

## RESEARCH ARTICLE

# Psychological Problems and Psychosocial Predictors of Cigarette Smoking Behavior among Undergraduate Students in Malaysia

Coumaravelou Saravanan\*, Imran Heidhy

### Abstract

**Background:** Cigarette smokers have their own motivation and justification to smoke. For example, smoking reduces their stress or enhances their pleasure. This study aimed to identify the (a) prevalence of cigarette smokers among undergraduates in Malaysia, (b) gender differences in nicotine dependence among current smokers, (c) differences in psychological problems (depression, anxiety and stress) based on the status of smoking cigarettes (current, former and non-smokers) and (d) extent to which precipitating factors (tension reduction, addiction, automatism, handling, social interaction, pleasure, and stimulation) predict the smoking behavior among current smokers. **Materials and Methods:** In this study 780 undergraduate students participated from a private university in Kuala Lumpur and Selangor state in Malaysia. The Depression, Stress and Anxiety Scale, Modified Reason for Smoking Scale and Fagerstrom Nicotine Dependence Test were used to measure psychological problems, predictors of smoking behavior and nicotine dependency among current smokers. **Results:** The results showed that 14.7% (n=106) of the students were smokers. Current smokers exhibited more psychological problems (depression, anxiety and stress) compared to former and non-smokers. Addiction, tension reduction, pleasure and automatism were predictors of smoking behavior among the current smoking students. Step wise regression analysis showed that smoking behavior was highly predicted by nicotine dependency or addiction. Smoking students were motivated to smoke cigarettes as they believed that it reduced their tension and enhance pleasure. **Conclusions:** Hence, there is a need for health promotion and anti-tobacco prevention as cigarette smokers experience more psychological problems. Nicotine dependency or addition was one of the major causes for smoking behavior among the student population in Malaysia.

**Keywords:** Psychological problems - smoking - prevalence - precipitating factors

*Asian Pac J Cancer Prev*, 15 (18), 7629-7634

### Introduction

Cigarette smoking behavior are defined as actively smoking one or more manufactured or hand rolled cigarettes with the intention to inhale the tobacco smoke (Statistic New Zealand, 2013). An estimated of 10000 death in Malaysia were associated to the smoking related illness annually (International Tobacco Control Malaysia, 2012). The prevalence of smoking cigarettes among men was 46.4% and women 1.6% in Malaysia (International Tobacco Control Malaysia, 2012). In addition, Global Adult Tobacco Survey Malaysia (GATS) identified that out of 4250 participants, 32.5% of them were students aged from 15 to 24 years and 54.9% of adult aged from 25 to 44 years were smokers in Malaysia (Center for Disease Control and Prevention, 2012). This indicates cigarette smoking is considered as one of the major problem among the students population. Most of the smokers don't believe that smoking cause serious illness and smokers think that

smoking reduces their psychological distress than non-smokers in Malaysia (Center for Disease Control and Prevention, 2012; Zawahir et al., 2013). Hence, there is a need to study the prevalence and precipitation factor of cigarette smoking among students in Malaysia.

Gender is one of an important determinant of smoking behavior among students (Kamal et al., 2011). The prevalence of smoking cigarette is higher among male students compare with female students from German, Italy and Spain pursuing their studies in Europe (Torre et al., 2012) and US students studying in US (Costa et al., 2007). On the other hand, female student from Poland smokes more cigarettes compare to the male students in Europe (Torre et al., 2012). Lim 2013 (Lim et al., 2013) identified that 59.3% of male aged from 21 to 30 smokes cigarettes compared to the other age groups in Malaysia. The prevalence of smoking was higher among male (41.2%) than female (17.5%) in one of the private university in Malaysia (Al-Naggar et al., 2013). There may

be many female smokers as like male in Asian countries, but female smokers from Asian countries are reluctant to admit to the researchers that they are smokers (Zawahir et al., 2013). Whether previous researchers had approached the female students while they were smoking cigarettes by female researcher to participate in their study is questionable. Hence, the present study female researcher aimed to approach female smokers during smoking to avoid the female smokers' bias to respond that they are non-smokers. Consequently, this type of approach would increase the internal validity of the responses from the female participants in Malaysia.

One of the factors determining smoking behavior is psychological distress. Depression, anxiety and stress are the major psychological distress experienced by students (Saravanan and Wilks, 2014). Smoking behavior and psychological problems (depression, stress and anxiety) are highly correlated (Mykletun et al., 2008; Pasco et al., 2008; Boden et al., 2010). The prevalence of smoking cigarettes among those with mental illness is between 38 to 98 percent as being compared to the general population which is 19.8 percent (U.S. Department of Health and Human Services, 2010). Smokers have an assumption and believe that smoking cigarette alleviates the symptoms of psychological distress, but smokers do not realize smoking leads to nicotine dependency and adversely affect their health (Mental Health Foundation, 2007). On the other hand, researchers found that cigarette smoking increases the risk of depressive and anxiety symptoms (Boden et al., 2010; Munafo and Araya, 2010). Previous studies identified that former smoker have a decreased risk of depression compare to the current smokers, where else the male former smoker have the same risk of depression compare to the non-smokers (Madsen et al., 2011). These previous studies had been conducted on adult in overseas but not on students. There is a need to study the differences in psychological problems among smokers, former and non-smokers and also how psychological problems predict the smoking behavior among students population

Smokers have their own reasons and motives to continue smoking cigarette. Fidler and West (2009) found that 50.7% of 1081 current smokers reported that they smoke cigarette for enjoyment and 47.2% of 1006 current smokers reported that they smoke cigarette to cope with stress. Further smokers assume that they feel proud to say others that they are smokers, smoking helps them to socialize while older smokers and some think smoking reduces their mental pain relief (Fidler and West, 2009). Smokers have various motivations to smoke cigarette. For example, smoking cigarettes reduce their tension, relax their mood and stimulate their pleasure (Souza et al., 2010). However, very limited studies have been done to explore few precipitating factors contribute for smoking cigarette among college students. For example, most of the students reported that they smoke because of stress (Al-Naggar et al., 2011) and smoking gives pleasure (Bonilha et al., 2013). There is a need to identify the psychosocial precipitating factors contribute for smoking cigarette among Malaysian students' perspectives and the result will be useful for Ministry of Health in Malaysia to target the precipitation factor in smoking cessation treatment

program.

Based on previous studies, it is well documented that very limited studies have been conducted on psychological problems and precipitation factor for smoking behavior among university students in overseas. Hence, the aim of the current study is to identify the: (a) prevalence of cigarette smokers among undergraduates in Malaysia, (b) gender differences in nicotine dependence among current smokers, (c) differences in psychological problems (depression, anxiety and stress) based on the status of smoking cigarette (current, former and non-smokers), (d) the relationship between precipitating factors (depression, anxiety, stress, stimulation, handling, pleasure, tension, addiction, automatism and social interaction) and cigarette smoking behavior among current smokers; and (e) extent to which the precipitating factors (depression, anxiety, stress, stimulation, handling, pleasure, tension reduction, addiction, automatism and social interaction) predict the cigarette smoking behaviour among current cigarette smoking students in Malaysia.

## Materials and Methods

### Participants

Convenient sampling method was used to collect data from undergraduate students from two private universities in Malaysia. The researcher selected one university from Kuala Lumpur and one from Selangor state in Malaysia as these two states have many number of private universities in Malaysia and previous studies did not focus on these major states in Malaysia. Based on the sample size calculation, a total sample of 714 students were needed from the two participating private university. A total of 780 questionnaires were distributed, 731 questionnaires were fully completed and remaining 49 participants' questionnaires were incomplete. Participant who smokes other smoking substances (n=12) (shisha, electronic cigarette and etc.) than cigarette were excluded from this study. The rest of the 719 participants data were used for analysis. The mean age of the participants was (21.6), male (n= 293) and female (n=426) participated in this study.

### Materials

**Socio Demographic Sheet:** was prepared to collect data regarding student's age, university, course enrolled, smoking status and smoking types (cigarette, shisha, etc.).

**Smoking Status:** this study categorized current, former and non-smokers based on the World Health Organization criteria. This criteria has been widely used by many researchers to categorize current, former and non-cigarette smokers (Clair et al., 2013; Lim et al., 2013).

Depression, Stress and Anxiety Scale (DASS-21; Lovibond and Lovibond, 1995). DASS-21 was used to measure the psychological state of the students. DASS-21 is scored in four point likert scale (0= does not apply to me at all, 1= Applied to me to some degree, 2= Applied to me to a considerable degree and 3= Applied to me very much). Cut-off score for depression scale would be normal (0-4) and depression (5-14). Cut-off score for anxiety scale would be normal (0-3) and anxiety (4-10+). Cut-off score for stress scale would be normal (0-7) and

anxiety (8-17+). The DASS-21 is reported to have very good Cronbach's alpha values for depression and anxiety (0.84 and 0.74, resp.).

Modified Reason for Smoking Scale (MRSS; Berlin et al., 2003). MRSS was used in this research to find the predictors of smoking behavior among the current smokers. MRSS consist of 21 items and scored in five likert scale format which is never (1), rarely (2), once in a while (3), most of the time (4), and always (5). The test consists of 7 categories which are stimulation, handling, pleasure, tension reduction, addiction (dependency), automatism (habit) and social interaction. The score for each category can be ranged from 3 to 15. The test-retest reliability for the MRSS is 0.83.

Fagerstrom Nicotine Dependence Test (FTND; Fagerstrom and Furberg, 2008). FTND was used to measure the level of nicotine dependence for smokers. FTND consists of 6 items and scoring for each item may differ from question to question. Cut-off score for FTND scale would be low dependence (1-2), low to moderate dependence (3-4), moderate dependence (5-7) and high dependence (8-10). Although the test-retest reliability of the FTND is 0.67, it has been used in many researches (Pineiro et al., 2013).

#### Procedure

After obtaining ethical and research approval from the International Medical University, the researchers approached students towards end of their lecture, private cafeteria where students smoke cigarettes and other places in the two private universities premises to participate in this study. Students were explained by the researchers about the aim and the outcome of the study. Before students sign the consent form, researcher of this study informed them that all information collected from

participants would be anonymous and kept confidential, it is not part of the university requirement to participate in this study and students are allowed to withdrawn from the study at any point of time.

## Results

#### Prevalence of cigarette smoking

Table 1 show the prevalence of current smokers is 14.7 % (106).

#### Gender differences in nicotine dependency

Table 2 shows there is no significant difference between male and female students on nicotine dependence ( $t(104)=-0.109$ ,  $p=0.904$ ) among current smokers

#### Psychological problem and smoking status

Table 3 shows there is a significant difference among the non-smoker, current smoker and former smoker on depression, anxiety and stress. Post Hoc test Tukey HSD shows there is a significant difference in stress, depression and anxiety between the non-smokers and current smokers, non-smokers and former smokers, but no significant difference is found between the current smokers and former smokers on stress and anxiety

#### Correlation between precipitation factor and smoking

Table 5 shows there is a significant positive relationship between addiction, tension reduction, automatism and smoking behavior among current smoking students. Negative correlation between pleasure and smoking behavior, but this study could not find correlation between smoking behaviour and depression, stress, anxiety, handling and social interactions.

#### Predictors of smoking behavior

A stepwise regression model was run with those independent variables addiction, pleasure, tension, and automatism significantly correlated with smoking

**Table 1. Prevalence of Smoking**

Smoking Status	No. of participant (n=719)	Percentage (%)
Non-smokers	604	84
Current smokers	106	14.7
Former smokers	9	1.3

**Table 2. Gender Differences in Nicotine Dependence**

	M (SD)	t(104)	P
Male	3.76 (1.208)	0.015	0.904
Female	3.79 (1.258)		

**Table 4. Post Hoc Comparison of Smokers, Former and Non-Smokers**

Psychological Problem	Smoking Status	Smoking Status	MD	SE	P
Stress	Non-smoker	Current smoker	-3.42	0.362	0.000*
		Former smoker	-3.57	1.156	0.006*
Anxiety	Former smoker	Current smoker	0.14	1.196	0.992
		Non-smoker	Current smoker	-2.09	0.364
	Current smoker	Former smoker	-4.09	1.162	0.001*
		Former smoker	-2.01	1.201	0.218
Depression	Non-smoker	Current smoker	-1.22	0.356	0.002*
		Former smoker	-4.71	1.136	0.000*
	Current smoker	Former smoker	-3.49	1.174	0.009*

\*P<0.001

**Table 3. Differences in Psychological Problem based on the Smoking Statuses**

	Non smokers M (SD)	Current smokers M (SD)	Former smokers M (SD)	F	P
Depression	3.40 (3.29)	4.62 (3.59)	2.78 (1.39)	6.362	0.002*
Anxiety	4.12 (3.43)	6.22 (3.48)	4.33 (1.87)	16.901	<0.001*
Stress	6.76 (3.51)	10.19 (2.90)	7.44 (2.46)	45.152	<0.001*

\*P<0.001

**Table 5. Correlation between Precipitation Factor and Smoking**

		Precipitating Factors			
		Pleasure	Addiction	Tension reduction	Automatism
Smoking	r	-0.210*	0.616**	0.424**	0.197*
Behavior	p	0.031	0	0	0.043

\* P<0.001; Correlation is significant at the 0.05 level (2-tailed) and \*\*, Correlation is significant at the 0.01 level (2-tailed)

**Table 6. Predictors of Smoking Behavior**

Variables	Beta	SE	b	p
Addiction	0.356	0.45	0.616	0.000*
Addiction tension	0.307	0.048	0.531	0.000*
Addiction tension pleasure	0.301	0.047	0.52	0.000*

\*p<0.001

behavior among current smokers. Table 5 shows that 37% (R<sup>2</sup>=0.379, F(1,104)=63.48; p=0.000) of addiction; 41% (R<sup>2</sup>=0.415, F(2,103)=36.49; p=0.000) of tension; 44% (R<sup>2</sup>=0.447, F(3,102)=27.47; p=0.000) of pleasure significantly predict smoking behavior and automatism is excluded from the model.

**Discussion**

This study was conducted to identify the difference in the psychological problems (depression, stress and anxiety) among current, former and non-smokers and examined at what extent stress, depression, anxiety, stimulation, handling, pleasure, tension reduction, addiction, automatism and social interaction are the predictor of cigarette smoking among current smokers from two private universities in Malaysia. The prevalence of smoking cigarette among the sample of two private universities in the present study was 14.7% percent. This prevalence is lower than other studies conducted in Malaysia found that 26.6% (Hashami et al., 1994) and 29.9% (Al-Naggar et al., 2011) among students. The prevalence of smoking in this study is lower compared too ther studies conducted in China 45.1% (Zhu et al., 2004), European countries Croatia 36.6%, Lithuania 27.6% and Czech Republic 21.6% (Warren et al., 2008) and Turkey 20.4% (Golbasi et al., 2011), but the present study prevalence is higher than Hong Kong 0.7 % (Lam et al., 2009). The major reason for lesser prevalence of smoking cigarette among students population is due to social custom, family restriction and cultural issues in Malaysia. For example, pre adults (students) are reluctant to smoke in front of elders (parents, senior students and others) due to social custom. Second reason is universities in Malaysia strictly not allow students to smoke inside university premises that reduce the stimulation to smoke cigarettes.

The result of the present study did not show significance difference between male and female smokers on nicotine dependency. This finding is supported by Pineiro 2013 (Pineiro et al., 2013) found that there were no significance gender difference on nicotine dependency. On contrary to present study findings, Fagerstrom and Furberg (2008) found that across

13 countries male has a higher nicotine dependence level compare to the female. Though the result of the study did not show significant difference on gender, but the mean value of the female smokers was higher compared to male. This is supported by previous study that anti-smoking education is necessary at schools to reduce susceptibility of female adolescent smokers in Malaysian (Zawahir et al., 2013). One of the reasonsfor higher mean values of female smokers dueto the researcher who collected data is a female and that attributed female smokers to admit that they are smokers. Previous study result showed that male smokes more cigarette than female as male most likely accept that they are smokers (Al-Naggar et al., 2011), but female smokers are reluctant to reveal to the researcher that they are smokers because of society and culture not accept female smokers in Asian countries. For example, when female smokers were approached by female researcher of this study, the smokers were reluctant to answer in the questionnaire that they are smokers.This most likely cause lesser prevalence of smoking cigarettes among female than male population in other studies.

The result of the current study showedthere was a significant difference in depression, anxiety and stress among the current, former and non-smokers. Post hoc test showed that there was a significant difference between the non-smokers and the current smokers, and the non-smokers and the former smokers,but no significant differences were found between the current and former smokers on stress and anxiety. This finding is supported by Parrott (1999); U.S. Department of Health and Human Services (2010) that the former and non-smokers experienced less stress compared to the current smokers.The former smokers experienced lesser stress as their stress decreased after quitted their smoking (Cohen and Lichtenstein, 1990). Further the result identified that stress wasnot the significant predictor of smoking behavior among students. This finding is supported by previous study by Parrott. (1999) that the nicotine dependency that contributes to stress rather than overall smoking itself. Regular smoker needs to maintain their nicotine level in order to maintain normal mood and avoid the unpleasant feelings of withdrawal symptoms that could be misinterpreted as stress.

Analysis from the Tukey’s HSD shows that there is a significant difference among the current, former and non-smokers students’ depression level. The mean value of the current smokers was higher compare to the former and the non-smokers. This isconsistent with previous study findings that depressed adults tend to smoke more cigarette than non-depressed adults (Khaled et al., 2012). Smoking increases the risk of depression and nicotine causes some changes in the neurotransmitter in the brain that could increase the chances of depression (Wu and Anthony, 1999; Boden et al., 2010). However, the preset study could not find depression is the predictor of smoking cigarette among current smoking students. Result indicated depression was not the precipitating factor of nicotine dependency, but depressed students prone for smoking cigarette as result showed current smokers depression score was higher and they may think smoking reduces their depression. However, scientifically smoking

never reduces the psychological distress in longer term.

Results of this study indicated that the current smokers experienced more anxiety than the former and non-smokers, but anxiety was not the predictor of the cigarette smoking among students' in Malaysia. Smokers tend to smoke more cigarettes to overcome the withdrawal symptoms of nicotine dependency and anxious that quitting cigarette may leads to withdrawal symptoms (Leventhal et al., 2013). Further anxious person believe that smoking stimulates their self-confidence, but when nicotine levels decreases they may be more anxious. Consequently smokes more cigarettes to avoid withdrawal symptoms of nicotine dependency.

Previous research has found few precipitating factors for smoking behavior but not many of them include a number of precipitating factors in one study among students population. The present study identified that addiction, tension, and automatism have significant positive relationship with smoking behavior among student population. This shows that, if either addiction, tension or automatism increases, smoking behavior would also increase. Pleasure on the other hand has a negative relationship with smoking behavior. This result indicates that when pleasure decreases, smoking behavior would increase, suggest that the current smoking students would smoke when they experience less pleasure. Similar to the present study findings, previous studies (Fidler and Wesr, 2009; Souza, Crippa et al., 2010) also found that addiction, pleasure and tension reduction are the predictor of smoking cigarettes among adult population in overseas, but the present study found automatism is also one of the predictive factor of smoking cigarettes among students.

Step wise regression analysis showed that addiction followed by tension and pleasure predicts the smoking behavior among students, but automatism was excluded. The present study found that nicotine dependency or addiction is one of the major precipitating factor predicts smoking cigarette behaviour among students than tension and pleasure, but smokers believe and justify that smoking cigarette reduce their tension, enhance their pleasure, facilitate to cope with stress, socialize with others and relax their mind (Berlin et al., 2003; Fidler and Wesr, 2009; Souza et al., 2010; Hock et al., 2014). Pragmatically tobacco consumption negatively reinforces the smoking habit (Zvolensky and Schmidt, 2003; Ozturk, et al, 2011). Further previous studies found that depression, stress, anxiety, stimulation and socialization are the precipitating factor for smoking cigarette among adults (Berlin et al., 2003; Leventhal et al., 2013), but the present study could not find these are the factors predict the smoking cigarette among students in Malaysia. Inadequate knowledge about nicotine dependency and its consequences of smoking cigarette (Al-dubai et al., 2012), and irrational belief that smoking reduces the psychological distress are most likely cause to smoke cigarette among students. As far as my knowledge this is the first study has been conducted in Malaysia to identify the precipitating factor for smoking cigarette among students. Some students know the consequences of smoking cigarettes but they cannot quit as they believe smoking reduces their psychological

distress and enhances pleasure (Souza et al., 2010; Ozturk et al., 2011). Smokers mind is most likely conditioned classically on psychological stress. So during stressful time smokers believe that smoking reduces their stress. Previous researchers had provided various treatments for smoking cessation, but based on this present study results, this study recommends that anti-smoking treatment should target modifying the irrational belief about the benefits of smoking cigarettes as it reinforces the smoking behavior among students (Ozturk et al., 2011; Al-naggar, 2013).

#### *Limitations and future recommendation*

The first limitation of the study would be that the categorization of current, former and non-smokers. The present study categorizations of smokers are based only on the World Health Organization criteria. Future studies should include categorization from the WHO criteria and also clinically interview the participant to strengthen the status of smoking behavior. The result cannot be generalized on all university students in Malaysia as the present study participants are from two private universities. Thus reduce the external validity. However, these two universities are located in major states in Malaysia. The present study included the gender differences among current smokers and did not include other socio demographic factors contribute for smoking behavior.

Present study recommends future research to collect data from female smokers by female researchers to increase the internal validity of the response from female smokers. Student counselors and Ministry of Health in Malaysia need to provide insight about the consequences of smoking cigarette such as nicotine dependency and health hazards, and inculcate smoking cigarette not reduces their psychological distress permanently rather than addictive for nicotine among students. Provide this information in higher secondary level and during orientation day in the university or college would be beneficial for students to enhance their insight about the biopsychosocial sequels of smoking cigarette.

This study concludes that current smokers experience more psychological problems such as depression, stress and anxiety compare with former and non-smokers. Addiction is one of the most significant predictor of cigarette smoking followed by tension and pleasure among university students. Universities need to concern about the co-occurrence of psychological problems among smokers as they most likely vulnerable for nicotine dependency and poor scholastic performance. Anti-smoking cessation workshop is indispensable to prevent smoking problems and modifying the irrational belief about smoking cigarettes among students in Malaysia.

#### **Acknowledgements**

This research was funded by International Medical University (Funding No.: BPS I-01/2011(01)2013). There is no conflict of interest among the authors to publish this research.

## References

- Al-Dubai SAR, Ganasegeran K, Alabsi AM, Alshagga MA, Ali RS (2012). Awareness and knowledge of oral cancer among university students in Malaysia. *Asian Pac J Cancer Prev*, **12**, 165-68
- Al-Naggar RA, Al-Dubai SAR, Al-Naggar TH, Chen R, Al-Jashamy R (2011). Prevalence and associated factors of smoking among Malaysian university students. *Asian Pac J Cancer Prev*, **12**, 619-24.
- Al-Naggar RH, Bobreryshev YV, Noor NABM (2013). Lifestyle Practice among Malaysian University Students. *Asian Pac J Cancer Prev*, **14**, 1895-03
- Berlin I, Singleton EG, Pedarriosse AM, et al (2003). The modified reasons for smoking scale: factorial structure, gender effects and relationship with nicotine dependence and smoking cessation in French smokers. *Addiction*, **98**, 1575-83.
- Boden J, Fergusson D, Horwood L (2010). Cigarette smoking and depression: tests of causal linkages using a longitudinal birth cohort. *Br J Psychiatry*, **196**, 440-46.
- Bonilha AG, de Souza ES, Sicchieri MP, (2013). A motivational profile for smoking among adolescents. *J Addict Med*, **7**, 439-46.
- Center for Disease Control and Prevention (2012). Global adult tobacco survey. [http://www.who.int/tobacco/surveillance/survey/gats/malaysia\\_fact\\_sheet\\_2011.pdf](http://www.who.int/tobacco/surveillance/survey/gats/malaysia_fact_sheet_2011.pdf)
- Clair C, Meigs JB, Rigotti NA (2013). Smoking behavior among US adults with diabetes on impaired fasting glucose. *Am J Med*, **126**, 541-58.
- Cohen S, Lichtenstein E (1990). Perceived stress, quitting smoking, and smoking relapse. *Health Psychol*, **9**, 466-78.
- Costa FM, Jessor R, Turbin MS (2007). College student involvement in cigarettesmoking: The role of psychosocial and behavioral protection and risk. *Nicotine Tob Res*, **9**, 213-24.
- Everett SA, Husten CG, Kann, L, et al (1999). Smoking initiation and smoking patterns among us college students. *J Am Coll Health*, **48**, 55-60.
- Fagerstrom K, Furberg H (2008). A comparison of the fagerström test for nicotine dependence and smoking prevalence across countries. *Addiction*, **103**, 841-45.
- Fidler J, West R (2009). Self-perceived smoking motives and their correlates in a general population sample. *Nicotine Tob Res*, **10**, 1182-8.
- Golbasi Z, Kaya D, Cetindag, A, Capik E, Aydogen S (2011). Smoking prevalence and associated attitudes among high school students in Turkey. *Asian Pac J Cancer Prev*, **12**, 1313-6.
- Hashami B, Halim AO, Yusoff K (1994). Smoking among university students: A comparative study between Malaysia students in Malaysia and Australia. *Med J Malaysia*, **49**, 149-57.
- Hock LK, Ghazali Sm, Cheong KC et al (2014). Prevalence and factors associated with smoking intentions among non-smoking and smoking adolescents in Kota Tinggi, Johor, Malaysia. *Asian Pac J Cancer Prev*, **15**, 4359-66
- International Tobacco Control Project (2012). ITC Malaysia national report. Findings from wave 1 to 4 surveys (2005–2009). university of waterloo, waterloo, ontario, canada;universitaisains Malaysia, pulau pinang, Malaysia; and Ministry of health, putrajaya, Malaysia.
- KamalSM, Islam MA, Rahman MA (2011). Sociopsychological correlates of smoking among male university students in Bangladesh. *Asia Pac J Public Health*, **23**, 555-67
- Khaled SM, Bulloch AG, Williams JV, et al (2012). Persistent heavy smoking as risk factor for major depression (md) incidence-evidence from a longitudinal Canadian cohort of the national population health survey. *J Psychiat Res*, **46**, 436-43.
- Lam TS, Tse LA, Griffiths S (2009). Prevalence of smoking and environmental tobacco smoke exposure, and attitudes and beliefs towards tobacco control among Hong Kong medical students. *Public Health*, **123**, 42-46.
- Leventhala AM, AmeringeraKJ, Osborn E, Zvolensky MJ, Langdon KJ (2013). Anxiety and depressive symptoms and affective patterns of tobacco withdrawal. *Drug Alcohol Depend*, **133**, 324-29
- Lim HK, Ghazali SM, Kee CC, et al (2013). Epidemiology of smoking among Malaysian adult males: prevalence and associated factors. *BMC Public Health*, **7**, 13.
- Lovibond SH, Lovibond PF (1995). Manual for the depression anxiety stress scales. (2nd. Ed.) Sydney: Psychology Foundation.
- Madsen TF, Scholten MB, Flachs EM, et al (2011). Tobacco smoking as a risk factor for depression. a 26-year population-based follow-up study. *J Psychiatr Res*, **45**, 143-49.
- Mental Health Foundation (2007). Smoking and Mental Health. London: Mental Health Foundation.
- Mykletun A, OverlandS, Aaro LE, Liabo HM, Stewart R (2008). Smoking in relation to anxiety and depression: Evidence from a large population survey: The HUNT study. *Eur Psychiatr*, **23**, 77-84
- Munafa MR, Araya R (2010). Cigarette smoking and depression: a question of causation. *Br J Psychiatry*, **196**, 425-26.
- Ozturk C, Bektas M, Yilmaz E, etal (2011). Smoking status of Turkish nursing students and factors affecting their behavior. *Asian Pac J Cancer Prev*, **12**, 1687-92.
- Parrott AC (1999). Does cigarette smoking cause stress?. *Am Psychol*, **54**, 817-20.
- Pasco JA, Williams LJ, Jacka FN, et al (2008). Tobacco smoking as a risk factor for major depressive disorder: population-based study. *Br J Psychiatry*, **193**, 322-326.
- Pineiro B, Duran AL, Rio EF, Martineu U, Becona E (2013). Gender differences in personality patterns and smoking status after a smoking cessation treatment. *BMC Public Health*, **13**, 306.
- Saravanan.C, Wilks, R (2014). Medical students' experience of and reaction to stress: The role of depression and anxiety. *Scientific World Journal*, **29**, 737382.
- Souza ES, Crippa JA, Pasian SR, Martinez JA (2010). University of São Paulo reasons for smoking scale: a new tool for the evaluation of smoking motivation. *J Bras Pneumol*, **36**, 768-78.
- Statistic New Zealand (2013). Cigarette smoking behaviour. U.S. Department of Health and Human Services (2010). How Tobacco Smoke Causes Disease: The Biology and Behavioral Basis fFor Smoking-Attributable Disease: A Report of the Surgeon General. Atlanta, Ga: Centers for Disease Control and Prevention, National Center For Chronic Disease Prevention And Health Promotion, Office On Smoking And Health pp1-9.
- Torre GL, Kirch W, Bes-Rastrollo M, et al (2012). Tobacco use among medical students in Europe: Results of a multicentre study using the global health professions student survey. *Public Health*, **126**, 159-64.
- Warren CW, Jones NR, Chauvin J, et al (2005). Tobacco use and cessation counselling: cross-country. Data from the Global Health Professions Student Survey (GHPSS). *Tob control*, **17**, 238-47.
- Wu LT, Anthony JC (1999). Tobacco smoking and depressed mood in late childhood and early adolescence. *Am J Public Health*, **89**, 1837-40.
- Zawahir S, Omar M, Awang R, et al (2013). Effectiveness of antismoking media messages and education among adolescents in Malaysia and Thailand: findings from the international tobacco control Southeast Asia project. *Nicotine Tob Res*, **15**, 482-91.
- Zhu T, Feng B, Wong S, Choi W, Zhu SH (2004). A comparison of smoking behaviors among medical and other college students in China. *Health Promot Int*, **19**, 189-96.
- Zvolensky MJ, Schmidt NB (2003). Panic disorder and smoking. *Clin Psychol Sci Pract*, **10**, 29-51.