Tobacco, Violence and Nutrition Health Behaviors Among Adolescents in Rural Ukraine

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Abstract

English:

This study examined tobacco, violence, and nutrition health behaviors in adolescents living in rural Ukraine using a modified version of the Youth Risk Behavior Survey. 478 adolescents ages 13-18 attending schools in Veliky Berezny, Ukraine participated. Descriptive statistics and Chi-square analyses were used to find associations between the independent variables gender and age, and the dependent variables tobacco, violence, and nutrition behaviors. Correlations among the ordinal variables, observed and personal abuse, were evaluated using Spearman's rank correlation coefficient and logistic regression. An alpha level of 0.05 was used. Boys were significantly more likely than girls to engage in smoking and violent behaviors at and away from school ($p < 0.001$). 65.6% of students had tried smoking and boys started smoking at an earlier age and were more likely to smoke regularly. Observed and personal abuse was more common among girls. Consumption of fruits, vegetables, and milk was low for both boys and girls, with girls significantly more likely to experience nutrition deficiencies. The majority of adolescents reported they were either trying to maintain or gain weight. Findings from this study were in part, used to develop and implement health education curricula in Veliky Berezny.

Spanish:

Este estudio examina los comportamientos relacionados con el uso de tabaco, violencia y nutrición en jóvenes que residen en la parte rural de Ukraine usando una versión modificada del Cuestionario de Comportamientos de Riesgo entre los Jóvenes (YRBS). Cuatrocientos setenta y ocho adolescentes, entre las edades de 13 y 18, que asisten las escuelas en Veliky Berezny, Ukraine, participaron. Estadísticas descriptivas y Chi-Square análisis fueron usadas para investigar las asociaciones entre las variables independientes de género y edad y las variables dependientes de comportamiento relacionado con tabaco, violencia, y nutrición. Correlaciones entre las variables ordinales, abuso personal y observado, fueron evaluadas usando Spearman's coeficientes de rango de correlación y regresiones logísticas. Un nivel de alpha de 0.05 fue usado. Los niños fueron más probables, significativamente, que las niñas en envolverse en comportamientos de fumar y violencia en y fuera de las escuelas ($p<0.001$). 65.6% de los estudiantes han tratado fumar y los niños empezaron a fumar a una edad mas temprana y son más probables de fumar regularmente. Abuso personal y observado fue más común entré las niñas. Consunción de frutas, vegetales, y leche fue bajó en ambos niños y niñas, con las niñas más probables, significativamente, ha experimentar deficiencia nutricional. La mayoría de los adolescentes reportaron que ellos estaban tratando de mantener o perder peso. Los resultados de este estudio fueron, en parte, usados para desarrollar e implementar un plan de estudios en educación de la salud en Veliky Berezny.

Key Words: Ukraine, Adolescent, Tobacco Use, Violence, Nutrition

Introduction

Ukraine is one of the largest countries in Eastern Europe. It has a population of 48.2 million and 17% of the population are less than 15 years of age, 14.8% are ages 15-24, 54.2% are between 25 and 64 years, and 14% are 65 years or older (World Health Organization, 2000b; Population Reference Bureau, 2002). Ukraine was part of the former Soviet Union, and regained its independence following the breakup in 1991. As a result of the breakup, it has experienced economic, political, social, and health problems.

The population is predominately urban with over two-thirds of residents living in metropolitan areas. Some areas, however, including Veliky Berezny (VB) which is the area of focus for this study, are rural. In rural regions 6%-7.95% of the population is registered as unemployed. The overall rate for registered unemployed in Ukraine is 4.24%. However, Ukraine has more unemployment than is apparent. The rates do not include underemployment or hidden unemployment, people who work but are not paid. The Department of Human Development Research of the Productive Forces Research Council, Ukrainian National Academy of Science indicates the rate of real unemployment is 12% and is higher in rural areas (Zubar, 2000). In 2001 unemployment in VB was reported being over 15% (Rampton, 2000).

Demographically there has been a trend toward negative population growth in Ukraine. The death rate has surpassed the birth rate since 1991 and in 2002, Ukraine had one of the highest rates of natural

population loss in the entire European Region at -0.8% (World Health Organization, 2000a; Population Reference Bureau, 2002). The trend is continuing and the projected population for 2025 is 45.1 million and 38.4 million for 2050 (Population Reference Bureau, 2002).

Life expectancy in Ukraine also has declined from 70 years in 1990 to 68 years in 2002 (World Bank Group, 2000; Population Reference Bureau, 2002). Female life expectancy decreased from 75 years in 1990 to 74 years in 2002, and it declined from 66 years to 62 years for males during this same time period (World Bank, 2000; World Health Organization, 2000a; Population Reference Bureau, 2002).

Within this context, it is not surprising that many indicators of health in Ukraine have declined since the early 1990's. The majority of health problems in Ukraine are related to lifestyle (Cockerham, 1997). They are exacerbated because the present state of political, economic, and social transition has caused a reduction or complete absence of nationally coordinated health campaigns that promote healthy lifestyle messages such as good nutrition and tobacco and violence prevention. Lack of preventive care and disease management, environmental pollution, occupational health conditions, poor diet, widespread smoking, excessive alcohol consumption, accidents, and high abortion rates also have contributed to the degenerating health of the population and its dwindling birth rates and excessive mortality rates (Zouev, 1999).

The leading causes of mortality for adults in Ukraine are similar to those in other parts of Europe. Over 75% of deaths are due to cardiovascular disorders and diseases of the circulatory system (males 44.9%, females 60%), oncological diseases (males 19.1%, females 13.5%), and the adverse effects of injuries, homicide and violence (males 14.4%, females 3.8%) (World Bank, 1993). No data are available for leading causes of death in Ukraine for youth age 15-24 (United Nations, 2001).

High death rates due to smoking and smoking-related risk factors in Ukraine are among the highest in the European Region. European Health Interview Surveys (EUROHIS) data indicate the smoking prevalence rate in Ukraine is 53.2% (72.9% male, 42.1% female). Ukraine also has one of the highest premature mortality rates due to cancer, especially lung cancer, in Europe. The incidence of thyroid cancer in children also increased significantly following the nuclear power plant disaster at Chernobyl. Mortality rates due to bronchitis, emphysema, and bronchial asthma are among the highest in the European Region (World Health Organization, 2000a). These types of illnesses can be linked directly to high rates of smoking, which often begins at a young age, and exposure to second-hand smoke. Results from the Global Youth Tobacco Survey (GYTS) for Kiev City indicate 77.3% of children aged 13 to 15 had smoked a cigarette, and 41% reported being current cigarette smokers (46.8% male, 33.8% female). About half of the children surveyed were exposed to second-hand smoke in their homes. More than half (58%) of the children who smoked said they wanted to stop smoking, and about two thirds had tried to quit during the past year (Centers for Disease Control and Prevention, 2001).

Another serious health problem in Ukraine is poor nutrition. Due to high rates of unemployment and poverty, many people can no longer obtain the foods necessary to maintain an adequate intake of energy, protein, vitamins, minerals and trace elements**.** A 1991 report indicated that fruit and vegetable consumption in Ukraine decreased 20-30% from the previous year. In addition, 58% less meat, milk, and eggs were consumed than in 1990 (World Bank, 1993). This trend continued from 1994 to 1997 as consumption of meat, fish, eggs, fresh vegetables and fruit continued to decline (World Health Organization, 2000a). Many of the poorest Ukrainians can only afford bread to eat resulting in increased anemia in children (Zouev, 1999). The impact of inadequate nutrition on children is often severe since it is a time when proper nutrition is one of the most significant determinants for healthy physical and cognitive development.

The collapse of the Soviet Union led to increased lethal violence in many former Soviet countries (Pridemore, 2002). Ukraine is not immune to the challenges of violent and aggressive behavior among its citizens. Homicide rates seem to be the standard measure determining the extent of interpersonal violence in the country. In 1999 homicide rates in Ukraine were 17/100,000 for males 15-29 years and 5.3/100,000 for females in the same age range (World Health Organization, 2002). Data for physical fighting, weapon-carrying, and other school-related interpersonal aggression such as bullying are not officially collected in Ukraine.

Domestic violence is a concern for many in Ukraine. However, data for overall and age specific domestic violence rates are limited and inconsistent. There are several probable reasons for this. 1) The government does not consistently keep statistics on the prevalence of domestic violence. Thus, there is no consistent means for reporting domestic violence within the country. 2) The criminal justice system does not promote reporting domestic violence to the proper authorities. 3) There are social taboos regarding domestic violence so women rarely talk publicly about abuse and are reluctant to report it. Oftentimes domestic violence is looked upon as being a psychological problem of the woman. 4) Fear for financial security and considering it a normal part of life are other reasons women hesitate to report domestic abuse (Minnesota Advocates for Human Rights, 2000).

Domestic violence in Ukraine, however, is a widespread problem and if anything it is under reported. Overall, 68% of women surveyed in Ukraine reported having been physically abused by someone related to them, according to Project Harmony, a U.S.

State Department contractor committed to the reduction of domestic violence in Ukraine (Cengel, 2001).

The survey instrument used to assess adolescent health behaviors in this study was a modified version of the Youth Risk Behavior Survey (YRBS). The YRBS was developed by the Division of Adolescent and School Health (DASH) of the Centers for Disease Control and Prevention (CDC). Since its inception in 1990, it has been used as a national survey in the United States to ascertain health-risk behaviors for students in grades 9-12. It is conducted biennially during odd-numbered years (Brener, Collins, Kann, Warren & Williams, 1995).

The YRBS is comprised of six categories of health-risk behaviors that directly influence adverse health and social problems in adolescents. The six categories are: (1) behaviors that result in unintentional and intentional injuries; (2) drug and alcohol use; (3) sexual behaviors that result in HIV infection, other sexually transmitted diseases and unintended pregnancy; (4) tobacco use; (5) dietary behaviors; and (6) physical activity. Brener et al. (1995) present evidence of reliability for the YRBS. Previous studies indicate the YRBS has been used to assess adolescent health behaviors in other countries besides the United States including Russia, Colombia, and China (McDermott et al., 1998; Lee, Tsang, Lee, & To, 2001; Pinzon-Perez & Perez, 2001).

Purpose

The purpose of this study was to assess the tobacco, violence and nutrition health behaviors among students ages 13-18 enrolled in public schools in VB, Ukraine a small, rural village outside of Uzhgorod, Ukraine. This study was conducted as part of a partnership between the Corvallis, Oregon Sister Cities Association and Uzhgorod, Ukraine. The project was sponsored through a grant from the United States Assistance and International Development (USAID) and was managed by the American International Health Alliance (AIHA). One outcome for the partnership, among others, was to obtain baseline data that could be used to develop school and community health education and health promotion initiatives in Uzhgorod and nearby villages.

Significance of the study

As stated previously, the majority of health problems in Ukraine are related to lifestyle choices exacerbated by the sweeping political, economic, and social transitions currently taking place in Ukraine. The impact of these circumstances is taking a toll on the overall health of the nation. Another dilemma supporting the significance of this study is the scarcity of data describing the current health status of children and adolescents in Ukraine. Data that are available often are incomplete or outdated. The Youth Risk Behavior Survey (YRBS) was used to determine health behaviors among all children in grades 9–12 in VB. While the YRBS includes six areas of risk behavior, for purposes of brevity, this report will focus on the tobacco, violence and nutrition findings. Findings from the other three areas will be presented in a future report. Findings from this study will be used to develop and implement health education curricula and health promoting programs for schools in VB. Results also will provide current data on adolescent health behaviors for the region.

Methods

Instrument

A modified version of the YRBS was used. The instrument was translated into Russian. The design of the instrument allows for the addition or deletion of items in order to meet the individual needs of the local education agency. Some questions for this study were added, deleted or modified to make them more applicable to the culture of the students participating in the survey. These decisions were based on recommendations from two native Ukrainian translators. The questionnaire contained 86 multiple-choice questions. Although not directly related to the purpose of the study, two qualitative questions were added at the end of the questionnaire for the purpose of curriculum development. Questionnaire understanding and comprehension were verified by face validity through two professional Ukrainian interpreters.

The self-administered questionnaire was distributed in the classroom during a regular class period. Students recorded their responses directly in a questionnaire booklet. Survey procedures for data collection were designed to protect the students' privacy by allowing for confidential and voluntary participation. VB school policy did not require parental consent for students to participate.

Participants

The sampling frame included the enrollment from all five high schools in VB, Ukraine, consisting of 478 students, and is characterized by gender, age, school grade, and ethnicity in Table 1. The largest percentage of students were girls, aged 16, in grade 10, and Ukrainian. The mean age was 15.4 (with standard deviation 1.2), ranging from 13 to 18.

Nearly every student ages 13-18 participated in the study by completing the 86 multiple-choice questions. Approximately 16 students from one school were in field training on the day the survey was administered, and they did not participate in the study. Data were collected during the third week of February 2000.

Data Analysis

Frequency distributions were derived for variables involving demographics, tobacco smoking, violence, and nutrition. Bivariate analyses were used to assess the association between selected tobacco smoking, violence, and nutrition variables and gender. These associations were evaluated using the Pearson chi-square (test for equality of proportions), the Mantel-Haenszel chi-square (test for trend), and the extended Mantel-Haenszel chi-square (test for equality of proportions adjusted for age). Correlations among the ordinal variables were evaluated using Spearman's rank correlation coefficient and logistic regression. All

decisions on the statistical significance were made using an alpha of 0.05.

Table 1. Frequency Distributions for Selected Demographic

	Number	%
Gender[a]		
Boys	194	41.5
Girls	273	58.5
Age (years)[b]		
13	23	4.8
14	93	19.6
15	124	26.1
16	140	29.5
17	91	19.2
18	4	0.8
School Grade		
9	72	15.1
10	106	22.2
11	101	21.1
Vocational School 1 year	83	17.4
Vocational School 2 year	43	9.0
Ungraded	73	15.3
Ethnicity[c]		
Ukrainian	460	98.7
Russian	1	0.2
Hungarian	1	0.2
Polish	0	0.0
Roma	1	0.2
Slovakian	2	0.4
Jewish	0	0.0
Other	1	0.2

Notes:
N = 478
[a] 11 missing cases
[b] 3 missing cases
[c] 12 missing cases

Because of the close correspondence between age and school grade, further analyses included only age and gender. In addition, analysis was not performed according to ethnicity because of the very small number who are not Ukrainian.

Results

Tobacco

Of 453 participants, 297 (65.6%) indicated they had previously smoked at least one cigarette. Having ever smoked significantly increased with age, from 52.4% for those aged 13 years to 75% for those aged 18 years (Mantel-Haenszel chi-square p = 0.0226). Percentages for respondents who first smoked prior to age 13 were 15.8% (less than age 9 years), 11.4% (9 or 10 years), and 16.5% (11 or 12 years). Frequency distributions of students who had previously smoked are presented for selected variables according to gender in Table 2. Boys were more likely than girls to have smoked in the past 30 days. They also smoked more frequently than girls and were more likely to smoke on school property. After adjusting for age, there was not a significant difference between boys and girls reporting to have ever been regular smokers. Of smokers, both male and female, the majority smoked daily. Students who smoked, most commonly reported smoking two to five cigarettes a day. Overall, however, boys reported smoking more cigarettes per day than girls (see Table 2).

Violence

A relatively small percentage indicated that in the past 30 days they had carried a weapon such as a gun or knife (43 of 470 respondents, 9.1%). A smaller percentage indicated that in the past 30 days they had carried a weapon such as a gun or knife on school property (23 of 442 respondents, 4.9%). The percentage reporting that during the past 12 months they had been in a physical fight was 43.7% and the proportion reporting involvement in a fight on school property was 22.3%. The percentage during the past 30 days who did not go to school because they felt they would be unsafe at school or on their way to or from school was 11.6%. Two questions related to physical abuse also were included. The first asked, "During the past 12 months, did anyone ever hit, slap or physically hurt you on purpose? (Check all that apply.)" In response, 61 (13.0%) indicated yes, by an adult, 61 (13.0%) indicated yes, by a peer, and 347 (74.0%) indicated no. The second question asked, "During the past 12 months, did you ever witness an adult in your home hit, slap, or physically hurt another adult in your home?" In response, 108 (23.2%) of 466 indicated they had.

Frequency distributions for selected variables involving violence are presented according to gender in Table 3. Boys were more likely than girls to have carried a weapon, either on or off school property, in the past 30 days (10.4%, 1.5%; 19.7%, 1.8%). They also were more likely to have been involved in a physical fight in the past 12 months. There was no significant difference between boys and girls in whether they did not go to school because they felt unsafe at school or on their way to or from school, in the past 30 days. While gender was not a statistically significant variable, girls were more likely to miss 1 or more days of school during the past month because they felt unsafe. Although there was no significant difference in whether anyone had either hit, slapped, or physically hurt them on purpose in the past 12 months, girls were more likely to have witnessed an adult in their home hit, slap, or physically hurt another adult in their home in the past 12 months (see Table 3).

Nutrition

During the 7 days prior to data collection, the percentage who ate at least one serving of fruit (not including fruit juice) was 79.3%, potatoes 91.8% (not including fried potatoes or potato chips), carrots 55.4%, other vegetables (not including potatoes or carrots) 66.9%, and who drank at least one glass of milk was

Table 2. Bivariate Analysis of Associations Between Selected Tobacco Smoking Variables and Gender

	Boys		Girls		Chi-square
	Number	%	Number	%	p value[a]
During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?					
I did not smoke	50	32.9	68	45.6	
Less than 1 per day	9	5.9	13	8.7	
1 per day	12	7.9	18	12.1	
2-5 per day	45	29.6	33	22.2	
6-10 per day	24	15.8	12	8.1	0.0323*
11-20 per day	7	4.6	2	1.3	0.0010*
20+ per day	5	3.3	3	2.0	0.0105*
During the past 30 days, on how many days did you smoke cigarettes on school property?					
0 days	72	48.7	101	64.3	
1 or 2 days	19	12.8	27	17.2	
3 to 5 days	7	4.7	5	3.2	
6 to 9 days	7	4.7	6	3.8	
10 to 19 days	16	10.8	4	2.6	0.0063*
20 to 29 days	4	2.7	3	1.9	0.0002*
All 30 days	23	15.5	11	7.0	0.0016*
Have you ever smoked cigarettes regularly, that is, at least one cigarette every day for 30 days?					
Yes	62	41.9	45	29.0	0.0192*
No	86	58.1	110	71.0	0.1661

Notes:
[a]Three p values are reported that correspond with the Pearson chi-square (test for equality of proportions), the Mantel-Haenszel chi-square (test for trend), and the extended Mantel-Haenszel chi-square (test for equality of proportions adjusted for age).
*Indicates .05 level of significance.

64.6%. Frequency distributions for selected variables involving nutrition are presented according to gender in Table 4. Boys were more likely than girls to drink fruit juices and to eat 4 or more servings of fruit during the prior 7 days. Although there was no statistical difference in the level of potatoes consumed between boys and girls after adjusting for age, boys were significantly more likely to eat 4 or more servings of carrots, 4 or more servings of other vegetables, and 4 or more glasses of milk in the previous 7 days (See Table 4).

Spearman's rank correlation coefficient showed that the linear associations between the variables within the tobacco and violence groups were statistically significant at < 0.001, with one exception. The question about not attending school because of feeling unsafe at school or on the way to or from school had small or no statistical association with the other violence variables. Given these findings, two items below referring to personal and observed abuse were assessed using logistic regression to determine whether these variables were associated with variables in each of the three groups. "During the past 12 months, did anyone ever hit, slap, or physically hurt you on purpose" and "During the past 12 months, did you ever witness an adult in your home hit, slap, or physically hurt another adult in your home."

Among the tobacco variables, only smoking on school property was associated with the two abuse variables (Table 5). Smoking on school property tended to be positively associated with personal abuse. Smoking on school property also was positively associated with observed abuse, but only among students who smoked all 30 days during the past month.

Students who did not go to school because they did not feel safe either at school or on their way to or from school were more likely to experience personal abuse and to observe abuse, when they missed two or more days of school (See Table 6). In addition, students involved in physical fights tended to be more likely to experience personal abuse or observe abuse. Finally, being involved in physical fights on school property was positively associated with personal abuse, but not observed abuse.

Table 3. Bivariate Analysis of Associations Between Selected Violence Variables and Gender

	Boys		Girls		Chi Square
	Number	%	Number	%	p value[a]
During the past 30 days, on how many days did you carry a weapon such as a gun or knife?					
0 days	151	80.3	268	98.2	< 0.0001*
1 day	10	5.3	3	1.1	< 0.0001*
2 or more days	27	14.4	2	0.7	< 0.0001*
During the past 30 days, on how many days did you carry a weapon such as a gun or knife on school property?					
0 days	164	89.6	269	98.5	< 0.0001*
1 day	9	4.9	3	1.1	< 0.0001*
2 or more days	10	5.5	1	0.4	< 0.0001*
During the past 12 months, how many times were you in a physical fight?					
0 days	56	29.0	205	75.1	< 0.0001*
1 day	53	27.5	42	15.4	< 0.0001*
2 or more days	84	43.5	26	9.5	< 0.0001*
During the past 12 months, how many times were you in a physical fight on school property?					
0 days	123	65.1	236	86.8	< 0.0001*
1 day	34	18.0	23	8.4	< 0.0001*
2 or more days	32	16.9	13	4.8	< 0.0001*
During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?					
0 days	169	90.4	237	87.8	0.5676
1 day	6	3.2	14	5.2	0.5255
2 or more days	12	6.4	19	7.0	0.5432
During the past 12 months, did anyone ever hit, slap, or physically hurt you on purpose? (Check all that apply.)					
Yes, an adult	24	12.8	34	12.6	0.1366
Yes, a peer	32	17.0	29	10.7	NA
No	132	70.2	208	76.7	0.3554
During the past 12 months, did you ever witness an adult in your home hit, slap, or physically hurt another adult in your home?					
0 days	159	85.5	193	71.5	0.0013*
1 day	12	6.4	44	16.3	0.0038*
2 or more days	15	8.1	33	12.2	0.0053*

Notes:
[a]Three p values are reported that correspond with the Pearson chi-square (test for equality of proportions), the Mantel-Haenszel chi-square (test for trend), and the extended Mantel-Haenszel chi-square (test for equality of proportions adjusted for age).
*Indicates .05 level of significance.

Table 4. Bivariate Analysis of Associations Between Selected Nutrition Variables and Gender

	Boys		Girls		Chi-Square
	Number	%	Number	%	p value[a]
During the past 7 days, how many times did you drink 100% fruit juices such as orange juice?					
Did not drink any	64	34.0	169	62.4	<0.0001*
1 to 3 glasses	63	33.5	60	22.1	<0.0001*
4 or more glasses	61	32.5	42	15.5	<0.0001*
During the past 7 days, how many times did you eat fruit? (Do not count fruit juice)					
Did not eat any	21	11.0	74	27.6	<0.0001*
1 to 3 servings	73	38.2	113	42.2	<0.0001*
4 or more servings	97	50.8	81	30.2	<0.0001*
During the past 7 days, how may times did you eat potatoes? (D not count fried potatoes or potato chips)					
Did not eat any	16	8.4	24	8.9	0.0387*
1 to 3 servings	50	26.3	100	37.2	0.0549
4 or more servings	124	65.3	145	53.9	0.0672
During the past 7 days, how many times did you eat carrots?					
Did not eat any	63	33.1	143	52.8	<0.0001*
1 to 3 servings	72	37.9	78	20.8	<0.0001*
4 or more servings	55	29.0	50	18.4	0.0001*
During the past 7 days, how many times did you eat other vegetables? (Do not count carrots)					
Did not eat any	35	18.3	70	25.8	0.0006*
1 to 3 servings	54	28.3	105	38.8	0.0006*
4 or more servings	102	53.4	96	35.4	0.0009*
During the past 7 days, how many glasses of milk did you drink?					
Did not drink any	47	25.0	118	43.2	<0.0001*
1 to 3 glasses	36	19.2	71	26.0	<0.0001*
4 or more glasses	105	55.8	84	30.8	<0.0001*

Notes:
[a] Three p values are reported that correspond with the Pearso chi-square (test for equality of proportions), the Mantel-Haenszel chi-square (test for trend), and the extended Mantel-Haenszel chi-square (test for equality of proportions adjusted for age).
* Indicates .05 level of significance

Table 5. Odds ratios (OR) and 95% confidence intervals (CI) for abuse according to tobacco behavior[a]

	Personal Abuse[b]		Observed Abuse[c]	
During the past 30 days, on how many days did you smoke cigarettes on school property?				
	OR	95% CI	OR	95% CI
0 days	1.00	Referent	1.00	Referent
1 or 2 days	1.51	0.74, 3.08	1.95	0.93, 4.08
3 to 5 days	3.56	1.07, 10.56*	1.10	0.22, 5.40
6 to 9 days	1.49	0.44, 5.02	0.88	0.18, 4.35
10 to 19 days	2.98	1.13, 7.89*	1.69	0.51, 5.58
20 to 29 days	3.29	0.70, 15.58	1.98	0.34, 11.49
All 30 days	2.36	1.08, 5.12*	5.58	2.43, 12.82*

Notes:
[a]Estimates in this table were adjusted for age and gender. Other tobacco variables (see Table 2) were not significant at the 0.1 level and were dropped from the models.
[b]During the past 12 months, did anyone ever hit, slap, or physically hurt you on purpose? Yes (an adult or peer) vs. No.
[c]During the past 12 months, did you ever witness an adult in your home hit, slap, or physically hurt another adult in your home? Yes (1 or more times) vs. No.
*Indicates .05 level of significance.

Table 6. Odds ratios (OR) and 95% confidence intervals (CI) for abuse according to violence behaviors[a]

	Personal Abuse[b]		Observed Abuse[c]	
	OR	95% CI	OR	95% CI
During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?				
0 days	1.00	Referent	1.00	Referent
1 day	3.88	1.41, 10.66*	0.64	0.18, 2.36
2 or more days	2.64	1.16, 6.04*	4.02	1.77, 9.14*
During the pat 12 months, how many times were you in a physical fight?				
0 days	1.00	Referent	1.00	Referent
1 day	1.91	1.02, 3.59*	2.45	1.33, 4.50*
2 or more days	1.97	0.97, 4.01	1.67	0.83, 3.36
During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?				
0 days	1.00	Referent	Not signfiicant	
1 day	2.62	1.33, 5.18*		
2 or more days	2.02	0.90, 4.52		

Notes:
[a]Estimates in this table were adjusted for age, gender, and the other variables listed for that model. Other violence variables (see Table 3) were not significant at the 0.1 level and were dropped from the models.
[b]During the past 12 months, did anyone ever hit, slap, or physically hurt you on purpose? Yes (an adult or peer) vs. No.
[c]During the past 12 months, did you ever witness an adult in your home hit, slap, or physically hurt another adult in your home? Yes (1 or more times) vs. No.
*Indicates .05 level of significance.

Because of the high correlation among the tobacco and violence variables, one variable from each group (involving the first questions in Tables 2 and 3) was selected for the remaining analysis.

There was a significant positive correlation between having carried a weapon in the past 30 days and level of cigarette smoking in the past 30 days (Spearman's rank correlation 0.234, $p < 0.0001$). Correlations between these variables and the violence variables involving physical abuse were assessed. A slight positive correlation was observed between level of witnessing an adult in the home hit, slap, or physically hurt another adult in the home in the past 12 months and level of cigarette smoking in the past 30 days (Spearman's rank correlation 0.102, $p = 0.031$). There were no statistically significant associations between the variables involving having been hit, slapped, or physically hurt on purpose during the past 12 months and any of these variables, based on the Pearson chi-square test.

Conclusions

Findings from this study indicate gender was a significant variable for many adolescent tobacco, violence, and nutrition behaviors. Males were more likely than females to be involved in violence and smoking tobacco. Girls, on the other hand, were more likely than boys to have witnessed family violence and to be deficient in most aspects of proper nutrition. These findings relate to many of the leading indicators of morbidity and mortality in Ukraine that were mentioned previously, especially cardiovascular disease and cancers related to tobacco use. Many of the studies used for comparison in this section of the paper are findings based on adolescents in the United States. Comparable studies in Ukraine are not available. Thus, it will be assumed that similar comparisons from the cited studies would apply with Ukrainian adolescents.

Data from this study indicated adolescent tobacco use in VB, a rural region in western Ukraine, was somewhat similar to adolescent tobacco use in Kiev. The number of adolescents indicating that they had ever smoked a cigarette was 77% in Kiev (Centers for Disease Control and Prevention, 2001) and 65.6% in VB. Current tobacco use was 41% in Kiev (Centers for Disease Control and Prevention, 2001) and 43% in VB. In both regions more than half of the adolescents have tried to quit smoking.

In VB, the majority of adolescent smokers (35.3%) smoked cigarettes daily. Of those who smoked, most smoked 2-5 cigarettes per day and 4.4% reported smoking a pack or more per day. Tobacco use is inversely associated with the price of cigarettes and it is likely that the low daily tobacco consumption reported in this population is related to economic factors (Krasovsky, Andreeva, Krisanov, Mashliakivsky, & Rud, 2002). In Ukraine it is possible to purchase individual cigarettes rather than an entire package but it is likely that most adolescents in VB do not have the financial resources to purchase cigarettes on a regular basis because they are not employed.

It is interesting that smoking on school property was associated with both personal and observed violence yet smoking at places other than school was not. Previous research findings show smoking cigarettes is a common health risk behavior among adolescents who have witnessed interpersonal violence (Berenson, Wiemann, & McCombs, 2001; Vermeiren, Schwab-Stone, Deboutte, Leckman, & Ruchkin, 2003). In addition, the findings from this study point toward a significant positive relationship between level of smoking cigarettes and carrying a weapon. While carrying a weapon most likely does not cause aggressive behavior, violent behavior by adolescents is significantly associated with early onset (Ellickson, Tucker, & Klein, 2000) and frequency of cigarette smoking (DuRant, Altman, Wolfson, Barkin, Kreiter, & Krowchuk). Thus in VB, if an adolescent smoker is more likely to carry a weapon, there is a chance the weapon would be used in a violent way if the individual were to be involved in a conflict.

Using 1999 YRBS data from the United States as a comparison, prevalence of violence-related behaviors on school property such as carrying a weapon tended to be lower among adolescents in VB than for American adolescents (4.9% and 6.9%) (Centers for Disease Control and Prevention, 2000). This may possibly be due to more severe punishments for carrying a weapon on school property in VB or that weapons, in particular firearms, are not as accessible to young people in VB as they are to youth in the United States. However, when compared to students in the United States, physical fighting at and away from school was higher among students in VB (22.3% vs. 14.2%; 43.7% vs. 35.5%). Further research to determine why this is the case would be beneficial, especially for purposes related to curriculum development and violence prevention in VB. There also was an association between physical fighting and experiencing personal and observed abuse. This finding coincides with well documented research that youngsters, especially boys, who are victims of violent behavior or witness violence between adults in their home, are at a higher risk for engaging in other aggressive or violent behaviors (Singer, Miller, Guo, & Flannery, 1999; Strasburger & Donnerstein, 1999; DuRant, et al., 2000). One reason might be that children witnessing adults in their home using violence as a means for communication and problem-solving would be more likely to express this modeled behavior, using physical fighting as a means for resolving their own interpersonal conflicts (Wolfe & Korsch, 1994). One concern in particular, for both the boys and the girls, is that they may view violence within intimate relationships as ordinary behavior and begin initiating or tolerating aggressive behavior as they begin dating.

Although statistically non-significant in terms of gender differences, the number of girls who missed at least one day of school in the past month because they

felt unsafe is nearly double that of boys missing school for the same reason. Students who did miss school for this reason were also more likely to have experienced observed and personal abuse. Depression, anxiety, lower self-esteem, and missing more days of school are commonly linked to exposure to violence (Hurt, Malmud, Brodsky, & Giannetta, 2001). Wolfe and Korsch (1994) state there also are gender differences when it comes to exposure to domestic violence. Boys tend to become more disruptive and aggressive whereas girls are more likely to experience a variety of somatic problems, and exhibit passive, withdrawn, and dependent behavior. These feelings of insecurity might add to the explanation for the higher rate of absenteeism from school for girls . Another risk factor for girls who witness family violence is that they are more likely to be victimized in their own relationships (Davis & Briggs, 2000).

Historically, domestic abuse, both physical and emotional, in Ukraine has been a problem (Minnesota Advocates for Human Rights, 2000). In addition, it is well documented that dynamics in the home can negatively impact a young person's academic performance (Wolfe & Korsch, 1994; Edleson, 1999; Hurt, Malmud, Brodsky, & Giannetta, 2001; Stiles, 2002). Findings from this study indicate adolescents in VB are witnessing violence between adults in their homes. In terms of these findings, the emotional and educational impact resulting from exposure to such violence is not known.

In general, most adolescents in VB reported a very low intake of nutrient dense foods. Nearly half of the participants did not drink any fruit juice during the previous week and 58.8% had just 1-3 servings, or less of fruit during that time period. Regarding vegetable intake during the past week, over half ate four or more servings of potatoes. On the other hand, 74.5% had only 1-3 servings, or less of carrots, and 55.2% had 1-3 servings, or less of other vegetables. These amounts are well under the recommended five servings per day of vegetables and fruit.

Fruit and vegetable intake varies by season. Data for this study were collected in February. Most families in VB have gardens for fresh fruits and vegetables, and it is likely that fruit and vegetable intake would be higher during the non-winter seasons (Biloukha & Utermohlen, 2001). Consequently, total fruit and vegetable consumption may have been underestimated by the timing of the survey. However, consumption of root vegetables like potatoes and carrots is less likely to be influenced by seasonal variability, and root vegetables were consumed in limited amounts by the study population. Therefore, despite possible seasonal fluctuations in fruit and vegetable consumption, there appears to be a serious deficiency, especially among girls, for obtaining and consuming fruits and vegetables.

In addition to the low fruit and vegetable consumption, adolescents reported a very low intake of milk. 22% had 1-3 glasses and 35% did not drink any milk in the previous seven days. The YRBS does not include questions about yogurt and cheese intake so it was not possible to estimate total calcium consumption. If these adolescents are unable to consistently include adequate intake of other calcium sources in their diet however, development of peak bone mass may be attenuated during the critical adolescent years with the concomitant increased risk of developing osteoporosis later as adults.

The reported low fruit, vegetable, and milk consumption among the participants was validated by the large percent of underweight adolescents: 30.1% had a BMI < 18.5 (Stonecipher & Hill, 2001). It seems that a large number of adolescents in VB regularly consumed a low calorie diet, and while some adolescents were attempting weight loss, the majority indicated that they were trying to maintain (53%) or gain weight (24%) (Stonecipher & Hill, 2001). Economic factors may play an important role in dietary patterns for this population. There is a constant theme of low intake across a wide variety of food items. Economic issues must be addressed in all health education strategies for this region. This premise was reinforced based on student responses to the open ended question "What do you consider to be the most serious health problem facing people your age in your community?" Lack of money was the overwhelming response (95%).

One limitation to the study might lie in the translation of the instrument. It was determined, with the help of two native Ukrainian professional translators, that since the vast majority of people in Ukraine speak Russian the instrument need only be translated into Russian. At the time of administering the survey, however, it was discovered that the students were bilingual and could speak Russian but they did not read it very well. The Ukrainian and Russian languages are similar yet different enough that there were some slight vocabulary differences resulting in some of the students requesting clarification for some questions. For example, there was some confusion regarding certain questions concerning alcohol use. Some students interpreted a drink, such as "one drink" and "5 or more drinks of alcohol" as being equivalent to the number of sips or swallows. With the assistance of the interpreter, clarifications like the one above were made and students were able to complete the survey without further questions.

Recommendations

It is not known if the schools participating in the study had any type of violence prevention policy. It is recommended that administrators, teachers and students in schools that do not have such policies, develop a comprehensive policy, while schools with violence prevention policies should review and revise such policies taking into the consideration the findings from this study.

Incorporating content and interactive skill-development in conflict resolution and anger management in health education curricula will assist students in learning and developing skills to help them cope in these stressful situations. In many cases community resources are not available for victims of domestic violence. Addressing the problem at the grass roots level, utilizing a community health coalition to institute community outreach organizations that include the services of medical professionals, counselors, clergy, school administration and staff, law enforcement, business owners, youth groups, and so on, is expected to be effective. These organizations could use the schools as a meeting place for support groups and educational workshops.

In addition, there is a need for developing and implementing an ongoing, consistent and comprehensive protocol for collecting, reporting, and monitoring data related to adolescent health behaviors in VB. Findings would aid authorities, health care workers, and educators in creating future programs that are most relevant to the emerging adolescent health behaviors in VB.

Summary

Findings from this study show adolescent health issues and trends, in VB are comparable to those in other parts of Ukraine and the world. Globally, countries are becoming more interdependent and the implications regarding the health status of a nation's children are felt worldwide. While the majority of health problems in Ukraine relate to lifestyle choices, it is recognized that economic, social and political factors contribute to the overall health status of the country as well. Findings from this study regarding Ukrainian adolescent tobacco, violence and nutrition health behaviors provided relevance for creating and implementing skill-based comprehensive school health education in VB. Research has shown that school health education offers many benefits to children and society in general. This study outlines clear school health priorities in peer and family violence, nutrition issues including caloric balance, and tobacco use. Comprehensive, skill-based school health programs can be a part of the solution to reducing the prevalence of high-risk behaviors in the young people of VB and Ukraine in general with the anticipated concomitant attenuation of morbidity and premature mortality associated with these high-risk behaviors. In addition, current, accurate data related to Ukrainian adolescent health behaviors is scarce. This study also provides up-to-date adolescent health behavior data for this region regarding these issues.

To date, outcomes based on findings from this study have resulted in the formation of a community health coalition in VB, development of a community health education center, implementation of a community-wide smoking prevention campaign, development of a healthy lifestyle curriculum for schools, and teacher training workshops on implementing the curriculum. The healthy lifestyle curriculum addresses mental health, community and domestic violence, responsible sexual behavior, proper nutrition, exercise, smoking, and alcohol and drug abuse.

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