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Full Length Research Paper

Knowledge, attitude and practice of university students towards smoking in Irbid, Jordan

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The purpose of this cross sectional study was to explore university students' knowledge, attitude and practice towards smoking and to compare these factors between smokers and non-smokers. A sample of 2793 students was randomly selected to complete a self-administered questionnaire about knowledge, attitude and practice of smoking at three universities in Irbid, Jordan. The Majority of the smoking students (75.2%) knew the adverse effects of smoking. Rates of non-smoking students who knew the adverse effects of smoking were significantly higher than that of students who smoke. A high rate of students showed an opposing attitude towards the assumption that smoking females would have more friends (89.6%), have stronger personality (93.4%), and be more attractive (90.6%) than non-smoking females. Similar higher rates of negative attitude were also observed towards the smoking male. About 50% of smokers have a misguided belief that smoking helps them concentrate while studying and 37.7% believe that smoking helps in avoiding obesity. Students that started smoking before enrollment in a university had a significantly higher rate of heavy smoking as compared to those who started smoking after being enrolled. Students smoke not because they lack the knowledge about the risk of smoking but due to misguided beliefs and attitudes.

Key words: Attitude, knowledge, practice, smoking, students, university.

INTRODUCTION

The World Health Organization (WHO) has estimated that five million deaths occur annually due to tobacco use and this number of deaths is expected to reach more than eight million by the year 2030 (Gajalakshmi et al., 2004; WHO, 2009). About 80% of this number will be in developing countries (WHO, 2009). However, the exact magnitude of the problem of smoking in developing countries is not well defined. There is little information to describe the characteristics of smoking patterns in these countries (Gajalakshmi et al., 2004). Smoking has a great economic burden by causing a decrease of economic productivity and high health care expenditures in addition to the cost of tobacco (Ruff et al., 2000).

Smoking also has an environmental impact due to second hand (passive) smoking (El-Ansari, 2002). The impact of smoking is not limited on the smokers, but it can spread to affect the non-smokers as well. Second hand smoking has an impact on birth outcomes represented in low birth weight (Abu-Baker et al., 2010), and contribute significantly to respiratory tract infections in infants (Jones et al., 2011).

It is well known that cessation of smoking is extremely difficult. This statement is supported by research that has proved beyond doubt that nicotine is highly addictive (Rugkasa et al., 2001). Smoking prevalence rises sharply during adulthood. This means that there is an induction of smoking even after high school (Torabi et al., 2002).

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Between 1991 and 1997, the rate of smoking had increased by 32% among 18 to 24 years old adults in the USA (Torabi et al., 2002). Studying smoking behavior and attitude among this sector of the population will add valuable information about the patterns of smoking among this age group (Vakeflliu et al., 2002). In addition, knowledge about previously identified socio-environmental factors associated with smoking among college students in developing countries is limited (Pickett et al., 2000; Moore, 2001).

In Jordan, the prevalence of smoking in university students ranged from 29.8 to 35% (Khader and Alsadi, 2008; Madanat et al., 2008, 2009). University students are considered the second target of marketing strategies of tobacco companies (Torabi et al., 2002). The effects of promotional campaigns reach all students regardless of gender, age, year in school, university or discipline (Wannamethee et al., 1995; Torabi et al., 2002). The environment of the university offers several possible channels to either discourage or encourage smoking among students (Torabi et al., 2002). Many surveys have been done to identify smoking patterns of this group by studying knowledge, attitudes and practices among university students (Ruff et al., 2000; Seguire and Chalmers, 2000; Rugkasa et al., 2001; Torabi et al., 2002; Vakeflliu et al., 2002; Thomas and Perera, 2006; Subhane et al., 2009) however little is known about that in Jordan. The aims of this study were (1) to explore the knowledge, attitude and practice (KAP) of university students towards smoking in Jordan, (2) to compare the knowledge and attitude of smokers versus non-smokers towards smoking, and (3) to compare the attitude of males and females towards students who smoke.

MATERIALS AND METHODS

Target population and sampling

This study targeted the under graduate students of three universities located in Irbid governorate, Jordan. These were Jordan University of Science and Technology (JUST), Yarmouk University (YU), and Irbid Private University (IPU). Both JUST and YU are public universities. JUST consists of ten undergraduate colleges, some of which in other countries would be considered as post-graduate schools that mainly focus on scientific studies, such as medicine, dentistry, pharmacy and engineering. YU on the other hand consists of 11 undergraduate colleges that concentrate on humanitarian studies. IPU consists of three colleges with both professional and educational specialties. All the three universities enroll students of both genders, and from different socioeconomic levels, diverse backgrounds and geographic regions of Jordan. Students were stratified according to the university, college and then according to the year of study in the college. A stratified weighted random sample was selected from each university.

Study design and instruments

A cross-sectional study design was used to assess smoking patterns among university students. A modified Arabic version questionnaire of the global youth tobacco survey that was designed by the Center for Disease Control (Centers for Disease Control and Prevention, 2002) was used. A pilot test of the data collection instrument was carried out in two medical and engineering classes at JUST. As a result, some appropriate modifications were made, mainly in editing and organization. Some questions were joined in a box to separate them from the others, some words were written in bold and different size to make the questions clear, readable and easy to follow.

Data were entered and analyzed using Statistical Package for Social Sciences (SPSS) version 11 software. The response of the knowledge, attitude and practice questions was dichotomous (yes or no). The comparison between the positive answers to questions in smoker and non-smoker groups, and male and female groups was tested using the Chi-square test.

RESULTS

Demographic data

The total sample size that responded was of 2793 students, representing almost 8.6% of the total enrolled active students in the three universities. Out of the total enrolled students, a sample of 1235 (44.2%), 1204 (43.1%) and 354 (12.7%) students representing JUST, YU and IPU, respectively was selected at random. Male/female students constituting the sample from three universities were 820/415, 760/444 and 230/124, respectively. On an average, the distribution of the sample population based on gender was 64.8% males and 35.2% females. The age range was 18 to 24 years with a median of 22 years. The prevalence rate of smoking in the three university students was 29.3%. It was 41.8% in males and 6.4% in females.

Knowledge

The majority of these students were well aware that smoking causes dangerous diseases (86.7%) and that passive smoking has a negative impact on others (86.9%). Comparison of this knowledge between smokers and non-smokers revealed that there is a significant difference ($P < 0.05$) between the two groups concerning this issue (Table 1). The percentage of smokers who knew that smoking causes dangerous diseases was 75.2%, which was significantly lower than that of non-smokers (91.5%). Also, the percentage of non-smoking students who were aware of the adverse effects of passive smoking on people around smokers was significantly ($P < 0.05$) more (92.4%) than that of students who smoke (73.8%) (Table 1). A high percentage (73.7%) of all the sample students knew that smokers cannot quit smoking easily, but there was no significant difference ($P > 0.05$) between the rates of smokers and non-smokers in regards to knowledge about how smoking can be addicting (Table 1).

Attitude

The attitude of smoking students towards the idea that

Table 1. Knowledge of the adverse effects of smoking among university students in Jordan.

Questionnaire statement	Total[+]	Answered "yes"		Answered "no"	
		N	%	N	%
Smoking causes serious diseases					
Smoker	819	616	75.2	203	24.8
Non-smoker	1970	1803	91.5*	167	8.5
Total	2789	2419	86.7	370	13.3
Passive smoking hurts					
Smoker	816	602	73.8	214	26.2
Non-smoker	1965	1815	92.4*	150	7.6
Total	2781	2417	86.9	364	13.1
Smoker can quit smoking easily					
Smoker	817	223	27.3	594	72.7
Non-smoker	1968	510	25.9	1458	74.1
Total	2785	733	26.3	2052	73.7

N: Number; [+N]Answered the question, *P<0.05.

smoking helps them fit in a group of friends was examined. It was found that students who smoke are more likely to have this attitude (19.0%) as compared to students who do not smoke (10.1%) (P < 0.05) (Table 2). Only 10.4% of the students believed that a smoking female student has more friends than a non-smoking female student. However, the rate of smoking students who believed that a smoking female has more friends (12.8%) was significantly higher (P< 0.05) than that of non-smoking students (9.5%) (Table 2). On the other hand, the rate of students who believed that a smoking male student has more friends than a non-smoking male student was 21.9%. Here however, the rate of non-smoking students that believed a smoking male has more friends (23.6%) was actually higher than that of smoking students (17.9%) (P < 0.05) (Table 2).

A low percentage (6.5%) of students believed that a smoking female student has a strong personality. However, the relationship between being a smoker and believing that a smoking female has a strong personality was found to be significant (P < 0.05) (Table 2); as 11.3% of smoking students believed so, whereas only 4.6% of non-smoking students found that to be true (Table 2). On the other hand, 8.3% of students believed that a smoking male has a strong personality. Here again, there was a significant difference (P < 0.05) between smokers and non-smokers concerning this belief. Smoking students who believed that a smoking male has a strong personality (12.1%) were almost twice as much as non-smokers (6.7%) (Table 2).

With regards to a smoking female being more attractive (to males) by being a smoker, only 9.4% of students believed so as compared to 90.6% who thought the contrary (Table 3). We found that 20.1% of the smokers see that a smoking female is more attractive, while only 5% of non-smokers believed so (P< 0.05) (Table 2). On the other hand, when we assessed the attitude of students towards the idea of a smoking male being more attractive (to females) as a result of smoking, we found that only 12.9% of the students believed so (Table 2). Result also showed that 18.5% of smokers find a smoking male to be more attractive, while only 10.6% of non-smokers share the same thought (P < 0.05) (Table 2).

Students who believed that smoking helps them concentrate while studying represented 20.3% of the participants (Table 2). When comparing the attitude of smokers and non-smokers regarding this issue, we found that there is a significant difference *(*P < 0.05). The rate of smokers who thought that smoking helps them concentrate while studying was 46.9%, while the rate of non-smokers was merely 9.3% (Table 2).

When addressing the attitude of students towards the idea that smoking helps in avoiding obesity, we found a significant difference (P < 0.05) between smokers and non-smokers. Smokers who believed that smoking helps in avoiding obesity were 37.7% as compared to 28.9% of non-smokers (Table 2).

When looking at a suggestion to conjure up a university law that would ban smoking, non-smokers showed a highly supportive attitude towards applying this ban (84.7%), while only one third of the smokers said that they would support such a law (33.4%) (P < 0.05) (Table 2).

When comparing the attitude of students, according to gender, towards personality and attractiveness related to smoking, we found that more males than females believe smoking female to have a stronger personality and are more attractive than non-smoking female (Table 3). On the other hand, more females than males believe that

Table 2. Attitude of university students toward smoking in Jordan.

Questionnaire statement	Total[+]	Answered "yes"		Answered "no"	
		N	%	N	%
Smoking increases ability to fit in a group					
Smoker	815	155	19.0*	660	81.0
Non-smoker	1963	198	10.1	1765	89.9
Total	2778	353	12.7	2425	87.3
Female smoker has more friends					
Smoker	815	104	12.8*	711	87.2
Non-smoker	1963	186	9.5	1777	90.5
Total	2778	290	10.4	2488	89.6
Female smoker has a strong personality					
Smoker	805	91	11.3*	714	88.7
Non-smoker	1963	90	4.6	1873	95.4
Total	2768	181	6.5	2587	93.5
Female smoker is more attractive					
Smoker	811	163	20.1*	648	79.9
Non-smoker	1964	99	5	1865	95
Total	2775	262	9.4	2413	90.6
5-Male smoker has more friends					
Smoker	816	146	17.9	670	82.1
Non-smoker	1967	464	23.6*	1503	76.4
Total	2788	610	21.9	2173	78.1
Male smoker has a strong personality					
Smoker	817	99	12.1*	718	87.9
Non-smoker	1960	132	6.7	1828	93.3
Total	2777	231	8.3	2546	91.7
Male smoker is more attractive					
Smoker	817	151	18.5*	666	81.5
Non-smoker	1969	209	10.6	1760	89.4
Total	2786	360	12.9	2426	87.1
Smoking helps student concentrate while studying					
Smoker	819	384	46.9*	435	53.1
Non-smoker	1973	183	9.3	1790	90.7
Total	2792	567	20.3	2225	79.7
Smoking helps in avoiding obesity					
Smoker	819	309	37.7*	510	62.3
Non-smoker	1974	570	28.9	1404	71.1
Total	2793	879	31.5	1914	68.5
Agree to apply university law to ban smoking					
Smoker	1696	1667	84.7*	302	15.3
Non-smoker	811	271	33.4	540	66.6
Total	2780	1938	69.7	842	30.3

N: Number; [+N]Answered the question, *P<0.05.

Table 3. Attitude of university students towards smokers according to sex

Questionnaire statement	Total Average N = 2778[+]		Male Average N = 1800		Female Average N = 978	
	Answered yes		Answered yes		Answered yes	
	N	%[++]	N	%[++]	N	%[++]
Female student smoker has a strong personality	181	6.5	136	7.6*	45	4.6
Male student smoker has a strong personality	231	8.3	148	8.2	83	8.5
Female student smoker is more attractive	262	9.4	219	12.2*	43	4.4
Male student smoker is more attractive	360	13.0	209	11.6	151	15.4*

N: Number; [+]Average N responded to the question; [++]Calculated from average responded N; *P<0.05.

smoking males to be more attractive, but there was no difference between males and females in relation to thinking that a smoking male has a strong personality (Table 3).

Practice

Study result showed that majority of smoking students (79.3%) smoke 5 to 7 days per week. There is a significant relationship (P< 0.05) between when a smoking student first started smoking and the number of days he/she smokes per week. Smokers who started smoking before enrollment in a university usually smoke 5 to 7 days per week (83.6%), while those smokers who started smoking after being enrolled have a significantly (P < 0.05) lower rate (68%) of smoking per week (Table 4). There is also a significant relationship (P < 0.05) between the number of cigarettes smoked per day and the time a smoking student first started smoking (Table 4). We found that students who started smoking before enrollment in a university consume significantly (P< 0.05) larger number of cigarettes as compared to students who started smoking after enrollment (Table 4). It was found out that only 39.2% of those who started smoking before enrolling in a university were relatively light smokers (1 to 15 cigarettes/day), while 63.2% of smokers who started smoking after enrollment in the university was light smokers. On the other hand, the prevalence rates of heavy smokers (≥ 16 cigarettes/day) among students who started smoking before and after enrollment in a university were 60.8 and 36.8%, respectively (Table 4).

The rate of students who smoke local brands of cigarettes (61.4%) was higher than those who smoke imported brands (38.6%). This issue is gender related, as there is a significant difference (P< 0.05) between males and females regarding the brand of cigarettes they smoke (Table 4). The rates of male and female students who smoke local cigarettes were 63.7 and 33.9%, respectively. On the other hand smoking females recorded a significantly (P < 0.05) higher percentage of smoking imported cigarettes (66.1%) as compared to smoking males (36.3%) (Table 4). About 53.8% of smoking students used other forms of tobacco products such as a hookah (also known locally as “shisha” or “argilah” and in other countries as “nargile” (Table 4). There is no significant difference (P > 0.05) between males and females concerning this issue. The percentages of smokers who used other forms of tobacco products were 63.5% for smoking females and 53% for male smokers (Table 4). More than half of the student smokers (58.1%) have the desire to quit smoking. There is a significant difference (P < 0.05) between males and females concerning this issue. Smoking Males who wanted to quit were 59.9%, while smoking females who had the same desire were 36.5% (Table 4).

Smoking has a heavy impact on the economic status of the students, since a smoking student spends on average 38.6% of his/her monthly allowance on smoking. This may have a negative impact on other aspects of the students’ life that requires finances.

DISCUSSION

The prevalence of smoking in university students (29.3%) is in accordance with other studies in Jordan (Khader and Alsadi, 2008; Madanat et al., 2008, 2009). We have explored important factors related to knowledge, attitude and practice of university students towards smoking. Most of the university students, regardless of their smoking status, have good knowledge about the harmful effects of smoking. However, we showed that smoking students have a lesser extent of that knowledge than non-smoking students. This might be explained by the fact that smokers in part experience self-denial towards such information and/or seriously underestimate the rates of future complications and death associated with smoking as long as they are feeling healthy. Similar results are also found in university students in both developing and developed countries (Wechsler et al., 1998; Ruff et al., 2000; Seguire and Chalmers, 2000).

Most of the students believe that smoking females do not have more friends; a similar result was also found in other studies (Abdullah and Husten, 2004). The rate of smokers who believed that smoking females have more

Table 4. Smoking practice of university students in Jordan.

Time students started smoking	Number of days student smoked last week				
	Total	1 - 4		5 - 7	
	N	N	%	N	%
Before enrollment in a university	587	96	16.4	491	83.6*
After enrollment in a university	228	73	32.0	155	68.0
Total	815	169	20.7	646	79.3

Time students started smoking	Number of cigarettes smoked per day				
	Total	1 - 15		≥16	
	N	N	%	N	%
Before enrollment in a university	587	230	39.2	357	60.8*
After enrollment in a university	228	144	63.2	84	36.8
Total	815	374	45.9	441	54.1

Gender of smoker	Brand of cigarettes smoked				
	Total	Local		Imported	
	N	N	%	N	%
Male	754	780	63.7 *	274	36.3
Female	62	21	33.9	41	66.1*
Total	816	501	61.4	315	38.6

Gender of smoker	Smoker uses other form(s) of tobacco				
	Total	Yes		No	
	N	N	%	N	%
Male	753	399	53.0	354	47.0
Female	63	40	63.5	23	36.5
Total	816	439	53.8	377	46.2

Gender of smoker	Student wants to quit smoking				
	Total	Yes		No	
	N	N	%	N	%
Male	753	451	59.9*	302	40.1
Female	63	23	36.5	40	63.5
Total	816	474	58.1	342	41.9

N: Number; *P < 0.05.

friends was more than that of non-smokers. This may be because smokers tend to gather together. One study (Seguire and Chalmers, 2000) said that smokers are perceived as friendly approachable people who had a common interest.

Some smokers thought that smoking helps them fit in with their peers; this was more pronounced among females. This may be because they feel that they are more accepted as smokers within their friends who are in most cases smokers as well. A study done by Seguire and Chalmers (2000) proposed that this may be due to the feeling of insecurity in social situations, and that one way to get rid of this feeling is to smoke so as to get an immediate connection with the group as every one is smoking. Gaining peers acceptance and sense of identity can easily be acquired by smoking (Seguire and Chalmers, 2000).

Only 6.6% of the students believe that a smoking females has a strong personality, so smoking female who think the opposite are mistaken and misguided. We also revealed that males are more likely to believe that a smoking female has a strong personality. This may be because they might think that she broke social barriers and common expectations by becoming a smoker. It is normal for smokers to support this attitude, because they are supporting themselves. It is worth mentioning, that the community in Jordan traditionally looks down at the idea of a smoking female. On the other hand, there was no difference among males and females regarding the idea that a smoking male has a strong personality,

because there is no social barrier to be broken; it is just accepted for males to smoke.

Prior studies reported that students in general see smokers as being unattractive (Biasco and Hartnett, 2002; Vakeflliu et al., 2002). We proved the same attitude, since majority of these students do not see smokers, whether being females or males, as being attractive. However, the idea that smoking is attractive was found to be truer for the opposite gender. In other words, it was found out that more males than females see the smoking female as attractive and more females than males see the smoking male as attractive. This factor alone is enough for many students to justify smoking especially in communities where friendship between male and female is very strict and limited.

About half the smokers believe that smoking helps them concentrate while studying. Student's grades and passing university examinations are some of the most important factors in building their future careers at this stage of a student's life. In other words, the core of the student's focus is to succeed and obtain high grades. They may take the risk of smoking for the sake of concentrating while studying. This negative attitude might be the most important factor to be considered in any smoking control program for university students. This wrong attitude and belief is contrary to the scientific fact that some of the substances included in cigarettes cause confusion and cognitive modifications (Lecacheux et al., 2009). In addition and in other studies, they found that smoking affects cognitive function and reduces mental performance in the long run, also the first direct biological evidence that smoking destroys brain cells has been proven (Richards et al., 2003). When the student smokes a cigarette, he will not be distracted by thinking of the next one, so a part of this belief may be psychological. Therefore, correcting this wrong attitude of "smoking helps me concentrate while studying" should be highly concentrated on in any smoking control program.

Smokers recorded the highest percentages in regards to the belief that smoking helps in avoiding obesity as compared to non-smokers. The relationship between smoking and body weight is complicated. Some studies revealed that smoking might cause irregularities in nutrient intake due to the enzymatic effects of smoking. Another suggestion was that smoking changes the taste in a smoker's mouth, which in turn leads to difference in dietary intake (Dallongeville et al., 1998). One might ask, is smoking the right way to control obesity?

Smokers showed a negative attitude toward applying university laws that would ban smoking because they do not want to be restricted. On the other hand, non-smokers showed a positive attitude toward such laws. This is most likely because non-smokers are annoyed by the smell of burning cigarettes and smoke and/or they do not want to be exposed to the effects of second hand smoke. Prior studies found that although students view smoking as harmful, they do not want more restrictions by law (Biasco and Hartnett, 2002).

We found out that the number of cigarettes smoked per day is associated with the time the student first started smoking. The students who start to smoke before enrollment in a university usually smoke more cigarettes than those who start after being enrolled. This can be explained by the fact that smokers are becoming more addicted to nicotine.

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