

Korn, L., Harel-Fisch, Y., Amitai, G., Social and Behavioral Determinants of Nargila Smoking among Israeli Youth: Findings from the 2002 HBSC Survey. Journal of Substance Use 13: 225 - 238 , August, 2008.

Abstract

Background: Nargila (also known by Hookah, Hubble-Bubble, Water Pipe and Shisha), is a device for smoking, which works by water-filtration and indirect heat. The use of substances, such as tobacco, herbs and even hard drugs in the device, is common. Over the past decade nargila smoking using mainly tobacco, is an accepted behavior among teenagers in Israel. This study examines nargila smoking among teenagers in relation to family and school problems. Also, the study examines risk behaviors, such as cigarette smoking, alcohol use and violence, in their background.

Methods: This article presents findings from the international study data of the HBSC (Health Behavior in School-aged Children), conducted by the World Health Organization. The Israeli representative sample consists of data collected from 6,681, 6th, 8th and 10th grade school children. Sampling consists of data from the Jewish and Arab state, secular and religious, school systems)

Results: This study shows a statistically significant association between nargila smoking and involvement with other health risk behaviors. Strong predictors in the use of nargila as a onetime experience as well as weekly use, correlate with a history of cigarette smoking, drunkenness and violence. Nargila, use with tobacco, follows patterns expressed in two sociological theories; "The Problem Behavior Theory" and the "The Gateway Theory" leading to the use of more dangerous substances.

Conclusions: These findings suggest that causes that influence nargila smoking also influence other risk behaviors, which in turn, effect this pass-time occupation. There is need for a State prevention program and protocol that consists of educating students, parents, teachers and public representatives about the risks of this accepted behavior and habit.

Introduction

During the past decade the use of nargila smoking has become a popular and common new risk behavior among Israeli adolescent school-aged children. Nargila smoking was known to be an adult behavior limited to middle-east adult-male populations as a long lasting cultural phenomenon. Several years ago, the Israeli youth adopted nargila smoking as a new social activity. In no more than a 3-5 year period, the prevalence of nargila smoking among teens in Israel rose from zero to almost 40 per one hundred teens under the age of 18¹. Children from age 11 and above started using nargila in Israel. Press publications describe 'hang-out places' where children and adolescent smoke nargila. Nargila smoking is a social, ethnic and family experience for these youngsters. This is a favorite hobby, described as 'enjoyable and euphoric'. Nargila is a main event at children's parties, Bar-Mitzvahs' and other gatherings. Parental approval of this behavior is common. Also, the Ministry of Health, Anti-drug Authority spread brochures on this subject.

Preliminary studies show this trend, common to the Middle East, affecting Israel: routine and daily use of nargila². In Lebanon 15% of the population use nargila regularly³, and 27% of pregnant women in Beirut smoke Nargila². Among adolescent in Beirut 9% report daily use and 39% report using it occasionally². Research conducted among customers in a coffee shop in Egypt shows 30% has a nargila device in their home. 94% have a friend who also smokes⁵. In the last few years, Syria reported a rise in Nargila smoking⁵. Nargila smoking is also popular in Sudan and Tunisia^{7,8}. In Israel data collected in 2002 of a representative sample shows those experimenting with Nargila to be 37.7% and those using Nargila regularly (daily and once a week) was 10%¹.

Most Israelis commonly view Nargila smoking of tobacco as an innocent and enjoyable leisure activity. Worldwide studies suggest otherwise. Documented risks of tobacco use in nargila are lung disease⁹ cancer of lung, mouth and cheek¹⁰, hypertension, chronic respiratory disease and ulcer disease¹¹. "Nargila eczema", is a specific eczema associated with the use of tobacco in nargila. Peeling of the skin, cracked, and stained palms are expressions of this dermatologic condition¹². In addition, there is a rise in the incidence of cardiovascular disease (pulse, blood pressure, carbon dioxide levels in the blood¹³). Nargila smoking is dangerous to the health of the unborn baby¹⁴. Routine and repetitive use of nargila causes long-term decrease in blood oxygen concentrations¹⁵. Nargila Smoke from burning tobacco in the nargila device contains larger quantities of nicotine, tar and heavy metals compared with smoking a single cigarette¹⁶. These studies show nargila smoking to be dangerous to health.

This article shows nargila smoking as a health risk. There is evidence of association of nargila smoking and other risk behaviors. According to the "Problem Behavior Theory"^{17,18,19} risk behaviors are not single behavior phenomenon. They develop in clusters and are maintained as lifestyle patterns¹⁷. For example strong

associations exist between smoking cigarettes, problem drinking, illicit drug use and truancy^{18, 19, 20}. Determinants of risk behaviors among adolescents fall into several categories. Those include: personal background, psychological, behavioral, social and environmental²¹. Studies have demonstrated that risk behaviors are the strongest predictors of additional risk behaviors and that the clustering effect is so strong that about 50% of the variance in main risk behaviors, such as use of marijuana, is explained by other risk behaviors^{17, 18, 19, 22}. Similar findings have been found in many other studies using a variety of health related risk behavioral patterns^{23, 24, 25, 26}.

Several studies show family characteristics of strong interrelations among family members including parents, to provide for healthy and stable behavior^{27, 28, 29}. One study correlates perceived strong family connection to low alcohol abuse in the adolescent. One study showed a significant correlation between reported family abuse and problem alcohol drinking. Smoking was higher in youth who sense parental neglect or excessive control – especially in boys³⁰.

School perceptions also influence behavior. Strong relationships between risk behaviors and negative school perceptions have been reported³¹. Students who perceive school positively have significantly less risk behaviors such as smoking and drinking at earlier ages³². Another frequent finding related to youth violence. School bullying behavior is directly proportional to negative school experience. The higher the number of negative school perceptions, the higher the risk of involvement in bullying³³.

Kandel's developmental stage model or, "Gateway Theory", explains drug use among adolescent. According to this, there is a progression from the use of light legal substances to dangerous illegal drug. The progression starts with experimenting with smoking cigarettes and progresses stage-by-stage to the use of hard illicit drugs³⁶. Alcohol consumption and smoking cigarettes are "gateways" to hard drug use. This model follows the logic of the epidemiological pyramid. Namely, that minor risk behavior have high prevalence rate whereas more major risk behaviors have lower prevalence rates. For example – more kids experiment with cigarette smoking compared to the number of kids that eventually smoke daily. This means that not all the kids that experiment will end up smoking cigarettes daily, but most of those who smoke daily got there by starting experimenting earlier in age. In the example stated earlier there is a progression from smoking tobacco and drinking alcohol; to smoking marijuana; to the use of illicit and mood changing drugs.

The theoretical models of Jessor and Kandel were developed and tested long before the use of nargila smoking appeared as a new major adolescent social activity. This study examines the use of nargila in context of these conceptual models. In addition, the study examines the relations between nargila smoking and perceptions of school, parental connectedness and other risk behaviors. The uniqueness of nargila compared to cigarette smoking is also explored.

Method

This study is based on secondary analyses of the data from the 2002 Israeli Health Behavior in School-Aged Children (HBSC). The HBSC is an on-going cross national study carried out under the auspices of the World Health Organization and collects data from national representative samples of 11-15 year old pupils in over 30 countries every 4 years³⁷. The HBSC provides information about health related risk behaviors, mental health and a wide variety of psychosocial determinants in the respective social environments that youth live in³⁸. The current study focuses on data from the Israeli national component of this study carried out in May-June of 2002.

Population and sample: The target population is 6th, 8th and 10th grade school children (ages about 11, 13 and 15) in state-secular and state-religious Jewish schools and in state-Arab schools. A national representative sample was assembled. The sample unit is one classroom. Using an updated computerized list of classrooms by schools, obtained from the ministry of education, including information on the number of children per classroom, a representative sample of classes was selected within each grade-level and type of school-system (secular, religious and Arab) strata. All pupils present in the sampled classroom on the day of the survey were included in the sample frame. The resulting sample of completed questionnaires included 6,681 students.

Research instrument: The survey used a classroom self administered anonymous questionnaire developed and tested over the years as part of the international HBSC scientific collaboration. The Israeli questionnaire included all the HBSC mandatory items and most of the optional ones. Some measures of particular interest in Israel were added. The Israeli questionnaire contained added questions, including those specific to nargila use³⁷. Detailed descriptions of the methodology of the international³⁸ and Israeli¹ HBSC surveys have been published, including information of questionnaire development and methodological assets^{37,38}.

Variables: *Use of nargila* is the dependent variable in this study. Two unique behaviors associated with nargila use are measured: (1) ever used a nargila, and (2) frequency of current nargila use. The former is based on the question: "Did you ever in the past smoke a nargila?" (1=yes, 0=no) whereas the second measure was based on the question: "How often do you smoke nargila today?" The frequency categories were collapsed for the analyses into 1=smoke at least once a week, and 0=do not smoke or smoke less than once a week.

Independent variables include *demographic predispositions* (gender, grade, religiosity, and ethnicity – Jewish vs. Arab). Other independent variables included parental connectedness and school perceptions.

Parental connectedness: respondents were asked "How easy is it for you to talk to the following persons about things that really bother you? (Father, mother, and a list of other persons). For each person the respondent answered on a scale from 1 ("very easy") to 4 ("very difficult"). Answers 1-2 were regarded as "easy to talk" and 3-4 as "not easy

to talk. Three "dummy-variables" were designed to capture the parent connectedness perceptions as follows: (1) children who reported that it is easy to talk with both father and mother, (2) children who feel that they can talk with only one of their parents (father or mother) and (3) children who feel it is not easy to talk with both their father and their mother.

School perceptions: To capture school perceptions, the HBSC includes a list of 17 items that cover most dimensions of school life according to the scientific literature. The school items have been intensively reported upon and their reliability and validity discussed³². The school items are used in this study to construct a school-perception scale measuring the amount of negative school perceptions that the respondent has out of 17 possibilities³³.

Questions consisted of 17 aspects of students' school experience. These 17 areas were:

- 1) Love of school.
- 2) Student's participation in setting rules in school.
- 3) Harshness of school rules;
- 4) Fairness of school rules;
- 5) Cleanliness of school as a place;
- 6) Sense of belonging in school;
- 7) Safety of school as a place;
- 8) Encouragement by teachers of different opinions in class;
- 9) Fairness of treatment of students by teachers;
- 10) Receipt of extra help from teachers,
- 11) Interest of teachers in me as a person,
- 12) Joy of students being together;
- 13) Students respectfulness and willingness to help;
- 14) Acceptance by others of student as he is;
- 15) Amount of homework;
- 16) Difficulty of homework;
- 17) Tiresomeness caused by homework.

The answers were on a scale 1 to 5 ("agree very much" to "not agree at all"). The responses were further grouped as 'negative school perceptions'. 'Least negative perception' was 0 (those who answered 'agree very much' to all the 17 above categories). An ascending scale range was built to adapt the graded answers to each of the 17 topics listed above, as follows: 1, 2 to 3, 4 to 6, 7 to 10 and 11 to 17. Answer "not agree at all" to all 17 questions was the most negative perception.

The study also examined risk behaviors. They were cigarette smoking experience (0-no, 1-yes), history of alcohol abuse (0-no, 1-yes) and participation in violent behavior (0-no, 1-yes).

Findings

Table 1: Distribution of variables by gender and sub-population

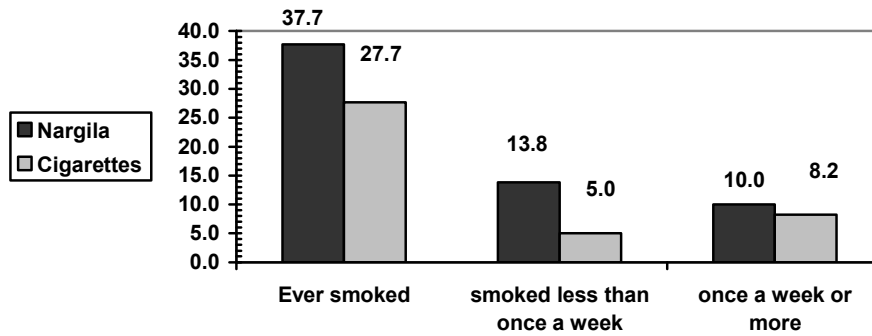
Measure	All	Gender		Jewish Secular	Jewish Religious	Arab
		Boys	Girls			
Nargila Use						
1. % ever smoked Nargila	37.7 (±0.62)	47.6 (±0.93)	29.1 (±0.79)	41.7 (±0.80)	32.4 (±0.95)	30.5 (±0.62)
2. % smoked Nargila once a week or more	10.0 (±0.38)	14.5 (±0.65)	6.1 (±0.41)	10.0 (±0.49)	7.1 (±0.61)	13.1 (±1.12)
Parental Connectedness						
3. % easy to talk with both mother and father	60.3 (±0.63)	65.1 (±0.90)	56.1 (±0.87)	58.9 (±0.81)	62.4 (±1.00)	66.7 (±1.56)
4. % easy to talk with mother or father	26.8 (±0.57)	21.3 (±0.77)	31.6 (±0.82)	28.0 (±0.74)	24.8 (±0.89)	21.7 (±1.36)
5. % Not easy to talk with mother and father	12.9 (±0.43)	13.6 (±0.65)	12.3 (±0.58)	13.1 (±0.55)	12.8 (±0.69)	11.6 (±1.06)
School Perceptions						
6. % no negative perceptions	22.8 (±0.53)	20.8 (±0.75)	24.6 (±0.75)	20.1 (±0.65)	27.0 (±0.90)	28.9 (±0.40)
7. % 1 negative perceptions	20.7 (±0.51)	20.2 (±0.74)	21.1 (±0.71)	20.0 (±0.65)	21.5 (±0.83)	21.7 (±1.33)
8. % 2-3 negative perceptions	19.9 (±0.50)	19.5 (±0.73)	20.1 (±0.70)	20.9 (±0.66)	18.3 (±0.78)	19.3 (±1.27)
9. % 4-6 negative perceptions	14.9 (±0.45)	15.6 (±0.67)	14.3 (±0.61)	15.0 (±0.80)	14.8 (±0.72)	15.8 (±1.18)
10. % 7-10 negative perceptions	13.5 (±0.43)	14.2 (±0.64)	12.9 (±0.58)	14.9 (±0.58)	11.3 (±0.64)	9.8 (±0.96)
11. % 11-17 negative perceptions	8.2 (±0.34)	9.6 (±0.54)	6.9 (±0.44)	8.9 (±0.46)	7.0 (±0.52)	4.1 (±0.64)
Risk Behaviors						
12. % ever smoked cigarettes	27.7 (±0.57)	33.6 (±0.88)	22.5 (±0.73)	30.8 (±0.75)	22.7 (±0.86)	22.7 (±1.36)
13. % ever been drunk	19.1 (±0.50)	25.5 (±0.81)	13.5 (±0.59)	22.1 (±0.67)	14.4 (±0.72)	11.5 (±1.03)
14. % involved in physical fights	38.6 (±0.62)	60.2 (±0.91)	19.5 (±0.69)	37.9 (±0.79)	39.6 (±0.72)	43.1 (±1.60)
Total N per sub population	6,196	2,901	3,295	1,197	1,172	3,748

**Table 2: Distribution of nargila use among Israeli youth
by grade level, gender and sub-population**

Nargila Use	Grade Level	All	Gender		Sub Population		
			Boys	Girls	Jewish Secular	Jewish Religious	Arab
Ever used nargila	6 th	19.7 (±0.89)	29.3 (±1.44)	10.0 (±0.95)	19.5 (±1.10)	17.2 (±2.22)	21.8 (±2.06)
	8 th	41.9 (±1.00)	53.1 (±0.52)	32.9 (±1.28)	47.9 (±1.33)	34.1 (±1.95)	32.4 (±2.30)
	10 th	52.8 (±1.02)	63.3 (±1.72)	43.9 (±1.62)	60.6 (±1.51)	44.1 (±2.89)	37.5 (±2.48)
	Total	37.7 (±0.62)	47.6 (±0.93)	29.1 (±0.79)	41.7 (±0.80)	32.4 (±0.95)	30.5 (±0.62)
	N	6,196	2,901	3,295	3,748	1,172	1,197
Used nargila more than once a week	6 th	4.6 (±0.47)	7.2 (±0.81)	2.0 (±0.44)	3.0 (±0.47)	3.8 (±1.12)	10.4 (±1.52)
	8 th	11.3 (±0.64)	16.9 (±1.11)	6.8 (±0.68)	12.7 (±0.88)	5.8 (±0.96)	14.5 (±1.72)
	10 th	14.5 (±0.85)	20.7 (±1.44)	9.3 (±0.95)	15.0 (±1.11)	12.9 (±1.95)	14.3 (±1.76)
	Total	10.0 (±0.38)	14.7 (±0.65)	6.1 (±0.41)	10.0 (±0.49)	7.1 (±0.61)	13.1 (±1.12)
	N	6,196	2,901	3,295	3,749	1,170	1,203

Figure 1 shows the comparison between the prevalence of smoking cigarettes and the prevalence of using nargila. As the data clearly show, there are many more youngsters who use nargila than they are who smoke cigarettes. This fact points at nargila use as being a major new gateway for tobacco consumption and more.

Figure 1: Prevalence (per 100) of nargila and Cigarette smoking among Israeli



P<0.001 for nargila vs. Cigarette
P<0.001 for the three time reference
N=6,196

Table 3 and Table 4 show results of applying logistic hierarchical regression models to predict the probability of "ever" nargila use (Table 3) and "weekly" nargila use (Table 4). There are six distinct hierarchically ordered models presented:

Table 3: Hierarchical Logistic regression models to predict “ever used* nargila”

measures	I	II	III	IV	V	VI
Demographic:						
Gender (0-Girl, 1-Boy)	***2.39	***2.40	***2.37	***2.37	***1.80	***1.86
Age: Sixth Grade	1.00	1.00	1.00	1.00	1.00	1.00
Eight Grade	***3.29	***3.15	***3.19	***3.06	***2.66	***2.71
Tenth Grade	***5.31	***4.91	***5.15	***4.82	***3.52	***3.27
Sub Populations (0-Arabic, 1-Jewish)	***1.18	1.15	1.13	1.11	1.11	
Religious Background						
Religious	1.00	1.00	1.00	1.00	1.00	1.00
Traditional	***1.80	***1.77	***1.78	***1.76	***1.59	***1.50
Secular	***2.12	***2.12	***2.08	***2.09	***1.55	***1.48
Parental Connectedness Index						

Easy to talk with both mother and father		1.00		1.00		1.00
Easy to talk with mother or father		***1.32		***1.29		1.02
Not easy to talk with mother and father		***1.73		***1.70		1.15
School:						
Negative school perceptions scale						
0 Negative perceptions			1.00	1.00		1.00
One negative perceptions			**1.37	**1.34		1.06
2-3 negative perceptions			1.15	1.10		1.00
4-6 negative perceptions			1.18	1.20		1.20
7-10 negative perceptions			***1.68	***1.66		**1.41
11-17 negative perceptions			***1.71	***1.61		1.11
Risk Behaviors						
Experimenting with Cigarettes.					***9.85	***9.74
Drunkenness					***2.63	***2.55
Participating in fights					***1.56	***1.41
Adj R ²	18.0%	18.7%	18.8%	19.4%	44.7%	44.4%
N	5,635	5,489	5,612	5,482	5,514	5,728

The significant value: ***p<0.001, **p<0.01, *p<0.05

*The value shown in the table is Odd Ratio

Table 4: Hierarchical Logistic regression models to predict use of nargila at least once a week

measures	I	II	III	IV	V	VI
Demographic:						
Gender (0-Girl, 1-Boy)	***2.95	***2.84	***2.89	***2.81	***1.93	***1.83
Age: Sixth Grade	1.00	1.00	1.00	1.00	1.00	1.00
Eight Grade	***3.35	***3.24	***3.31	***3.21	***2.34	***2.33
Tenth Grade	***4.37	***4.26	***4.32	***4.23	***2.43	***2.49
Sub Populations (0-Arabic, 1-Jewish)	***0.55	***0.52	***0.53	***0.51	***0.43	***0.41
Religious Background						
Religious	1.00	1.00	1.00	1.00	1.00	1.00
Traditional	***2.22	***2.24	***2.27	***2.23	***2.07	***2.12
Secular	***1.90	***1.92	***1.93	***1.91	***1.35	***1.40
Parental Connectedness Index						
Easy to talk with both mother and father		1.00		1.00		1.00
Easy to talk with mother or father		1.24		1.23		0.93
Not easy to talk with mother and father		***1.51		**1.48		0.97
School:						
Negative school perceptions scale						

0 Negative perceptions			1.00	1.00		1.00
One negative perceptions			*1.39	**1.46		1.14
2-3 negative perceptions			1.01	1.01		0.87
4-6 negative perceptions			1.02	1.11		1.12
7-10 negative perceptions			1.17	1.23		1.02
11-17 negative perceptions			*1.49	**1.50		0.95
Risk Behaviors						
Cigarette experimenting					***5.50	***5.82
Drunkenness					***3.34	***3.24
Participating in fights					***1.48	***1.43
Adj R ²	11.5%	11.5%	11.9%	11.9%	31.6%	31.3%
N	5,639	5,489	5,616	5,482	5,522	5,376

The significant value: ***p<0.001, **p<0.01, *p<0.05

* The value shown in the table is Odd Ratio

- I. **Demographic model** (Gender, grade, sub-population and religiosity)
- II. **Parental Connectedness model** (Demographics + ease of talk to mom or dad index)
- III. **School Perceptions model**(Demographics + Negative School Perception Scale)
- IV. **Social Settings model** (Demographics + Parental connectedness + School Perceptions)
- V. **Risk Behaviors model** (Demographics + smoking, drinking and physical fights)
- VI. **Full Model (Demographics + Parental connectedness + school perceptions + risk behaviors)**

As the findings suggest, the demographic variables alone explain about 18% of the variance of "ever" and 11.5% of the variance of "weekly" use of nargila. For both "ever" and "weekly", parental connectedness and negative school perceptions have statistically significant odds ratios of about 1.5, however, they do not add more than 1.5% to variance explained (Models III – IV).

The findings of Model V, however, are the most interesting and meaningful. For both dependent variables (Tables 3 and 4) the three risk behaviors alone (smoking, drinking and fights) almost triple the amount of variance explained by Model I. For "ever" used nargila the Rsq jumps from 18.0 to 44.4 (!) and for "weekly" use from 11.5 to 31.3. The odds ratios of the single behavioral items reveal that cigarette smoking is the most powerful predictor – with odds ratios of almost 10 for "ever" and 5.5 for "weekly". The odds ratios for ever being drunk is also between 2-3.5 – suggesting that the use of nargila is very closely related to the consumption of both tobacco and alcohol. The full model (VI) that brings all four clusters of independent variables together suggests that the added value of parental connectedness and school perceptions to the explanation of

nargila use behavior among Israeli youth is redundant over and above the prediction power of cigarette smoking and problem drinking behaviors.

The use of drugs was measured in the Israeli HBSC survey only for the 10th grade sampled students. Drug use behavior was therefore not included in the regression models presented above that pertain to all the sample of 6th, 8th and 10th grade students. Table 5, however, presents the odds ratios of marijuana and ecstasy use for 10th grade students only, who (1) ever used a nargila but use it less than once a week, and (2) use a nargila regularly at least once a week. Odds ratios are compared to kids who never used a nargila. The findings show an extremely strong association. Nine percent of all 10th grade students who use nargila on a weekly base report ever using marijuana and almost 2.5% report ever using ecstasy this is compared to less than one percent of kids who never used nargila (odds ratios of almost 15 and 3.7 respectively). Almost 17% of all 10th grade students who use nargila on a weekly base report ever using marijuana and almost 9% report ever using ecstasy this is compared to less than one percent of kids who never used nargila (odds ratios of 30 and 14.4 respectively). This is such a strong and linearly escalating risk that the danger of nargila as a gateway to drug use is made very obvious.

Table 5: Lifetime prevalence of marijuana and ecstasy use per hundred, by status of nargila use among Israeli 10th grade students

Drug Use	Never used nargila	Ever used nargila, but less than once a week	Use nargila at least once a week
Marijuana	0.7 OR=1.0	9.0 OR=14.9	16.6 OR=30.0
Ecstasy	0.7 OR=1.0	2.4 OR=3.7	8.7 OR=14.4
N	3,755	1,712	573

Discussion

Less than a decade ago, nargila smoking was a non-existing behavior among teenagers in all western cultures. It was common only among adult male populations especially in middle-eastern countries. During the past several years, nargila smoking appeared on the scene of the Israeli youth life style and caught on like a bush on fire. Within a period of 3-5 years the prevalence of nargila smoking grew from zero to almost 40 per hundred among school-aged children age 11-17¹. The fashion of nargila use was introduced into the youth daily lives as a past time social gathering activity rather than a "thrill-seeking" type of risk behavior such as the appearance of line-roller-skating several years earlier. In the perception of the Israeli public, nargila use was not associated with health hazards. Therefore, during the first few years of its appearance it was not regarded by parents, teenagers or educators as a health compromising risk behavior that has the potential to lead some teens into the world of drug use. Rather, it was seen as a new social phenomenon that took the place of the "Kumzitts" - a traditional Israeli social gathering sitting around a bomb-fire singing songs and telling tails. The findings of this study support this assumption.

The findings show that the life-time prevalence of nargila use among Israeli mid-adolescent schoolchildren is about one of every two boys and one of every three girls. The distribution of the behavior over sub-populations of youth is so similar that it is obvious that we are studying a social behavioral norm that has been accepted by all parts of the population with no specific sub population that is leading its distribution.

An attempt is made here to fit the data to Jessor's "problem behavior theory"^{17, 18, 19} and to Kandel's "gateway theory"^{34, 35, 36}. The association of nargila use with cigarette smoking, problem drinking and drug use is very strong. This suggests that despite the common lay perception among the Israeli public that nargila use is only a social activity – it is actually a classic risk behavior that in accordance to the "problem behavior theory" belongs to the cluster of alcohol, tobacco and drug use. Furthermore, it is obvious that the high prevalence of nargila use (much higher than cigarette smoking), and the specific unique attributes of the nargila itself have opened a wide and very dangerous new "gateway" to this cluster of tobacco, alcohol and drug consumption related behaviors.

The findings also show that the relationships between poor connectedness with parent and negative school perceptions and the use of nargila are very weak. This is probably due to the fact that nargila use has become an "introductory" behavior into the cluster of substance use and is still very low on the epidemiological pyramid and is shared by a very wide population of teens from all levels of risk. It is only later in the process that disadvantage in psycho-social resources will predict the move through additional "gateways" that are higher on the risk-level gradient. Future studies should closely monitor this process and further investigate the developing role of nargila use in the lives of kids and in their ever developing and challenging social-behavioral habits.

Reports of HBSC research teams in several countries in Europe have already indicated that the fashion of nargila use is starting to appear in the youth culture of their respective populations during the past few years, and the feeling is that it is growing rapidly. As earlier experiences teach us, (line-roller skating as one example), a fashion like this can catch on extremely fast. Knowing the danger, we must introduce measures of nargila use to all national monitoring risk behavior systems and get ready to implement health education campaigns to cope with this new behavior as it makes its debut across the European and American scene.

References

1. Harel, Y., M. Molcho, E. Tillinger (2003). Youth in Israel – Health, Well-Being and risk behaviors. Summary of Findings from the Third National Study (2002) and Trend Analysis (1994-2002). Jerusalem: Bar-Ilan University, Department of Sociology and Anthropology. (HEB)

2. Saade, G.A., (2003). Lebanon global school personal survey on tobacco, 2001, Ministry of health, Beirut Lebanon, Lebanon. *Global action for a tobacco free future, World conference on tobacco or health, Helsinki, Finland.*
3. Harfouch, S., Gehshan N., Gehshan A., Aoun, S.G. (2003). Toxicological analyses of nictine and polycyclic aromatic hydrocarbons in the smoke produced by Arguile, Faculty of medicine, Universite Sant Joseph, Beirut, Lebanon. *Global action for a tobacco free future, World conference on tobacco or health, Helsinki, Finland.*
4. Chaaya, M., Awwad, J., Campbell, O.M., Sibai, A., Kaddour, A. (2003). Demographic and psychological profile of smoking among pregnant women in a Lebanon, *Public health implications maternal and child health journal*, 7 (3): Pp. 179-186.
5. Gadalla, S., El-Setouhy, M., Mohamed, M., Mikhail, N., Israel, E., (2003). Water Pipe (Shisha) café survey, Egyptian smoking prevention research institute, Cairo, Egypt. *Global action for a tobacco free future, World conference on tobacco or health, Helsinki, Finland.*
6. Ward, K.D., Maziak, W., Eissenberg, T., (2003). Status report on the syrian center for tobacco studies, Syrian center for tobacco studies, Aleppo, Syrian Arab Republic. *Global action for a tobacco free future, World conference on tobacco or health, Helsinki, Finland.*
7. Fakhfakh, R., Hsairi, M., Maalej, M., Achour, N., Nacef, T. (2003). Tobacco use in Tunisia: Behavior and awareness, *Bull world health organization*, 80 (5): Pp. 350-356.
8. Idris, A.M., (2003). Country profile- Sudan, Toombak and smoking research center, Khartoum, Sudan. *Global action for a tobacco free future, World conference on tobacco or health, Helsinki, Finland.*
9. Sharma, R.N., Deva, C., Behera, D., Khanduja, K.L., (1997). Reactive oxygen species formation in peripheral blood neutrophils in different types of smokers, *Indian journal of medical research*, pp. 75-80.
10. El-Hakim, I.E., Uthman, M.A., (1999). Squamous cell carcinoma and keratoacanthoma of the lower lip associated with Goza and Shisha Smoking, *International journal of dermatology*, 38 (2): Pp. 108-110.
11. Sun, J., S. Hu, J. Liu, (2001). The effects of smoking and drinking on the incidence of senile disease, *Chinese journal of clinical psychology*, 9 (4): Pp. 280-283.
12. Onder, M., Qztaz, M., Arnavut, O., (2002). Nargile (Hubble-bubble) smoking-induced hand eczema, *International journal of dermatology*, 41 (11): Pp. 771-772.

13. Shafagoj, Y.A., Mohammed F.I., (2002). Levels of maximum end-expiratory carbon monoxide and certain cardiovascular parameters following Hubble-bubble smoking, *Medical journal*, 23 (8): Pp. 953-958.
14. Nuwayhid, I.A., B.Yamout, G. Azar, M. A. Kambris, (1998). Narghile (Hubble-bubble) smoking, low birth weight, and other pregnancy outcomes, *American journal of epidemiology*, 148 (4): Pp. 375-383.
15. Wolfram, R.M., F. Chehne, A. Oguogho and H. Sinzinger (2003). "Narghile (Water-pipe) smoking influences platelet function and (iso-) eicosanoids". *Life science*. 74 (1): Pp. 47-53.
16. Shihadeh, A., (2003). Investigation of mainstream smoke aerosol of the Argileh water pipe, *Food chemical toxicology*, 41 (1): pp.143-152.
17. Jessor, R. (1984). "*Adolescent development and behavior health*". Behavioral health. in: J.D. Matarazzo, S.M. Weiss, J. A., Herd and N. E. Miller (Eds.) New York: John Wiley & Sons, pp. 69-90.
18. Jessor, R. (1987). "Problem-behavior theory, psycho-social development, and adolescent problem drinking". *British journal of addiction* 82: Pp.331-342.
19. Jessor, R. and S.L. Jessor (1977). *Problem behavior and psychosocial development: A longitudinal study of youth*. New York: Academic press.
20. Jones, S. E., J. Oeltmann, T.W. Wilson, N.D. Brener, C.V. Hill, (2001). Binge drinking among undergraduate college students in the Untied States: Implication for other substance use, *Journal of American college health*, 50 (1): pp. 33-38.
21. Laufer, A. (2000). "The behavioral-social model for understanding the involvement of adolescent in Israel". A work made for accepting Ph.D. in Philosophy, the department of sociology and anthropology, Ramat-Gan: Bar-Ilan University. (HEB)
22. Donovan, J. E. (1996). "Problem behavior theory and the explanation of adolescent marijuana use". *Journal of drug issues* 26 (2): Pp. 379-404.
23. Tychman, Meir (2001). "From the gods Nectar to the poison cup" on alcohol and alcoholism – factors and resons, prevention and treatment. Tel – Aviv: Tel – Aviv University, Ramot. (HEB)
24. Lufur, A, and Yossi Harel (2003). The connection between school perceptions and students involvement in bullying, fights and carrying wepone. Megamot. MB (3), P. 437-459. (HEB)

25. Gabhainn, S., Francois, Y. (2000). Health and health behavior among young people, Health behavior in school-aged children: A WHO cross-national study (HBSC) international report, Chapter 9: *Substance use*, Pp. 97-105.
26. Molcho, M., Y. Harel, D. O. Lache (2004). Substance Use and Youth Violence. A Study among 6th to 10th Grade Israeli School Children. *International Journal of Adolescent Medicine and Health*. 16(3): Pp. 239-251.
27. Sampson, R., J. Laub (1994). "Urban poverty and family context of delinquency: A new look at structure and process in a classic study". *Child development* 65: Pp. 523-540.
28. Johnson, B.M., S. Shulman and W.A. Collins (1991). "Systemic patterns of parenting as reported by adolescents: Developmental differences and implications for psychological outcomes". *Journal of adolescent research* 6: Pp. 235-252.
29. Svensson, R. (2000). "Risk factors for different dimensions of adolescent drug use". *Journal of child and adolescent substance abuse*. 9 (3): Pp. 67-90.
30. Foxcroft, D. R., G. Lowe (1995). "Teenage Drinking: A 4-Year Comparative Study". *Alcohol and Alcoholism* 30: Pp. 713-719.
31. Nutbeam, D., A. Leif (1991). "Smoking and pupils attitudes towards school: the implications for health education with young people". *Health education research* 6 (4): Pp. 422-426.
32. Samdal, Oddrun and Bente Wold (1997). The Relation between Pupils Well-Being in School and Their Reported Health and Quality of Life.
33. Harel, Y. (1999). Adolescent violence in Israel 1994-1998, the findings of the international survey on risk behavior and injuries of adolescent 1998, the department of sociology and anthropology and the Joint- brookdale institute, Ramat-gan: Bar-Ilan University. (HEB).
34. Kandel, D.B. (1975). "Stages in adolescent involvement in drug use". *Science* 190: Pp. 912-914.
35. Kandel, D.B. (1982). "Epidemiological and psychological perspectives on adolescent drug use". *Journal of American academy of child psychiatry* 21: Pp. 328-347.
36. Kandel, D.B. (1991). Developmental stages of involvement in substance use and other problem behaviors: Establishing the evidence and identifying the commonality versus the specificity of risk factors. *Conference on adolescent problem and risk taking behavior, National institute of child health and human development*. Vest Virginia.

37. WHO- World Health Organization, (2002). HBSC- Health behavior for school-aged children, *Research protocol for the 2001/02 Survey*.
38. Currie, C., O. Samdal, W. Boyce and B. Smith (2001). *Health behavior in school-aged children: A world health organization cross-national study*. Research protocol for the 2001/02 survey. Scotland: University of Edinburgh.