Knowledge, attitudes and practices of secondary-school pupils in Oman: I. Health-compromising behaviours

Y.A. Jaffer,[1] M. Afifi,[1] F. Al Ajmi[1] and K. Alouhaishi[2]

تقصي معارف ومواقف وممارسات طلاب المدارس الثانوية في عُمان: 1. السلوكيات المُنْتَقِصة من الصحة

ياسمين بنت أحمد جعفر، مصطفى عفيفي، فاطمة العجمي، خالد الوحيشي

الخلاصة: قام الباحثون في إطار هذه الدراسة بتقصي ممارسة بعض السلوكيات المؤثرة سلباً على الصحة بين المراهقين العُمانيين، والعوامل المرتبطة بهذه السلوكيات، وذلك في عينة وطنية ممثِّلة، من طلبة المدارس الثانوية، اشتملت على 1670 من الذكور و1675 من الإناث. وكان العمر الوسطي للعينة 17.13 عاماً (الانحراف المعياري 1.35). وتم سؤال هؤلاء المراهقين من خلال استبيان ذاتي الاستكمال عن 6 سلوكيات محفوفة بالمخاطر، وهي: التدخين في الوقت الراهن، تعاطي الخمر في وقت من الأوقات، الخضوع لضغوط الزملاء بتعاطي المخدرات غير المشروعة، قيادة السيارات بدون رخصة قيادة، القيادة بسرعة عالية، والاشتباك في مشاجرة عنيفة خلال الشهر السابق على دراسة المسح. كما تم تقييم المتغيرات الديمغرافية والنفسية الاجتماعية ذات العلاقة بالسلوكيات المحفوفة بالمخاطر لهؤلاء. ودلّت النتائج على أن 4.6٪ من أفراد العينة هم من المدخنين في الوقت الحاضر، وأن 4.3٪ قد سبق لهم تعاطي الكحوليات، و4.6٪ تعاطوا المخدرات، وأن 20٪ اشتبكوا في مشاجرة خلال الشهر السابق للمسح، و33.4٪ قادوا سياراتهم بدون رخصة قيادة، و33.9٪ يحبون القيادة بسرعة عالية. وكان الجنس المذكّر وضعف الاعتداد بالنفس هما أقوى العوامل المنبِّئة بانتهاج السلوكيات المحفوفة بالمخاطر.

ABSTRACT We investigated the practice of some of health-compromising behaviours among Omani adolescents and their correlates in a nationally representative secondary school-based sample of 1670 boys and 1675 girls. The mean age of the sample was 17.13 (SD 1.35) years. Through a self-administrated questionnaire the adolescents were asked about 6 risky behaviours: current smoking, ever use of alcohol, succumbing to peer pressure to take illicit drugs, driving without a licence, speeding while driving and being involved in a physical fight in the month prior to the survey. Demographic and psychosocial variables related to their risk behaviours were also assessed. The results indicated that 4.6 % were current smokers, 4.3% had drunk alcohol and 4.6% had taken drugs. About 20% had been involved in a physical fight in the month prior to the survey, 33.4% drove without a licence and 33.9% liked to speed. Male sex and low self-esteem were the strongest predictors of risky behaviour.

Connaissances, attitudes et pratiques des élèves du secondaire à Oman : I. Les comportements qui compromettent la santé

RÉSUMÉ Nous avons examiné la pratique de certains comportements qui compromettent la santé chez des adolescents omanais ainsi que leurs corrélats dans un échantillon national représentatif de 1670 garçons et 1675 filles en milieu scolaire secondaire. L'âge moyen de l'échantillon était de 17,13 (E.T. 1,35) ans. Les adolescents ont été interrogés au moyen d'un auto-questionnaire sur 6 comportements à risque : tabagisme au moment de l'enquête, consommation d'alcool au cours de la vie, prise de drogues illicites sous la pression de pairs, conduite sans permis, vitesse au volant et implication dans une bagarre durant le mois précédant l'enquête. Des variables psychosociales et démographiques liées aux comportements à risque ont également été évaluées. Les résultats ont indiqué que 4,6 % des sujets étaient fumeurs au moment de l'enquête, 4,3 % avaient consommé de l'alcool et 4,6 % avaient pris des drogues. Environ 20 % avaient été impliqués dans une bagarre au cours du mois précédant l'enquête, 33,4 % conduisaient sans permis et 33,9 % aimaient la vitesse. Le sexe masculin et la faible estime de soi étaient les facteurs prédictifs les plus forts pour le comportement à risque.

[1]Ministry of Health, Muscat, Oman (Correspondence to M. Afifi: afifidr@yahoo.co.uk).
[2]Department of Research and Studies, League of Arab States, Cairo, Egypt.
Received: 06/01/04; accepted: 12/09/04

Introduction

Adolescence, the age period between 10 and 19 years of age, is both a transient stage, between childhood and adulthood, and a formative period during which many life patterns are learned and established [*1*]. Adolescents are commonly regarded as being in the healthy spectrum of human life and are thus considered to have no special needs [*2*]. However, health professionals are increasingly realizing the need for information on morbidity of this age group and their special health needs [*3*].

In the past 30 years, improved child survival and good health care have resulted in a sizeable increase in the adolescent population of the Oman; 30% of its population is in the adolescent age group, which is 10% higher than the average figures for the adolescent population in the world. Despite a 35% drop in the total fertility rate (TFR) in Oman from 1995 to 2000 [*4*], the TFR is still higher than other Arab and neighbouring countries [*5,6*]. It indicates that Oman will continue to have a relatively high percentage of adolescents in its population for many more years to come [*7*].

This relatively rapid growth of the Omani population and the lack of information about Omani adolescents prompted the study of the health profile of adolescents in Oman with the aim of gaining a better understanding of the youth in Oman today. The overall goal of the study was to establish a database on the knowledge, attitudes and practices of secondary-school adolescents regarding health-compromising behaviour (the aim of the current study) and reproductive health (the aim of the second part of the study) [*8*], in order to establish policies and programmes addressing the needs of this age group [*9*].

In Oman the prevalence of diabetes and obesity is increasing [*10,11*], the prevalence of hypertension is relatively high [*12*], as is the morbidity and mortality due to road traffic accidents [*13*]. These are undoubtedly contributed to by a number of behaviours, including unhealthy diet, sedentary lifestyle, tobacco use and reckless driving. The antecedents, values, and beliefs that influence these behaviours are complex but are usually acquired during childhood and adolescents [*14*]. Such behaviours can not only lead to serious consequences related to adolescents' overall health status, but could also adversely affect their educational and academic achievement and hence their careers [*15*]. Moreover, adolescent risk behaviours would be expected to be interrelated or clustered and thus strategic interventions to prevent or correct them should take into consideration their clustering and cumulative nature [*16*]. Hence the present study investigated some of the health-compromising behaviours present among Omani adolescents and their correlates.

Methods

This was a cross-sectional study of a nationally representative sample of secondary-school students of both sexes conducted in 2001 by the Ministry of Health in collaboration with other ministries and the United Nations Children's Fund (UNICEF) and funded in part by the World Health Organization (WHO) Regional Office for the Eastern Mediterranean who also provided technical assistance.

A multi-stage stratified random sampling technique was used, and the sample size was calculated assuming that the least prevalent variable to be studied was 5% at the 90% confidence interval. The sample size of

students was calculated in relation to the proportion in each governorate and grades in different strata. The primary sampling unit was the school class. The total number of secondary schools in Oman is 257; the total number of students is 50 716 boys and 54 192 girls. In the same academic year 2001, a number of classes were selected randomly (primary sampling unit) from a list of all classes in the secondary schools ordered according to the region, student sex, grade (I, II, III) and section (Science, Art) and representing all the regions of Oman. After selection of 152 classes from boys' schools and 152 from girls' schools in proportional allocation to student population size in each region, 11 students were randomly selected from each selected class. Accordingly, 1670 adolescent boys (3.3% of a total of 50 716 secondary-school boys in Oman) and 1675 adolescent girls (3.1% of a total of 54 192 secondary-school girls) were selected. Of these, 1485 boys and 1629 girls (total 3114 students) responded (response rate 89% and 97% respectively) and their data were entered into the statistical analysis. To avoid a non-response bias due to student's absence on the day of the survey, sample weights were used for analysis of data.

The survey was conducted using a self-administrated anonymous questionnaire answered by all the students in the sample. The following topics were covered: puberty, marriage issues, birth spacing, sexually transmitted diseases and HIV/AIDS, female genital cutting, sources of information on reproductive health, risk behaviours, social upbringing (in terms of the parental control) and relationships, role of schools and school health services. We made use of the Arabic translation of the Youth Risk Behavior Surveillance System [*17*] adopted by Lebanon but expanded it to cover knowledge and attitude for some locally selected areas. It was further refined with the help of the WHO Regional Office for the Eastern Mediterranean and fine-tuned during the 2 weeks of training of 32 researchers from the Ministry of Health (school health doctors, nurses and educators). It was then pilot tested in one class each in 2 regions of Oman (Muscat and South Batinah) and modified accordingly before putting it in its final form. The data collection phase began in April 2001 and continued for 1 month. The students took around 1–1½ hours to complete the questionnaire. Data entry personnel were trained on ISSA software before embarking on data entry and management.

In this paper, we focus on 6 health-compromising behaviours namely: current smoking, ever use of alcoholic beverages, peer pressure to take drugs, driving without a licence, speeding while driving, and physical fighting in the month prior to the survey. The question relating to peer pressure was used as a proxy for ever use of drugs as is was felt that students would be reluctant to answer a direct question on use.

These 6 behaviours were considered as the dependent or output variables in the statistical models. We included 12 independent or predictor variables categorized into 3 groups: 1) demographic data of students, namely sex, age, socioeconomic class [*18*]; 2) mental health proxies of students: experiencing sleep disorders, possessing self esteem and confidence [*15*], having negative traits (anxiety, depression, sadness or frustration), having positive traits (satisfaction, happiness, success, inner peace); 3) social environment of students: pattern of parent relations with each other, parents' treatment of the student, witnessing of violence in the family and or among friends, experience of physical punishment.

Data entry was done using ISSA; data analysis was done using *SPSS*, version 6.0. In bivariate analysis, data were presented

as percentages and means. The likelihood chi-squared test examined the distribution of data, while group means were compared using ANOVA. Multiple logistic regression models were constructed to test the most important associated factors with the 6 studied dependent binary variables. A *P*-value ≤ 0.05 was considered statistically significant.

Results

About 48% of the sample were boys and the mean age (standard deviation) of the sample was 17.13 (1.35) years. The majority of the sample (72%) was of middle socioeconomic class according to the scale used which was adapted from Abdul Moati (A.B. Abdul Moati, unpublished report, 2002). About 40% of the sample reported 1 or more negative trait, while 63% reported positive traits. The majority reported some sleeping disorder (85%). Parents of 61% of the students were mostly happily married and 80% treated their children with love, respect and equality. However, 8.2% of the students (12.5% males, 3.7% girls) were punished physically. Moreover, the majority had witnessed violence within their families and among their friends – sometimes or often (72.7% and 66.0% respectively). As regards health-compromising behaviours, the boys were more likely than girls to practise such behaviour; 4.6 % (6.4% boys, 2.9% girls) were current smokers and 14.9% (26.2% boys, 3.8% girls) were ever smokers, while 4.3% (6.6% males, 2.0% girls) had drunk alcohol and 4.6% (7.2% males, 2.2% girls) had been persuaded to take drugs by their peers. About 20% (22.9% males, 17.9% girls) had been involved in one or more physical fight in the month prior to the survey, 33.4% (57.5% males, 12.2% girls) drove cars without a licence, and 33.9% (42.1% males, 26.3% girls) liked to speed while driving (data not shown in tables).

Tables 1–3 show the proportion in cross-tabulation of the overall sample of adolescents who reported practising (or not) the 6 health-compromising behaviours with the 11 studied (binary or categorical) independent variables. The likelihood chi-squared test showed significant differences in the majority of variables.

We conducted a multivariate analysis to examine the most significant predictors, adjusted to each other, of the 6 health-compromising behaviours. A logistic regression model was constructed for each risk behavior to test for its most significant predictors adjusted for each other (Table 4). Female sex and a high self-esteem score were found to be protective against practising almost all the health-compromising behaviours. Older adolescents were more likely to drive without a licence. Those with a constant sleeping problem were more likely to have ever drunk alcohol or been involved in physical fights. Those who reported 2 or more positive traits were less likely to drive without a licence, while those who reported 2 or more negative traits were 4 times more likely to drive fast. In addition, students from the highest socioeconomic class were twice as likely to drive without a licence or to speed than students from the lower socioeconomic classes. Students who had experienced physical punishment by their parents or those who often witnessed violence among their family members were about twice as likely to have got involved in physical fights in the month prior to the survey. Poor parental relations as well as uncaring treatment of adolescents by parents also increased the odds of displaying some risk behaviours, namely driving without a licence or speeding.

Table 1 **Distribution of current smokers and those persuaded by friends to take drugs by demographic and psychosocial variables**

Variable	Current smoking (%)		χ^2	Persuaded to take drugs (%)		χ^2
	No	Yes		No	Yes	
Sex			16.6*			43.65*
Male	93.65	6.35		92.79	7.21	
Female	97.08	2.92		97.81	2.19	
Total	95.35	4.65		95.38	4.62	
Age (years)			6.71			2.55
13–15	97.22	2.78		95.70	4.30	
16	96.70	3.30		95.64	4.36	
17	95.56	4.44		96.03	3.97	
18	94.35	5.65		95.28	4.72	
19–24	93.73	6.27		94.43	5.57	
Total	95.50	4.50		95.51	4.49	
Social class			7.94*			8.87*
1	93.63	6.37		92.82	7.18	
2	96.08	3.92		96.05	3.95	
3	93.35	6.65		94.45	5.55	
Total	95.35	4.65		95.38	4.62	
Negative traits			3.59			0.45
None	96.06	3.94		95.24	4.76	
1	94.28	5.72		95.57	4.43	
2 or more	95.33	4.67		94.99	5.01	
Total	95.37	4.63		95.35	4.65	
Positive traits			5.52			0.87
None	94.26	5.74		95.39	4.61	
1	96.13	3.87		95.42	4.58	
2 or more	94.02	5.98		93.84	6.16	
Total	95.37	4.63		95.35	4.65	
Sleep problems			3.07			6.15
Never	96.78	3.22		94.47	5.53	
Rarely	94.96	5.04		95.33	4.67	
Sometimes	95.51	4.49		96.17	3.83	
Often	93.96	6.04		93.24	6.76	
Total	95.37	4.63		95.35	4.65	
Physically punished			3.09			0.64
No	95.46	4.54		95.19	4.81	
Yes	92.90	7.10		93.85	6.15	
Total	95.24	4.76		95.07	4.93	
Parental relation			4.81			2.77
Never have marital disputes	95.41	4.59		94.86	5.14	
Rarely have marital disputes	95.19	4.81		96.19	3.81	

Table 1 **Distribution of current smokers and those persuaded by friends to take drugs by demographic and psychosocial variables** *(concluded)*

Variable	Current smoking (%)		χ^2	Persuaded to take drugs (%)		χ^2
	No	Yes		No	Yes	
Sometimes have marital disputes	95.26	4.74		95.85	4.15	
Often have marital disputes	97.58	2.42		94.55	5.45	
One parent deceased	96.71	3.29		93.78	6.22	
Separated/divorced	92.51	7.49		96.15	3.85	
Total	95.45	4.55		95.40	4.60	
Family treatment			10.65			8.06
Loving	94.99	5.01		94.51	5.49	
Equal treatment of sons and daughters	96.74	3.26		96.46	3.54	
Interested in child's education	93.94	6.06		94.16	5.84	
Neglectful	91.21	8.79		94.00	6.00	
Discrimination between sons and daughters	96.76	3.24		97.08	2.92	
Cruel	92.58	7.42		95.40	4.60	
Total	95.41	4.59		95.32	4.68	
Violence in family			0.65			1.09
Never	94.89	5.11		96.03	3.97	
Sometimes	95.75	4.25		95.87	4.13	
Often	95.21	4.79		94.80	5.20	
Total	95.41	4.59		95.70	4.30	
Violence among friends			8.38*			4.96
Never	96.63	3.37		96.38	3.62	
Sometimes	94.07	5.93		94.38	5.62	
Often	93.91	6.09		93.83	6.17	
Total	94.88	5.12		94.94	5.06	

*$P < 0.05$.

Discussion

The major findings of this study are that out of the 12 demographic and psychosocial variables entered in the different logistic models, 11 were found to predict health-compromising behaviour among Omani adolescents. Only witnessing violence among friends did not predict the practice of health-compromising behaviours. The 11 could be categorized into 3 groups: 1) adolescent demographic variables (sex, age, socioeconomic class); 2) adolescent mental health proxies (having sleep disorders, self esteem, reporting negative or positive traits) and 3) adolescent social environment (parental relations, how parents treat him/her,

Table 2 **Distribution of adolescents who had ever taken alcohol and had driven without a licence by demographic and psychosocial variables**

Variable	Ever drunk alcohol		χ^2	Driven without a licence		χ^2
	No	Yes		No	Yes	
Sex			35.76*			743.19*
Male	93.38	6.62		42.45	57.55	
Female	97.96	2.04		87.85	12.15	
Total	95.75	4.25		65.72	34.28	
Age (years)			14.97*			37.29*
13–15	96.65	3.35		76.39	23.61	
16	97.52	2.48		70.18	29.82	
17	96.00	4.00		65.67	34.33	
18	94.98	5.02		64.00	36.00	
19–24	92.87	7.13		54.25	45.75	
Total	95.81	4.19		65.94	34.06	
Social class			2.53			17.55*
1	94.56	5.44		69.80	30.20	
2	96.12	3.88		66.56	33.44	
3	94.99	5.01		56.79	43.21	
Total	95.75	4.25		65.72	34.28	
Negative traits			4.43			6.64*
None	96.40	3.60		67.11	32.89	
1	94.73	5.27		63.11	36.89	
2 or more	94.70	5.30		69.86	30.14	
Total	95.72	4.28		65.70	34.30	
Positive traits			3.55			7.71*
None	94.71	5.29		62.67	37.33	
1	96.28	3.72		67.14	32.86	
2 or more	96.72	3.28		72.51	27.49	
Total	95.72	4.28		65.70	34.30	
Sleep problems			23.99*			23.46*
Never	96.39	3.61		65.65	34.35	
Rarely	96.55	3.45		66.05	33.95	
Sometimes	96.52	3.48		68.22	31.78	
Often	90.10	9.90		54.57	45.43	
Total	95.72	4.28		65.63	34.37	
Physically punished			5.48*			18.86*
No	96.28	3.72		65.61	34.39	
Yes	92.23	7.77		50.33	49.67	
Total	95.95	4.05		64.33	35.67	
Parental relation			7.87			4.21
Never have marital disputes	95.63	4.37		68.06	31.94	
Rarely have marital disputes	96.42	3.58		64.97	35.03	

Table 2 **Distribution of adolescents who had ever taken alcohol and had driven without license by demographic and psychosocial variables** *(concluded)*

Variable	Ever drunk alcohol		χ^2	Driven without a licence		χ^2
	No	Yes		No	Yes	
Sometimes have marital disputes	95.13	4.87		63.95	36.05	
Often have marital disputes	98.10	1.90		62.06	37.94	
One parent deceased	95.11	4.89		65.54	34.46	
Separated/divorced	92.29	7.71		68.36	31.64	
Total	95.75	4.25		65.70	34.30	
Family treatment			10.71			32.09*
Loving	96.06	3.94		66.31	33.69	
Equal treatment of sons and saughters	96.60	3.40		70.28	29.72	
Interested in child's education	91.92	8.08		52.92	47.08	
Neglectful	91.28	8.72		58.57	41.43	
Discrimination between sons and daughters	95.74	4.26		65.34	34.66	
Cruel	94.95	5.05		51.73	48.27	
Total	95.72	4.28		65.87	34.13	
Violence in family			0.36			1.64
Never	96.01	3.99		62.89	37.11	
Sometimes	95.81	4.19		66.39	33.61	
Often	95.73	4.27		65.76	34.24	
Total	95.85	4.15		65.31	34.69	
Violence among friends			6.05*			35.96*
Never	96.40	3.60		71.37	28.63	
Sometimes	95.65	4.35		61.04	38.96	
Often	93.52	6.48		55.08	44.92	
Total	95.45	4.55		63.21	36.79	

*P < 0.05.

being punished by beating, and witnessing violence among family members).

Another major finding from our study is that the Omani adolescents in our sample were generally healthy compared to other Arab or non-Arab countries. The prevalence of smoking in the current study (4.6%) is much lower than other studies of prevalence of current smoking among adolescents which ranges from 20%–29% in Saudi Arabia [*19,20*], 19% in the United Arab Emirates [*21*] and 19.6% in Yemen [*22*]. Smoking was significantly higher among boys, which is consistent with what was found in Saudi Arabia, Yemen and Tunis [*19–23*]. Similarly, the prevalence of ever drinking alcohol (4.3%) is much less than that found among university students

Table 3 **Distribution of adolescents who liked to speed and who were involved in physical fights by demographic and psychosocial variables**

Variable	Likes to speed		χ^2	Involved in physical fights		χ^2
	No	Yes		No	Yes	
Sex			86.97*			11.98*
Male	57.95	42.05		77.10	22.90	
Female	73.71	26.29		82.06	17.94	
Total	66.09	33.91		79.66	20.34	
Age (years)			7.09			12.35*
13–15	59.77	40.23		80.57	19.43	
16	68.48	31.52		76.05	23.95	
17	66.05	33.95		79.65	20.35	
18	65.91	34.09		83.58	16.42	
19–24	65.91	34.09		79.76	20.24	
Total	66.05	33.95		79.66	20.34	
Social class			24.24*			0.586
1	70.12	29.88		79.60	20.40	
2	67.24	32.76		79.93	20.07	
3	55.45	44.55		78.22	21.78	
Total	66.09	33.91		79.66	20.34	
Negative traits			57.54*			23.76*
None	71.52	28.48		82.23	17.77	
1	58.51	41.49		75.14	24.86	
2 or more	55.92	44.08		84.60	15.40	
Total	66.16	33.84		79.68	20.32	
Positive traits			53.85*			24.73*
None	58.00	42.00		74.97	25.03	
1	71.18	28.82		82.14	17.86	
2 or more	67.05	32.95		86.00	14.00	
Total	66.16	33.84		79.68	20.32	
Sleep problems			42.21*			25.86*
Never	71.40	28.60		85.25	14.75	
Rarely	66.00	34.00		81.66	18.34	
Sometimes	68.41	31.59		79.20	20.80	
Often	51.12	48.88		70.79	29.21	
Total	66.12	33.88		79.68	20.32	
Physically punished			11.29*			35.41*
No	67.19	32.81		79.54	20.46	
Yes	54.60	45.40		59.35	40.65	
Total	66.14	33.86		77.86	22.14	
Parental relation			18.44*			8.79
Never have marital disputes	70.81	29.19		80.95	19.05	
Rarely have marital disputes	66.85	33.15		80.18	19.82	

Table 3 **Distribution of adolescents who liked to speed and who were involved in physical fights by demographic and psychosocial variables** *(concluded)*

Variable	Likes to speed		χ^2	Involved in physical fights		χ^2
	No	Yes		No	Yes	
Sometimes have marital disputes	59.51	40.49		77.77	22.23	
Often have marital disputes	60.16	39.84		72.91	27.09	
One parent deceased	67.17	32.83		81.72	18.28	
Separated/divorced	65.72	34.28		77.91	22.09	
Total	66.16	33.84		79.55	20.45	
Family treatment			52.61*			5057*
Loving	70.29	29.71		83.03	16.97	
Equal treatment of sons and saughters	67.46	32.54		80.57	19.43	
Interested in child's education	52.75	47.25		73.60	26.40	
Neglectful	48.03	51.97		55.26	44.74	
Discrimination between sons and daughters	60.19	39.81		74.96	25.04	
Cruel	49.61	50.39		63.42	36.58	
Total	66.08	33.92		79.67	20.33	
Violence in family			2.23			4758*
Never	65.23	34.77		87.04	12.96	
Sometimes	66.50	33.50		78.50	21.50	
Often	63.50	36.50		70.69	29.31	
Total	65.57	34.43		79.35	20.65	
Violence among friends			13.39*			694*
Never	68.72	31.28		80.70	19.30	
Sometimes	63.65	36.35		79.19	20.81	
Often	58.64	41.36		75.03	24.97	
Total	64.30	35.70		78.83	21.17	

*$P < 0.05$.

in Lebanon (49.4%) [*24*]. Reckless driving practices were studied by Arnett et al. who found that the majority of their study sample of both sexes reported driving at high speed, and a quarter reported driving while intoxicated [*25*]. Hartos et al. also found that risky driving was reported in 80% of the teenagers in their sample [*26*]. In our study 33.9% liked to drive fast and 33.3% reported driving without a licence. Beck et al. recommended increasing parents' power to impose and enforce driving restrictions on previously licensed teenaged drivers [*27*]. In our study risky driving significantly increased with age in both bivariate and multivariate analysis which is consistent with what Schootman et al. found [*28*]. Non-fatal fight-related injuries among young people result in lost capacity and high costs of medical care and rehabilitation [*29*]. Witnessing violence is a significant predictor of getting involved

Table 4 **Adjusted odds ratio of the significant predictors of the health-compromising behaviour by logistic regression**

Variable	Smoking	Drug use	Alcohol use	Driving without a licence	Speeding	Physical fighting
Sex						
Male	1	1	1	1	1	1
Female	0.35**	0.35**	049*	0.09**	0.45**	0.74*
Age (years)						
13–15				1		
16				1.46		
17				1.71*		
18				1.88*		
19–24				2.32**		
Social class						
1				1	1	
2				1.62*	1.32	
3				2.34**	2.44**	
Negative traits						
None					1	1
1					1.93**	1.37*
2 or more					4.06**	0.72
Positive traits						
None				1		
1				0.662**		
2 or more				0.41**		
Sleep problems						
Never			1	1		1
Rarely			0.64	0.69		0.06
Sometimes			1.19	0.81		1.45
Often			2.39	1.26		1.82*
Self esteem	0.89**	0.9**	0.86**		0.95**	0.95*
Physically punished						
No						1
Yes						1.82*
Parental relation						
Never have marital disputes				1	1	
Rarely have marital disputes				1.47*	1.32	
Sometimes have marital disputes				1.8**	1.94*	
Often have marital disputes				1.97*	1.79*	
One parent deceased				1.57	1.23	
Separated/divorced				1.57	1.46	

Table 4 **Adjusted odds ratio of the significant predictors of the health-compromising behaviour by logistic regression** *(concluded)*

Variable	Smoking	Drug use	Alcohol use	Driving without a licence	Speeding	Physical fighting
Family treatment					1.26	
Loving					1.74**	
Equal treatment of sons and saughters					2.04*	
Interested in child's education					1.43*	
Neglectful					1.42	
Discrimination between sons and daughters						
Cruel						
Violence in family						
Never						1
Sometimes						1.61*
Often						2.12*
Violence among friends						
Never						
Sometimes						
Often						

*P < 0.05; **P < 0.01.

in fights [*29*]. Witnessing violence within the family was found to increase the likelihood of getting involved in physical fights in the current study, where the prevalence was about 20%. Other studies in the United States showed that 39%–53% of studied adolescents had been in physical fights [*30*]. Loeber et al. found that the prevalence of a psychiatric diagnosis after 7 years follow up was 3 times higher for persistent fighters than for non-fighters [*31*].

We did not investigate all the 6 categories of priority in the Youth Risk Behavior Surveillance System. These behaviours contribute to unintentional injuries and violence, tobacco use and other drug use, sexual behaviours that contribute to unintended pregnancy and sexually transmitted diseases, HIV infection, unhealthy dietary behaviour, and physical inactivity. Although other studies have compared health risk behaviours among students from different countries [*32*], our study used a different methodology and accordingly such comparison was not feasible [*33*]. This is in part because our study was part of a national survey where many other topics were also studied. Some risk behaviours, such as unhealthy dietary behaviour and physical inactivity will be tackled in another paper by the authors and others cannot be easily addressed in the Omani culture. However, some areas that were not touched upon, such as violence and suicidal ideation or attempted suicide, are important and in some other studies in Arab countries these behaviours have not been found uncommon [*34,35*].

It should also be noted that the findings of this survey cannot not be generalized to

the entire adolescent population in Oman as this was a school-based survey. Despite universal education in Oman, some adolescents drop out before secondary school. Furthermore, private and alternative schools were not included in our survey as they do not exist in all regions of the country. Nevertheless, to the best of our knowledge, this study is the first of its kind to investigate health-compromising behaviour among adolescents in a Gulf Cooperation Council country.

The importance of this study is that it not only reports the prevalence of these behaviours, but also illustrates the psychosocial variables correlated with them. Knowledge of the presence and impact of risk factors on the health of adolescents and youth is not enough. We have to focus on examining the protective factors and sources of disturbance in the lives of adolescents, which can offer insight into possible effective interventions and programmes [*36*].

Promoting the mental health status of our adolescents and its proxies, provision of a healthy social environment and parental connection are some of the protective factors found in the current study. Accordingly, the study findings provide valuable information to policy-makers, educators, health providers and community workers that can be used to improve the health and well-being of adolescents in Oman.

Given that youth-specific health services may promote service utilization and provide a better outcome for young people, our future work will focus on studying the relationship between health-compromising behaviour and use of health services. Previous studies have indicated a strong relationship between service utilization and adolescent psychopathology [*37*]. In addition, unhealthy dietary behaviour and physical inactivity will be discussed in a separate paper.

Acknowledgements

We would like to thank the Ministry of Health and the WHO for their financial support in conducting this study. Special thanks to Dr. M.H. Khayat for his continuous support and sustained efforts to make this work successful. We would also like to thank His Excellency the Minister of Health, their Excellencies the Undersecretaries of Planning, Health Affairs and Financial Affairs, Director-Generals at the Ministry of Health headquarters as well as in the regions, and a large number of other people within the Ministry of Health for their support.

References

1. Senderowitz J. *A review of program approaches to adolescent reproductive health. Poptech Assignment Number 2000.176 June 2000*. Available at: http://www.poptechproject.com/pdf/review06_00.pdf (accessed 23/11/05).

2. Reproductive, family and community health and population issues. In: *The Work of WHO in the Eastern Mediterranean Region. Annual report of Regional Director, January 01–December 31, 1998*. Alexandria, WHO Regional Office for the Eastern Mediterranean, 2000: Chapter 4.1.

3. Reproductive, family and community health and population issues**.** *In: The Work of WHO in the Eastern Mediterranean Region. Annual report of Regional Director, January 01–December 31, 1996*. Alexandria, WHO Regional Office for the Eastern Mediterranean, 1997: Chapter 4.1.

4. Al Riyami AA, Afifi M. Determinants of women's fertility in Oman. *Saudi medical journal*, 2003, 24(7):748–53.

5. El Zanaty F, Way A. *Egypt Demographic and Health Survey* 2000. Calverton, Maryland, ORC Macro and Cairo, Ministry of Health and Population, National Population Council, 2001:44.

6. *Jordan Population and Family Health Survey 1997*. Calverton, Maryland, ORC Macro and Amman, Department of Statistics, 1998:26.

7. *Annual statistical report 200*2. Muscat, Ministry of Health, 2003.

8. Jaffer YA et al. Knowledge, attitudes and practices survey of secondary-school adolescents in Oman. II. Reproductive health. *Eastern Mediterranean health journal*, 2006, 12(1–2):50–60.

9. Jaafer YA, Al Agami F, Alouhaishi K. *Towards better understanding of youth*. Muscat, Ministry of Health, 2003.

10. Al-Lawati JA et al. Increasing prevalence of diabetes mellitus in Oman. *Diabetic medicine*, 2002, 19(11):954–7.

11. Al-Lawati JA, Jousilahti PJ. Prevalence and 10-year secular trend of obesity in Oman. *Saudi medical journal*, 2004, 25(3):346–51.

12. Al Riyami AA, Afifi M. Hypertension in Oman: distribution and correlates. *Journal of the Egyptian Public Health Association*, 2002, 67(3,4):384–407.

13. *General outlines of the health development programs of the sixth 5-year plan [2001–2005]*. Muscat, Ministry of Health, 2001:84–8.

14. Jessor R. Risk behavior in adolescence: A psychological framework for understanding and action. *Journal of adolescent health*, 1991, 12:597–605.

15. Fetro JV, Coyle KK, Pham P. Health risk behaviour among school students in a large majority–minority school district. *Journal of school health*, 2001, 71(1): 30–7.

16. Takakura M, Ueji M, Sakihara S. Comparison of cigarette smoking and other health-risk behaviour among Japanese high school students: a preliminary study. *Journal of epidemiology*, 2001, 1(5): 224–8.

17. YRBSS: Youth Risk Behavior Surveillance System. Available at: http://www.cdc.gov/HealthyYouth/yrbs/index.htm (accessed 29/11/05)

18. Jaafer YA, Afifi M. Adolescents' attitudes toward gender roles and women's empowerment in Oman. *Eastern Mediterranean health journal*, 2005, 11(4):805–18.

19. Al Yousef MA, Karim A. Prevalence of smoking among high school students. *Saudi medical journal*, 2001, 22(10): 8723–4.

20. Hasim TJ. Smoking habits of students in colleges of applied medical sciences, Saudi Arabia. *Saudi medical journal*, 2000, 21(1):76–80.

21. Bener A, Al-Ketbi LM. Cigarette smoking habits among high school boys in a developing country. *Journal of the Royal Society of Health*, 1999, 119(3):166–9.

22. Bawazeer AA, Hattab AS, Morales E. First cigarette smoking experience among secondary school students in Aden, Republic of Yemen. *Eastern Mediterranean health journal*, 1999, 5(3):440–9.

23. Ghannem H et al. Study of cardiovascular risk factors among urban schoolchildren in Sousse, Tunisia. *Eastern Mediterranean health journal*, 2000, 6(5–6):1046–54.

24. Karam E et al. Use and abuse of licit and illicit substances: prevalence and risk factors among students in Lebanon. *European addiction research*, 200, 6(4): 189–97.

25. Arnett JJ, Offer D, Fine MA. Reckless driving in adolescence: state and trait factors. *Accident; analysis and prevention*, 1997, 29(1):57–63.

26. Hartos J, Eitel P, Simons-Morton B. Parenting practices and adolescent risky driving: a three-month prospective study. *Health education & behavio*r, 2002, 29(2)1:194–206.

27. Beck KH, Shattuck T, Raleigh R. Parental predictors of teen driving risk. *American journal of health behavior*, 2001, 25(1): 10–20.

28. Schootman M et al. Safety behavior among Iowa junior high and high school students. *American journal of public health*, 1993, 83(11):1628–30.

29. Borowsky IW, Ireland M. Predictors of future-related injury among adolescents. *Pediatrics*, 2004, 113(3 Pt 1):530–6.

30. Lowry R et al. Weapon-carrying, physical fighting, and fight-related injury among US adolescents. *American journal of preventive medicine*, 1998, 14(2):122–9.

31. Loeber R et al. Physical fighting in childhood as a risk factor for later mental health problems. *Journal of the American Academy of Child and Adolescent Psychiatry*, 2000, 39(4):421–8.

32. Denny SJ, Clark TC, Watson PD. Comparison of health behaviour among students in alternative high schools from New Zealand and the USA. *Journal of paediatric child health*, 2003, 39(1):33–9.

33. Grunbaum JA et al. Youth Risk Behavior Surveillance – national Alternative High School. Youth Risk Behavior Survey, United States, 1998. *MMWR. Morbidity and mortality weekly report. CDC surveillance summaries*, 1999, 48(7):1–44.

34. Afifi M. Prediction & prevention of adolescent suicidal behavior in Alexandria secondary schools. *Journal of the Bahrain Medical Society*, 2000, 12(3):134–8.

35. Afifi M. Depression, aggression and suicide ideation among adolescents in Alexandria, Egypt. *Neurosciences journal*, 2004, 9(3):447–53.

36. Adolescent Health Research Group. A health profile of New Zealand youth who attend secondary school. *New Zealand medical journal*, 2003, 116(1171):U380. Available at: http://www.nzma.org.nz/journal/116-1171/380/content.pdf (accessed 22/11/05).

37. Afifi M. Adolescent use of health services in Alexandria, Egypt: association with mental health problems. *Eastern Mediterranean health journal*, 2004, 10(1–2): 64–71.