Correlates and perceived risk of harm from tobacco products use in Brunei Darussalam: A secondary analysis of adult tobacco survey.

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Abstract

Background:

Smoking is a modifiable risk factor for cancer and heart disease, and it has been related to a shorter life expectancy in people who continue to smoke. Aim: We measured the perceived risk of harm from tobacco product use and predicted factors among adult Bruneians.

Methodology:

A secondary analysis of the 1295 adult population using a record of adult tobacco survey conducted in December 2014- January 2015 in Brunei Darussalam

Results:

Out of the 92% of respondents who do not consider a smoke-free environment as important or not at all important, only 13.7% of them were smokers. Of the 89% of respondents with a good perceived risk of harm from tobacco product use, 12.8% of them were smokers and 76.1% were non-smokers, and 87.4% of respondents with good knowledge of tobacco health-related issues, 12.2% were current tobacco smokers against 75% non- smokers.

Conclusion:

The age of respondents and their level of education were associated with the perceived risk of harm.

Recommendation:

Regulatory system is needed in reducing exposure to tobacco smoke.

Keywords: Knowledge, Perceived risk, Tobacco products, Tobacco survey, Brunei Darussalam, Date submitted: 16th/08/2022 Date accepted: 20th/10/2022

1. Background of the study:

Smoking is a modifiable risk factor for cardiovascular disease and cancer; continued smoking among individuals is linked to reduced survival time [1]. The tobacco epidemic is often described as a global catastrophe, with an estimated 1.3 billion people that smoke worldwide, 88% of this number live in low and middle-income countries, and female smokers account for 10.3% of the world's population compared to 47.5% of male smokers [26, 27]. Smoking has been identified as a top risk factor for Noncommunicable diseases,

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which accounts for 63% of the 57 million deaths in 2008 worldwide, 82% of all deaths in Brunei were attributed to NCD alone in 2011. Cancer has killed more people in the last 4yrs than any other disease condition in Brunei. The Brunei Darussalam National Multi-sectoral Action Plan for the Prevention and Control of Non-communicable Diseases reports that 32% of the adult population currently smokes and ranks among the highest among the developed countries [28]. The Brunei population pyramid has shown a decrease in the young people's population against the aged population which explains the sudden increase in the death of the elderly from cancer-related deaths [29].

A study by Weinberger and colleagues found that increased use of cigarettes is associated with depression and could be dependent upon one's age or ethnicity [2]. Evidence from Qualitative studies exploring adult adolescents' perspectives on factors influencing smoking revealed that smoking behaviour from peers and family members, accessibility to tobacco products, addictive nature, and less knowledge about harm, are among the factors influencing smoking initiation among young people [3]. Similarly, an adolescent tobacco survey in Southern Taiwan found that the educational level of parents and behaviour of peers greatly influences smoking initiation and self-efficacy [4, 5]. A study by Alijarah and colleagues reports poor harmfulness of Hookah use and a low perceived risk of causing cancer regardless of one's ethnicity or demographic background among adults. In a cross-sectional study sampling 502 adults, 15 years and above reported poor knowledge and perceived risk of users of smokeless tobacco [6, 7]. Non-cigarette smoking use and openness to trying non-cigarette tobacco among young people aged 15 – 29 has become prevalent as reported in the US National Tobacco survey 2014 [8].

Similarly, beliefs of less harm from products have added to the sudden rise of smokeless product consumption [9]. Furthermore, an intervention study applying brief education to young people showed an increase in knowledge and perceived risk of harm from water-pipe tobacco use and other products when compared to those not exposed to brief online education on the subject [10]. Wrong labelling of tobacco products is associated with perceived risk of harm and continued use of smokeless tobacco by smokers [11]. A systematic review on electronic cigarette smoking found that the increased use among adults is reflective of their perception of alternative or reason for quitting smoking during cessation program and less harm it poses to them which has become a primer for clinicians [12]. An online cross-sectional study among high school students in the U.S reveals that menthol cigarette use is perceived to be associated with ever smoking cigarettes in the future [13], a type of tobacco smoked is dependent on young people's perceived risk of harm [14] and the concurrent use of cigarettes and other forms of tobacco products is as a result of the low perceived risk of harm [15].

Warning labelling could be effective in reducing the use of water-pipe smoking through compliance with the current tobacco legislature [16, 17], providing tobacco constituent information in tobacco packs will provide smokers with the level of toxicity and decreases consumption rate [18], legal and social sanctions are stronger evidence to tobacco use reduction [19]. More so, non-users believe that lower-risk health warning labels increase the use of smokeless and e-cigarette products, hence smokeless tobacco and e-cigarette should carry warning labels [20]. A study on the evaluation of e-cigarette nicotine delivery systems in Singapore and pictorial health warnings in Lao PDR found irregularities in the product labelling which may be misleading to users' perception of products to be less harmful [21]. A similar study in India reported that tobacco users found the pictorial health warning of tobacco products not convincing enough to quit smoking across other demographic characteristics as stated in the WHO Framework Convention on Tobacco Control [22], salient health warning labels on tobacco products early with adolescent result to provoking thought, a means to reducing and ever starting smoking [23]. Supporting, and motivating tobacco smokers to quit smoking could be achieved through unified themes of health messages on tobacco products and national campaign mediums [24]. Further-

more, theory base approaches and involvement of ex-smokers and nonusers could help improve the use of negative health warnings on tobacco products that promote quitting smoking tobacco products [25].

This study measured the perceived risk of harm from tobacco product use among adults 15 years old or more in Brunei to inform future National Campaign strategies on tobacco product use reduction and its public health impacts.

2. Study Methods and Materials

Study Design

Observational analytical cross-sectional secondary analysis of national adult tobacco questions for a survey to estimate prevalence, knowledge score, and perception score and to test whether socio-demographic characteristics influences perceived risk of harm of tobacco product use.

Study Setting/Population

The survey included all men and women aged 15 years old or older, individuals who consider Brunei as their place of primary residence, and those not considered citizens but reside in Brunei and consent to participate. Those visiting the country (tourists), those who indicated their primary place of residence to be a military base or group quarters, and those that are institutionalized (residing in hospitals, prisons, and nursing homes) were excluded from this study.

Study variables and Data Management

The following variables were included in this study; age, gender (Male, and Female), level of education, race (Malay, Chinese, and Others), knowledge, and perceptions questions. A secondary analysis of the national adult tobacco questions for a survey conducted in December 2014- January 2015, Section A, F, G, and H of the KAPNCDs instrument was extracted from Health Promotion Centre (HPC) data bank.

The level of knowledge and level of perception was computed by adding similar variables under knowledge and perception questions from the KAPNCDs instrument. There were four (4) knowledge questions, with yes coded as 4, and no, refused to answer, and don't know responses coded as 0; with a score of 16. Hence, score <6 =poor knowledge, 6-10 =average and >10 = good knowledge. There were seven (7) perception questions, with the highest score at 14; yes, coded as 2, no, refused to answer, and don't know coded as 0. A score of <5 was considered poor, 5-9 was average, and >10 was good. A Cronbach's alpha was computed to check the reliability and weight of variables within the context they were to measure. Level of knowledge and perception Cronbach's alpha was 84.5% and 77.2% respectively.

Statistical analysis

Statistical Package for Social Science (SPSS), IBM version 21 was used for data analysis. The frequency distribution of respondents was determined, and prevalence, level of knowledge, and perception were estimated. The difference in mean between educational levels was computed using one-way ANOVA. The Chi-square test and simple and multiple linear regression were used to assess the level of statistical difference. All statistical difference at $P<0.05$ was considered significant.

Ethics Considerations

All records from the HPC data bank were retrieved and transformed into SPSS. Names and addresses were not considered for this research, all variables considered in this study were coded in the statistical software thereby making it impossible to trace any variable to a specific person. The study protocol was approved by the Medical and Health Research Ethics Committee (MHREC), Ministry of Health, Brunei Darussalam.

3. Results

The study shows that there were less male (49.3%) compared to female (50.7%) respondents. About 50% of the study population had a secondary school education. About 32.2% are government employees, 19.0% are privately employed, and 12.4% are unemployed. Overall our study recorded good knowledge (87.4%) and good perception (89.0%) among the study population.

Table 1: Frequency distribution of respondents.

Variables	f	%
Gender Male	638	49.3
Female	657	**50.7**
Race Malay	942	72.7
Chinese	124	9.6
Indian	29	2.2
Others	200	15.4
Level of Education	44	3.4
No formal education	137	10.6
Primary school (1-6)	646	**49.9**
Secondary school (1-5)	60	4.6
Technical or vocational	244	18.8
A' Level- diploma	162	12.5
Degree-PhD	2	0.2
Others		
Employment status	161	**12.4**
Unemployed	417	**32.2**
Employed by government	246	**19.0**
Employed by private	148	11.4
Student	137	10.6
Housewife	63	4.9
Self-employed	109	8.4
Retiree	14	1.1
Not applicable		
Smoke free Environment	6	0.5
Very important	57	4.4
Fairly important	42	3.2
Neither important nor unimportant		
Not important	349	**26.9**
Not at all important	841	**64.9**
Level of knowledge		
Poor		
Average	107	8.3
Good	56	4.3
Level of perception	1133	87.4
Poor		
Moderate	47	3.6
Good	96	7.4
	1153	89.0

Table 2: Proportion of smokers with good knowledge of tobacco health related issues and good perception of risk of harm from tobacco product use

	Current smokers			
Variables	Daily smokers	less than daily	do not smoke	don't know
Perception				
Poor	20(1.5%)	6(0.5%)	19(1.5%)	1(0.1%)
Moderate	27(2.1%)	9(0.7%)	60(4.6%)	0(0.0%)
Good	115(**8.9%**)	65(**3.9%**)	985(**76.1%**)	3(0.2%)
Ground Total	**12.5**	**5.1**	**82.2**	**0.3**
Knowledge				
Poor	40(3.1%)	12(0.9%)	53(1.4%)	1(0.1%)
Average	14(1.1%)	2(0.2%)	40(3.1%)	0(0.0%)
Good	108(**8.3%**)	51(**3.9%**)	971(**75.0%**)	3(0.2%)
Ground Total	12.5	5	79.5	0.3

Respondents who are smokers account for 17.5%; daily use of smokeless tobacco was 24.6% against 75.4% less than daily users.

About 14.3% of the respondents experience daily smoking of tobacco products in their homes against 2.8% weekly smoking experience at home. Of the 89% of respondents with a good perceived risk of harm from tobacco product use, 12.8% of them were smokers and 76.1% were non-smokers. Also, of the 87.4% of respondents with good knowledge of tobacco health-related issues, 12.2% are current tobacco smokers and 75% do not smoke. Of the 92% of respondents who do not consider a smoke-free environment as important or not at all important, only 13.7% of them were smokers.

Table 3: Trends and patterns of Perceived risk of harm from tobacco products use and socio-demographic characteristics

	Level of perception	N (%)	
Variables	**Poor**	Moderate	Good
Gender: Male	36(2.8%)	35(8.6%)	547(42.2%)
Female	10(0.8%)	41(3.2%)	606(46.8%)
Race: Malay	32(2.5%)	67(5.2%)	843(65.1%)
Chinese	6(0.5%)	10(0.8%)	108(8.3%)
Indian	2(0.2%)	3(0.2%)	24(1.9%)
Others	6(0.5%)	16(1.2%)	178(13.7%)
Educational status:			
No formal Edu	3(0.2%)	6(0.5%)	35(2.7%)
1^0 School (1-6)	13(1.0%)	10(0.8%)	114(8.8%)
2^0 School (1-5)	23(1.8%)	50(3.9%)	573(44.2%)
Technical	1(0.1%)	10(0.8%)	49(3.8%)
A' Level-diploma	4(0.3%)	13(1.0%)	227(17.5%)
Degree-PhD	2(0.2%)	7(0.5%)	155(12%)
Employment Status:			
Unemployment	8(0.6%)	14(1.1%)	139(10.7%)
By government	18(2.1%)	27(2.1%)	372(28.7%)
By private	4(0.3%)	21(1.6%)	221(17.1%)
Student	2(0.2%)	13(1.1%)	133(10.3%)
Housewife	3(0.2%)	6(0.5%)	128(9.9%)
Self-employed	3(0.2%)	5(0.4%)	55(4.2%)
Retiree	7(0.5%)	7(0.5%)	95(7.3%)
Not applicable	1(0.1%)	3(0.2%)	10(0.8%)
Level of knowledge			
Poor knowledge	47(3.6%)	55(8.8%)	5(0.4%)
Average knowledge	0(0.0%)	23(1.8%)	33(2.5%)
Good knowledge	0(0.0%)	18(1.4%)	1115(86%)

We observed a higher perception of risk of harm among females (46.8%) compared to 42.2% of male respondents. The poor perception was also observed in the same group (4.1% male and 1.5% female). From employment status, the perceived risk of harm from tobacco products was higher among government employed (28.7%) respondents compared to respondents privately employed.

Table 4: Educational Status and perceived risk of harm (n=1295)

Variable	n	Mean (SD)	F Statistics[a] (df)	P value
No formal education	44	2.65(0.71)		0.363
Primary school (1-6)	137	2.73(0.62)		0.363
Secondary school (1-5)	646	2.83(0.49)	4.116	**0.025**
Technical/vocational	60	2.70(0.67)	(6, 1288)	0.678
A' Level diploma	244	2.90(0.38)		**0.003**
Degree-PhD	162	2.91(0.35)		**0.002**

a. One-way anova test

b. All pairs were significantly different except No formal edu, Primary school and Technical school status have similar mean value by post-hoc (LSD procedure)

We observed that the perceived risk of harm is associated with one's educational status. Respondents with secondary school, A' level, and degree status were statistically significant at p values 0.025, 0.003, and 0,002 respectively. The mean values among respondents with no formal education, primary school education and those with technical/vocational educational level were the same (M=2.65, 2.73, and 2.70 respectively) compared to the slight difference observed in mean values between respondents with Secondary, A' level diploma and degree-PhD educational status at mean values of M=2.83, 2.90, and 2.91 respectively.

Table 5: Factors associated with perceived risk of harm from tobacco product use among study population (n=1295) using Multiple Logistic Regression

Variables	β	t. stat	95% CI	P value
Age	0.005	-1.88	-0.00, 0.00	0.064
Gender	0.12	4.29	0.06, 0.15	**0.001**
Race	0.01	0.71	-0.02, 0.02	0.718
Educational Status	0.05	1.96	0.00, 0.01	**0.049**
Employment	0.00	0.91	-0.01, 0.01	0.909

The multiple logistic regression analysis model summaries showed that; gender and educational status were statistically associated with the perceived risk of harm from tobacco product use. The odds of observing a difference in gender (Male or Female) of study participants is 0.001 times less likely. (β=0.001, 95% CI= 0.00 – 0.01), p-value 0.001. The odds of a difference in smoking status due to education is 0.008 times less likely. (β=0.008, 95% CI= 0.00 – 0.01), p-value 0,049. Level of knowledge accounts for 77% of the variance in the level of perception among respondents and is statistically significant at a p-value of 0.001, Perceived risk of harm of tobacco product use does increase with the level of knowledge of health-related issues.

4. DISCUSSION:

A secondary analysis of 1295 adult samples 15 years or more was carried out to estimate the perceived risk of harm from tobacco product use and associating factors using the record of adult tobacco survey conducted in December 2014- January 2015 from the Health Promotion Centre (HPC) Ministry of Health, Brunei Darussalam. Of the 92% of respondents who do not consider a smoke-free environment as important or not at all important, only 13.7% of them were smokers, suggesting that the people are comfortable with cigarette or tobacco smoke. Perceived less harm from tobacco products predicts future smoking initiations of adolescents 6 parents, peers smoking behaviours [3], socializing, pleasure and relaxation encourage second-hand exposure to tobacco smoke [7].

It is believed that the conventional cigarette does not provide the varieties of flavours and clouds compared to electronic cigarettes hence, the cravings and the increased use, of electronic cigarettes are a far less harmful alternative to cigarette smoking and could reduce the health implication of smoking cigarettes in the long run [31]. The higher prevalence of less perceived harm from the use of electronic cigarettes observed in the United Kingdom compared to Australia was attributed to the type of regulatory system a country has [32]. Similarly, banning smoking in public places has reduced the prevalence of people exposed to second-hand smoke [33].

Successful bans on smoking in public places could reduce mortality related to second hand smoking and hospital admissions.

About 13.6% of the study population used E' cigarettes daily compared to 86.2% less than daily usage. A study by Mays and colleague indicates that the use of non-cigarette is on the rise 10, and lowered-risk health warning labels increases the use of non-tobacco products [23]. Increased use of smokeless tobacco or E' cigarette is attributed to the less perceived harm or a form of alternative to cigarette smoking [6, 11, 14]. Less addictiveness of smokeless tobacco increases the use of non-tobacco products [7, 32]. Also, the type of tobacco used is dependent on young people's perceived risk of harm it poses [15, 16, and 17]. And a type of regulatory system a country has influenced the prevalence of electronic cigarette use

[33].

Our study has shown that most smoking respondents have poor knowledge of health-related issues and perceived risk of harm from tobacco products. Similarly, a study by Ali and colleagues indicated that most smokers have poor knowledge and perceived risk of smokeless tobacco [9], perceived less harm from tobacco products predicts future smoking initiations of adolescents [6]. Despite the increased perceived risk of harm from tobacco products among females (46.8% against 42.2% male), about 32.1% of the sampled female respondents are exposed to secondhand smoke [33]. Similarly, [1] increased exposure to smoking, a modifiable risk factor for NCDs exposes victims to serious illness and reduces survival time.

Consequently, supporting and motivating smokers to quit smoking could be achieved through unified themes of health messages on tobacco products and national campaign mediums. Age and educational status were associated with the perceived risk of harm from tobacco products and accounted for 92% of the variance in perception scores. The overall regression model was significant at a p-value of 0.001. Increased use of cigarettes could be dependent upon one's age or ethnicity [2], health education plays an important role in smoking initiation as observed among young adults.

5. Conclusion and Recommendations

Increased knowledge of tobacco products could increase the high perceived risk of harm from tobacco products among the adult population in Brunei. Poor knowledge and perceived risk of harm were found among smokers. Females were found to have a better-perceived risk of harm than males. Age of respondents, gender, ethnicity, level of education, and employment status were all associated with perceived risk of harm.

Strict laws and social regulations have been effective in reducing mortality and hospital admission from smoking and exposure to secondary smoke. Hence, the need in reducing the use of smokeless tobacco and other forms of tobacco-related behaviours through a regulatory system.

6. Limitation

The study focused on a subset of the Adult Tobacco Survey in Brunei Darussalam with an interest to determine the correlates and perceived risk of harm from tobacco product use; hence this is not the overall objective of the adult tobacco survey.

7. Funding

Not applicable

8. Authors Biography

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A commonwealth scholar, researcher, and public health expert with over 11 years of experience who focuses on research implementation, avoidable communicable and non-communicable diseases, and effective sustainable community, and health development. A specialist with the capacity to forge close bonds with any target demographic and who consistently works to engage students by fostering environments that promote effective learning. The range of work includes enhancing health systems, capacity building, survey designs and instruments, data management, and classroom management and ethics.

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