Ecological Approach to School Health Promotion

Review of Literature

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For Health Promotion"

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Section I: Background and Description

1. Introduction

This review of literature follows recommendations set by the Project Team and pertains to the "Multifaceted Potential of the School as an Environment for Health Promotion" Project. The review examines an ecological approach within the school setting and the complex subsystems that interplay between physical, mental, social and environmental aspects in order to affect positive change.

The review responds to the challenges researchers have encountered over the past decade in implementing principles based on the Ottawa Charter on Health Promotion (World Health Organization, 1986) specifically in the area of encouraging community action and linkages between schools and other agencies; and, reorienting health services to enhance youth access and identifying services best carried out in schools. Other principles of the Ottawa Charter that have been implemented successfully i.e. promoting public policies for school health; fostering supportive physical and psychosocial environments; and, promoting personal skill development on specific health behaviours, are included in this review as best practices from international and national perspectives (i.e. American, Australian, European, South American and Canadian).

2. Literature Search Strategy

The purpose of this literature review has been to examine settings and systems applications as they relate to the school as a setting for health promotion along with the evolution and best practices within health promoting schools. To this end an extensive literature review was conducted, involving on-line database keyword searches, additional searches for other studies, screening of abstracts, assessing the methodological strength of the studies and integrating the findings.

The literature search process included the following major steps:

- Development of keywords and search strategies;
- Review of the references sections of articles in possession to identify potentially useful studies;
- On-line searches of databases for potentially relevant articles;
- Review of government departments and NGO websites and related links for additional studies and/or unpublished documents;
- Screening of the abstracts to identify studies for further review; and,
- Canvassing of selected academic experts, organizations and government departments for additional studies and/or unpublished documents.

3. Search Terms

The search terms originally developed were refined during the course of the on-line searches to reflect the terms and keywords used by various on-line services and authors. Searches were conducted on the following databases:

- PubMed;
- Social Sciences Index;
- Web of Science;
- Social Work Abstract;
- Academic Elite – EBSCO Host
- Humanities and Social Sciences
- PsycInfo
- Sociological Abstracts
- ERIC
- WHO and Health Canada resources; and,
- National and international health research and/or child/youth service web sites.

Section II: School Health

1. History of School Health

In North America health was first introduced to schools in 1850 via the Shattuck report, created by a teacher serving as a school committee member in Massachusetts. Shattuck recognized that the public school system could be used as a vehicle to promote public health and prevent disease. The report stated that "everything connected with wealth, happiness and a long-life depends upon health" (Means, 1975). The Shattuck report was adopted by other states and when a smallpox outbreak occurred in New York due to the constant influx of immigrants, education officials opened the schools to health professionals, allowing them to become the place to administer the vaccine, also making the vaccination a prerequisite to school attendance (Duffy, 1974). School health at the end of the 19th century consisted primarily of disease prevention strategies, involving routine medical inspections to identify students with contagious eye, skin and serious diseases such as tuberculosis. Also, school nurses began working in schools, reducing absenteeism up to 50% by treating minor illnesses in school and making home visits for major illnesses.

In the early twentieth century the influence of the temperance movement led to the inclusion of information about the effects of alcohol, tobacco and narcotics on humans. The majority of states in The United States passed legislation, which incorporated this instruction into the physiology and hygiene curriculum. The early leaders in the physical education movement had medical degrees and saw P.E. as a blend of the medical and education fields (Lee & Bennett, 1985). The range of school-linked services was very broad at this time including dentistry and even some minor surgeries. These services were sometimes seen as helpful for eliminating school failure and delinquency (Tyack, 1992).

World War I marked the turning point in the history of school health programs because many children in North America were suffering from poverty, malnutrition, and in dire health need. New philosophies and methods of health promotion were developed which focussed on the psychological and behavioural aspects of school-aged children. One of the most intensive research efforts was the Astoria Plan, carried out in the Astoria District of New York city, which from 1936-1940 targeted children most in need of services, thus streamlining school health services (Means, 1975).

In the 1960s and 70s the US government developed Great Society and War on Poverty programs, providing substantial federal health and social service funds. Relevant legislation passed at this time included Medicaid, Headstart, the Elementary and Secondary Education Act, the Community Health Center Program, the Education for All Handicapped Children Act, and the Child Nutrition Act that established the School Breakfast program and the Nutrition Training Education Program, and permanent reimbursements for school lunches served to needy students (Allensworth et al., 1997).

The most significant school health initiative of the 1960's in North America was the School Health Education Study, which created a foundation upon which current legislation is based. The study consisted of 10 conceptual areas of focus which have gradually been adapted into instructional curricula over the years and include: human growth & development, personal health practices, accidents & disease, food and nutrition, mood-altering substances, and the role of the family in fulfilling health needs (Sliepcevich, 1964).

2. Evolution of Comprehensive School Health

Initially in the 1970's, school health education consisted of teachers providing information packages to students about health risk behaviours. However, researchers determined that these methods produced little-to-no change in health behaviour, making it clear that more innovative methods needed to be examined (Goodstadt, 1978; Thompson, 1978; Green and Lewis, 1986). Thus, in the early 1980s school-health programming became focused on developing skills and attitudes to help students make healthy lifestyle choices particularly in the area of drug abuse prevention. Components of programs included: awareness of social influences (e.g., peers, media, parents); training in refusal skills; interpersonal/ communication skills; problem solving; assertiveness training; and enhancement of self control and self-esteem. The researchers found some immediate and short-term decrease in drug use among students, but the effects largely disappeared at 4 and 5-year follow-up (Botvin, 1980, Perry et al, 1980, Luepker et al, 1983; Lynagh et al., 1997).

The realization that health education and social skills training were having little or no long-term impact on the health behaviours of school children forced practitioners to look beyond existing models and develop a new approach to school health practice (Lynagh et al., 1997). The Declaration of Alma Ata (WHO, 1978) and the Ottawa Charter (WHO, 1986) both recognised that education is just one strategy for improving children's health, and argued for a more holistic view of health behaviour which takes into account the environment and community in which one lives (Lynagh et al., 1997). The Ottawa Charter provided broad directional documents defining five principles needed for optimal and long-term effects on health-risk behaviour, namely: building healthy public policy, creating supportive environments, strengthening community action, developing personal skills and reorienting health services. Ronson (2003) describes the Ottawa Charter as a "guiding light in action planning for community and national health programs around the world". Regional school health programs that have been based on these five principles include New South Wales in Australia, Brazil, Kiev, the Ukraine, Hastings-Prince Edward County, the European arm of WHO, the southern part of the Western pacific, Latin America, Southern Africa, Southeast Asia and the northern part of the Western Pacific (WHO, 1999; Konu & Rimpela, 2002; Ronson 2003).

The WHO revised Global School Health Initiative (WHO, 1998) proposes four strategies for creating health promoting schools: strengthening the ability to advocate improved school health programmes; creating networks and alliances for the development of health

promoting schools; strengthening national capacities; research to improve healthy school programmes. The European Region of WHO initiated a project called the European Network of Health Promoting Schools (ENHPS) and in an ENHPS conference resolution in Greece (May, 1997; Burgher et al., 1999) 10 principles of health promoting schools were outlined: Democracy, equity, empowerment and action competence, school environment, curriculum, teacher training, measuring success, collaboration, communities and sustainability.

Also in the 1980s and of equal importance and influence was the development of Comprehensive School Health (CSH) Education from kindergarten to school leaving with the aim of instilling lifelong health habits in children/youth. CHS was a tri-partite model that considered not only instruction but also the school environment and health services. By 1994 the CSH model plus 'Social Supports' was endorsed by twenty-four organizations in Canada including CAHPERD (the Canadian Association of Health Physical Education Recreation and Dance) and Health Promoting Schools in Australia.

In the United States the movement of CSH (now known as Coordinated School Health to diffuse the stigma of the word Comprehensive seen as overwhelming by an already overburdened education system) was expanded by Kolbe and Allensworth (1987) to include eight components: health education, physical education, health services, nutrition services, counselling and psychological services, healthy school environment, health promotion for staff, and parent/community involvement. Ronson (2003) explains that with strong support from the Center for Disease Control and Prevention in Atlanta and other organizations, this model has been used around the world, and recently, a Report of the 2000 Joint Committee on Health Education and Promotion Terminology defined Coordinated School Health programmes as:

> "An organized set of policies, procedures and activities designed to protect, promote, and improve the health and well-being of students and staff, thus improving a student's ability to learn. It includes but is not limited to comprehensive school health education; school health services; a healthy school environment; school counselling; psychological and social services; physical education, school nutrition services; family and community involvement in school health; and school site health promotion for staff."

3. Rationale for Health Promoting Schools/Coordinated School Health Programmes

Allensworth et al. (1997) point out that while some observers question whether school health programs and school-accessed comprehensive services go beyond the intended function of the schools, school health has been developing in scope and complexity for over a century and is simply regularly updating itself to meet the needs of the times. They also point out parallels between today's instruction in HIV (human immunodeficiency virus) and AIDS (acquired immunodeficiency syndrome) and previous instruction in physiology and hygiene. Similarly, present school-based clinics are equivalent to medical inspections in the past and current family services programs are

comparable to teacher home visits for immigrant urban tenements. However, whereas a century ago, health problems of disease prevention resulted in permanent solutions, i.e., vaccines, today's chronic diseases (e.g., cancer, diabetes, heart risk and depression) take more lives. "New social morbidities" have created the need for prevention programs to address issues of violence, anger management, substance abuse, HIV/AIDS, sexually transmitted diseases, teen pregnancy, depression, sedentary lives and poor nutrition (Allensworth et al., 1997).

Lynagh et al., (1997) cite factors which make schools attractive to international health organizations looking for ways to address these complex health risk behaviours of the school age community, namely: school age children are in the developmental years when health risk behaviours are often adopted as lifetime habits (Kolbe, 1985); schools possess existing structures and systems for integration of new knowledge and skills curricula which are screened for acceptability and are more cost effective (Wiley et al., 1991); the 'hidden' curriculum of a school, i.e., whether class instruction is reinforced or undermined outside of the classroom, can significantly influence students' attitudes and behaviours (Nutbeam *et al., 1993b);* teachers can respond to interventions targeted at schools thus changing their own health risk behaviours and serving as role models for students; and schools provide avaluable link to parents and the community.

Lynagh et al., (1997) also identify key international health organizations which see schools as potentially playing an important role in influencing the present and future health behaviours of young people. A major rationale for looking to schools as an arena amenable to health promoting programs is "the potential of the school to access nearly the entire population of young people including disadvantaged and minority groups (World Health Organization, 1985; the US Department of Health and Human Services, 1991; and Nutbeam et al., 1993b). The WHO has strongly influenced the current direction of school-based health promotion around the world with the European WHO Regional Office, in collaboration with the Council of Europe, and the Commission of European Communities establishing a network of Health Promoting Schools (HPS) in over 37 countries (McDonald & Ziglio, 1994; Leger, 1998). Similarly, the U.S.A. has paralleled the efforts of WHO in its Coordinated School Health education approach, which has been reinforced by the Healthy People 2000 Report (US Department of Health and Human Services, 1991). McBride et al., (1999) also found international organizations and groups highlighting schools as important in promoting children's health behaviours (United States Public Health Service, 1990; WHO, 1991; Green and Kreuter, 1991; Latvin et al., 1992; Australian Department of Health Housing and Community Services, 1993).

St. Leger (2001) describes the new approach to comprehensive school health beginning in the 1990s as one which "shifted health into a more dynamic and political domain, and to provide young people with skills in advocacy and to achieve a sense of empowerment".

One of the reasons for using schools to promote health is the fact that the existing structures and systems that schools possess for integration of new knowledge and skills curricula is cost effective (Wiley et al., 1991). St. Leger (1998) notes that claims have

been made that integrated and quality promoting schools CSH programmes are very cost effective (World Bank, 1993; Rothman et al., 1994). In 2000, WHO, UNICEF, UNESCO and the World Bank collaborated to create cost- effective components of school health hygiene and nutrition programs based on the traditional three components of Comprehensive School Health, instruction, school environment, and health services plus 'Health-Related Policies' in schools (Ronson, 2003). The Healthy School Project in British Columbia, Canada provides minimal grant funding to schools to define local health issues and produce and implement an action plan to reduce health risk behaviours. The strong community partnerships created provided other funding supports, and yearly evaluations continue to point out the cost-effectiveness of this program (Miller, 1993, 1997).

4. Relationship between Health and Learning

Ronson (2003) suggests that the first attempts at producing health literate graduates was the development of Comprehensive School Health Education in the 1980s which involved a continuous yearly curriculum aimed at covering and reinforcing the range of information and skills needed to develop lifelong health habits and health status.

St. Leger (2001) proposes that there is a very close connection between the health promoting school and the enabling factors necessary in achieving health literacy. Nutbeam (2000) defines three levels of health literacy as basic/functional literacy, through communication/interactive literacy to critical literacy. He believes achieving the critical literacy allows for more autonomy and personal empowerment. The approach suggested by St. Leger and Nutbeam is very different from topic-based and school-located health promotion interventions e.g., drug reduction, weight management, etc.

St Leger and Nutbeam (2000) see four main school-related outcomes in developing health literacy. These are: 1. Lifelong learning; 2. Competencies and behaviours; 3. Specific cognate knowledge and skills; and, 4. Self attributes. Within these four school-related outcomes the three levels of health literacy can be applied and have global application as school health curricula in most countries are based on common factors which are a focus on building certain knowledge, an attention to developing certain competencies, and developing certain attitudes, (e.g., towards one's own health and, interpersonal relationships).

St. Leger and Nuttbeam (2000) state that educational research indicates literacy has a crucial role in academic achievement. Similarly, health sector research indicates that the association between poor educational attainment and adoption of health-compromising behaviors is strong and persistent, as is the association between the school environment and health behaviours (McLellan et al., 1999; Samdal et al., 1998). Leger and Nutbeam (2000) suggest that the health sector should be as concerned about poor educational outcomes as it is about the direct promotion of health in schools and efforts should be made to monitor those mental and physical health problems that affect attendance,

attentiveness, and other factors related to literacy, communication skills, and academic outcomes.

St. Leger (2001)) notes that the concept of health literacy is very compatible with the health promoting school concept and could form an acceptable outcome by which the success of a health promoting school could be achieved and assessed (NHMRC, 1996; WHO, 1996a; WHO 1996b; Lister-Sharp et al., 1999). However, there are three challenges that must be addressed to enable schools to achieve this level: 1. the traditional structure and function of schools; 2. teachers' practices and skills; and 3. time and resources (St. Leger, 2001).

5. Processes of Policy-Making and Program Development

Encouraging schools to adopt comprehensive health promotion programs is often difficult in the current education climate of devolved decision-making, crowded curricula, an increasing number of curriculum areas vying for status and time on school agendas and industrial disturbances (McBride, 1999). The gap between common practice and "what ought to be" is great in the health education area (Seffrin, 1992).

Rorbach et al. (1993) suggest that unless school-level or district-level policies that mandate program implementation are in place, long-term maintenance is unlikely. The use of linking agents or program advocates within the school has been found to increase ongoing program maintenance.

Taylor et al., (2000) states that in the international literature, policy statements are considered as major strategic tools for health promotion in schools. In Sweden, the five principles of the Ottawa Charter for Health Promotion (WHO 1986) have been adapted to seven strategies within the school setting, the first of which is policy development.

According to Rist (1994), the policy process has three stages: policy formulation, policy implementation and policy accountability. Policy as strategy for health promotion includes legislation and regulations on a national and local level, financial measures, as well as administrative and organizational changes.

Taylor et al., (2000) examined the policy development and implementation within the school plans of 62 municipalities (i.e., policy instruments that indicate the aims, objectives, as well as moral and political values of the municipality) to determine their content related to the physical and social aspects of health within schools. They found that almost all the municipalities included health promotion as part of their local policy and concluded that certain areas in health promotion have been prioritized nationally (e.g. anti-smoking and then followed up locally) (Nutbeam et al., 1993). Studies implemented in the U.S. and England demonstrate that in order for policy plans in schools to have an effect, it is necessary to have broadly-based programs in the community at the same time (Reid et al., 1995; Gillies, 1998)

The seven strategies outlined by Taylor et al., (2000) and used throughout Sweden move from policy development to program development and include: 1. policy development happening at different societal levels (national, local), 2.laws and regulations (affecting public health), 3.reorienting organizations (aims at obtaining sustainable development in organizations to support public health), 4. advocacy for improved health (encourages actions for improved health at different societal levels preceded by activities responding to health needs), 5. building alliances and creating awareness (new alliances between different partners in different settings), 6. enabling (providing basic prerequisites to support people to follow health conducive behaviour such as product development), and 7. mobilizing/empowering

Many other researchers have concluded that schools need to have health policies (Nutbeam et al., 1987; Smith et al., 1992; Tones and Tilford, 1994) and that such policies should be aimed at students, teachers and support staff (Smith et al., 1992). Policies should also include the need for enhanced community links (Smith, 1992), in-service training and involvement for non-teaching staff, parents and other adults (National Foundation for Educational Research, 1993). It was also recommended that young people have a role in the decision-making procedures in all matters relating to health (WHO, 1993; Miller, 1993, 1997).

Grebow et al., (2000) state that students learn best in a school that promotes their physical and psychosocial health as a matter of established policy. Policies which support a healthy physical environment carry the message that students are valued, that adults respect them and give them a connectedness and sense of well-being related to school. If the emphasis on the physical environment becomes policy it is not susceptible to budget cuts. Policies that address the needs of the people in the building of their relationship to one another make up the psychosocial environment. When academic and extracurricular opportunities are open to everyone, students are free from harassment and discrimination; and they receive the support services they need, students are free to learn.

Grebow et al., (2000) also suggest that a thoughtful policy analysis will consider the various needs and cultures within the school, with attention to input from youth. In addition, although teachers and administrators try to meets the needs of staff and students, policy goes a long way in ensuring protections and supports for everyone. Valuing teachers and creating policy which commits the district to ensuring professional treatment for all teachers, regardless of changes in schools or administration, seems to be important as well. They describe teachers as the keystone of efforts to strengthen student achievement and valued and supported teachers are more likely to model positive strategies for communication and conflict resolution. Creating policy to institutionalize family and community engagement as part of every day school life is another consideration. Also community members volunteer in schools and attend cultural events and athletics, where they view the school in a positive light. In addition, policy is essential for the coordination of a school health program – for the integration of a healthy school with a school's other health-related goals that helps it become an institutionalized part of the school culture. The authors suggest linking school environmental health issues to the district's mission, goals, and budget and its stated priorities. For instance,

national attention to standardized testing has led to local school boards focused on increasing academic achievement. Therefore, if hiring a social worker or beginning a family outreach program is the goal for the healthier school environment, then emphasize the potential for strengthening student achievement. Finding community advocates who share the goal for improving the school environment can help support school health policies. Consider possible challenges to the recommendations and also ways to implement in small steps. Incrementally, working through advisory boards and committees also garners support and working through appropriate channels expedites getting the information to the right people and conveys authority. Finally, the authors say that it is important to understand limitations of protocol and that not all efforts will succeed on the first try.

Section III: Settings Approach

1. Settings and Systems

Essentially systems theory emphasises the importance of seeing any organization in its totality, and of understanding the inter-relationships and interdependencies between significant components or subsystems of the organization. Therefore, considering an organization in this manner would then appear to be compatible with the intent of the settings approach to modify the context (or system) within which individuals exist (Nadler and Tushman, 1977; Dooris, 2003).

Rappaport (1977) and Scileppi (1984) suggest that schools can best be understood as open, rather than closed systems. Individuals who work in schools (teachers, support staff, and administrators) as well as individuals who use schools (parents, students) may think of themselves as working or learning in rigidly bounded organizations (closed systems). These individuals will behave differently from those who think of themselves as working and learning in open systems in which inputs can come from almost anywhere and whose members attitudes, behaviours, and decisions are expected to have effects in the community/society outside the school itself.

Kloos et.al.(1997) stated that in an open system accountability is considerably more ambiguous. It is less clear who may exert legitimate influence and how they may exert it. An open system is by definition more receptive to innovations and change but also more vulnerable to conflict and tension. Viewing the school as an open system necessarily affects the way one thinks about school consultation. If the school is understood to be part of a neighbourhood (rather than a separate entity located in a neighbourhood), then the school is both a forum for community conversation and a resource owned by the community. The decision about what will take place within the walls of the school and when are seen to be a legitimate community responsibility, and it explicitly becomes the task of the consultant to help the school find ways to make participation more accessible to more citizens (Kloos et al., 1997).

The challenge then within a school settings approach is to develop models that reinforce key values of health promotion and can actually be applied to the realities that schools operate within, and that can deliver benefits not only to the organization (school) and students, but also to the teachers, support staff, parents and the wider community.

2. Settings Approach to Health Promotion

A settings approach to health promotion recognizes that individuals exist and interact within complex subsystems including family, peer groups, organizations, community, culture, physical and social environments, economic, and political. These various systems can enhance or damage health and are the focal point of the settings approach to health promotion. Therefore, a settings approach utilizes interventions geared towards

modifying the context within which individuals exist rather than solely attempting to change the individuals themselves. Poland, Green and Rootman (2000) stated that this approach signifies a shift in focus from reductionist strategies that emphasise individual action to a more salutogenic philosophy, with programmes that acknowledge the impact of wider environmental determinants – i.e. a social ecological model of health promotion.

Mullen et al. (1995) describes settings as “major social structures that provide channels and mechanisms of influence for reaching defined populations”. Settings involve frequent and sustained interaction, and are characterised by formal and informal membership and communication. These qualities create efficiencies in time and resources for health promotion programming and offer more access and greater potential for social influence (Mullen et al. 1995). Mullen et al. (1995) has identified the following characteristics of settings that facilitate health promotion:

- Provide channels for delivering health promotion
- Diffusion of information occurs in, is facilitated by settings
- Builds on relationships between participants, authorities, and organizations
- Provides access to gatekeepers
- Provide entry points and access to specific populations
- Unique practices and training traditions
- Professional identities linked to setting

The notion of health as created in the relationship between individuals and their environment reinforced the assertion that people are not definable solely by their “risk identities” (Kickbusch, 1995). From a health promotion perspective, settings has been defined as “a place or social context in which people engage in daily activities in which environmental, organizational and personal factors interact to affect health and well-being” (Nutbeam, 1998).

The WHO, especially its Regional Office for Europe, has provided considerable leadership and momentum for the “settings approach” to health promotion (Green et al, 2000). The focus on “supportive environments for health” as one of the five key strategies of the Ottawa Charter, and its recognition of the fact that many determinants of health are setting specific, provided an impetus and legitimizing discourse for a settings approach. The settings approach has powerful appeal for practitioners as a concrete, practical focus insofar as settings represent a pragmatic and manageable scale at which to direct change efforts (Green et al., 2000).

3. Settings as an Ecological Approach for Health Promotion

One of the key factors behind the increased interest in the settings approach has been the ecological perspective of health behaviour and health promotion, demanding that individuals not be treated in isolation from the larger social units in which they live, work and play. An ecological approach recognizes that individuals live in social, political, and economic systems that shape behaviours and access to the resources they need to maintain good health (Brown, 1991; Gottlieb and McLeory, 1994; Krieger, 1994; Krieger et al., 1993; Lantz et al., 1998; McKinlay, 1993; Sorensen et al., 1998; Stokols, 1992,

1996; Susser and Susser, 1996a,b; Williams and Collins, 1995; World Healthy Organization, 1986). Also, there is an effort to expand methods for evaluating interventions that incorporate an ecologic approach (Fisher, 1995; Green et al., 1995; Hatch et al., 1993; Israel et al., 1995; James, 1993; Pearce, 1996; Sorensen et al., 1998; Steckler et al., 1992; Susser, 1995).

Health promotion is relatively young, but ecology is not, and one can find streams of thought and action where ecological perspectives have influenced health promotion (Green et al., 2000).

Ecological Models/Approaches are comprehensive health promotion models that are multifaceted, concerned with environmental change, behavior, and policy that help individuals make healthy choices in their daily lives. The defining feature of an ecological model is that it takes into account the physical environment and its relationship to people at individual, interpersonal, organizational and community levels. The philosophical underpinning is the concept that behavior does not occur within a vacuum.

Ecological Models address multiple levels of behavior influence, leading to a more comprehensive approach to health promotion. Many of the predominant theories or models of behavior focus on one dimension of health promotion, such as knowledge attitudes, or skills. These one dimensional approaches do not necessarily result in desired behavioral change. Ecological models provide a mechanism for linking health promotion and health protection emphasizing a shared framework for change targeted at individual behaviors and the environment. This may lead to improved program effectiveness.

Historically, some of the earliest applications of pubic health incorporated an ecological approach. Roots in Public Health and Psychology stem back to the mid 1800's, when ecological factors such as poverty and social class were studied in relation to health/disease, i.e., typhus epidemic (Stokal, 1992). A host-agent-environment model was considered basic for analysis of infectious disease.

Kurt Lewin (1936) looked at ecological psychology and studied the influence of the outside environment on the individual. He hypothesized that environments influenced behavior indirectly through effects on psychological variables. Perceptions of the external environment were deemed important. In the area of psychology B. F. Skinner (1953) is considered an early and influential forerunner to ecological models. He found antecedents and consequences in observable environment control behavior.

Believing environments directly affect behaviour Roger Barker (1968) developed the concept of behavior settings looking at the social and physical situations in which behavior takes place. Urie Bronfenbrenner (1979) described three levels of environmental factors, namely, microsystem, mesosystem, and exosystem. In the 1970's Rudolph Moos considered a social ecological approach to health promotion and specified four sets of environmental factors relevant to health studies: 1. physical settings, 2. organizational, 3. human aggregate (sociodemographic or sociocultural characteristics), and 4. social climate.

Stokols (1992) stated that interventions must address environmental resources that may facilitate or hinder targeted health behavior changes. While the theory of ecological models has evolved over a long period of time, the application for health promotion programming has been a recent development and Stokols has become a leader in developing ecological models for health promotion.

The ecological perspective, according to Stokols (1992), is distinguished by four assumptions:
Assumption One: Multiple facets of both the physical environment (for example, geography, architecture, and technology) and the social environment are integral to a social ecological analysis. Applying Assumption One to health promotion, Stokols (1992) stated that the promotion of well-being is of necessity "based on an understanding of the dynamic interplay among diverse environmental and personal factors…". This is in contrast to an analytical framework that focuses "exclusively on environmental, biological, or behavioral factors" (Stokols, 1992). By way of elaboration, in Assumption One the health status of individuals and groups "is influenced not only by environmental factors but also by a variety of personal attributes, including genetic heritage, psychological dispositions, and behavioral patterns" (Stokols, 1992).

Assumption Two: The relative scale and complexity of environments may be characterized in terms of a number of components such as:

- physical and social components,
- objective (actual) or subjective (perceived) qualities, and
- scale or immediacy to individuals and groups (Adapted from Stokols, 1992)

In Assumption Two independent attributes of environments are relevant such as lighting, temperature, noise, space arrangement or group size. Additionally relevant are the "composite relationships among several features, as exemplified by such constructs as behavior settings, person-environment fit, and social climate." (Stokols, 1992).

Assumption Three: The Social ecological perspective incorporates multiple levels of analysis and diverse methodologies. The perspective in Assumption Three assumes that the effectiveness of an intervention "can be enhanced significantly through the coordination of individuals and groups acting at different levels..." (Stokols, 1992). In the area of health promotion, the multi-level aspect of the Third Assumption is illustrated by family members who make efforts to improve their health practices, the efforts of managers to shape organizational health policies, and the activities of public health officials who direct community health services (Stokols, 1992).

Assumption Four: The social ecological perspective incorporates concepts from systems theory to take into account both the interdependencies that exist among immediate and more distant environments, and the dynamic interrelations between people and their environments. By way of illustration on the components of Assumption Four, when it is applied to health promotion, Stokols (1992) drew attention to the following:

- "people-environment transactions are characterized by cycles of mutual influence, whereby the physical and social features of settings directly influence their occupants' health..."
- "concurrently the participants in settings modify the healthfulness of their surroundings through their individual and collective actions." (Stokols, 1992)."

The key idea in Assumption Four is the recurrent cycles of mutual influence which are basic to understanding transactions between people and their environments. Another key idea in Assumption Four is the notion of levels of human environments where some are more local and others are more distant but still with immediate influence. An example provided by Stokols (1992) in the area of health promotion is where state and national ordinances aimed at promoting environmental quality and protecting public health directly influence the occupational safety and health of community work settings.

Core Principles of Social Ecological Theory

Stokols (1996) addressed the challenge of translating social ecological theory into guidelines for community health programs. The result was the development of a clearly specified theoretical foundation utilizing core principles of social ecological theory. In the process of developing guidelines for community health promotion, Stokols compared the key strengths and limitations of three distinct and complementary perspectives on health promotion: behavior change, environmental enhancement, and social ecological approaches.

In this synopsis of Stokols' approach, the focus will be on core principles of social ecology. Social ecology is alternately conceived as an "overarching framework" or "set of theoretical principles" which assist with understanding interrelationships: for example, among diverse environmental and personal factors in human health and illness. This focus on understanding interrelationships is in recognition of the compelling circumstance that: "...most public health challenges...are too complex to be understood adequately from single levels of analysis and, instead, require more comprehensive approaches that integrate psycho logic, organizational, cultural, community planning, and regulatory perspectives" (Stokols, 1996). In this conception of social ecology as assisting with understanding interrelationship among complex phenomena, the term "ecology" refers to "the study of the relationship between organisms and their environments" (Stokols, 1996). There is attention to the social, institutional, and cultural contexts of people-environment relations as well as human ecology's emphasis on biologic processes and the geographic environment in which they occur. The expanded emphasis on people -- environment relationships with cultural, institutional, and social components is reflected in the core principles of the social ecology paradigm.

Principle One: Multiple Dimensional Analysis

Environmental settings have multiple dimensions which influence the person environment interaction. Environmental settings may be analyzed ("ecological analysis") from numerous perspectives which are relevant to health and well-being. Examples of such multiple dimensions include social cohesion, emotional well-being, development maturation, and physical health status. Social ecology theory emphasizes "the importance of identifying various physical and social conditions within environments that

can affect occupants: physiologic, emotional, and/or social well-being." Emotional well-being may be influenced by the perceived predictability, controllability, novelty, and symbolic values of environments.

Principle Two: Differential Dynamic Interplay
The emphasis is on interrelationships between personal and situational factors. This is in contrast to an orientation which focuses exclusively on behavioral, biological, or environmental factors. This approach recognizes that environmental factors may affect people differently depending on such factors as personality, health practices, perceptions of the controllability of the environment, and financial resources. In social ecological research which incorporates differential dynamic interplay, the "level of congruence (or compatibility) between people and their surroundings is viewed as an important predictor of well-being..." (Stokols, 1996).

Principle Three: Relevance of Systems Theory
Understanding the dynamic interaction between people and their environment requires the application of such principles from systems theory as interdependence, deviation amplification, homeostasis, and negative feedback. This incorporation of systems theory facilitates the characterization of people-environment transactions in terms of cycles of mutual influences. In such a characterization, for example, physical and social settings both influence health, and the participants may engage in individual or collective action to modify both the social and the physical settings.

Principle Four: Interdependence of Environmental Conditions
This principle recognizes the importance of the interconnections between multiple settings and life domains, and the close interlinkage between the social and physical facets of those settings. By way of example, there can be independent effects and joint effects on individuals from a wide range of social and physical aspects of settings. Interdependencies exist among both immediate and distant environments. A "core principle of social ecology is that the environmental contexts of human activity function as dynamic systems. This systemic quality of settings is reflected in the interdependencies between physical and social conditions within particular environments and in the nested structure of multiple settings and life domains" (Stokols, 1996). Multiple settings affect participant well-being. It is important not to neglect consideration of the links between the social and physical aspects of environments and the joint influence of those multiple settings. In this context, "social ecological theory emphasizes not only the interrelatedness of conditions within single settings but also the links between multiple settings and life domains within the broader community" (Stokols, 1996).

Principle Five: Inherent Interdisciplinarity
Social ecology analyses emphasize the integration of multiple levels of analysis (for example macro level preventive strategies of public health and epidemiology with micro level individual strategies from medicine) with diverse methodologies (epidemiological analyses, environmental recordings, medical examinations, questionnaires, and behavioral observations). Interdisciplinary research in the area of health promotion is

essential to the development of comprehensive programs which "link the perspectives of medicine, public health, and the behavioral and social sciences" (Stokols, 1996).

Stokols (1992) conceptualized health promotion broadly as "a dynamic transaction between individuals and groups and their psychosocial milieu". Such a conceptualization requires an analysis of both the environmental resources which are available and the life-styles and health habits of the individuals under study. The first step was to measure the features of the environment which promote personal and collective well-being by different criteria at different levels of analysis. In taking this first step Stokols employed one of the basic assumptions of the ecological perspective that "healthfulness is a multifaceted phenomenon encompassing physical health, emotional well-being, and social cohesion," (Stokols, 1992).

Conceptualizing Health-Promotion Environments

For Stokols, an "explicit recognition of the multiple facets of healthfulness has important implications for ecologically oriented analyses of health promotion," (Stokols, 1992). Such recognition leads to defining the health promotion capacity of an environment in terms of multiple health outcomes resulting from people-environment transactions over a specified time interval. Thus, for any environmental context of behavior, it is important to specify key environmental resources or constraints that are likely to influence personal and collective well-being among members of the setting (Stokols, 1992).

4. Examples of Ecological Approaches in Health Promotion (Annotated Bibliography)

Brownson, R. C., Koffman, D. M., Novotny, T. E., Hughes, R. G., & Eriksen M. P. (1995). **Environmental and policy interventions to control tobacco use and prevent cardiovascular disease.** *Health Education Quarterly*, 22 (4).

This article discusses the value of environmental and policy interventions to control tobacco use and prevent cardiovascular disease. Interventions include clean air acts, tobacco taxes to fund public health programs directed at smoking, and urging state and local health departments to collaborate with other entities. Interventions such as the clean air acts encourage change in individual behavior based on changes in the environment.

Stokols, D., Pelletier, K. R., & Fielding, J. E. (1996). **The ecology of work and health: Research and policy directions for the promotion for employee health.** *Health Education Quarterly*, 23 (2).

This article, co-written by Dr. Stokols, one of the founders of the ecological model addresses new research and policy in the field of worksite health promotion. Three major themes in this article are: the influence of social and physical environments on occupational health, the effects of non-occupational settings on employee well being, and issues in design and evaluation of worksite health. This research indicates that a change from individually oriented wellness programs toward more comprehensive programming is essential.

Sorensen, G., Stoddard, A., Ockene, J. K., Hunt, M. K., & Youngstrom, R. (1996). **Worker participation in an integrated health promotion/health protection program: Results from the WellWorks Project.** *Health Education Quarterly*, 23 (2).
The Well Works intervention was a worksite health promotion intervention based on the ecological model. The intervention targeted worksite change at individual and environmental levels. Worker participation and worker perception of managerial change were measured in the study. Results showed that blue-collar workers were less likely than white-collar workers to report participating in the program. Results also indicated that blue-collar participation in exposure-related activities versus nutrition activities may increase worker participation in worksite health promotion programming. Finally, when workers were aware of managerial intervention, they were more likely to participate in smoking reduction and nutrition programs.

Coulton, C. J. (1996). **Measuring neighborhood context for young children in an urban area. (Special Issue: Ecological Assessment).** *American Journal of Community Psychology*, 24(1). The article describes the effects that an urban environment might have on young children. The urban environment often presents a certain degree of neighborhood decline. Children in this type of surroundings typically develop certain patterns of risk behavior. An ecological model is applied to analyze the effects that the urban environment has had in these children. Furthermore, this article also presents a description of racial segregation and the consequences of it. Finally, the study describes the relationship among neighborhood characteristics and individual behavior.

Lesar, S. (1995). **HIV infection in children: family stress, social support, and adaptation.** (Families of Children and Adolescents with Special Needs). *Exceptional Children*, 62(3).
This article presents the effects that caring for children with HIV has on family members. The results examined include family functioning, parenting stress, and social support of caregivers. An ecological model is applied to analyze how the HIV infected children affect family functioning. Family stress and support are examined as well. Thus, the study presents how caring and relating to children with HIV affects behavior and coping of individuals.

Perkins, D. D. (1996). **The ecology of empowerment: Predicting participation in community organizations.** *The Journal of Social Issues*, 52(1).
This article has a strong application of an ecological model and public health. The subject studied in this case is the empowerment of communities and grassroots organizations. The behavior observed on individual members of empowered communities is assessed carefully. Certain individuals and communities participate more than others. This last issue is examined in the study by applying an ecological model.

5. Best Practices of Ecological Approaches within the School Environment
(Annotated Bibliography)

Perry, C. L., Williams, C. L., Mortenson, S. V., Toomey, T. L., Komro, K. A., Anstime, P. S., McGovern, P.G., Finnegan, J. R., Forster, J. L., Wagenaar, A. C., & Wolfson, M. (1996). **Project Northland: Outcomes of a community wide alcohol use prevention program during early adolescence.** *American Journal of Public Health*, 86. **and** Perry, C.L., Williams, C.L., Komro, K.A., Veblen-Mortenson, S., Forster, J.L., Bernstein-Lachter, R., Pratt, L.K., Dudovitz, B., Munson, K.A., Farbakhsh, K., Finnegan, J., and McGovern, P. (2000). **Project Northland High School Interventions: Community action to reduce adolescent alcohol use.** *Health Education & Behavior*, Vol. 27(1), February.
These two articles present Phase I and II findings of Project Northland which is a randomized community trial initially implemented in 24 school districts and communities in northeastern Minnesota, with goals of delaying onset and reducing adolescent alcohol use using community-wide, multiyear, multiple interventions. Through an ecological approach the study targets the Class of 1998 from the 6th to 12th grades (1991-1998). The early adolescent phase (I) of Project Northland has been completed, and reductions in the prevalence of alcohol use at the end of 8th grade were achieved. The program used social-behavioral programming in the schools, peer education, parental and community involvement and community task forces to reduce adolescent alcohol consumption. The project aimed at changing individual behavior and the environment (or accessibility) in regards to alcohol use. After three years, results indicated that prevalence and onset of alcohol use in targeted communities had decreased. These results indicate that multi-level alcohol interventions are effective in decreasing adolescent alcohol use. Phase II of Project Northland, targeting 11th and 12th-grade students, uses five major strategies: (1) direct action community organizing methods to encourage citizens to reduce underage access to alcohol, (2) youth development involving high school students in youth action teams, (3) print media to support community organizing and youth action initiatives and communicate healthy norms about underage drinking (e.g., providing alcohol to minors is unacceptable), (4) parent education and involvement, and (5) a classroom-based curriculum for 11th-grade students. These article describes the background, design, implementation, and process measures of the intervention strategies for Phase I and II of Project Northland.

Parcel, G.S., Perry, C.L., Kelder, S.H., Elder, J.P., Mitchell, P.D., Lytle, L. A., Johnson, C.C., and Stone, E.J. (2003). **School climate and the institutionalization of the CATCH Program.** *Health Education and Behavior*, 30 (4), August.
Parcel et al. (2003) studied the effectiveness of school climate on the institutionalization of the Child and Adolescent Trial for Cardiovascular Health program. CATCH was the largest field trial of school-based health promotion in the US conducted in 96 schools in four geographic areas. Data were collected from classroom teachers, PE specialists, food services workers, and administrators through two different school climate questionnaires that measured principal and teacher behaviour (42-item questionnaire); organizational health (37-item questionnaire); principal/teacher openness and school health composite

scores. The study included 56 intervention schools and 40 control schools. Findings suggested that schools in which both principals and teachers were more open were more likely to have received more hours of CATCH curriculum training, used CATCH for lesson plans, and had a greater percentage of teachers who were teaching CATCH. Schools that were high in organizational health were more likely to be using CATCH for lesson plans and had a greater percentage of teachers who taught one or more hours of CATCH. This study demonstrates that interventions that help schools maintain and institutionalize a health promotion program may be more effective if they take into consideration the school climate and address those aspects of the school climate that may not support continued implementation of an innovative program. The researcher stated that practitioners can use instruments to assess the organizational climate to evaluate the readiness of the school to implement and sustain an innovative program. Following this evaluation, they can then initiate interventions to help the schools develop more supportive climates before investing time and resources to implement a program that might not be sustained. Once an innovative program has been implemented, assisting the school in addressing and maintaining a supportive climate could also improve the sustainability of a program. The authors stated that school-based health intervention programs have been shown to have positive effects on various adverse health behaviours. When such intervention programs begin as part of a pilot or research project, certain variables such as administrative support need to be considered to ensure feasible and effective programs have a lasting impact beyond the research agency's funding, in order to sustain, or extend and enlarge, the program's positive effects. The conceptual framework used by authors is based on diffusion theory where change occurs in a series of processes and outcomes as a result of the introduction of an innovation. An innovation can be any new idea that is different to current practice and can represent a product, a behaviour, or a program. For this study the researchers conceptualized the diffusion process as occurring through four stages: (1) dissemination (awareness of and motivation to use an innovative program), (2) adoption (a decision by the organization to use the program) (3) implementation (putting the program into use by the organization), and (4) institutionalization (routine use of the program over an extended time period).

Josefowicz, D.M. and Allen-Meares, P. (2002). **Poverty and Schools: Intervention and resource building through school-linked services.** *Children and Schools*, 24(2), April. This article focuses on the devastating consequences poverty has on the educational outcomes of school children and such microsystems, exosystems, and mesosystems as their home, school, and community. An ecological-systems perspective is offered to identify interventions and change the quality of interactions and processes among these systems in ways that improve service delivery and ultimately student achievement. Supporting early interventions with infants, preschoolers, and their parents are associated with positive social and academic outcomes, particularly for poor children. After-school and youth development programs have had positive results such as improved problem-solving, courtesy, rejection of wrong-doing, ethical behaviour, feelings toward school and grades, increased attendance and grades, cultural pride, commitment to the group, and positive view of adults.

King, A.C., Stokols. D., Talen, E., Brassington, G.S., and Killingsworth, R. (2002). **Theoretcial approaches to promotion of physical activity: Forging a transdisciplinary paradigm.** *American Journal of Preventive Medicine*, 23(2S).
This article addresses the current and future physical inactivity epidemic facing the U.S. population. Strengths and limitations of personal-level, physical activity-theory are identified as well as introducing new concepts from the social ecology and urban-planning fields and potential relevance to the physical-activity arena. The authors provide an overview of potentially relevant theoretical perspectives aimed at different levels of understanding and analysis, from the personal level through the broader-scale meso- and macro-environmental perspectives. In addition, the authors suggest initial steps to take in developing a transdisciplinary paradigm encompassing numerous levels of analysis and investigation. Recognizing a correlation between pedestrian-oriented environments and physical activity the authors view changes at personal, meso and macro-levels towards pedestrian-oriented communities as having the potential to positively affect the physical activity status of Americans.

Nash, J.K. (2002). **Neighborhood effects on sense of school coherence and educational behavior in students risk of school failure.** *Journal of Children and Schools*, 24(2), April.
This article presents results from a sample of 4,772 middle and high school students identified as being at risk of school failure. The study investigated the relationships among neighbourhood informal social control, crime, and negative peer culture; students' sense of school coherence; and students' educational behaviour. The conceptual framework of this study was based on ecological-developmental and social disorganization theories that highlight the importance of, and links between, neighbourhood factors and sense of school coherence. The results demonstrated that efforts to promote school success in students at risk of school failure may be more effective if practitioners and policymakers broaden the scope of intervention and seek to assess, target and change key neighbourhood characteristics. The study demonstrated how taking an ecological approach to interventions aimed at building neighbourhood informal social control and reducing neighbourhood crime may be especially important in schools serving large numbers of students at risk.

Dishion, T.J. and Kavanagh, K. (2000). **A multilevel approach to family-centered prevention in schools- process and outcome.** *Addictive Behaviors*, 25(6).
This intervention strategy is based on an ecological framework for studying social and emotional development in children and adolescents, emphasizing a network of contextual factors within which parenting is both directly and indirectly influential on the development of problem behavior. The Adolescent Transitions Program (ATP) is a multilevel approach to family-based interventions within a middle-school setting that includes a universal, selected, and indicated strategy for serving families with young adolescents. The ATP model is designed to address the needs of families of young adolescents that present with a range of problem behavior and diverse developmental histories. Three interventions levels (universal, selected, and indicated) are described, and results indicated the effectiveness of this ecological approach, the benefits of family interventions (especially for high-risk youth) within a school context, and the significant

contribution made in reducing problem behavior and substance use from a public health perspective.

Bond, L., Glover, S., Godfrey, C. Butler, H, Patton, G.C. (2001). **Building capacity for system-level change in schools: Lessons from the Gatehouse Project.** *Health Education & Behavior*, 28(3).
This article presents program evaluation results of the Gatehouse Project (a comprehensive approach to mental health promotion in secondary schools). This intervention is based on an understanding of individual and social risk processes for adolescent depression and emotional well-being. The focus ranges from aspects of the school's social environment (e.g., conflict, bullying, isolation, and alienation) to aspects of an individual's cognitive and social skills. Young people who experience difficulties in their social interactions and are exposed to adverse environments are at higher risk of experiencing emotional difficulties. Furthermore, those students who are socially isolated are more likely to engage in health risk behaviors. The conceptual framework of the project emphasizes the importance applying an ecological approach and of healthy attachments (sense of positive connection with teachers and peers). The project has identified three priority areas for action: building a sense of security and trust, enhancing skills and opportunities for good communication, and building a sense of positive regard through valued participation in aspects of school life. The intervention is a multilevel strategy designed to promote change in the social and learning environments of the school and to promote change at an individual level. The strategy seeks to make changes in the schools' social and learning environments, to introduce relevant and important skills through the curriculum, and to strengthen the structures within the school that promote links between the school and its community. The key elements of the whole-school intervention are the establishment and support of a school-based adolescent health team; the identification of relevant risk and protective factors in each school's social and learning environment from student surveys; and, through the use of these data, the identification and implementation of effective strategies that address the school environment issues. The implementation of the whole-school intervention was facilitated by the Centre for Adolescent Health liaison team, which provided training and resources and generally acted as a "critical friend" in the change process. The project evaluation used a cluster-randomized controlled trial design involving 26 schools. Analysis of data from field notes, key informant interviews, and school background audits revealed that the key elements that contributed to system changes within the schools were feedback of the school social climate profile, establishment of the adolescent health teams, input of the critical friend, and identification of appropriate intervention strategies for each school. Also demonstrated was considerable success in reducing smoking rates among students.

Coyle, K., Kirby, D., Parcel, G., Basen-Enquist, K., Banspach, S., Rugg, D., and Well, M. (1996). **Safer Choices: a multicomponent school-based HIV/STD and pregnancy prevention program for adolescents.** *Journal of School Health*, 66(3).
This five-year research project was directed at 14-18 year olds to reduce risk behaviours or increase protective behaviours to prevent pregnancy, HIV, and STD infections. The program applies an ecological approach and includes five components: a School Health Promotion Council involving administrators, school staff, students, parents, and

community members; curriculum and staff development activities; school environment activities designed and implemented by a team of peer educators; parent education activities; and school-community linkage activities. This article describes the theoretical framework, process for intervention development, and key intervention strategies used in Safer Choices. The project took place in two urban sites one in Southeast Texas and one in Northern California.

Good, T L., Wiley, A.R., Thomas, R.E., Stweart, E., McCoy, J., Kloos, B., Hunt, G.D., Moore, T., Rappaport, J. (1997). **Bridging the gap between schools and community: Organizing for family involvement in a low-income neighborhood.** *Journal of Educational and Psychological Consultation,* 8(3).
This article describes an approach to neighbourhood-based consultation that emphasizes collaboration with advocacy for local citizens. The primary goal is to facilitate involvement of families and other citizens in collective action. It illustrates the assessment, collaboration, and organizing activities dictated by an open-system, ecologically oriented community approach. The authors define an open system as one that is understood to be part of its local context. In this case, school boundaries are assumed to extend into the neighbourhood, and vice versa. Considered within the school boundaries are families of the school children, neighbours, local businesses, churches, and other community resources. Similarly, the school is viewed as a potential resource for each of these. Practice involves assessment of direct interests as defined by participants, development of bridge-building activities between school and citizens, small wins over time, and long-range commitment to creation of organizational structures that connect the culture of the school and the interests of the neighbourhood. Three types of participation structures were identified: (a) settings and opportunities for families to have two-way communication with the school; (b) settings and opportunities that promote communication among families; and (c) active parent organizations that participate in decision making and planning, allowing for families to communicate their interests as a group of stakeholders. Bridging activities include special event and program planning along with spontaneous "moments of opportunity" that express family and neighbourhood interests. The entry, assessment, and development of bridging activities in search for more permanent structures is described in the context of the school district and its historical relation to the neighbourhood. Questions addressed in the article included: 1) How can low-income families be involved in schools in ways that benefit both their own empowerment and the well-being of their children? 2) Where do barriers exist for meaningful participation of families in schools?, and 3) What are the characteristics of meaningful family involvement?

McBride, N., Midford, R., and Cameron, I. (1999). **An empirical model for school health promotion: the Western Australian school health project model.** *Health Promotion International, 14(1).*
The Western Australian School Health (WASH) project involved over seventy elementary and secondary schools, trained school staff and parents in school health promotion, provided access to a central health/educational professionals and provided time for school-based representatives to plan and implement school health promotion activity. The model used in the WASH project is loosely based on Kolbe's (1986) model

'School Health Promotion Components and Outcomes' and also draws on systems theory related to school organizational change (Holder and Howard, 1992). The key components of the WASH model include:

1. *School health education* – curriculum, health teaching, teacher training, resources
2. *School physical education* – curriculum, sport, daily physical activity
3. *School health environment* – physical environment, policies and procedures
4. *School nutrition and food service* – healthy canteen or food service` healthy fundraising, healthy food eating incentives/competitions
5. *School health services* – access to nurse, dental hygienist, vaccinations, screenings
6. *School counselling services* – pastoral care, counselling support
7. *School staff health promotion activities* – healthy food options, personal health information, regular physical activity opportunities at work
8. *Integrated school and community health promotion activities* – school links with school agencies and professionals, involvement with the local and extended community
9. *Parental involvement* – extending the time and effort dedicated to health promotion by alleviating some tasks of school staff and by providing alternative areas of health related expertise (i.e., parents as helpers/organizers, training in health promotion, parents as school health promotion planners, parent group funding health promotion activity)
10. *School health management* – organizational support plays a vital role in extending the time and scope of school health promotion activity (i.e., providing an adequate budget, personnel and resources to school health promotion, training staff, and the school's planning, review and evaluation processes of health promotion activities).

The model used in WASH indicates that a developmental process occurs and there is a particular interrelationship between the components. However, the process was not necessarily sequential allowing flexibility for numerous entry points and development pathways (i.e., a school might have a health concern identified through student or teacher health data, or have a parent or staff member lobbying strongly for health development). The WASH project defined critical individuals as *gateway personnel* such as administrators, *key decision makers* such as administrators, school-based decision making groups, and parent associations, *key workers* such as motivated school community members, parents and community organizations. They then defined *process considerations* including a *needs assessment* to see if the school wants and needs to promote school health, *school community* link into school health needs, *school management* link health into school management procedure, *school health promotion* use of theories of school health promotion, an intersectoral approach and a structured and participatory planning process to develop a comprehensive school health program. The authors also make an important distinction between the similarly sounding terms *school health promotion* and *health promoting schools*, incorporating as part of their model "Management Factors' and 'School Community' as well as using 'Health Promotion Factors'.

Moon, A.M., Mullee, M.A., Rogers, L., Thompson, R.L., Speller, V., and Roderick, P. (1999). **Helping schools to become health-promoting environments-an evaluation of the Wessex Healthy Schools Awards.** Health Promotion International, 14(2).
The researchers conducted an evaluation as an external agent of the Wessex Healthy Schools Award (WHSA) scheme in England. A total of 306 schools participated in WSHA since its launch in 1992 and the scheme involved nine key areas – the curriculum, links with the wider community, a smoke-free school, healthy food choices, physical activity, responsibility for health, health promoting workplace, environment and equal opportunities and access to health. Participating schools had to select two areas in addition the health education curriculum and be involved for 3-4 terms. Recruiting control schools was difficult resulting in a small selection and low power to detect statistically significant results and this is the only study in the literature that was reviewed to try a controlled observation comparison. The intervention schools made progress in all key areas except taking responsibility for health and physical activity, even though many students and staff were unaware of WSHA in their school. Support staff, parents and governors were aware of the contribution they can make to healthy school initiatives and consultation on health matters, and were eager to participate. Teaching staff were unaware of the wishes of these groups to be involved actively and they remain a largely untapped resource. The authors cited a number of factors which facilitate effective school health education, these include: involving parents in their child's health education; involving the wider community; providing a comprehensive, cross-curricular program throughout a child's school career; combining health education with other health promoting initiatives in school; providing a variety of teaching methods and strategies which actively involve students in their learning and focuses on them as individuals and identifies their present needs; and, developing a role for young people in all decision-making processes.

Section V: Conclusion

Numerous organizations throughout the world concur that the best opportunity to positively affect an individual's health is to work through the schools. When lifelong behaviours are being determined, the vast majority of the population can be accessed in a cost-effective way, and there are existing standards for equity and quality. The evolution of school health from a simple disease prevention program a century ago to a complex Coordinated (formerly Comprehensive) School Health program has been guided by the five principles defined by The Ottawa Charter on Health Promotion (World Health Organization, 1986). The application of these principles to health promotion in a school setting has become known as the 'Health Promoting School' concept (Kickbush, 1992). Originating in Europe, the 'Health Promoting School' concept incorporates the five principles of the Ottawa Charter as a framework for linking health and education. It proposes that school community members in collaboration with the local, wider community can have a positive effect on children's health status by creating a healthy school environment; addressing school policies relevant to health issues; involving local community groups in activities and sharing resources; improving health-related knowledge, attitudes and skills of students and staff; and re-orienting school services to provide healthy choices (WHO, 1995). A 'Health Promoting School' looks at the whole school environment and all aspects of school life. Healthy school communities are those in which the classroom, the whole school atmosphere, and the home/school/community relationship consistently reinforce caring about health and well-being (WHO, 1996a, and b).

Since their inception in 1986, the five principles of Ottawa Charter for Health Promotion have been refined and reworked by organizations and researchers in an attempt to better meet the needs of children/adolescents and the education systems responsible for delivery. Within a school setting, examples of promoting principles now include: democracy, equity, empowerment and action competence, school environment, curriculum, teacher training, measuring success, collaboration, communities and sustainability, school counselling; psychological and social services; physical education, school nutrition services; family and community involvement in school health; and school on-site health promotion for staff. In addition, a movement toward creating policy at national and local levels to shape health promoting schools is a current topic of research and health literacy is also being considered as a potential part of school health with the hope that individuals can move from basic/functional literacy, through communication/ interactive literacy to critical literacy-- a much more empowered and informed state. However, in examining current national and international literature it is clear that two of the five principles of 'Health Promoting Schools' have proven problematic to implement. These include 1) encouraging community action and linkages between schools and other agencies and 2) reorienting health services to enhance youth access and identifying best services carried out in schools.

Thus, a common frustration in most of the research is the inability of the school systems to link effectively with the community and integrated health services. A pragmatic and

manageable approach to the complex problems facing school health is a settings approach which looks at social ecological conceptualization of health promoting environments that emphasizes the interactions among individuals and groups in aspects that affect their emotional, physical, and social well-being.

In a settings approach interventions are geared toward modifying the context within which individuals exist recognizing complex subsystems such as family, peer groups, organizations, community, culture, physical and social environments, economic and political. The WHO (2000) recognize that many determinants of health are setting specific and have supported a settings approach as a pragmatic and manageable scale at which to direct change efforts.

The settings approach is considered an ecological method which recognizes that individuals live in social, political, and economic systems that shape behaviours. Stokols (1992) clarifies the ecological perspectives through four assumptions: 1) the health status of an individual or group is influenced by the dynamic interplay among diverse environmental factors but also by personal attributes, including genetic heritage, psychological dispositions, and behavioural patterns, 2) independent attributes of environment affect health status, such as lighting, temperature, noise, space arrangement or group size as well as composite relationships such as behaviour settings, person-environment fit, and social climate, 3) effective interventions need to incorporate multiple levels of analysis and diverse methodologies, and, 4) cycles of mutual influence occur such as state and national ordinances which directly influence community work settings.

A more in-depth examination of core principles of social ecological theory provides a more comprehensive approach to examining public health challenges. Stokols (1996) defines five core principles these are: 1) environmental settings have multiple dimensions which need to be analysed, 2) differential dynamic interplay between personal and situational factors, 3) applying principles from systems theory such as interdependence, deviation, amplification, homeostasis, and negative feedback, 4) interdependence of environmental conditions between multiple settings and life domains within the broader community, and 5) inherent interdisciplinarity linking the perspectives of medicine, public health, and the behavioural and social sciences.

Applying ecologically oriented analyses to the study of health promoting schools requires recognition of multiple facets of healthfulness which leads to defining the health promotion capacity of a school environment in terms of multiple health outcomes resulting from people-environment transactions over a specified time interval. The best practices of ecological models within the school environment provide clear direction for future research implementing two principles of the Ottawa Charter, namely, encouraging community action and linkages between schools and other agencies, and reorienting health services to enhance youth access and identifying services best carried out in schools.

In the literature many studies identified educator training and participation as the problem. However, if educator participation is examined closely over time, it is clear that

educators have supported vast numbers of health promoting programmes only to see them disappear due to loss of funding and/or political change, halting progress towards creating community links and successful integrated services which normally take four or five years to establish. Examining receptiveness of schools for institutionalizing health promotion interventions addresses this problem and provides indicators to determine if a school is likely to sustain interventions once funding is removed or staff change (Goodman et al., 1993; Goodman et al., 1989).

Efforts to promote school success in students at risk of school failure may be more effective if practitioners and policymakers broaden the scope of intervention and seek to assess, target and change key neighbourhood characteristics. Taking an ecological approach to interventions aimed at building neighbourhood informal social control and reducing neighbourhood crime may be especially important in schools serving large numbers of students at risk.

The fact that schools are investing time and resources in so many health promotion programs suggests that they value these and would like them to become integrated into common practice of schools. However, once funding and/or personnel are removed, the education budget mandates unfortunately do not include creating and sustaining community links and integrated health services. If education policy speaks to this need then it has been shown that educators will support mandated policy because they see it as supported by the school board and community and are confident they will receive the necessary resources and staffing to implement such policy (Reid et al., 1995; Gillies, 1998)

Over the past fifteen years students have also been training in such areas as anti-bullying, violence prevention, becoming tolerant and accepting others, interpersonal communication, conflict resolution, peer education and mentoring, developing skills around leadership pertaining to planning, organizing and critical thinking. St. Leger and Nutbeam (2000) state that a great deal has been achieved in school health in the last twenty ears and the evidence base of what is effective has increased considerably. They point out that better evaluations need to be conducted on the benefits that have already been achieved in schools using the HPS/CHS model, (i.e., assessing changes in health or cognitive outcomes, might give a clearer and more positive picture of the impact these initiatives have had on our schools). Presently, numerous evaluation studies that have been conducted examine implementation issues based on the five health promoting principles from the Ottawa Charter and perhaps do not allow us to recognize other gains (Went, 1992; Cameron & McBride, 1995)

St. Leger and Nutbeam (2000) state that while Australian schools are over-researched from the outside, they may be under-researched from the inside and suggest that experienced HPS personnel coach teachers in the practice of research and evaluation. They suggest less of an emphasis on specific health outcomes, and a greater emphasis on the importance of the whole school’s health to teacher well being and continued school improvement. St. Leger and Nuttbeam and others (Rudduck,1991; Fullan, 1993; Hargreaves, 1994) speak to the fact that teachers are overwhelmed by change and the

large number of innovations that schools are expected to address, (technology, different learning styles, different personality styles, communication and conflict resolution skills, adapting learning outcomes to individualized learning plans for multiple special needs students, social responsibility, raising student achievement to name a few of the aspects that teachers have trained vigorously in the past fifteen years). Shaping policy is a good place for health researchers to start linking better with the education community i.e., identifying ways to adapt the HPS/CHS principles with present school district goals such as literacy and social responsibility (Grebow, 2000; McBride et al., 1999).

Finally, the literature in this review as well as other sources offer guidance for future practice in developing multi-component intervention strategies which embrace a settings and ecological approach to school health promotion.

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