantly, the instructional strategies used in the classroom. Teachers can also work with colleagues to address apprehensions and possible problems before attempting implementation. Bottom line, teachers who attend these types of workshops are much more likely to deliver the effective health instruction that most benefits their students.

The findings of this study also have implications for preservice teacher preparation programs. The Proposed Standards for Teacher Preparation in Health Education involve 8 areas including planning and implementation expectations that “candidates select appropriate strategies to meet learning objectives” and “reflect on their practice, adjusting objectives and instructional strategies as necessary to enhance student learning.” Candidates are also supposed to base planning and implementation on an understanding of pedagogy plus health education theories and models and be able to identify the National Health Education Standards.

These specific competencies can provide a viable framework for preparing candidates in the use of effective instructional strategies. First, the National Health Education Standards clearly focus on skills and, more importantly, learner acquisition of skills. A way of assuring this is to require candidates to prepare lesson plans that clearly contribute to specific standards and indicators and that include robust verbs from the higher levels of the cognitive and psychomotor domains that denote skills, matched to complementary skills-based teaching strategies.

Just as middle and high school students need to practice skills in order to be able to use them in the real world, teacher candidates need to repeatedly experience and practice active learning strategies. This can be done by “taking a page” from high-quality professional development programs, which involve
teachers as learners who “experience” strategies from a learner’s perspective. To do this, instructors of curriculum courses can plan their lessons around specific active learning strategies and, especially, those strategies commonly found in effective curricula.

One additional implication has to do with the use of technology. Today’s adolescents have never experienced a time without computers and are steeped in technology. Therefore, it behooves health education curriculum developers to consider moving beyond the time-tested medium of video into more advanced technologies that can be designed to simulate real-world situations where participants learn to apply decision making and other health skills.

REFERENCES
