A Complementary Ecological Model of the Coordinated School Health Program

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SYNOPSIS

A complementary ecological model of the coordinated school health program (CSHP) reflecting 20 years of evolved changes is proposed. Ecology refers to the complex interrelationship among intrapersonal factors, interpersonal processes and primary groups, institutional factors, community factors, and public policy. Public health and child development theories that incorporate the influence of personal and social environments on health behavior, along with models that incorporate the influence of ecology, were consulted. Concepts from several models were combined with the eight components of CSHP to formulate an ecological model involving six program and services components in an inner circle surrounded by four concentric rings representing the healthy school environment, essential structures of CSHP, local school district governance, and family and community involvement. This complementary ecological model is intended to serve as an additional conceptual approach to CSHP practice, evaluation, and research, and should prove especially useful to practitioners and researchers who already have a fundamental understanding of CSHP.

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In 1987, Kolbe and Allensworth introduced the eight components of a coordinated school health program (CSHP), an innovation that strongly influenced school health over the ensuing years. Previously, the operative conceptualization of school health was the “three-legged stool” of health education, health services, and the healthy school environment.¹ The new approach retained these components and added food and nutrition services; health promotion for staff; physical education; counseling, psychological, and social services; and family and community involvement.

The eight-components approach was adopted and recommended by the Centers for Disease Control and Prevention, Division of Adolescent and School Health (CDC/DASH) and, via CDC/DASH-funded national organizations and state and local education agencies, became the operative framework in the U.S.^{2,3} By the late 1990s, a version had been adopted by the World Health Organization under its Health Promoting Schools initiative and implemented in countries across the globe.⁴ The eight-components approach, and variants of it, is a very successful innovation that has enjoyed an impressive dissemination and adoption curve.

CSHP is commonly depicted as a series of eight connected bubbles in orbit around two generic students (Figure 1).⁵ The lines connecting the component

bubbles connote coordination. By implication, the components seem to have equal status and all function in a single dimension.

Somewhat in contrast, the expanded CSHP approach was originally depicted through a diagram (Figure 2) that illustrated the direct impact of seven components on student health-related behaviors and, subsequently, their health status, cognitive performance, and educational achievement.¹ The eighth component, a health-promotion program for faculty and staff, is shown as initially influencing employee health behaviors, health status, and cognitive performance and then, via healthy and high-performing employees, student health and educational outcomes. This diagram portrayed true health promotion because it clearly involved health education plus policy, regulatory, organizational, social, economic, and/or political interventions that support actions and conditions of living⁶ across all components and, thereby, enhanced health, educational, and social outcomes of students and school employees.⁷

The bubble visual of CSHP has proven very functional in conveying a general impression of CSHP. Most people who see it have attended U.S. public schools and readily recognize the majority of components. They have all been in physical education or gym, were served by the “lunch ladies,” have visited the school

Figure 1. Bubble depiction of a coordinated school health program^a

^aAdapted from Centers for Disease Control and Prevention (US). Healthy youth! Coordinated school health program [cited 2007 Jul 30]. Available from: URL: <http://www.cdc.gov/HealthyYouth/CSHP>

THE ROLE OF ECOLOGY IN HEALTH

The health status of humans is determined by a mix of factors as illustrated by the current obesity epidemic.¹⁷ While body weight is partially dependent on genetics, historically most people have been able to maintain a normal weight through relatively healthy eating and exercise behaviors. Within the past three decades, the environmental factors that influence weight changed, making it more difficult for many individuals to maintain a healthy weight despite having little biological predisposition to obesity.¹⁷ Environmental changes that influence consumption patterns include availability of abundant food along with processed foods that are high in fat and sugar and, for many low-income families, limited availability of fresh fruits, vegetables, and other whole foods; aggressive marketing of food products; hectic lifestyles conducive to fast-food consumption; and increased portion sizes served in restaurants.^{17,18} Environmental changes that impact exercise include communities designed for vehicle traffic, inadequate or unsafe facilities for routine physical activity such as walking, and passive entertainment such as television and computer games. Together, these and other environmental changes encourage the overconsumption of food and sedentary living that contribute to obesity and related diseases including Type II diabetes.¹⁷

Most of the environmental changes that negatively impact body weight also occurred in the schools, surrounding neighborhoods, and homes of children, youth, and school employees.¹⁸ Like obesity, many of the myriad health problems experienced by children and youth today are influenced by their ecology—the complex interrelationship among intrapersonal factors, interpersonal processes and primary groups, institutional factors, community factors, and public policy.¹⁹

ECOLOGICAL MODELS

The influence of environmental factors within human ecology is acknowledged in health education and health-promotion theories and models. For example, in his Social Cognitive Theory, Bandura recognized the reciprocal determinism of an individual's personal factors and self-control with environment.²⁰ Personal factors such as past history, self-efficacy, and behavioral capacity, and self-control mechanisms such as locus of control, self-observation, self-judgment, and self-reaction, are influenced by the environmental factors of observational learning. And behavioral reinforcement or inhibition is moderated by real or perceived consequences to self or others. Further, Bandura proposed

several teaching and learning strategies designed to influence this interaction.

In their Precede/Proceed Model, Green and Kreuter contend that three types of factors affect health behavior. Predisposing factors are antecedents to behavioral or environmental changes that provide the motivation for behavior, enabling factors are antecedents to behavioral or environmental changes related to policy, and reinforcing factors provide reward or incentive to persistent repetition of a behavior. They contend that health education and health-promotion programs can be designed to modify these factors, thereby positively influencing health behaviors and/or environments and, ultimately, enhancing the quality of life. One phase of this model involves both educational and ecological assessments intended to “examine the highest-priority behavioral and environmental conditions linked to health status or quality-of-life concerns to determine what causes them.”²¹

Hovel, Wahlgreen, and Gehrman proposed a Behavioral Ecological Model (BEM) based on principles of respondent and operant conditioning, as well as concepts of Social Cognitive Theory, which posits that the interaction of physical and social contingencies can explain and control behavior. BEM follows a hierarchy of contingencies ranging from highly individualized to generic that include individual physical and social characteristics, local networks made up of friends and coworkers, community contingencies that include policies and laws, and culturally specific and nationality-related societal contingencies. Interventions designed to influence health behavior are implemented through social institutions including schools and families using a variety of media and social marketing strategies.²²

Through their synthesis of the various ecological models of health behavior, Sallis and Owen devised seven guiding principles: (1) multiple levels of factors influence health behaviors; (2) multiple types of environmental influences affect health behavior; (3) behavior-specific ecological models can be useful; (4) multilevel interventions may be most effective; (5) multilevel interventions are most easily implemented by multisectorial groups; (6) ecological interventions should be evaluated and their implementation should be monitored to assess changes in mediators at multiple levels; and (7) political dynamics can limit ecological interventions. They provide examples of successful health interventions based on these principles and recommend their use for guiding both intervention development and research.¹⁹

Bronfenbrenner's Ecological Systems Theory provides a widely accepted explanation of the impact of environment on children and adolescents. This theory

holds that a child's development is affected by multiple layers of influencers identified as the microsystem that includes direct influencers such as family, school, neighborhood, and childcare; the mesosystem that connects the structures of the microsystem; the exosystem that constitutes the larger, indirect social system including parental workplace and community-based resources; the macrosystem that includes values, customs, and laws; and the chronosystem that denotes the relationship between time and timing of external life events and internal processes related to physical maturation. Key concepts include the bidirectional influences across layers and the premise that children are both products and producers of their environments.²³

PROPOSED ECOLOGICAL MODEL OF CSHP PROMOTION

Clearly, multiple authorities recognize the impact of ecology on health behavior, and several commonly applied health theories and theory-based models incorporate an ecological approach to health promotion. Additionally, at least one ecological theory of child and adolescent development exists.²³ Based on these precedents, the levels of influence on child and adolescent health and health behavior can be envisioned.

The depiction in Figure 3 includes concepts from the ecological models and theories previously described and, especially, incorporates the layers of influence from Ecological Systems Theory,²³ with the microsystem and mesosystem represented by health education classrooms, the whole school, family structure and culture, and neighborhood spheres, and the exosystem and macrosystem represented by the popular culture sphere. Figure 3 subsumes the following concepts:

- In health classrooms (commonly the general education classroom at the elementary level), students learn essential knowledge and skills they can employ to engage in healthy behaviors.²⁴ Instruction about health can be provided through other CSHP components including physical education, school counseling, and school health services and can be integrated into other subjects such as science.
- The entire school constitutes an immediate environment that supports or impedes students' inclinations and abilities to engage in healthy behaviors.^{10,18}
- Family and neighborhood are additional environments that support or impede students' inclinations and abilities to engage in healthy behaviors.¹⁰
- The greater community constitutes a proximal context and health-related resource for individuals, health educators, schools and school systems, families, and neighborhoods.¹⁰
- Popular culture provides the overarching values, customs, and laws, including those related to health, and influences students' health-related behaviors, especially through the many types of media.¹⁷ (While this probably cannot be influenced by a CSHP, students can be taught how to recognize and counteract negative cultural influences.²⁴)
- For school health education to be effective in influencing students to behave in healthy ways, the lessons they learn must be supported and reinforced throughout the school as well as by the family and neighborhood.^{7,10,16}

Figure 3. Spheres of ecological influences on child and adolescent health behavior and health from the school perspective

An ecological model specific to CSHP emerges (Figure 4) by telescoping the first five spheres from Figure 3 and combining them with the eight components from Figure 1.⁵ In this new model, the six components that comprise programs and services provided to students and school employees are located in the center circle. These six are fully described elsewhere.^{10,14,25} The outcomes derived from them are the same as indicated in Figure 2.¹

The major differences between the model in Figure 4 and the visual in Figure 1 that it is intended to complement are found in the four concentric rings that surround the middle six components—the healthy school environment (inner ring), essential governance structures of a CSHP (second ring), local school system infrastructure within which a CSHP exists and functions (third ring), and family and community involvement (outer ring). The “chutes” running from the outer ring through the three adjacent rings to the inner circle are meant to convey coordination across all layers, as well as the concept that family members and a diverse, wide array of community organizations and agencies can be involved bidirectionally in any and all other components and/or provide resources at any and all levels of the CSHP. (Note that the many major categories of community organizations attached to the outer ring can be further delineated; for example, local, state, and national government can include many entities such as city councils, police departments, courts and probation departments, child protective services, parks, and recreation departments.)

Ecological model advantages

This ecological model has several advantages. First, it more closely represents CSHP as the originally intended health-promotion strategy by explicitly including the mechanisms through which policy, regulatory, organizational, social, economic, and/or political changes can occur.¹ It clearly shows that a CSHP exists within and is dependent on the overall local school district infrastructure, including school board policies, administrative procedures, budgetary resources, and operating systems.¹² Therefore, it is subject to and influenced by decision makers and stakeholders whose vision and mission may be more focused on traditional educational outcomes¹⁰ than on health outcomes or who may not readily recognize the strong relationship among students’ and school staffs’ physical, mental, emotional, and social health status and educational outcomes.^{1,7} For CSHP to be implemented and sustained over time, this relationship to local school district infrastructure, indicative

of strong administrative support, must be recognized and continuously nurtured.^{11,12}

Second, the three essential structures of a CSHP that evolved over the past eight to 10 years are included. The composition, roles, functions, and responsibilities of the health coordinator, coordinating council, and team have been fully described and are recognized as necessary to the effective functioning of a CSHP.^{10,26,27} Therefore, it is appropriate to include these structures in any current CSHP model.

The third ring also includes a “champion.” Emanating from Diffusion of Innovation Theory, a champion is defined as “a charismatic individual who throws his or her weight behind an innovation, thus overcoming indifference and resistance that the new idea may provoke in an organization.”²⁸ Champions are recognized as seminal to the implementation and institutionalization of school health programming and can be external (e.g., local physician, activist parent, or director of a voluntary health agency) or internal (e.g., school board member, central office administrator, school principal, school nurse, or influential teacher) to a school district.^{29,30}

Finally, the healthy school environment and family and community involvement components are distinguished from the other six direct program and services components because, in reality, they are different. Ecologically, the healthy school environment provides the overall context enveloping students and school employees. As the component in which the within-school components and all other aspects of schooling function, it constitutes the innermost ring.

This ring signifies the higher level of importance that the healthy school environment merits and more explicitly portrays its true complexity.³¹ The correlation of a healthy school environment with learning and school success is clearly recognized by the “education establishment.”⁹ And something as seemingly inconsequential as natural daylight in classrooms is highly correlated with faster math and reading skill development.³¹ Complexity is demonstrated by ring segmentation into four distinct parts—psychosocial climate, safety, facilities, and transportation—all of which are crucial to establishing and maintaining a school culture in which all students can be safe, secure, and successful.⁹ To further illustrate, just one of the four segments—the psychosocial climate—can be separated into the whole school climate and individual classroom climate.¹⁶ The former can further be delineated as (1) expectations for students and staff, (2) ownership and bonding, and (3) conduct and discipline, and the latter as (1) opportunity to learn, (2) classroom

Figure 4. Coordinated School Health Program (CSHP) Ecological Model

tone, (3) student self-management, and (4) classroom management.¹⁶

Family and community involvement is likewise different from the six inner components as it represents an aspect of the children's and adolescents' microsystem (family) and their entire exosystem of community-based resources that can complement and support a CSHP. Although they may be inclined to favor initiation of CSHP in their schools, education decision makers may not feel they have the resources to do so. The importance of capturing and focusing sufficient, untapped resources that may be present in the greater community has been demonstrated via numerous case studies.¹³ Beyond the issue of resources, however, involvement of the greater community in CSHP is crucial to initiation and maintenance of healthy behaviors

as well as desired health and educational outcomes.³² Three examples illustrate this point.

Involving the community in CSHP

Implementation of CSHP in a small southern school district over several years was shown to positively impact both education and health indicators, including improved standardized test scores and graduation rates, decreased dropout rates, reduced juvenile crime rates, and substantial reductions in second pregnancies for teenage mothers.³³ Initially, district leaders asked the community constituents to answer three questions: (1) What do they not like about the district? (2) What do they want the district to be like? and (3) What should be done to get there? The answers showed community commitment to development of the "whole child" and

provided the impetus for enhanced school health programming coordinated with programming provided by medical, social, and criminal justice agencies in the community. This school-community approach is credited with generating positive education and health outcomes.³³

Researchers in Minnesota were successful in establishing the efficacy of a health education curriculum that resulted in less onset and lower use of alcohol in intervention vs. control school districts.³⁴ These successes were attributed to several aspects of the curriculum including adequate instructional time, fidelity in implementation, peer leader involvement, and a focus on social influences, life skills, and peer-resistance skills accompanied by school-based demand reduction efforts. Key to the curriculum effect was the ability to influence perceived alcohol use norms by involving parents, peers, and the community. In particular, a task force was established in each intervention community to focus on policies and activities to reduce the availability of alcohol to minors in the community and provide alcohol-free activities for teens.³⁴

One Midwest suburban community was also successful in reducing use of gateway drugs by adolescents, but via a somewhat different approach.³⁵ Utilizing the Precede/Proceed Model,²¹ program planners organized risk and protective factors within predisposing, enabling, and reinforcing categories. They then identified which factors in each category could best be influenced by schools, families, and the community. This exercise demonstrated that, while school-based programs were vital, most of the risk factors could best be influenced by families and the greater community. Over time, a multilevel school-family-community prevention program, including a very broad-based community coalition, was implemented and resulted in substantial reductions in alcohol, tobacco, and marijuana use that were sustained beyond a decade.³⁵

Besides highlighting the importance of family and community involvement, these three examples suggest the evolution of CSHP into a community organization and community-building approach that potentially could involve all aspects of the community.³⁶

CONCLUSION

In summary, the eight-components model of CSHP first introduced in 1987 realized tremendous success in influencing school health programs and practices in the U.S. and around the globe. CSHP has traditionally been represented by a bubble visual that is readily interpreted by school personnel and parents, and for this reason should continue to be used as a means of

introducing CSHP to naive audiences. Nevertheless, multiple developments and features of CSHP and in the field of health promotion, which evolved over the ensuing years, are not represented in the traditional visual. Thus, a complementary model based primarily on Ecological Systems Theory²³ and consistent with the seven guiding principles of public health ecological modeling¹⁹ is proposed as an additional conceptual approach to CSHP practice, evaluation, and research.

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