

RESEARCH ARTICLE

School Health Promotion Policies and Adolescent Risk Behaviors in Israel: A Multilevel Analysis

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ABSTRACT

BACKGROUND: Health promotion policies targeting risk-taking behaviors are being implemented across schools in Israel. This study identified the most effective components of these policies influencing cigarette smoking and alcohol consumption among adolescents.

METHODS: Logistic hierarchical linear model (HLM) analysis of data for 5279 students in 95 Jewish public schools from the Health Behavior in School-Aged Children (HBSC) 2010-2011 survey in Israel enabled simultaneous estimation of the relationship between student- and school-level variables (health promotion policy) to alcohol consumption and smoking behavior. Principals of participating schools also were interviewed to ascertain their degree of adoption and implementation of a health promotion policy.

RESULTS: Most of the variance in adolescent risk behaviors is explained by student-level variables: negative perceptions of school, lack of parental support for school issues, and more time spent with friends. Among the school-level policy measures, parental participation in health promotion intervention programs was repeatedly associated with lower rates of risk behaviors, over and above student characteristics.

CONCLUSIONS: School health promotion policies should focus on parents' involvement in intervention programs and should seek to improve students' perceptions of school and their sense of well-being to promote resilience. Further research is needed to identify additional factors that may increase the effectiveness of school health promotion policies.

Keywords: adolescence; smoking; alcohol consumption; health promotion; risk behavior; school policies.

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Risk behaviors such as alcohol consumption and cigarette smoking among youth are often a means to gain recognition, control, and a sense of independence. Many studies indicate that during adolescence, experimentation with risk behaviors increases.¹⁻³ Currently, the rates of alcohol consumption and cigarette smoking among youth in Israel are one of the highest among the countries participating in the Health Behavior in School-Aged Children (HBSC) studies.⁴ Only in recent years the Israel Ministry of Education has begun encouraging school principals to adopt and implement a health promotion policy in their schools.

This study is grounded in the bioecological model of Bronfenbrenner⁵⁻⁷ that defines 4 major levels of environmental influences: (1) the microsystem, which includes the systems in which the child grows up and that have a direct effect on the child's development, such as family, educational institutions, and friends; (2) the mesosystem, which consists of reciprocal relationships between 2 microsystems, such as the relationship between the child's parents and the school staff, which can affect the child's development; (3) the exosystem, ie, the external social setting that affects the child's life, although indirectly, for example,

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This study used the HBSC-protocol of the 2010-2011 WHO/EURO cross-national survey. The Israeli principal investigator of the 2010-2011 survey is Yossi Harel-Fisch, PhD, of Bar Ilan University.

the reciprocal relationships among the members of the educational staff; and (4) the macrosystem, ie, the system that reflects the culture and ideology of the society in which the child lives. The study is also based on the model of “adolescent resilience,”⁸ that focuses on promoting the health and well-being of students by addressing 4 resilience-promoting factors in the adolescent’s life: a significant adult role model, daily experiences, a sense of self-esteem, and a sense of social connectedness.

Individual factors (microsystem) that can predict risk behaviors among students include parental support on issues related to school, students’ perceptions of the school and of their peers as agents for acquiring and altering knowledge, approaches, and behaviors, time spent with friends, and loneliness.^{6,9-11} School-level factors (mesosystem) refer mainly to components of a health promotion policy that includes: agenda setting, school rules, intervention, student involvement, and parental involvement.¹²⁻¹⁴

The school mesosystem influences students by constituting a universal and normative environment to which youth belong until the age of 18. The school’s role in providing a formal education has been the focus of much research; however, the school setting is also important from the health perspective and can serve as a platform for advancing health issues, potentially affecting students’ health attitudes and behaviors.^{14,15}

There is evidence linking policy and environmental change to desired behavior.^{16,17} Schools and their existing infrastructure offer an ideal setting to impact students; indeed a coordinated approach to school health is the ecological model applied in the school setting.^{7,17}

The vast academic literature on the topic of health promotion indicates that one of the most significant factors contributing to a healthful environment at school is the establishment of a properly structured school health promotion policy under the guidance of the school principal.¹⁸⁻²¹ According to proposed models of health promotion and education, the school principal plays a crucial role in integrating intervention programs and implementing health changes throughout the school. Hence, the school principal’s perceptions, management, and policies have a direct effect on the development and design of a viable health-behavior culture to be adopted by students and teachers alike.^{19,22}

Health promotion policies in schools vary according to the needs of the particular institution; a school might prefer to focus on the bullying phenomenon and emphasize issues of mental well-being, whereas another school will prioritize proper eating habits and the consumption of healthy foods.²³⁻²⁵ Numerous studies have found a correlation between health-promoting policies and positive behavioral changes among students, eg, adopting healthy eating habits,

increasing physical activity, avoiding drug use, and reducing the rate of cigarette smoking, violence, and bullying.²²⁻²⁵

For example, studies showed that enforcement of rules and implementation of intervention programs regarding cigarette smoking cessation significantly decreased the rate of smoking among students.^{18,19} Given these observations, this study attempts to examine the correlation between individual-level (parental support in school matters, students perception of school and social involvement) and school-level (school health policy) factors on risk behaviors among adolescents in Israel.

This study was based on an ecological model that discusses the interaction between environment, including, family, school and social interaction, and individual behavior. This theoretical framework may help to understand the factors that influence health behaviors.

This study may help policymakers, health and education professionals, and parents understand the relationship between risk behaviors and school characteristics, and thereby, may contribute to development of health promotion interventions and policies toward developing a healthier generation.

Purpose

The goal of this study is to understand which factors at the student-level (parental support on issues related to school, perceptions of the school and of the student, and social involvement), and school health promotion policy level (agenda setting, school rules, intervention, student involvement, and parental involvement), predict substance use (excessive alcohol consumption and cigarette smoking). We hypothesized that (1) when student-level characteristics are higher, the level of students’ alcohol consumption and cigarette smoking will be lower; and (2) a higher level of school health promotion policies will lower the level of students’ cigarette smoking and alcohol consumption.

METHODS

Participants

The current study is part of the multinational project HBSC, undertaken under the auspices of the World Health Organization (WHO). The HBSC is a school-based survey of adolescent health, behaviors and psychosocial determinants, carried out every 4 years, using an international standardized methodological protocol.¹⁵

This standard, anonymous, self-administered in class questionnaire includes mandatory and optional items. The Israeli questionnaire follows the international protocol and includes the optional packages on

alcohol use, tobacco use, school perception, parental support, and social connectedness.

This study was based on the Israeli data from the 2011 HBSC-WHO cross-national survey of children aged 11, 13, 15 and 17 (6th, 8th, and 10th grade). The 2011 WHO survey included 5279 students in 225 classrooms from 95 Jewish schools. Using the classroom as the sampling unit, the class-level response rate was 94.5% with a 99% response rate of children enrolled in participating classes. In addition, for the first time, to the best of our knowledge, our study in 2011 also included a survey of the principals of the sampled schools to ascertain the degree of adoption and implementation of a health promotion policy. The interview questionnaire included questions regarding the principal's commitment to health promotion in school, the existence of school policies for regulation and enforcement of alcohol and tobacco use, implementation of intervention programs, and participation of students, parents, and teachers in health promotion activities.

Procedure

Data were collected with anonymous self-report questionnaires distributed in the classroom. Using the lists of classes and schools obtained from the Israeli Ministry of Education, a random stratified 2-stage cluster sample was obtained. Stratum included region, type of school and grade level. The sample unit was a classroom, with a maximum of 2 classrooms within each sampled school allowed. All students enrolled in a sampled classroom and present on the data collection day were included as sampled children. While it is possible that in some schools data may have been collected from more students than in other schools, with such a large sample size it is unlikely that this introduces an effect on results. Because no variable had more than 7% missing data, listwise deletion was used as suggested in the literature.^{15,26} At the beginning of each 45-minute administration session, issues of confidentiality, anonymity, and voluntary participation were discussed with the participants.

For the first time since the implementation of the WHO-HBSC project in the early 1980s, school principals were surveyed. The researcher, assisted by the Israeli research staff, administered a questionnaire to 160 principals of the same schools in which the students were sampled. Information was gathered regarding their perceptions of school policies related to health behavior and their implementation of health promotion activities. Of the 160 principals surveyed, 24 questionnaires were not completed due to lack of time or interest, and were not included in our research. Only 100 principals' responses were actually included in the study, after excluding those

who were not from public secular or religious schools.

Measurements

Dependent variables. Risk behavior was assessed by 2 student-level indicators: binge drinking and cigarette smoking. Binge drinking was measured by the question: "In the past 30 days, how many times have you drunk 5 drinks of alcohol or more within a period of a few hours?" Answers were recoded to a binomial variable with values of never (0); and once or more (1). Similarly, cigarette smoking was measured by 1 question: "How often do you smoke cigarette?" The response was dichotomized into never (0); and once a week or more (1). All substance use measures have been validated for international use.¹⁵

Level 1: student-level independent variables. All level 1 variables were derived from self-reported data obtained from the student survey. Respondents' sex was entered in all models (0 = female, 1 = male), age group (6th, 8th, and 10th-12th) sector (secular or religious), 5 more variables were measured at the student level as described below. All variables were used to capture the differences in tendency for risky behavior across demographic categories as well as individual characteristics.

- *Material wealth* was assessed by summing the scores of 4 items that comprise the HBSC Family Affluence Scale¹⁵ "Does your family have a car or a van?" (0 = no; 1 = yes; 2 = yes, 2 or more). "Do you have your own bedroom?" (0 = no; 1 = yes). "During the past year, how many times did you travel away on holiday (vacation) with your family?" (0 = not at all; 1 = once; 2 = twice; 3 = more than twice). "How many computers does your family own?" (0 = none; 1 = one; 2 = two; 3 = more than 2). The summed score (ranging between 0 and 9) was then converted to 1 of 3 material wealth levels: low, medium, or high. Because only 4.9% of the participants in this study were low in material wealth, this variable was dichotomized by joining the low and medium levels together. Responses were coded as 0 = low, 1 = medium and high. These classifications have been used by several national surveys.¹⁵ Cronbach's alpha was 0.81.
- *Parental support* at school was measured by a 5-item scale: "If I have problems at school my parents are ready to help"; "My parents are prepared to come to school to talk to my teachers"; "My parents encourage me to do well at school"; "My parents are interested in what happens to me at school"; "My parents are willing to help me with homework." Each item was measured on a 5-point scale (5 = strongly agree; 1 = strongly disagree). Cronbach's alpha was 0.83.

- *Students' school perceptions* were measured by 12 questions concerning 4 different dimensions of the variable: (1) general school perceptions; (2) student social relationships; (3) teacher-pupil relations; and (4) rules and regulations. The questions are detailed in a previous HBSC survey that highlights the importance of the psychosocial school environment to students' health and health behavior.⁵ Students expressed the degree to which they agreed with the statements, using a Likert scale ranging from 1 to 5 (1 = strongly agree; 5 = strongly disagree). The scale was inverted so that high scores represented positive perceptions. Cronbach's alpha was 0.85.
- *Social connectedness* was indicated by 2 factors in this study: Excess time spent with friends was measured by "How many days a week do you spend time with your friends after school?" "How many evenings a week do you usually spend out with friends?" from (0 to 7). Responses were recorded as 1 (0-3 days/nights out with friends), 2 (4-5 days/nights) and 3 (6-7 days/nights) Test-retest reliability has been found to be moderate yet within an acceptable level of stability.¹⁵
- *Loneliness* was measured using the single item: "Have you ever felt lonely?" (1 = No, 4 = Yes, very often).¹¹

Level 2: school-level variables. In the survey of principals of the sampled schools, 5 factors were measured to assess the school's level of health promotion:

- *Principals' commitment to health promotion in school* was operationalized by the sum of the binary answers (1 = yes, 0 = no) to 5 different questions: "Does your school mission statement explicitly contain the topics of health or health promotion?" "Do you have a plan how to implement the aims for health promotion at your school?" "Is your school a member of a health promoting school network?" "In your school, are there teacher hours dedicated specifically for health promotion?" "Do you have a person at your school who is dedicated to health promotion?" Higher summed score on the scale of 0-5 indicated a broader health promotion agenda in school. Cronbach's alpha was 0.74.
- *School rules regarding risk behavior* was measured by 4 questions with binary answers (1 = yes, 0 = no): "Does your school have procedures to inform students, teachers, and parents about smoking-related rules at school and about practices when breaking the rules?" "Does your school have procedures to inform students, teachers, and parents about alcohol-related rules at school and about practices when breaking the rules?" "Do you control compliance with these rules on alcohol use at your school (especially during school events)?" "Do you

routinely control compliance with these rules on smoking at your school"? Higher averaged score on the scale of 0-1 indicated a more consistent and strict applying of school rules. Cronbach's alpha was 0.80.

- *Implementation of school policies* was operationalized by averaging the principals' answers to 4 questions (1 = yes, a written policy; 2 = yes, an informal policy; 3 = no): "Does your school have a policy stating that the following topics will be routinely discussed in lessons about alcohol?" "Does your school have a policy stating that the following topics will be routinely discussed in lessons about smoking?" "Does your school have a program dedicated to health or mental health" "Does your school have an anti-smoking program?" Higher averaged score indicated a more activation an intervention program. Cronbach's alpha was 0.77.
- *Student participation* was operationalized using the principals' responses to the following 4 statements: "Students in this school are actively invited to participate in: "development of school policies or school rules" (eg, house rules and behavior rules); "organization of the physical school environment"; "development and design of health promotion measures"; "planning and organizing school events" (project weeks or days, sport weeks or days, etc). The response options for these items were on a 5-point ordinal scale: never, rarely, sometimes, often, and almost always. To create 1 index of student participation, the answers were recorded into 1 = yes (sometimes, often, and almost always); 0 = no (never or rarely). Cronbach's alpha was 0.77.
- *Parental participation* was operationalized by averaging the principals' responses to the following 5 statements: Parents of students in this school are actively invited to participate in: "development of school policies or school rules (eg, house rules and behavior rules); "organization of school physical environment"; "development and design of health promotion measures"; "planning and organization of school events (project weeks or days, sport weeks or days, etc)"; "school days dedicated to health promotion (safe sex, smoking prevention, etc)." The response options for these items were on a 5-point ordinal scale: never, rarely, sometimes, often, and (almost) always. To create 1 index of parental participation, the items were recorded into 1 = yes (sometimes, often, and almost always); 0 = no (never or rarely). Cronbach's alpha was 0.87.

Data Analyses

Because binge drinking and cigarette smoking are dichotomous dependent variables, and the independent variables include individual- and school-level data, a hierarchical linear model (HLM) with Bernoulli distribution log-link functions was carried out

separately for each risk behavior. The conceptual framework for the international comparisons involves variables at 2 levels: the individual and the school level. These levels are hierarchical, in that respondents are nested within schools. Hierarchical linear model²⁷ is particularly suitable for these analytical conditions; HLM enables the simultaneous estimation of relationships of variables at multiple levels. It borrows strength from all the data in each of the schools and makes it possible to estimate effects at each level, thereby enabling us to test the school effect over and above the individual-level effect.²⁷⁻²⁹

RESULTS

Descriptive Statistics

Table 1 provides descriptive statistics for the student-level variables and Table 2 provides descriptive statistics of the operational variables at the school level. Overall, 9% of students were classified as cigarette smokers and 28% as drinkers.

To evaluate the simultaneous impact of variables at the student and school levels on the prevalence of binge drinking, a multilevel model was estimated with explanatory level 1 and 2 variables. Table 3 shows the results in 3 steps. The null model includes only the intercept providing the benchmark partition of variance between and within schools. The intraclass correlation is 18%, while there is a 58% variance among schools to begin with. Model 1 includes all the student-level variables. The model shows that with the introduction of the student-level variables, the variance among schools was only 26% as opposed to 58% in the null model, thereby indicating that they account for much of the variance in drinking behavior.

Model 2 proceeds to include the school-level variables. Only parental participation in the development, planning and implementation of school health promotion programs was found to be a significant predictor of binge drinking by a factor of 1.3. In addition, the Model indicates that boys drink 1.8 times more than girls and that binge drinking is more prevalent among students of both sexes in the higher grades. Furthermore, students with a negative perception of school tend to drink 5% more, and students who spend time with their friends tend to drink 31% more.

To assess student- and school-level predictors on cigarette smoking behavior, Table 4 displays a 3-step multilevel model. The null model decomposes the variance and estimates the intraclass correlation at 45%. Model 1 includes all student-level variables, thereby reducing the variance among schools by 35%. Addition of the school-level variables in model 2 reduces the variance among schools by 49% compared with the null model. The student-level variables prove to be stable between models 1 and 2, except for the sector variable that became significant in the latter.

Table 1. Descriptive Statistics for Student-Level Variables (N = 5279)

Variable				
Sex				
Boys			52%	
Girls			48%	
Age group				
6th			27%	
8th			22%	
10th-12th			50%	
Sector				
Secular			73%	
Religious			27%	
Family Affluence Scale				
High			31%	
Low + medium			69%	
	Mean	SD	Minimum	Maximum
Parental support	4.57	0.59	1	5
Negative school perception	2.46	2.51	1	5
Time spent with friends	2.56	1.51	0	7
Loneliness	1.58	0.76	1	5

Table 2. School-Level Variables (N = 146)

Variable	N	Mean	SD	Minimum	Maximum
Principal's commitment to health promotion	95	0.28	0.32	0	1
School rules for alcohol consumption	95	0.86	0.3	0	1
Intervention policy	95	1.16	0.58	0	2
Student participation in health promotion	95	3.44	0.59	1	5
Parental participation in health promotion	95	3.07	0.89	1	5

Model 2 indicates that boys smoke 1.38 times more than girls, and that in the higher graders smoking is prevalent 5.28 times more than in the lower ones. Students from the secular schools tend to smoke 1.67 times more than their peers in the religious schools; more time spent with friends increases the rate of smoking by 64%. On the other hand, family affluence status and loneliness were not found to be significant in this case. As for the school-level predictors, only parental participation is a significant predictor of smoking behavior, with a 36% lower rate of cigarette smoking in schools with greater parental involvement.

DISCUSSION

Risk behaviors among adolescents, like drinking alcohol and using drugs, are major public health concerns.^{1,2,8} School constitutes an environment in which youth spend the majority of their day and the majority of the years during which they

Table 3. HLM Models Predicting Adolescent Binge Drinking. Multilevel Logistic Regression Analyses Examining Student- and School-Level Factors Associated With Adolescent Binge Drinking

	Model 0			Model 1			Model 2		
	B	OR	CI	B	OR	CI	B	OR	CI
Intercept	-0.89***	0.41	0.34-0.48	-0.61	0.54	0.20-1.47	-0.45	0.64	0.21-1.91
Student-level variables:									
Sex				-0.6**	0.55	0.43-0.68	-0.58**	0.56	0.44-0.70
Age group				0.98**	2.67	1.90-3.75	0.71*	2.04	1.13-3.68
Sector				0.01	1.01	0.71-1.41	0.05	1.05	0.72-1.50
Family Affluence Scale				0.13	1.14	0.89-1.44	0.14	1.15	0.90-1.46
Parental support				-0.3**	0.74	0.61-0.88	-0.3**	0.74	0.61-0.88
Negative perception of school				0.05**	1.05	1.01-1.08	0.05**	1.05	1.01-1.08
Time spent with friends				0.27**	1.31	1.21-1.41	0.27**	1.31	1.21-1.41
Loneliness				0.11	1.11	0.98-1.25	0.1	1.11	0.98-1.24
School-level variables:									
Agenda setting							0.04	1.05	0.59-1.83
School rules							0.18	1.2	0.58-2.46
Intervention							-0.03	0.97	0.65-1.44
Student involvement							0.04	1.04	0.78-1.39
Parental involvement							-0.27*	0.77	0.61-0.95
Variance components:									
u ₀		0.71			0.35			0.34	
R		0.95			0.95			0.96	

*p < .05, **p < .001.

HLM, hierarchical linear model.

Table 4. HLM Models Predicting Adolescent Cigarette Smoking. Multilevel Logistic Regression Analyses Examining Student and School-Level Factors Associated With Adolescent Smoking

Smoking	Model 0			Model 1			Model 2		
	B	OR	CI	B	OR	CI	B	OR	CI
Intercept	-2.07***	0.13	0.09-0.17	-3.9**	0.02	0.00-0.08	-3.33**	0.04	0.01-0.13
Student-level variables:									
Sex				-0.36*	0.7	0.51-0.94	-0.32*	0.72	0.52-0.99
Age group				2.78**	16.14	8.65-30.11	1.66**	5.28	2.09-13.33
Sector				0.32	1.37	0.71-2.61	0.54*	1.72	1.00-2.93
Family Affluence Scale				0.1	1.1	0.78-1.53	0.1	1.1	0.78-1.54
Parental support				-0.47**	0.63	0.51-0.76	-0.51**	0.6	0.48-0.74
Negative perceptions of school				0	1	0.94-1.05	0	1	0.94-1.05
Time spent with friends				0.48**	1.62	1.46-1.78	0.49**	1.64	1.48-1.81
Loneliness				0.09	1.09	0.89-1.32	0.08	1.08	0.88-1.32
School-level variables:									
Agenda setting							0.29	1.34	0.67-2.65
School rules							1.15	3.15	0.87-11.39
Intervention							0	1	0.52-1.90
Student involvement							0.06	1.07	0.71-1.58
Parental involvement							-1.03**	0.36	0.24-0.51
Variance components:									
u ₀		2.75			1.77			1.4	
Level-1, r		0.69			0.72			0.76	

*p < .05, **p < .001.

HLM, hierarchical linear model.

develop and mature.^{3,14} Consequently, school is an appropriate framework through which to address these issues.^{16,19} This study focused on exploring the factors on individual and school levels that correlate with adolescent risk behaviors in Israel, given that youth are at risk for developing risk behavior patterns.^{1,8}

The results confirmed the student-level hypotheses that the prevalence of risk behaviors is lower when parental support, school perception, and social connectedness are higher. These findings are in accordance with previous studies showing that higher parental support and parental involvement in school matters are linked with lower rates of student

risk-taking behaviors.^{10,30-32} In addition, our study shows that students who reported negative school perception also reported higher rates of risk-taking behaviors compared with students with positive school perception, thus corroborating previous findings about the relationship between school perception and risk behaviors.^{14,33}

In our study, when school was perceived as a safe, structured, and helpful place, students had a higher chance of feeling a sense of belonging, and the school then became a “protective factor” against developing risky behavioral patterns. In addition, social involvement was found to be a contributing factor influencing drinking alcohol or cigarette smoking. Our findings show that the more students are engaged in social interactions, the more likely they are to drink in an excessive pattern. This finding can be explained by adolescents’ developmental characteristics, such as egocentrism, the tendency to conform, and to spend an increasing amount of time with friends.¹²⁻¹⁴ Risk behaviors may result from feeling different, being criticized, and wanting to impress.¹⁰ In addition, the increasing amount of time adolescents spend away from parents’ monitoring and the decrease of positive familial interaction may explain the gap that allows negative interactions and their connection to risk behaviors.³⁴⁻³⁶

The school-level hypothesis that school structure and health policy variables were related to the risk and health behaviors of young people was only partly confirmed. No significant association was found with health promotion policies and only a few school characteristics were linked with students’ health behaviors. However, among the school-level measures, parental participation in health promotion intervention programs repeatedly proved to be associated with lower rates of risk behaviors, over and above student characteristics.

In this study, higher parental involvement in developing, organizing, and implementing the school’s health promotion policy was significantly linked to lower rates of cigarette smoking and alcohol drinking among participants. This finding is in accordance with the scientific literature, which emphasizes the importance of different ecological systems to a person’s well-being.³⁶⁻³⁸ This finding also shows the importance of parents, students, and teachers coming together in a mission to lower risk behaviors rates.

Parent-child communication and parental influence have both been found in earlier studies to be major preventers of early age drinking and predictors of negative perception of alcohol among adolescents.³² Compared with social interactions, parent-child communication has a greater influence on children and adolescents’ risk behaviors.³⁴⁻³⁶ Our study has shown parents’ involvement influences students’ risk

behaviors, thus making it an important factor to include in interventions and prevention programs in schools.

In sum, it is apparent that to promote healthy behaviors among students effectively, schools should engage the cooperation and involvement of students as well as their parents.

Limitations

The first limitation is that this study was based on cross-sectional data collected at a single point in time and did not consider the influence of a health promoting policy on adolescents risk behaviors over time. Hence, the study is unable to infer causality. Studies on the long-term impact of school wellness policies are needed. Longitudinal studies and repeated measures of the same variables over long periods of time would be able to establish operational conclusion with high validity value. Furthermore, all of the findings are based on students’ and principals’ data obtained using self-reported questionnaires, therefore, responses may be biased.

Because the findings pertaining to the school principals reflect the situation in Israel, any generally applicable implications of the findings should be considered carefully. Finally, because the sample did not include students in the Arab or Jewish ultraorthodox sectors, nor in educational institutions outside of the public school system (eg, religious yeshivas, boarding schools, and others), the findings of this study are not representative of the entire Israeli population.

Conclusions

This study provides new insight into the links between adolescents’ ecology system and the manners of substance use from early adolescence to early adulthood. The multilevel analysis adds to our understanding of the factors that contribute to risk behaviors of youth by identifying consistent relationships between individual- and school-level characteristics and risk behaviors. It emphasizes the positive influence of parental participation in intervention programs, as part of the development, planning and implementation of school health promotion policies to reduce risk-taking behaviors and improve students’ sense of well-being.

IMPLICATIONS FOR SCHOOL HEALTH

Results from our study indicate that student-level variables are the strongest predictors for student risk behaviors and well-being; they are also influenced by school-level variables. Most importantly, involvement of parents at both levels is central to reducing rates of risk behaviors, decreasing psychosomatic symptoms,

and improving a sense of well-being among youth. The ecological system theory emphasizes the importance of interaction and communication between schools and family and numerous studies have supported applying it as an educational model that prevents risk behaviors among students.

Therefore, we recommend:

- 1 The Ministry of Education should facilitate by helping school principals create an infrastructure for a health-promoting environment and by establishing standards that would include the implementation of a health-promoting policy. Training programs for principals will give them an opportunity to overcome knowledge gaps and become familiar with the rationale and tools for health promotion.
- 2 Health promotion should be a part of the curriculum and incorporated routinely and continuously in programs (physical education, social studies, and biology classes) and special activities (sports days, workshops on relevant topics, trips, etc) with students participating in planning to increase their commitment.
- 3 Schools should strengthen their relationship with parents by engaging their participation in the development, planning, and operation of health promotion programs. Parents who work in health professions, such as doctors, dieticians, and fitness trainers, should be encouraged to contribute their knowledge and experience and to recruit other parents. Publicizing findings of successful intervention programs conducted in the past may encourage parents to take part in future programs. Parental participation and level of motivation may increase because they are not perceived as the source of the problem, rather as an important and significant partner in the educational process.
- 4 School-based smoking and alcohol prevention programs should focus on increasing students' satisfaction in school and generating a climate of a protective and safe environment.

Human Subjects Approval Statement

The Israel Ministry of Education, Office of the Chief Scientist, approved this study.

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