Respiratory Symptoms, Knowledge and Attitude among Male Smoker Students in Mutah University, Jordan

Nedal Alnawaiseh¹, Arwa Rawashdeh², Samar Salahat³ and Salma Ajarmeh⁴

¹Departement of Public Health, Faculty of Medicine, Mutah University, Jordan.
²Departement of Physiology and Pathology, Faculty of Medicine, Mutah University, Jordan.
³Departement of nursery, Faculty of Karak College, Al-Balqa' Applied University, Jordan.
⁴Departement of pediatrics, Faculty of Medicine, Mutah University, Jordan.

Smoking phenomenon has become one of the leading public health burdens. Smoking prevalence among university students in Jordan was unexpectedly elevated, with a lot of serious respiratory consequences like respiratory symptoms, diseases and lung function impairment. The chief purpose of this study was to assess the adverse respiratory health impact of smoking, also to evaluate student's attitudes toward and knowledge about smoking habit among Mutah university male students. A cross sectional design was chosen. Using a randomly selected, cluster sampling technique at Mutah University students including all colleges and levels, the total participants were 204 male students (Jordanian). A per-designed questionnaire was used to collect information adopted from Global Adult Tobacco Survey (GATS), and anthropometrics measurements and lung function indices following the standard recommendations (ATS). Health indicators were calculated. Data were analyzed using SPSS (ver.22). A higher, shocking prevalence was identified (71%); adverse respiratory health effects were noticed, in addition to pulmonary function tests impairments, other important findings were poor knowledge of the study participants about smoking hazards, and positive attitude toward smoking. The smoking rate among male university students was very high; nevertheless most of them have short duration of smoking the respiratory health impact was noticed. Most of current smokers (male students) have the desire to quit smoking. Antismoking campaign was highly recommended among Jordanian university students In order to encourage a smoking free life style, additionally leisure time activities should be incorporated.

Keywords: Smoking, Respiratory, Attitude, Knowledge, University Students, Jordan.

More than 7 million people killed annually due to smoking, which represent about 50% of tobacco users, about 6 million of them killed due to direct effect of voluntary smoking or tobacco use; while about 900 000 are due the environmental tobacco smoking (ETS) as a result of involuntary or second-hand smoking among non-smokers. About 80% of smokers all over the world are living in low and middle income countries. Along with smokers who are cognizant of the risks of tobacco, most of them want to give up. Medication and counseling can duplicate the successful probability to quit smoking. [1] A Cigarette smoke has been predicted to cause the deaths of 10 million per year by 2020, it contain more than 3000 chemical substances, and most of them have been found to be cancerous substances, so smoking a cigarette with this in mind is like intentional suicide.

The most common substances in cigarette like carbon monoxide, nicotine, ammonia,

formic acid, hydrogen cyanide, nitrous oxide, formaldehyde, phenol and arsenic are considered as highly toxic and carcinogenic substances. [2] In addition to that, the International Agency for Research on Cancer (IARC) demonstrates the tumorigenic effect of chemical compounds in tobacco smoke with sufficient evidence to initiate carcinogenicity in laboratory animals and humans. [3,4]

The International Agency for Research on Cancer (IARC) has classified a number of constituents of tobacco smoke as carcinogenic; IARC classifies substances into four categories, based on an extensive evaluation of the evidence that is carried out separately for animals and humans. Among the several constituents of tobacco smoke, there are twenty carcinogens credibly cause pulmonary cancer in laboratory animals or humans and likely to be implicated in lung cancer initiation like (polycyclic aromatic hydrocarbons and the tobacco-specific nitrosamine 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone). [5]

Tobacco smoke contains compounds established as irritants, toxins, mutagens, and carcinogens. The major irritants identified in environmental tobacco smoke (ETS) are respirable particulates, certain aldehydes, and phenol, ammonia, toluene, sulfur dioxide, and nitrogen oxides. Tobacco smoke is composed of gases and particulate matter. The gases include numerous organic solvents, which are known to incite a wide range of central nervous system damage. However, if manifestation of many solvents linked to neurotoxic effects at low concentrations; there is no basis to neglect these effects when released as a part of collective doses of cigarette smoke. [6] Indeed, there have been some inferences from the texts which link daily exposures to parental smoking and learning difficulties among their children. [7]

Smokers who continue to smoke live shorter than those who quit; and the smokers who quit early will get the greater health benefit. Also, risk of dying from smoking-related diseases reduced upon early quitting smoking. [2]

Number of years a person smoked, the number of cigarettes smoked per day, and the age at which start smoking would determine the magnitude of risk reduction, like stop smoking before the age of 35 reduce the related risk by 90%.

[2] Tobacco-related diseases could be significantly reduced even for smokers who quit before the age of fifty. [8]

The effect of nicotine to reduce the stress seems to be deceiving or false sensation rather than a real effect, as a result of dopamine release by the effect of nicotine stimulation which provides the enjoyable feelings, so when the blood nicotine level decrease they start to desire for smoking. [9]

Cigarette Smoking stills the main cause of avoidable death in Europe. Tobacco industries encourage the marketing and promotion tactic of the tobacco utilization which further increase the morbidity and mortality related to tobacco products, and unfortunately young people of school age was their main target, as many studies revealed that about 90 percent start smoking before the age of twenty and around 60% of smokers starts their smoking before the age of 13. Children and adolescents should have the priority in the prevention strategy and recommendations. [10] Therefore, for tackling and combating this dilemma the community and principally parents should have the correct and proper knowledge which include many items, especially what the tobacco manufacturing is doing to target our teen and what programs are available in your community to prevent or help stop teen smoking, and know how to participate and taking an active role in our teen's life, in addition to encourage teens to participate in school sports, while Keeping an honest and open dialogue regarding this problem. [10]

Rationale

More data and information needed about the real figures about tobacco use primarily among university students, whereas fighting smoking is more difficult than drugs. As, trading with drugs is forbidden, while production of cigarettes is permissible, which makes smoking more complicated to control, so intensified efforts to control its use are highly needed.

Purpose

The main objective of this study was to assess the magnitude of smoking habit among Jordanian university students, and to evaluate the adverse respiratory health impact of smoking, also to evaluate student's attitudes toward and knowledge about smoking habit among Mutah university male students.

METHODS

A predesigned, recoded self-administered questionnaire was used in a randomly selected, cluster sampling technique at Mutah University students including all colleges and levels, the total participants were 204 male students (Jordanian).

Questionnaire including information about family, socio-demographic and environmental state, also information about history of respiratory symptoms, diseases and health conditions were collected. The questionnaire contains multiple questions about attitude towards smoking habit and their knowledge about carcinogenic effect of cigarettes.

The questionnaire also includes anthropometric measurement (height, weight) and pulmonary function tests (FVC, FEV1, FEV1%, PEFR, FEF25-75, FEF75, FEF50 and FEF25) following the standard recommendations by (ATS). [11] The used questionnaire was adopted from Global Adult Tobacco Survey (GATS). [12] Data were collected using GATS in Arabic language (with an acceptable validity and reliability).

The questionnaire items were translated into Arabic language by a local bilingual translator, who subsequently translated the responses into English language for data processing and analysis. Health indicators were calculated.

Data were analyzed using SPSS (ver.22). [13] A smoker defined as a student who smoked cigarettes on 1 or more of the 30 days preceding the survey. [14]

RESULTS

The total participants were 204 male students, their mean age was 21.3±2 years (17-34 years old), their mean age at starting smoking was 16.6±2.5 years, they smoke 23.2 cigarettes per day, and most of them pay about 29.3 JD per month (Table 1).

Overall prevalence of current smoking was 51%. However, Smoking Status (current, irregular and ex-smokers) was 71.1%, smoking prevalence among their fathers and mothers were 38.2% and 5.4%, respectively.

The prevalence of chronic cough, phlegm and chest wheeze were 50%, 47.1%, and 27%, respectively, as shown in Table 2.

Chronic cough (50%) and chronic phlegm (47.1%) were higher among current smokers compared to nonsmokers, chronic cough was significantly associated with the smoking status with $\div^2 = 10.51$, p-value = 0.001, also chronic phlegm was significantly associated with the smoking status with $\div^2 = 9.12$, p-value = 0.003.

Table 3 showed that; there was no significant difference in the mean age, height, and weight between smokers and nonsmokers. However, regarding pulmonary function tests the mean values of FEV1% and FEF25 were significantly lower among smokers, and there was a statistically significant difference in FEV1% and FEF25 with t-test 3.7 and 4.1, respectively (p-value <0.05).

Regarding students' attitudes; Table 4 portrayed that the first attempt of smoking was tried with school friends (32.4%); and 65.2% of them hesitating to quit smoking because of its side effects, about 36% of smokers were encouraged by old smokers, the majority of our target students became smokers as their first attempt initiated by just trying smoking (42.2%), clothes smell bad by smoking habit recorded by 86.6% of students. Smoking gives confidence, reduce weight, improve mode and calming persons were reported by 25.5%, 57.4%, 56.4%, and 63.2%, respectively. 52% of the smokers are willing to quit smoking, and about 45% tried to quit in the past as shown in Table 4.

Regarding students' knowledge about smoking; Table 5 revealed that about half of the participants get health education sessions about smoking and about 92% of participants recognize that nicotine content of cigarettes can cause addiction, however, regarding their knowledge about carcinogenic content of cigarettes only 35% agree with nicotine and 23% with tar contents. The majority of students don't know about the presence of zinc, hydrogen, lead and cyanide in cigarettes. Moreover, 24.5% of the students don't know about the carcinogenic effects of cigarettes smoking.

DISCUSSION

The prevalence of current smoking was 51%, yet smoking status prevalence as (current, irregular and ex-smokers) was 71.1%, and these scary figures need more strategies and vigilant techniques to overcome this life threatening hazard.

Table 1. Socio-demographic and smoking habit related characteristics

	Age	Age at starting (year)	Number of cigarette	Cost of smoking/ month	Weight (kg)	Height (cm)
Mean	21.3	16.6	23.2	29.3	70.3	174.8
STD	2.0	2.5	11.0	16.9	11.5	6.6

STD: Standard Deviation

Table 2. Smoking status and adverse respiratory health occurrences

Variables	n	%
Current smokers	104	51.0
Nonsmoker	59	28.9
Smoking Status (current, irregular and ex-smokers)	145	71.1
Chronic cough	102	50.0
Chronic phlegm	96	47.1
Dyspnoea and chest wheeze	55	27.0
Treatment for asthma	10	4.9

However, a low figure was recorded in another study in the adult population of Jordan; which revealed that smoking prevalence was 54.9 % among males and 8.3 % among females for all smoking types (cigarettes, cigar and hookah). [15]

A surveillance summary of smoking in Jordan also, noticed some high figures of smoking prevalence (50%), and nearly 40% of all adults aged 25 years or older reported having smoked at least 100 cigarettes during their lifetime but still low compared to high figures among Mutah university student. [16]

Table 3. Independent sample t-test of the mean difference of FEV1% and FEF25

	Smoking Status	Mean±st.d	t-test	p-value
Age	Smoker	21.4±2.1	1.19	0.235
	Non-Smoker	21.2±1.6		
Height	Smoker	175.5±6.2	1.32	0.223
	Non-Smoker	173.9±7.1		
Weight	Smoker	71.1±11.2	1.72	0.172
	Non-Smoker	68.9±12.1		
*FEV1%	Smoker	91.5±21.3	3.7	0.045
	Non-Smoker	93.3±22.2		
**FEF25	Smoker	3.8±1.1	4.1	0.042
	Non-Smoker	4.2±1.3		

*FEV1%: Forced vital capacity in one second, *FEF25: Maximum flow rate at 25% of FVC

A study done among University students in Jordan revealed that cigarette smoking rates were 29% in the past 30 days and 57% ever. [17] The reported prevalence of current smoking among a previous study in university students in north Jordan was 35.0% (56.9% for males and 11.4% for females), increased prevalence of smoking among university students in Jordan was noticed among males with lower educational attainment and elevated income, and higher numbers of friends who smoke. [18]

A study done in Jordan University of Science and Technology (JUST) revealed that that the prevalence of smoking was 50.2% among male students, and consistent with our results regarding the main source of the first smoking attempts which was attributed to their friends rather than their families. Also, in the same study; the main benefit

Table 4. Participant's attitudes toward smoking

	n	%
First attempt of smoking:·		
• Alone	31	15.2
• School friends	66	32.4
• Other friends	42	20.6
• Brother, sister and parents	6	3.0
Quitting smoking is difficult	133	65.2
because of its side effects		
Big smokers encourage young ones	74	36.3
Smoking makes clothes smell bad	177	86.8
Smoking gives confidence	52	25.5
Smoking reduce weight	117	57.4
Smoking improve mode	115	56.4
Smoking calm persons	129	63.2
What made you smoke (trying smoking)	86	42.2
Want to quit smoking	106	52.0
Tried to quit	92	45.1

Table 5. Participants' basic knowledge about smoking

	n	%
Health education about smoking	110	53.9
Substance cause addiction		
• Nicotine	188	92.2
• Tar	8	3.9
• CO	1	.5
• Don't no	7	3.4
Substance cause cancer		
• Nicotine	72	35.3
• Tar	47	23.0
• Co	35	17.2
Presence of zinc in cigarettes	65	31.8
Presence of hydrogen in cigarettes	88	43.1
Presence of lead in cigarettes	80	39.2
presence of cyanide in cigarettes	53	25.9
Don't no	50	24.5

of smoking for males was calming down, and about 66% of smokers intended to quit smoking in the future (52%) which is higher than our rate of the readiness to quit smoking in the future. [19]

A research done in 2007 about male college students in Karachi, Pakistan, revealed that students who have smoker friends were more likely to smoke compared to non-smokers (adjusted OR = 4.8; 95% CI: 3.1 - 7.4). [20]

In regards to students knowledge and attitude toward smoking; it's worth mention that even Jordanian nurses and physicians do not be aware of the addictive characteristic of smoking, and health team receive no official training in smoking cessation course to use with patients. Although, most nurses and physicians recognize that University curriculum must contain information related to smoking quitting. [21]

Older students were more likely to quit smoking before graduation if they decreased the quantity of smoking since their coming to university. [22] Tobacco clients were remarkably less encouraging to rigid control and policy measures than never tobacco users and had less information of some of the health effects of tobacco use.

Regarding students' knowledge about smoking; about half of the participants have health education about smoking, and most of participants knew that nicotine content of cigarettes can cause addiction; however, regarding their knowledge about carcinogenic content of cigarettes was remarkably low, and the majority of students don't know about the presence of many heavy metals and carcinogenic and mutagenic substances.

Consequently, health education interventions mostly needed and able to have a helpful influence on student behavior, particularly reducing tobacco use among college students, and increasing tolerability of smoking policies and campus limits among both tobacco users and nonusers. On the other hand, About one half of smokers have an unwise belief that smoking helps focusing while studying and about 38% believe that smoking reduce obesity. Students smoke not because they lack the knowledge about the risk of smoking but due to wrong beliefs and attitudes. [23,24]

CONCLUSIONS

The prevalence of smoking among male university students was very high; respiratory health impact was noticed, chronic cough and chronic phlegm were significantly associated with smoking status. Additionally, low values of pulmonary indices like FEV1% and FEF25 were noticed and significantly lower among smokers.

The first attempt of smoking was tried with school friends and most of them hesitating to quit smoking because of its side effects, also the majority of smokers were encouraged by old

smokers, misguided belief that smoking gives confidence, reduce weight, improve mode and calming persons were reported by the majority of smokers.

The majority of smoking students are willing to quit smoking, and most of them tried to quit in the past. Generally, most of our target students have appositive attitude toward smoking, but with a little knowledge.

Translation to Health Education Practice

School and university students have to be concerned more regarding health education about smoking and its adverse health impact, also highlighting the importance and effectiveness of the family and community role in preventing smoking, and to help smokers to quit smoking as early as possible. Implementation of legislation concerning smoking in public places, developing new methods in health education to recognize teenagers about smoking and its social, economical, environmental, and health consequences, establish smoking-quitting specialized clinics.

Intervention programs should be prepared and implemented by the related community sectors. Antismoking campaign was highly recommended among Jordanian university students In order to encourage a smoking free life style, additionally leisure time activities should be incorporated.

On the other hand, behavioral change among individuals' patients or providers is innate in the translation practice; so commitment of health care systems and stakeholder organizations is essential to attain helpful translation and continual improvements.

Specific health education courses and training programs should be designed to develop these competencies to adapt a model framework to support new healthy translation development of medical evidence into practice, policy, and public health improvements and interventions that can have a considerable effect on health. However, challenges with translation are possibly best exemplified by the finding that spreading of practice element rarely changes practice. [25]

An important component of the cause for the slow translation of study findings into practice in the health promotion discipline is lack of awareness to matter of generalization and factors that potentially limit the strength of interventions. [26]

Male university students have better knowledge and positive manner toward smoking; still this knowledge and attitude do not inevitably translate into health behavioral outcome i.e. not smoking. In a previous study about the educational differences in healthy behavior changes among middle-aged Americans which indicate that no significant correlation between the educational level and quitting smoking, and give an idea about the effect of education on the smoking-related knowledge, attitude and practice among adults male smokers, possibly enhanced education might improved understand health information, and translating health information into action, however, this knowledge and attitude did not necessarily translate into health behavioral outcomes, therefore attention should be directed to the high education level of smokers as well as low educational level. [27,28]

REFERENCES

1. WHO, Tobacco. (online) http://www.who.int/en/news-room/fact-sheets/detail/tobacco. Published March 9, 2008. Accessed April 21, 2018.
2. www.members.tripod.com. Facts on smoking that you never hear about (online).
3. Hoffmann D, Hecht SS. Advances in tobacco carcinogenesis. In: Cooper CS, Grover PL, eds. *Heidelberg: Springer-Verlag.*: 63-102 (1990). *Handbook of Experimental Pharmacology.*
4. www.brown -and-williamson.com (online).
5. Hecht SS. Tobacco smoke carcinogens and lung cancer. *J Natl Cancer Inst.*; **91**(14):1194-1210 (1999). doi:10.1093/jnci/91.14.1194.
6. www.cdc.gov/TOBACCO/sgr/sgr_1986/SGR1986-Chapter5.pdf.
7. http://www.umanitoba.ca/faculties/dentistry/oral_biology/research/journal/online/constituents_3.html (online).
8. http://www.tobacco.org/resources/history/1book (online).
9. Jarvis MJ, Wardle J. Social patterning of individual health behaviours: the case of cigarette smoking. In: Marmot M, Wilkinson RG, eds. *Social Determinants of Health.* Oxford: Oxford University Press; (2005).
10. https://www.teenhelp.com/smoking-tobacco/teen-smoking-statistics/(online)
11. Ferris BG. Standardization Project: II. Recommended respiratory disease questionnaires for use with adults and children in epidemiological research. *Am Rev Respir Dis.*; **118**:7-52 (1978).

12. WHO, Tobacco Free Initiative (TFI). (online). http://www.who.int/tobacco/surveillance/survey/gats/ind/en/.

13. SPSS Inc. SPSS Base [computer software]. Version 22.0 for Windows User's Guide. Chicago IL; 2018. https://www.ibm.com/analytics/spss-statistics-software (online).

14. https://www.cdc.gov/tobacco/data_statistics/tables/trends/cig_smoking/(online).

15. Jaghbir M, Shreif S, Ahram M. Pattern of cigarette and waterpipe smoking in the adult population of Jordan. *East Mediterr Health J*.; **20**(9):529-537 (2014). doi:10.26719/2014.20.9.529.

16. Belbeisi A, Al Nsour M, Batieha A, Brown DW, Walke HT. A surveillance summary of smoking and review of tobacco control in Jordan. *Global Health*.; **5**(1):18 (2009). doi:10.1186/1744-8603-5-18.

17. Khabour OF, Alzoubi KH, Eissenberg T, et al. Waterpipe tobacco and cigarette smoking among university students in Jordan. *Int J Tuberc Lung Dis*.; **16**(7):986-992 (2012). doi:10.5588/ijtld.11.0764.

18. Khader YS, Alsadi AA. Smoking habits among university students in Jordan: prevalence and associated factors. *East Mediterr Health J*.; **14**(4):897-904 (2008).

19. Haddad LG, Malak MZ. Smoking habits and attitudes towards smoking among university students in Jordan. *Int J Nurs Stud*.; **39**(8):793-802 (2002). doi:10.1016/S0020-7489(02)00016-0.

20. Rozi S, Butt ZA, Akhtar S. Correlates of cigarette smoking among male college students in Karachi, Pakistan. *BMC Public Health*.; **7**(1):312 (2007). doi:10.1186/1471-2458-7-312.

21. Shishani K, Nawafleh H, Sivarajan Froelicher E. Jordanian nurses' and physicians' learning needs for promoting smoking cessation. *Prog Cardiovasc Nurs*.; **23**(2):79-83 (2008). doi:10.1111/j.1751-7117.2008.07745.x.

22. Harris JB, Schwartz SM, Thompson B. Characteristics associated with self-identification as a regular smoker and desire to quit among college students who smoke cigarettes. *Nicotine Tob Res*.; **10**(1):69-76 (2008). doi:10.1080/14622200701704202.

23. Labib Sharif1, Abeer Qandil and Ahmed Alkafajei. Knowledge, attitude and practice of university students towards smoking in Irbid, Jordan. *J Public Health Epidemiol*.; **5**(1):29-36 (2013). doi:10.5897/JPHE12.070.

24. Murphy-Hoefer R, Griffith R, Pederson LL, Crossett L, Iyer SR, Hiller MD. A review of interventions to reduce tobacco use in colleges and universities. *Am J Prev Med*.; **28**(2):188-200 (2005). doi:10.1016/j.amepre.2004.10.015.

25. Glasgow RE, Lichtenstein E, Marcus AC. Why don't we see more translation of health promotion research to practice? Rethinking the efficacy-to-effectiveness transition. *Am J Public Health*.; **93**(8):1261-1267 (2003). doi:10.2105/AJPH.93.8.1261.

26. Green LM, Kreuter MW. *Health Promotion Planning: An Educational and Ecological Approach*. 3rd ed. Mountain View, Calif: Mayfield Publishing Co; (1999).

27. Margolis R. Educational differences in healthy behavior changes and adherence among middle-aged Americans. *J Health Soc Behav*.; **54**(3):353-368 (2013). doi:10.1177/0022146513489312.

28. Ockene JK, Emmons KM, Mermelstein RJ, et al. Relapse and maintenance issues for smoking cessation. *Health Psychol*.; **19**(1S):17-31 (2000). doi:10.1037/0278-6133.19.Suppl1.17