

An evaluation on the impact of the smoking ban policy in a schools' health program in Brunei Darussalam

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Abstract

Smoking among adults and youths is a growing epidemic worldwide. Tobacco use among adolescents has detrimental health effects and may lead to tobacco addiction. School-based cigarettes smoking prevention programs could become one of the most effective strategies to reduce tobacco use among adolescents, but the evidence for their effectiveness is not yet clear. There is limited literature focussing on evaluative studies in this area to establish the effectiveness of such programs. Therefore, a study was designed to evaluate the implementation, impacts as well as limiting and promoting factors of the smoking ban policy in a school health program among secondary schools in Brunei Darussalam.

The study was conducted using a cross-sectional design and monitoring evaluation approach. There were 40 participants recruited in this study which comprise key informants, teachers and administrators from seven government and thirteen non-government secondary schools in the country. The most significant limitation highlighted by all participants was a lack of proper smoking statistics database to monitor the smoking trends among students. Therefore, conclusive evidence showing an increase or decrease of smoking trends among students in the schools was not found in this study. Legislation on banning tobacco sales to minors is a crucial factor perceived by all participants in managing smoking activities among students. The religious 'fatawa' about smoking may work in reducing or preventing smoking uptake among the general public and students. Another key finding of the study is an expressed need among teachers for comprehensive smoking prevention health education resources for lower secondary students to enable delay of smoking initiation and potentially lower smoking uptake among the students.

Introduction

The prevalence of smoking has reached epidemic proportions among adults and youths in many parts of the world [1]. In 2000, 4.83 million premature deaths in the world were attributable to smoking, with 2.41 million deaths in developing countries [2]. According to U.S Food and Drug Administration (FDA), eighty per cent of tobacco users in United States begin smoking before they reach adulthood and more than 3, 000 children begin to smoke each day, consequently at least 1,000 of those children will eventually die from a tobacco-related illness [3]. Tobacco use among adolescents causes various detrimental health

conditions particularly reduction in lung function, severe respiratory illnesses and accelerate development of cardiovascular diseases [4]

Centre for Disease Control and Prevention (CDC), United States (US) report suggested that school programs designed to prevent tobacco use could become one of the most effective strategies available to reduce tobacco use in the country [5,6]. The report underlines guidelines for school health programs, including; development and enforcement of a school policy on tobacco use; provision of tobacco-use prevention education; provision of program-specific training for teachers; and involvement of parents or families in support of school-based programs.

School policy on tobacco use, smoking ban, health education counselling, disciplinary action, and print advertising campaign are among strategies used in school-based smoking prevention programs. However, evidence

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of the effectiveness of interventions in use in the school-based smoking prevention programs have been equivocal. An evaluative study among secondary schools in Ontario, Canada found that a smoking ban on school property had not affected either smoking behaviour or attitudes towards smoking among students but it should be included among strategies to reduce smoking among youths [7]. While some researchers claim that cigarette smoking policies reduced smoking rates among students [8,9], others argue that smoking bans in schools may be effective in reducing smoking uptake only if students perceive them to be well enforced [10]. Meanwhile, counselling with discipline strategies may help to reduce teenage smoking activities rather than a discipline only strategy in the school-based smoking prevention program, as shown by another study [11]. School based programs with information giving alone are evidently not effective in preventing smoking. A program consisting of social influences models (e.g. anti-tobacco resistant skills training), community interventions and general social competence training (e.g. self-management personal and social skills) may promote the effectiveness of the interventions in preventing children and adolescents from starting smoking [12, 13].

Smoking ban policy in the school health program

Health problems related to smoking, particularly heart disease and lung cancer are the leading causes of death in Brunei Darussalam. Smoking prevalence in the country appeared to be increasing among the adult population from 20% in 1988 [14] to 36.4% (i.e. 31.1% for men and 5.3% for women) in 1997 [15]. Meanwhile, for early adolescents (i.e. 12 to 15 year olds) the incidence of smoking is reported at approximately 4.5 per cent among boys (data for girls is unavailable). For 15-19 year olds it is reported that 16 per cent of boys smoke as do 1.6 per cent of girls [15].

In Brunei Darussalam, the government responses in tackling health problems related to smoking in the country at school level include incorporating smoking ban policy into the school health program. The Prime Minister's Office (PMO) issued a circular in 1994, declaring all government premises including schools as non-smoking zones [16]. In the year 2001, the smoking ban policy was incorporated into School Health Promoting (Sekolah Mempromosikan Kesihatan – 'SMK') Program and was regulated by the School Health Promotion Unit (SHPU), Ministry of Education (MOE). In the same year, the MOE

rolled out the 'SMK' program in all schools in the country. Also, the MOE has complemented 'SMK' program with other initiatives including school-based anti-smoking health education, anti-drug education within the school curriculum, anti-smoking regulations, counselling services for students and the establishment of peer support groups [17].

The program logic model (PLM) of the smoking ban school health program at the school level is shown in Figure 1. The model is developed and adapted from the Funnel model to describe the underlying causal assumptions linking the program objectives and activities with program outcomes [18].

There is limited literature focussing on evaluative studies in this area to establish the effectiveness of school based smoking prevention programs. Specifically, this study was designed to evaluate the implementation, impacts as well as limiting and promoting factors of the smoking ban policy in a school health program among secondary schools in Brunei Darussalam. The research questions are as followed:

- 1) Has the program been implemented in every schools?
- 2) How has the program been implemented in schools?
- 3) Does the program work in managing smoking among students in the schools?
- 4) What are the barriers and promoting factors for implementing the program at school level?

Methodology

The study was conducted using a cross-sectional design and monitoring evaluation approach. The data collection process began with recruitment of 14 government and 6 non-government secondary schools in the country, which were randomly selected from MOE Directory Official websites. The process took 2 months to be completed, which began, from 1st June till 30th July 2005. The primary outcomes measured in this study are reflected in the 12 objectives of PLM objectives, including the availability of action plan for 'SMK' program with anti-smoking initiatives, implementation of the action plan by schools and the availability of health education materials in schools. Standard operational definitions were developed and applied throughout the process of the study, as shown in Table 1.

Figure 1. Program logic model of the smoking ban policy in school health program in Brunei Darussalam

GOAL: REDUCING THE INCIDENCE OF SMOKING AMONG STUDENTS				
Objectives	Program Activities & Resources	Outputs	Outcomes	
			Short-term	Long-term
1) By 2004, 80 per cent of all schools in the country have the action plan for 'SMK' program with anti-smoking initiatives.	'Sekolah Mempromosikan Kesihatan' (SMK) Program was introduced in 2001 within School Health Promotion Unit, MOE.	Smoking ban policy is incorporated into the SMK program,	Action Plan for smoking ban program ('SMK' program with anti-smoking initiatives) is put in place in all schools in the country.	1) Establishment of extensive smoking ban program strategies within the SMK program that include: <ul style="list-style-type: none"> • Cessation interventions • Quit support interventions • Rehabilitation interventions.
2) By 2004, 80 per cent of schools in the country have implemented SMK program with anti-smoking initiatives.	Smoking ban program ('SMK' program with anti-smoking initiatives) is implemented in all schools.	<ul style="list-style-type: none"> • Seminar on SMK program organized for all schools principals and deputy principals. • Providing consultation and guidance in planning SMK action plan and its implementation to schools. 	All schools in the country have implemented the program.	
3) By 2004, 80 per cent of all schools in the country have health education materials for the 'SMK' program with the anti-smoking initiatives.		Health education materials are provided to all schools.	All schools have health education materials for the SMK program with anti-smoking initiatives.	
4) By 2004, 80 per cent of all schools in the country have implemented various anti-smoking health education activities.	School-based health education anti-smoking activities are implemented	School-based health education anti-smoking activities are implemented in schools, including: essay writing competitions, posters competitions, forums, quizzes & debates	All schools in the country have implemented various anti-smoking health education activities.	2) An evaluation on SMK Program is carried out every five years by MOE.
5) By 2004, 80 per cent of all schools in the country are visited by the inspectorate from the school health promotion unit, MOE.	School visits are carried out by inspectorates from SCHPU to monitor implementation of the program.	5 schools are inspected every month by the inspectorates from SCHPU.	All schools in the country are visited by inspectorate from the SHPU, MOE.	
6) By 2004, 80 per cent of all schools in the country are implementing anti-smoking regulations.	Anti-smoking measures are incorporated into School Regulations.	Regulations against smoking in school premises are implemented.	Increasing number of schools has implemented anti-smoking regulations	3) Students are compliance to the anti-smoking regulation implemented.

Figure 1. Program logic model of the smoking ban policy in school health program in Brunei Darussalam.

Objectives	Program Activities & Resources	Outputs	Outcomes	
			Short-term	Long-term
7) By 2004, 80 per cent of schools in the country are providing counselling services to support students with tobacco addiction.	Counselling units are established in every school to provide support for students with tobacco addiction.	Counselling services are provided in all schools	All schools provided counselling service to support students with tobacco addiction.	5) Students in all schools in the country are exposed to counselling services provided in by schools.
8) By 2004, 80 per cent of schools in the country are utilizing counselling services at the Counselling unit at the School Department.	Counselling services provided by counselling unit at the School Department, MOE for referral cases from schools' principals.	Referrals are made by school principals to the Counselling unit at the School Department, MOE.	Increasing referrals from schools to counselling unit at the School Department.	
9) By 2004, 80 per cent of all schools in the country are implementing Anti-drug education within the school curriculum.	Development of anti drug education within the school curriculum including tobacco use is proposed	Draft of anti-drug education within the school curriculum is completed	Anti-drug education within school curriculum is implemented in schools	4) Changes in school curricula and policies supporting notion against smoking
10) By 2004, 80 per cent of schools in the country have peer-support groups and are implementing some anti-smoking actions	Peer support groups anti-smoking actions are formed in schools.	Peer support groups implemented several anti-smoking actions including: <ul style="list-style-type: none"> Giving out educational material Exhibitions Attending health talks 	Increasing number of peer support groups established in schools. Increasing number of anti-smoking actions implemented by peer-support groups, such as: <ul style="list-style-type: none"> Peer counselling services Focus groups Workshops 	6) National Students Peer Support Action Body against smoking established in the country. 7) Lower incidences of smoking among students.
11) By 2004, smoking incidences among students lower by 3 per cent.				
12) By 2004, smoking incidences among students lower by 3 per cent.	Smoking statistic among students is collected each year by each school. Comparison of previous year smoking incidence with the current incidence.	Data on smoking statistic among student compiled each year. Smoking data reported each year.	Database of smoking statistic established by each school.	Evaluation conducted on the smoking data collected.

Figure 1. Explains the program logic of the smoking ban school health program which shows the underlying causal assumptions linking program objectives and activities with program outcomes. There are 12 objectives of the program which are in hierarchical order according to its implementation process. The PLM is adapted from Funnel (1997) model, which comprise of objectives, program activities, outputs and outcomes.

The targeted population was 82 participants within the age range 21 to 54 years old. The key informants in this project are Head of SHPU, SHPU Inspectorate, Counselling teachers and Discipline teachers. The main criteria for selecting the sample were that the schools must enrol students from age group 12 to 18 years old and come from the four main districts in the country. There were total 40 participants invited in the study which comprised Head of SHPU (1), School Inspectorate of SHPU (1), schools

administrators (12), counselling teachers (7), disciplinary teachers (12) and teachers (7) from government (13) and non-government (2) secondary schools from the four districts in the country. Some of the targeted participants are not recruited in the study because of the following; a limited time frame (one month) to conduct data collection and there was a lack of response from some schools and some were unable to fit an appointment within the given time frame.

Table 1. Operational Definitions for the Study

TERM	DEFINITIONS
1) Urban schools	Schools located in the central business district of the country, i.e. Brunei-Muara District.
2) Rural schools	Schools which are located in other districts and not within the central business district of the country, including Tutong District, Kuala Belait District and Temburong District
3) Program implementation	The program initiatives that has been implemented by the organization at any point of time since the year of 2001
4) Reported smoking incident	An incident where a student is found smoking by teacher/s or school administrators in school compound
5) Incidence	No. of smoking cases for student who are found smoking in the school compound as reported in the past 12 months by the teachers.
6) New initiative	It is any form of initiatives implemented by the school at any point of time since the year of 2001, which is not included in the program logic initiatives.
7) NTCP	National Tobacco Control Policy (which is implemented in Brunei Darussalam).
8) 'SMK' Program	'Sekolah Mempromosikan Kesihatan' program is school promoting health program in which anti-smoking ban is incorporated into the program since 2001 regulated by SHPU at the Ministry of Education, Brunei Darussalam.

Table 1. Explains the definitions used throughout the process of the study and the purpose is to standardise the data collected in the study.

The recruitment process begins with a formal letter (written in English and Malay language) submitted to the MOE (Brunei) to obtain permission to conduct the study. An Ethics approval letter from the University, Plan Language Statement (PLS) and consent form were attached to the application letter. Upon approval given by the MOE, the invitation letter and a package of information was sent to all the schools. The investigator made follow up phone calls to the school administrators to set up appointments for discussion.

School administrators were explained about the study during the meeting, before obtaining the written consent to participate in the study. Similarly, potential participants are also recruited during the meeting based on the role of participants and suggestions from the administrators. The data were collected using a triangulation approach using

interviews, documentation review and observations. Each interview session was carried out for 30 to 45 minutes and was audio recorded with written permission. The summary of each interview was shared with each of the participants for verification. During the investigator’s visit in each school various documents were reviewed including the school annual report and the school smoking ban school policy. The general environment of each school was observed for physical indicators of the implementation of smoking ban policy and smoking activities occurring in the environment. The physical indicators include smoking ban signs boards, health education materials and signs of smoking activities such as cigarettes butts on staircases and hallways. The flow of the study is shown in Figure 2.

The interviewee responses for all participants were transcribed and the transcripts from the Malay speaking respondents were back-translated into English by the

Figure 2. The flow of the study.

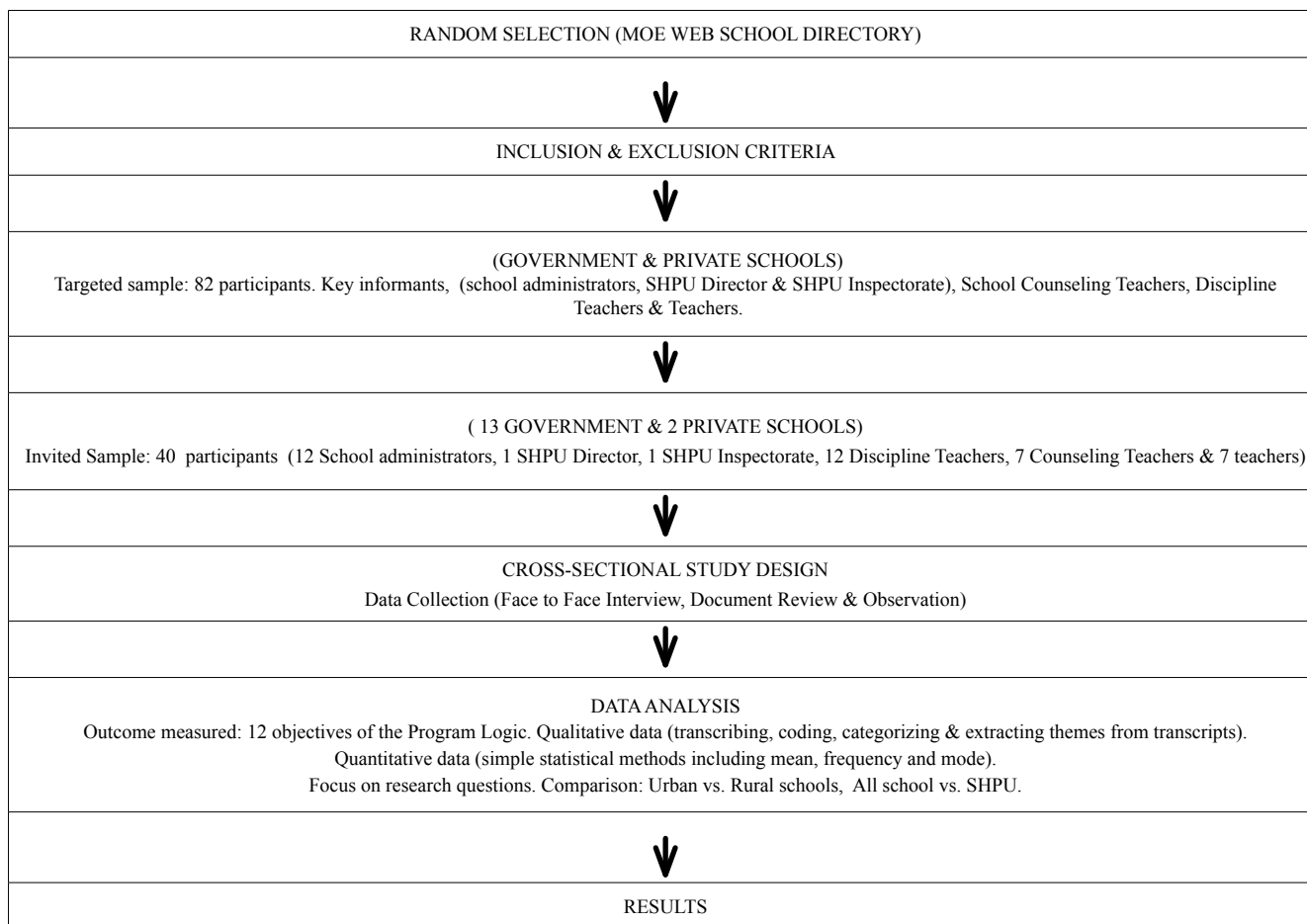


Figure 2. Explains the data collection and analysis process of the evaluative study of the smoking ban school health program as conducted by the investigator.

investigator with the assistance of qualified professionals. The data were analyzed according to the four research questions and the primary outcomes. All the data were coded and recurring emergent themes were identified by constant comparison of the interview transcripts. The transcripts for each participant were sorted according to each organization (i.e. school and SHPU) and then the similar themes from each organization were grouped according to urban schools, rural schools and SHPU. The quantitative data were analyzed using simple statistical calculations including frequency distributions, mean and percentages. Then, the investigator compared the analyzed data based on urban schools and rural schools as well as all schools and SHPU to examine similarities as well as differences in perspectives and statistical indicators in the respective groups.

Results

Has the program been implemented in every schools?
(Research question 1)

Urban & Rural Schools

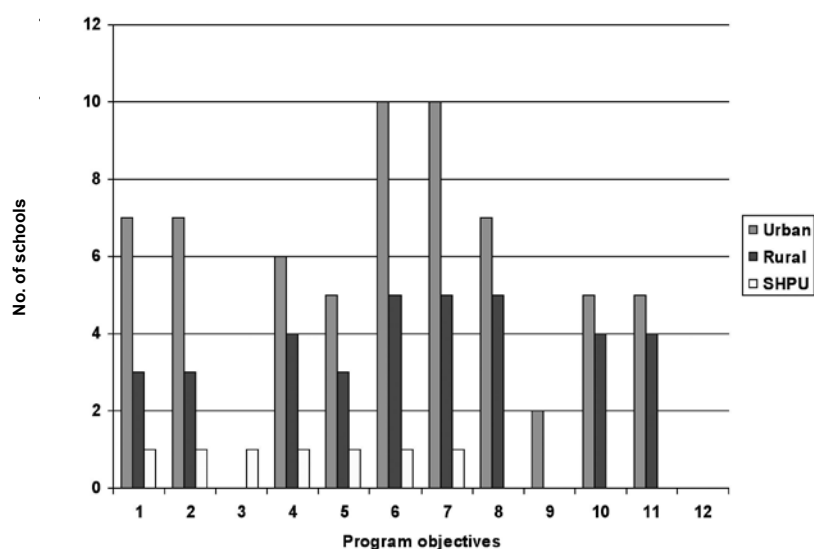
All schools in the study have reported implementing the program, but the number of program initiatives implemented (i.e. based on the program logic) by the schools varied from one another, as shown in Table 2.

School Health Promotion Unit (SHPU)

Table 2. Reported program initiatives implemented by urban school group, rural school group and SHPU (based on the PLM).

US	PLO	Total No	RS	PLO	Total No	SHPU	PLO	Total No
1) A	1,2,4,5,6,7,8,9,10 & 11	10	1) K	1,2,4,6, 7, 10 & 11	7	1	1,2,3,4,5,6 & 7	7
2) B	1,2,6,7 & 8	5	2) L	4, 5, 6, 7, 8, 10 & 11	7			
3) C	6, 7,8,10 & 11	5	3) M	1, 2, 4, 5, 6, 7, 8, 10 & 11	9			
4) D	1, 2, 4,5,6,7 & 10	7	4) N	1, 2, 6 & 7	4			
5) E	4, 5,6,7,8,9,10 & 11	7	5) O	4, 5, 6, 7, 10 & 11	6			
6) F	1, 2, 4,5,6,7,8,10 & 11	9						
7) G	6 & 7	2						
8) H	1, 2, 6 & 7	4						
9) I	1, 2, 4,5,6,7 & 9	7						
10) J	1, 2, 4, 6, 7, 8 & 9	7						

Reported Program Objectives Reported by Schools and SHPU



The figure from Table 2 above explains the 12 objectives of the program logic for the smoking ban school health program with the total number of the program initiatives implemented by schools and SHPU. The numbers of schools implementing the program initiatives are shown according to the given categories (i.e. urban school group, rural school group and SHPU).

Meanwhile, SHPU reports that “Yes the program has been ‘rolled out’ to all schools in the country since 2001. It is estimated 80 per cent of schools have implemented the program by 2004.”

How has the program been implemented in schools?
(Research Question 2)

Urban & Rural Schools

The primary strategies in managing students who are found smoking in the school compound as reported by urban and rural schools are anti-smoking regulation and individual counselling. Yet, the schools have not clearly reported having health education materials and achieving smoking incidences among students lowered by 3 per cent each year, as shown in Table 2. Both groups tend to impose verbal warnings for disciplinary action and disciplinary action (unspecified) as the main strategies

in dealing with teachers and staff found smoking in the school compound.

SHPU

SHPU reported implementing seven (7) program initiatives (i.e. based on the program logic), as shown in table 2. Participant ‘A’ states that “...according to MOE school regulation, teachers and staff caught smoking in the school compound will be given disciplinary action and repeated offenders will be suspended from work...”

Both schools and SHPU claimed to have implemented ten new initiatives to complement the current program which is reported by the participants in the study (as shown in Table 3).

Does the program work in managing smoking among students in the schools? (Research Question 3)

Table 3. Reported new initiatives implemented by the urban school group, rural school group and SHPU

Urban	Rural	SHPU
1) Incorporating Islamic perspectives on anti-smoking and anti-drug education into the school curriculum. 2) Parent-teacher meeting every end of the school semester. 3) Providing website access for parent to monitor their children school progress reports, including academic results and disciplinary performance. 4) Working with the community by distributing school contact numbers.	1) Anti-smoking drama presentation (role play) organized by students as part of annual school project. 2) School health promotion unit is established in the school to regulate health education programs.	1) Organizing forums for school administrators and communities. 2) Establishing smoking task force involving various government & non-government agencies. 3) Collaboration with other multidisciplinary personnel. 4) Implementing monitoring strategies by direct contacts with school and obtaining via feedbacks.

Table 3. Shows the list and number of new initiatives implemented as reported by some participants in the given groups to complement the program. The urban (urban school group) has reported of implementing 4 new initiatives, the rural (rural school group) has reported 2 and SHPU has reported 4, accordingly.

Urban & Rural Schools

Smoking Trends

All participants have reported that the program works but with some limitations, as shown in Table 4. Five schools from all schools reported an increase in smoking trends among students, whereas only two schools reported a decrease. It is inconclusive that the smoking trend

among student increases or decreases among students in both groups. The range of smoking incidents occurred in schools premises reported for the all the schools in the year 2004 are 0 to 29. All schools have reported that there is no proper documentation of smoking statistics available to validate 3 per cent lower smoking incidences per year in their schools. The data are based on reported cases by teachers and their observation on smoking activities occurring in the school compound.

Characteristics of Reported Smoking Incidents

Table 4. Reported smoking trends among students by urban school group, rural school group and SHPU

USG	TRENDS	I	SMOKING INCIDENTS
1) A	Stable	23	Male. Lower & Upper
2) B	Stable	U	U
3) C	Unknown	U	U
4) D	Increase	U	More male than female. More Lower & Upper.
5) E	Zero	0	U
6) F	Unknown	U	U
7) G	Increase	U	U
8) H	Stable	U	More male than female. More Lower & Upper.
9) I	Decrease	0	Lower
10) J	Increase	5	Lower & Upper.
RSG	TRENDS	INC	CASES
11) K	Decrease	13	Male. Lower & Upper
12) L	Zero	1	Male. Upper
13) M	Stable	29	More male than female. More Lower & Upper.
14) N	Increase	19	More Male than female. More Lower & Upper.
15) O	Increase	23	More male than female. More Lower & Upper.
S	TRENDS	INC	CASES
PA	Stable	3 to 4 %	Male and female cases (increasing over the years)
PB	High	U	U

Table 4. Explains the reported smoking trends, incidence (I) and the characteristics of the smoking incidents reported by all participants in schools and SHPU. The letters represent the schools which have participated in the study except for PA and PB. The schools are categorised into urban and rural school group as shown above. There is only slight difference between range of program initiatives implemented between urban (2 to 10 initiatives) and rural (4 to 9 initiatives) schools. However, there is no difference in the average number of program initiatives implemented between the urban (6) and rural (6.6) school group.

Legend:

USG (urban school group)

RSG (rural school group)

S (SHPU)

PA (participant A from SHPU)

PB (participant B from SHPU)

I refers to incidence

U (Unknown)

Eight (8) out of fifteen (15) schools have reported that many lower secondary male students are caught smoking in the school compound (as shown in table 4). An Administrator from School H states ‘...our teachers reported that many of the lower secondary students are found smoking in school premises while most of the upper secondary students are found smoking outside the school premises. There are more male students than female students who are found smoking in school compound...’ The majority of smoking incidents reported by both groups are from lower secondary students and there are more male students who are found smoking than females.

Major Impacts

The major impacts of the program which are commonly reported by the participants from both groups (as shown in Table 5) include increase in awareness on negative effects of smoking on health and increased compliance to the school smoking ban regulations among students, and teachers/staffs. An Administrator from School K reported that, ‘...since the implementation of the program, students are not found smoking in visible areas of the schools but they tend to smoke in hidden areas like inside toilets and outside school premises such as nearby shops...’ The participants perceived that the program has limited positive impact on knowledge and behaviour about smoking prevention among students, teachers and staffs.

SHPU

Table 5. Reported impacts of the program by urban school group, rural school group and SHPU

No	Urban	Rural	SHPU
1	Teachers, staffs and students are reported compliance to smoking ban regulation in the school (9 schools).	The teachers reported increasing students’ awareness about smoking ban regulations and smoking health hazards (5 schools).	It estimated 80 per cent of all schools have implemented ‘SMK’ program
2	The teachers reported increasing students’ awareness about smoking ban regulations and smoking health hazards (6 schools).	Only teachers and staffs are reported compliance to school smoking ban regulations but students are not (4 schools).	All schools implemented smoking ban regulations
3	Students don’t smoke visibly in school as reported by teachers (3 schools).	Students don’t smoke visibly in school as reported by teachers (3 schools).	Increase awareness on smoking health hazards and smoking as socially unacceptable behaviour among students and teachers.
4	Only teachers and staffs are reported compliance to school smoking ban regulations but students are not (1 school).	Reduce number of students found smoking in the school (2 schools).	
5	Smoking prevalent is reported zero by teachers (1 school).	Teachers, staffs and students are reported compliance to smoking ban regulation in the school (1 school).	
6	Smoking prevalent is reported unknown by teachers (1 school).		
7	Some evidences of smoking noted, i.e. cigarettes but found in school compound (1 school).		

Table 5. Explains the new program initiatives which has been implemented (as reported by the participants from the schools and SHPU) to complement the current program. The number of school which has implemented the new initiatives is indicated at each given initiative as shown above. The schools have claimed implementing six (6) new initiatives and four (4) for SHPU to complement the current program.

Participant ‘A’ reports that ‘...according to MOH report, the prevalence of smoking among school children is stable at approximately 3 to 4 per cent. Smoking among young girls is found to be increasing...’ SHPU has reported that there is no proper smoking database system available yet to validate the reported and observed smoking data. SHPU estimates the smoking incidence among students in each school will be reduced approximately from 1 to

3 per cent each year as a result of the implementation of ‘SMK’ program in all schools. SHPU has reported that the program is perceived to have three major impacts (as shown in table

5). Participant ‘B’ states that ‘...those major impacts are only based on observation and reports during the school visits and feedbacks from the school administrators...’

What are the barriers and promoting factors for

implementing the program at school level? (Research Questions 4)

The following are four main categories of perceived barriers and promoting factors in implementing the program as reported by all participants: 1) causes of smoking among

students, 2) school system, 3) organizational and 4) policy/legislation, as shown in Table 6.

Barriers

Table 6. Reported barriers and promoting factors of implementing the program as perceived by the urban school group, rural school group and SHPU

BARRIERS					
Urban	N	Rural	N	SHPU	N
1. REASONS/CAUSES OF SMOKING AMONG STUDENTS					
1) Peer pressure (close friends smoke)	10	1) Peer pressure i.e. close friends smoke.	5	1) peer pressure (close friends smoke)	1
2) Role Modelling (parent & sibling who smoke)	8	2) Role Modelling i.e. parent & sibling who smoke.	5	2) Role Modelling (parent smoke at home & teacher smoke in school compound)	1
3) Family stressors (i.e. divorce & single family)	3	3) Family stressors (i.e. divorce & single family).	1	3) Smoking advertisement	1
4) Boosting self-image.	2	4) Curiosity to try cigarettes.	1	4) Adolescent developmental (i.e. Boosting self-image)	1
5) Lack of parental supervision.	2	5) Cheap cigarettes prices (affordable).	1	5) Cheap cigarettes prices.	1
6) Curiosity to try cigarettes.	1				
7) Cheap cigarettes prices.	1				
8) Stress reliever.	1				
2. SCHOOL SYSTEM BARRIERS					
1) Lack of support from parents.	3	1) Lack of teachers' time.	3	1) Lack of support & monitoring efforts from some schools &	1
2) Lack of budget.	3	2) Heavy teaching workloads.	3	2) Lack of reinforcement of smoking ban regulations among teachers who smoke in school compound.	1
3) Health education talks not interesting.	2	3) Lack of support from parents.	3		
4) Lack of teachers' time.	2	4) Lack of budget/funding.	2		
5) Heavy teaching workloads.	2	5) Lack of support from teachers and staffs.	1		
6) Lack of cooperation among teachers.	1	6) Lack of community support.	1		
7) Trespassers selling cigarettes to students	1	7) Geographical location.	1		
8) Lack of community support	1				
9) Lack of cooperation between teachers and students	1				
10) Limited manpower.	1				
3. ORGANIZATIONAL BARRIERS					
1) Lack of smoking prevention health education resources.	2	1) Effective comprehensive smoking prevention program (not available)	1	1) Lack of publicity on school health promotion programs, &	1
2) Comprehensive smoking prevention health education program not available	1	2) Lack of support from MOE.	1	2) Lack of funding support from private sectors & NGOs.	1
3) Limited resources for counselling services (i.e. training).	2				
4. POLICY/LEGISLATION BARRIERS					
1) NTCP: lack of reinforcement of smoking ban regulations.	5	1) NTCP: lack of reinforcement of smoking ban regulations.	5	1) NTCP less effective in changing behaviour, adult population &	1
2) NTCP: Not made available in hard copy to school.	3	2) NTCP: lack of reinforcement on increasing cigarettes price.	5	2) mainly focussing on general	1
3) NTCP: lack of effective strategies in changing smoking behaviours.	2	3) NTCP: Less focus on smoking prevention initiatives for youths.	1	3) Lack of evaluation on its effectiveness.	1
4) NTCP: focus on information giving only.	2				
5) NTCP: lack of effective anti-smoking health promotion messages.	1				
6) NTCP: Not made explicit to the public.	1				
7) NTCP: Less focus on smoking prevention initiatives for youths.	1				
8) NTCP: lack of reinforcement on increasing cigarettes price.	1				

Table 6. Continued

PROMOTERS					
2. SCHOOL SYSTEM					
Urban	N	Rural	N	SHPU	N
1) School, parent and community involvement.	4	1) School, parent and community involvement.	4	1) Teachers promote good role model	1
2) Availability of full-time counsellor.	3	2) Reduce teaching workloads for teachers who are involved in the program.	2	2) More reinforcement of smoking ban regulations in schools among teachers, staffs and students,	1
3) Increase school authority to expel students.	2	3) Availability of full-time counsellor.	1	3) Schools must adapt multi-sectoral approach ,	1
4) Reduce teaching workloads for teachers who are involved in the program.	2	4) More funding.	1	4) Promote community participation,	1
5) Interesting health talks appropriate for youths.	2	5) Offer rewards/incentives for students who stopped smoking.	1		
6) Promote cooperation between schools and parents.	2				
7) Promote cooperation between teachers & students.	1				
8) Active participation of Peer Support Group.	1				
9) More funding from NGOs and private business agencies.	1				
10) Availability of day security personnel.	1				
3. ORGANIZATIONAL					
1) Availability of comprehensive smoking prevention program.	5	1) Availability of health education materials/ resources.	1	1) Increase cooperation between SHPU and schools.	1
2) Availability of health education materials/resources.	4	2) More support from MOE & SHPU.	1	2) Increase cooperation between government, public sectors and the community,	1
3) More support from MOE.	1	3) Availability of comprehensive smoking prevention program.	1	3) MOH established smoking cessation clinic and quit hotline,	1
4) Improve communication between schools & MOE.	1			4) Active participation of National Tobacco Committee & National Health Promotion Committee,	1
4. POLICY/LEGISLATION					
1) Implementation of legislation banning tobacco sales to minor.	10	1) Implementation of legislation banning tobacco sales to minor.	5	1) NTCP includes initiatives targeting children and youth,	1
2) NTCP: inclusive of comprehensive smoking prevention health education program.	3	2) NTCP: Reinforcement of smoking ban regulations.	4	2) Implementation of revised legislation on tobacco by including Islamic rules & ban on tobacco sales to minor.	1
3) NTCP: Reinforcement of smoking ban regulations.	2	3) NTCP: Reinforcement on increasing cigarettes prices.	1		
4) NTCP: copy of the policy made available to all school as reference.	1				
5) NTCP: Transparency of policy initiatives to the general public including schools.	1				
6) NTCP: Reinforcement on increasing cigarettes prices.	1				

Table 6. Explains reported barriers and promoting factors in implementing the program as perceived by the participants. The responses are categorised by urban school group, rural school group and SHPU. The total number of schools reporting the factors is indicated at each respective barriers and promoters as shown above.

Urban & Rural Schools

Peer pressure (i.e. close friends smoke) and role modelling (i.e. parents and siblings who smoke) and family stressors (i.e. divorced and single parent families) are among reported causes of smoking as reported by teachers when students are caught smoking in the school compound. Lack of support from parents and lack of budget are among the five (5) common perceived barriers related to school system reported by urban and rural schools. A total of five (5) perceived organizational barriers in implementing the program are highlighted by the schools. The participants reported that unavailability of comprehensive smoking prevention health education program is perceived as the most important barrier in effectively managing smoking uptake among students. The following are the three policies and legislation barriers for both groups (which are linked to reinforcement, pricing and initiatives): 1) lack of reinforcement of smoking ban policy, 2) lack of reinforcement on increasing cigarettes price and 3) less focus on smoking prevention initiatives for youths.

SHPU

Similarly, SHPU has reported peer pressure (i.e. close friends smoke) and role modelling (i.e. parent and teachers who smoke) as the main causes of smoking as reported by the schools. The unit has reported the following school system barriers in implementing the program which include lack of support and monitoring efforts from some schools. The organizational barriers claimed by SHPU are lack of publicity on school health programs and lack of funding from the private sector. National Tobacco Control Policy (NTCP) mainly focuses as on the general adult population and is among barriers related to policy and legislation reported by the unit.

Promoters*Urban & Rural Schools*

The schools have reported four (4) common promoting factors associated with the school system that relate to staffing, community, resources and funding. The availability of a comprehensive smoking prevention program and health education materials/resources are significant organizational promoters in implementing the program in schools as reported by all participants. Both, groups perceive the following three policies and legislation promoting factors as important: 1) Legislation banning tobacco sales to minors needs to be implemented and NTCP must 2) reinforce smoking ban regulation and 3) also reinforce an increase in cigarette prices.

SHPU

Meanwhile, SHPU has highlighted four (4) school system related promoting factors including teachers being good role model and reinforcement of smoking ban regulations in schools. The unit has reported four (4) perceived organizational barriers in implementing the program, including increased cooperation between the unit and schools. It has expressed a different view on organizational promoting factors compare to the schools. The promoters related to policy and legislation propose by unit relate to expansion of the policy target audience. Participant 'B' states that '...The NTCP is apparently effective in raising awareness among the public about smoking hazards via health education talks, posters, and issuing religious 'fatawa' or religious rules about smoking. But it is less effective in changing behaviour which may be due to a lack of evaluation and lack of hard evidence to show its effectiveness. The policy has a huge focus on the adult general population, hence there is a need to incorporate more initiatives targeting children and youths...'

Discussion

The investigator has found that the smoking ban school health program is implemented in all schools in the study but with some limitations. The most significant limitation highlighted by all schools and SHPU is a lack of proper

smoking statistics database or documentation system available to monitor the smoking trends among students. Therefore, there is no conclusive evidence showing an increase or decrease in smoking trend among students in the schools in this study. This may affect the effective planning of the current and future anti-smoking program for the targeted population.

In regards to the program implementation, there is only a slight difference observed on how the program has been implemented at urban and rural schools. The schools rely heavily on smoking ban regulations, brief counseling and health talks (posters) as the primary strategies in managing and preventing the students from smoking in the schools. There is no statistical evidence available to show the strategies work in managing smoking habit among the students. The findings correlate with the results of other studies which are discussed above [7]. However, the investigator has found that the interventions may increase awareness about the negative health impacts of smoking and may promote compliance of smoking ban regulation in the schools among students and teachers, as reported by the participants.

Few differences are identified in the process of the program implementation and delivery between SHPU (MOE) and the schools, which surface as barriers in carrying out the program as perceived by the participants. Those gaps may include a lack of effective communication mechanism between the organizations, a lack of an effective monitoring system built into the program and a lack of outcome success indicators tailored according to the needs of each organization in implementing the program. The three major causes of smoking as reported by the participants may need to be tackled by designing comprehensive school-based smoking prevention programs by incorporating various strategies, including social influences model and community interventions, as suggested by previous studies [12, 13].

There is also a profound policy and legislation issue which can make a significant difference in reducing the smoking incidence among students. The relevant authority may want to consider making the National Tobacco Policy more transparent, comprehensive and inclusive as suggested by the participants as mentioned above. As reported by the participants, the religious 'fatwa' about

smoking may work in reducing or preventing smoking uptake among the general public and students. However, there is lack of evaluative evidences to validate the reports. Legislation on banning tobacco sales to minors is a crucial apparatus as perceived by all participants to manage smoking activities among students in schools. Another key finding of the study is an expressed need among teachers for comprehensive smoking prevention health education resources for lower secondary students to enable delay of smoking initiation and potentially lower smoking uptake among the students.

The main limitation of the study is that most of the data are based on reports from the key informants and teachers only, which are subjected to views and perception of the respondents, and may or may not reflect the views of the students. However, the study findings can be generalized to other schools in the country as the sample is inclusive of government and non-government schools from rural and urban areas of the four main districts. There is lack of statistically significant data to associate the reduction of smoking incidence among the students to the program activities.

Conclusions

The findings of this study have implications not only in strengthening the current program but also providing baseline information for designing future evidence-based school health education programs in the country. Several program activities were identified and considered significant to the program, which need to be explored, utilized and effectively implemented. Counselling services, community partnership as well as religious 'fatwa' and other culturally appropriate activities are the main strengths of this program that can be fully utilized for effective implementation of the program. The findings also reflect the needs of the audience and stakeholders of the program which may be useful for the policies makers in planning and implementing more cost effective policies, particularly in public health policies in the near future for the country. This study is intended to enrich evidence and generate more research conducted in promoting the quality of life of young people in Brunei and in other counties with similar socio-cultural context.

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References

1. Gajalakshmi C, Jha P, Ranon K. Global patterns of smoking and smoking-attributable mortality. In: Jha P, Chaloupka F, editors. Tobacco control in developing countries. New York: Oxford University Press: 2000. p. 11-39.
2. Ezzati M, Lopez A. Estimates of global mortality attributable to smoking in 2000. *Lancet* 2003;362:847-52.
3. Perracchio LA. The development of an advertising campaign to discourage smoking initiation among children and youth. *J Advertising* 1998;27(3):49-56.
4. Centres for Disease Control and Prevention (CDC). Preventing tobacco use among young people: a report of the Surgeon General [US Department of Health and Human Services, Public Health Service, CDC; 1994; Available from: URL:http://www.cdc.gov/tobacco/sgr/sgr_1994/
5. CDC. Guidelines for school health programs to prevent tobacco use and addiction [US Department of Health and Human Services, Public Health Service, CDC; 1994 [cited 2005 April, 25th]
6. VanDyke EM, Riesenber LA. Effectiveness of a school-based intervention at changing preadolescents' tobacco use and attitudes. *J Sch Health* 2002;72(6):221-5.
7. Northrup DA, Ashley MJ, Ferrence R. The Ontario ban on smoking on school property: perceived impact on smoking. *Can J Public Health* 1998;89(4):224-8.
8. Booth-Butterfield M, Anderson R, Williams K. Perceived messages from schools regarding adolescent tobacco use. *Commun Educ* 2000;49:1-18.
9. Sinha DN, Gupta PC, Warren CW, Asma S. Effect of school policy on tobacco use by school personnel in Bihar, India. *J Sch Health* 2004;74(1):3-5.
10. Wakefield MA, Chaloupka FJ, Kaufman NJ, Orleans CT, Barker DC, Ruel EE. Effect of restrictions on smoking at home, at school, and public place on teenage smoking: cross-sectional study. *BMJ* 2000;321:333-7.
11. Hamilton G, Cross D, Lower T, Resnicow K, Williams P. School policy: What helps to reduce teenage smoking? *Nicotine Tob Res* 2003;5(4):507.
12. Thomas R. School-based programmes for preventing smoking [Review] [CDSR: 2005 [cited 2005 April, 24th]
13. Langlois MA, Petosa R, Hallam JS. Why do effective smoking prevention programs work? Student changes in social cognitive theory constructs. *J Sch Health* 1999;69(8):326.
14. CDC. Tobacco or Health: A Global Status Report: Brunei Darussalam [2004 [cited 2004 May, 14th]; Available from: URL:<http://www.cdc.gov/tobacco/who/brunei.htm>
15. BruDirect.Com. Evils of smoking stressed and figures shown [2004 [cited 2005 3rd Jan]; Available from: URL: <http://www.bruDirect.com/DailyInfo/News/Archive/Jun04/200604/nite02.htm>
16. Brunei Government. Brunei considers jumping on the Anti-smoking Bandwagon [The Government of Brunei Darussalam Official Website; 2003 [cited 2005 30th March]; Available from: URL:http://www.brunei.gov.bn/hotnews/0404/03/Smoking_Ban.htm
17. Ministry of Education Brunei. School Health Promotion Unit [Ministry of Education Brunei; 2004 [cited 2005 March 5th]; Available from: URL:<http://www.moe.gov.bn/departments/health%20promtion/index.htm>
18. Funnell S. Program logic: an adaptable tool for designing and evaluating programs. *Evaluation news and comment* 1997;6(1):5-17.