

Pragmatic pilot cluster randomised control trial of a school-based peer-led anti-smoking intervention for 13-14 year olds in Malaysia: Process evaluation

Author(s):

Elniee Melson, (Health Promotion Unit, Health Department of Labuan, FT Labuan, Malaysia)

Christopher Bridle, (Lincoln Institute of Health, University of Lincoln, Lincoln, UK)

Wolfgang Markham, (Warwick Medical School, University of Warwick, Warwick, UK)

Citation:

Elniee Melson, Christopher Bridle, Wolfgang Markham, (2017) "Pragmatic pilot cluster randomised control trial of a school-based peer-led anti-smoking intervention for 13-14 year olds in Malaysia: Process evaluation", *Health Education*, Vol. 117 Issue: 6, pp.599-616, <https://doi.org/10.1108/HE-02-2017-0013>

Abstract:

Purpose

The purpose of this paper is to report the process evaluation of a pilot randomised control trial of an anti-smoking intervention for Malaysian 13-14-year olds, conducted in 2011/2012. It was hypothesised that trained peer supporters would promote non-smoking among classmates through informal conversations.

Design/methodology/approach

Smoking-related baseline and follow-up questionnaires were administered, seven months apart, to Form 1 students (n=2,118) attending eight schools across two districts in Sabah (Kota Kinabalu; Keningau). Concealed stratified randomisation assigned two schools per district to the control and intervention arms. Control schools received usual care. Intervention schools received usual care and the peer supporter intervention. Peer supporters completed smoking-related knowledge and attitudes questionnaires before and after peer supporter training and peer supporter training evaluation questionnaires. They also discussed the peer supporter training and role in focus groups immediately following training (n=4) and three months later (n=3), and additionally, recorded post-training anti-smoking activity in diaries.

Findings

The pilot trial found that student recruitment was high (baseline students matched at follow-up n=1,681 (79 per cent of class-registered students). More boys (n=38) than girls (n=35) attended peer supporter training. Post-training, most peer supporters had improved smoking-related knowledge (n=55; 75 per cent) and attitudes (n=57; 78 per cent) and returned diaries (n=49; 67 per cent). Some focus group boys reported they were reluctant peer supporters and/or found resisting smoking difficult.

Practical implications

Future trials would benefit from outlined modifications to peer supporter selection, recruitment and training and additionally, assessments of context and intervention acceptability and reach.

#### Originality/value

Trials of complex public health interventions are scarce in economically developing countries.

Keywords: Schools, Adolescent tobacco prevention and cessation, Peer education

Type: Research paper

Publisher: Emerald Publishing Limited

Accepted: 09 July 2017

#### Acknowledgments:

The authors would like to thank members of staff from the Sabah State Health Department (Sabah Health Promotion Unit and Sabah Non-Communicable Disease Unit) for their support and help during the pilot trial and peer supporter training. The authors would also like to thank Dr Dahlia Janan for back translating the quotes included in this paper.

© Emerald Publishing Limited 2017

#### Article

##### Background

Cigarette smoking is the primary cause of premature death in Malaysia (Ministry of Health, Malaysia, 2003). Reducing adolescent smoking is consequently an important Malaysian public health objective (Ministry of Health, Malaysia, 2010). Overall the prevalence of adolescent smoking in Malaysia is relatively high (20 per cent) (Mochizuki-Kobayashi et al., 2006; Warren et al., 2008), but is much higher among adolescent boys (36 per cent) than adolescent girls (4 per cent) (Hammond et al., 2008; Sirichotiratana et al., 2008). Attending primary school until the age of 12 is mandatory in Malaysia (Ministry of Education, Malaysia, 1996), but most Malaysian teenagers attend secondary school. Hence, secondary school-based anti-smoking interventions in Malaysia are potentially wide-reaching.

Social cognition models such as Bandura's (1977) social learning theory and the theory of planned behaviour (TPB) (Ajzen, 1991) purport to explain human behaviour including smoking during adolescence. Bandura (1977) reasoned that people would learn to smoke indirectly by observing and modelling other people with whom they identify. The TPB (Ajzen, 1991) predicts that smoking-related behaviour is determined by behavioural intention which is future intention regarding smoking uptake or abstaining from smoking. Behavioural intention, in turn, is determined by three proximal variables: attitudes, subjective norms and perceived behavioural control. Attitudes are beliefs for or against smoking and views regarding the consequences of choosing to smoke or choosing to refrain from smoking. Subjective norms focus on what a person believes important

people such as friends want him/her to do in relation to smoking. Perceived behavioural control refers to the perceived difficulty a person has in acting in accordance with her/his smoking-related wishes. Factors such as gender, ethnicity and socio-economic status are external to the model and only influence behavioural intention through their influence on the three proximal variables.

School-based peer-led anti-smoking interventions are theoretically informed by social learning theory (Bandura, 1977) and the TPB (Ajzen, 1991). These interventions aim to promote positive changes in adolescent smoking-related behaviour through social influence and modelling. Two types of intervention fall under the umbrella term of school-based peer-led interventions (Audrey et al., 2004). First, students may deliver classroom-based sessions on smoking-related issues to peers or younger students. Second, trained peer supporters may influence the classmates' smoking-related behaviour through informal conversations, social influence and modelling. Drawing upon the work of Audrey et al. (2004), this paper proposes that through these informal conversations, peer supporters are hypothesised to be able to change their classmates' smoking-related knowledge and attitudes, act as role models for their peers and thereby promote non-smoking subjective group norms and customs within school and help their classmates to formulate strategies to resist coercive pressure from other people to smoke and thereby promote the perceived behavioural control of their classmates.

A school-based peer-led anti-smoking intervention based upon the informal conversations between trained peer supporters and their classmates was evaluated in a large comprehensive randomised control trial in the UK (the ASSIST trial) (Campbell et al., 2008). Smoking uptake among 12-13-year olds in this trial was significantly lower in intervention schools (IS) (Campbell et al., 2008). However, a relatively recent systematic review found that the ASSIST trial was the only published randomised control trial that had evaluated this type of intervention (Thomas et al., 2013). Additionally, trials of complex public health interventions including school-based anti-smoking interventions are relatively rare in economically developing countries.

This paper reports on the mixed-methods process evaluation of a pragmatic feasibility and pilot cluster randomised control trial of a school-based peer-led anti-smoking intervention for 13-14-year olds in their first year at eight Malaysian secondary schools (Melson, 2015). The pilot trial was conducted in 2011/2012 (Melson, 2015). The pilot trial intervention was similar in purpose and intent to the intervention adopted by the ASSIST trial (Campbell et al., 2008). This paper therefore chimes with the findings of Bloor et al. (1999) who reported on the pilot trial preceding the ASSIST trial.

The objectives of this paper are to report on pilot trial recruitment, baseline smoking-related health promotion activity, the feasibility and acceptability of the peer supporter training including an economic evaluation, the implementation and functioning of the peer supporter intervention and potential improvements to both the design and evaluation of subsequent trials of school-based peer-led anti-smoking interventions in Malaysia. Additionally, when discussing the study findings, this paper draws retrospectively upon the MRC guidelines for process evaluation (Moore et al.,

2014). These guidelines recommend that feasibility and pilot trials should focus on fidelity, dose, reach and context (Moore et al., 2014).

## Methods

### Trial design

Detailed description of the pilot trial is available (ISRCTN registry, 2016; Melson, 2014) and outlined in Figure 1. Briefly, eight schools were recruited, four from Kota Kinabalu and four from Keningau. Kota Kinabalu and Keningau are districts in the Malaysian State of Sabah located on the island of Borneo. Concealed stratified randomisation was used to assign two schools per district to the intervention arm of the pilot trial and two schools per district to the control arm of the pilot trial. Intervention schools (IS) received the peer supporter intervention and usual care. Control schools (CS) received usual care. The IS were – Kota Kinabalu – Intervention School 1 (IS1), Intervention School 2 (IS2); Keningau – Intervention School 3 (IS3), Intervention School 4 (IS4).

Usual care was co-ordinated and delivered by the designated health promotion officers. These designated health promotion officers attended a briefing session on usual care guidelines that was delivered by the researcher (EM). Usual care activities included health talks, health exhibitions, displays of audio-visual documentaries and the distribution of leaflets. These activities were commonly implemented in the school hall and open to all students including Form 1 students. The aim of these activities was to promote increased awareness of smoking-related issues throughout the school. Usual care did, however, differ between districts and the pilot trial was, therefore, pragmatic.

### Logic model and process evaluation methods

The hypothesised influence of the intervention on smoking-related outcomes is outlined in a logic model (Figure 2).

Process evaluation data were obtained through a variety of sources (Table I).

The following questions were included in the baseline questionnaire that was administered to Form 1 students attending both intervention and CS: “Can you remember hearing about smoking at school, e.g. health talks and exhibitions?”, “During this school year, were you taught in any of your classes about the dangers of smoking?” and “How long ago did you discuss smoking and health as part of a lesson?”

Process evaluation regarding the peer supporter training programme focussed on peer supporter selection and recruitment, the training programme itself, peer supporters’ perceived training needs, peer supporters’ pre- and post-training smoking-related knowledge and attitudes, training programme evaluation and training programme costs.

The intended peer supporter selection process was supported by the head teacher of every intervention school and had two stages. A counselling teacher from each intervention school was asked to:

Schedule the administration of a poll for Form 1 students to nominate classmates for peer supporter training who were respected, easy to talk to and had leadership qualities.

Draw upon the poll results and select students for peer supporter training who could communicate effectively and had an interest in helping peers, a pleasant personality and leadership qualities. Each peer supporter provided written parental consent. Students who smoked were eligible for peer supporter training providing they agreed to stop smoking.

However, EM discovered after the peer supporter training had been completed that even though head teachers in all the IS supported a counselling teacher-administered student poll, these polls were not administered in any intervention school. Instead counselling teachers selected students directly for peer supporter training.

The peer supporter training programme was synthesised from the YPEER (2003) Peer Education: Training of Trainers Manual, IPPF/WHR (2004) Peer to Peer: Creating Successful Peer Education Programs, the Peace Corps (2001) Life Skills Manual and the Malaysian PROSTAR (2004) peer supporter training programme for young people that was originally aimed at HIV prevention. Programme details are available (Melson, 2014) but briefly the programme comprised seven sessions: Session 1: Introduction and ice breaker; Session 2: Understanding the role of peer supporter; Session 3: Communication; Session 4: Facts about tobacco and smoking; Session 5: Identifying high-risk smoking-related situations and overcoming peer pressure; Session 6: Reflection session (values and perceptions related to smoking); and Session 7: Planning and leadership. The aims, objectives and example activities of the peer supporter training programme are outlined in Table II.

Peer supporter training in each district was delivered over three consecutive days in a venue outside of school premises. This training was facilitated by EM and 11 staff members from various health agencies in Sabah. Co-trainers had previously trained as PROSTAR programme trainers and additionally attended a training session on the newly developed anti-smoking peer supporter training programme and accompanying training manual.

The needs assessment questionnaire was administered immediately prior to the peer supporter training. It focussed on characteristics and support that students believed were required in order to be a successful peer educator, e.g. motivation, knowledge, supervision, recognition and reward. It also asked students what skills and personal strengths they believed they had, e.g. self-confidence, helpfulness, patience, good listening skills, good team work skills and good communication skills.

The knowledge and attitudes questionnaires are available (Melson, 2014). Briefly, the knowledge questionnaire comprised 12 smoking-related statements with answer options true, false and do not know. Questions included “More than 10,000 people are killed by cigarette smoking in Malaysia each year”; “Nicotine in cigarettes is not addictive”; “Smokers are more likely to get lung cancer than non-smokers”; “The health of people is not affected by second-hand smoke”. Students scored 1 for a correct answer and 0 for other answers. The attitudes questionnaire comprised 12 statements that had five-point scales anchored “strongly agree” and “strongly disagree”. Agreement corresponded with a positive (anti-smoking) attitude in most attitude questions. Positive (anti-smoking) attitudes scored 2 for strongly agree, 1 for agree, 0 for do not know, -1 for disagree and -2 for strongly disagree. Some questions were inverted in intent so that strongly agree corresponded with a negative (pro-smoking) attitude but were reversed for scoring purposes. Questions included “I prefer being with friends who do not smoke”; “Smoking should be strictly prohibited in public areas in order to promote public health”; “Smoking reduces stress and is relaxing”.

The evaluation of training questionnaire asked peer supporters to identify the component of the training programme they found most useful, identify any component of the training programme they disliked and provide suggestions for improving the training course.

Two single-gender focus group discussions that aimed to elicit peer supporters’ views of their training were conducted in each district immediately following the peer supporter training. Students (n=8 per focus group) were drawn from both IS in that district. In each district, EM facilitated one focus group discussion and a co-trainer of the anti-smoking peer supporter training programme facilitated the other. The focus group discussions were semi-structured and identical topic guides and prompts were used. Efforts were made to involve all participants in these discussions in order to ensure that data collection was not simply focussed on a few participants.

The second set of three mixed gender focus group discussions were conducted three months after the peer supporter training was completed and aimed to elicit students’ views regarding their role as peer supporters. Each focus group was comprised of students from the same school (IS1, six boys, two girls; IS3, four boys, four girls; IS4, five boys, six girls). Students attending IS2 did not participate in these focus group discussions. EM facilitated these semi-structured focus group discussions on school premises using the same topic guide and prompts. Efforts were made to involve all the participants in these discussions in order to ensure that data collection was not simply focused on a few participants.

All focus group discussions were conducted in Malay and digitally recorded. Recordings were anonymised, transcribed verbatim and translated into English. The transcribed discussions were manually reviewed to identify themes. Analytic induction (Bendassolli, 2013) allowed EM to compare and contrast the different accounts and build up categories of themes that were directly or obliquely related to the topic guide components. Focus group discussion excerpts were labelled according to the related theme and used to provide quotes to illustrate the theme. Quotes included in this paper were back translated to ensure that they are authentic and accurately reflected what the young

person said. Included quotes are labelled to indicate the student's gender and school but students' names have been changed.

Post-training, peer supporters recorded their smoking-related peer supporter activity in diaries. The diaries are available (Melson, 2014). Briefly, peer supporters were asked to record when the peer supporter activity took place, what activity took place e.g. helping classmates, discussions, anti-smoking campaigns, who the peer supporters talked to, i.e. individuals, small groups (<ten people), large groups (ten or more people) and where the activity took place, i.e. at school, home or outside of school and home. Peer supporters were asked to return their peer supporter diaries to the researcher six months after the peer supporter training had been completed. The number of times each activity was recorded in the diaries was summated across all the returned diaries.

The following questions were included in the follow-up questionnaire that was administered to Form 1 students attending both IS and CS: "Have you ever talked to your classmates about smoking issues?" and "Have you ever talked to your classmates about the disadvantages of smoking?"

## Results

### Recruitment of schools

The first eight schools that were approached agreed to participate in the pilot trial.

### Student recruitment to the pilot trial

The proportion of class-registered students (total n=2,118; IS n=1,122; CS n=996) who completed baseline and follow-up questionnaires was high (baseline questionnaires: IS, n=1,038 (93 per cent); CS, n=933 (94 per cent); follow-up questionnaires IS, n=990 (88 per cent); CS, n=898 (90 per cent)). The proportion of class-registered students whose baseline and follow-up responses were matched, i.e. belonging to the same person was also high (IS, n=889 (79 per cent); CS, n=792 (80 per cent)).

### Baseline smoking-related health promotion activity

At baseline, intervention school students were significantly less likely to recall talks organised by health promotion officers on the dangers of smoking (IS n=841, 81 per cent; CS n=793, 85 per cent) (OR (95 per cent CI); 0.95 (0.92-0.99)). Similar proportions of students in intervention and CS reported they had been taught by teachers about the dangers of smoking (IS n=830, 80 per cent; CS n=774, 83 per cent) (OR (95 per cent CI); 0.96 (0.92-1.01)). However, relatively few recorded that this teaching occurred in secondary school (IS n=104, 10 per cent; CS n=74, 8 per cent) (OR (95 per cent CI); 1.26 (0.95-1.68)).

### Peer supporter selection

In the first set of focus group discussions, most peer supporters reported they were happy and/or proud and/or excited to be selected for peer supporter training and agreed immediately. Some reported they were shocked because they had only been in their new school for about six months. A few said they agreed even though they were worried, but reported that their anxiety abated after attending the training course.

Discussions within both sets of focus groups indicated that, contrary to the outlined peer supporter selection procedure, no counselling teacher within an intervention school had conducted student polls. Instead, counselling teachers selected students directly. Therefore, many peers did not know about the selection process:

Classmates asked me, how I could have been chosen for the peer educator training

(Ella (girl) IS3).

Other peers were unhappy they had not been selected:

Some classmates were jealous when we went for the [peer educator] training, they asked why we were chosen by the counselling teacher

(Lina (girl) IS4).

Peer supporter recruitment

The planned peer supporter recruitment rate was 80 peer supporters for n=1,122 class-registered students. Thus, the planned ratio of peer supporters to class-registered students was one peer supporter per 14 class-registered students (7 per cent). However, even though written parent/guardian consent was obtained from every selected student only n=73 were trained. Recruitment of students consequently varied across schools (IS1 n=12, 5 per cent of class-registered students: n=233; IS2 n=23, 6 per cent of class-registered students: n=393; IS3 n=19, 10 per cent of class-registered students: n=191; and IS4 n=19, 6 per cent of class-registered students: n=300). More boys (n=38) were recruited than girls (n=35).

Peer supporters' needs assessment

The needs assessment questionnaires that were completed by peer supporters prior to peer supporter training indicated that the majority of students believed that successfully undertaking the role of peer supporter required students to be motivated (n=64; 87 per cent) and have knowledge (n=64; 88 per cent). A minority of students also reported that in order to undertake peer supporter-related tasks they would need supervision (n=31/73; 43 per cent) and/or recognition (n=12/73; 16 per cent) and/or reward (n=5/73; 7 per cent).



In relation to personal skills and strengths, the majority of peer supporters believed that prior to the training they were self-confident (n=64; 88 per cent), willingly helped others (n=61; 84 per cent) and were patient (n=57; 78 per cent). More than half also thought they were good listeners (n=50; 69 per cent), able to work in a team (n=47; 64 per cent) and mixed well with others (n=44; 60 per cent). However, nearly half of the students (n=35; 48 per cent) did not believe they were good communicators.

#### Evaluation of the peer supporter training course

Students rated the seven sessions of the training course on a scale of 1 (needs a lot of improvement) to 5 (excellent) (Melson, 2014). All seven sessions obtained a mean score of at least 4 (good) out of 5:

Session 1: introduction and ice breaker mean score: n=4.0.

Session 2: understanding the role of peer supporter mean score: n=4.4.

Session 3: communication mean score: n=4.2.

Session 4: facts about tobacco and smoking mean score: n=4.3.

Session 5: identifying high-risk smoking-related situations and overcoming peer pressure mean score: n=4.5.

Session 6: reflection session (values and perceptions related to smoking) mean score: n=4.3.

Session 7: planning and leadership mean score: n=4.3.

Thus, the highest mean score (n=4.5) was obtained for Session 5 which aimed to help students identify high-risk smoking-related situations and included role play using structured scenarios. No student had experienced role play using structured scenarios before the peer supporter training.

In the evaluation of training questionnaire, peer supporters were asked to identify the part of the training programme they found most useful and any aspect they disliked. Regarding usefulness, the most common answer referred to learning ways to communicate effectively (n=18; 25 per cent). The first set of focus group discussions supported this finding:

I liked the communication session. We practiced communicating with each other and it will help us in our daily talks and actions

(Rafi (boy) IS4).

I liked the communication process and the tips to be a good listener

(Shida (girl) IS4).

A sizable proportion (n=31; 43 per cent) reported they did not dislike any aspect of the programme. The component that was most commonly reported as being disliked was the reflection component (n=14; 19 per cent). This component aimed to reaffirm students' commitment to their families. One participant raised concerns about this component in the first set of focus group discussions:

I didn't really like the reflection session. It is good to remind us how our parents love, work hard and sacrifice for our sake, but I pitied one pupil from our school, he just lost his father, I think it needed to be adjusted

(Lina (girl) IS4).

#### Peer supporters' suggestions for improving the training course

In the evaluation of training questionnaire, approximately half of the peer supporters (36; 49 per cent) did not provide any suggestions for improving the peer supporters training course. The most common suggestions for improving the training course included increasing the number of educational games (n=7; 10 per cent), extending the training course (n=5; 7 per cent) and continuing the training (n=3; 4 per cent). The most common focus group suggestion centred on extending the training programme:

Extend the training to a bit longer [...] [...]. To one week

(Din (boy) IS2).

#### Peer supporters' smoking-related knowledge and attitudes pre- and post-peer supporter training

The maximum possible score for the knowledge questionnaire was 12. The mean knowledge score increased by 1.8 points from 8.2 pre-training to 10.0 post-training. Post-training, most students had higher knowledge scores (n=55; 75 per cent), some had the same knowledge score (n=13; 18 per cent) and a few had lower knowledge scores (boys n=4, girls n=1; 7 per cent overall).

The maximum possible score for the attitudes questionnaire was 24. The mean attitudes score increased towards non-smoking by 3.4 points from 18.2 pre-training to 21.6 post-training. Post-training, most students had more positive anti-smoking attitudes scores (n=57; 78 per cent), some had the same attitudes score (n=7; 10 per cent) or more negative pro-smoking attitudes scores (boys n=6, girls n=3; 12 per cent overall).

#### Costs of delivering the peer supporter training courses

The total direct costs (including two nights and three days accommodation, food, training venue hire, stationary and a banner/backdrop) were Malaysian Ringgit (MYR) 13,282.10 or £2,656.40 at a rate of MYR5 for £1. The average costs were MYR3,320 (£664) per school and MYR182 (£36) per peer supporter. Catered food for students was the largest contributor to training costs (MYR6,000).

## Peer supporters' experiences

Post-training, peer supporters' experiences were ascertained during the second set of focus group discussions. These discussions focussed on personal abstinence from smoking and smoking-related discussions. Personal development outwith the role of non-smoking peer supporter was also identified.

### Abstaining from smoking

The peer supporter training programme aimed to promote commitment to non-smoking. When asked in focus groups three months after the training how difficult it was or would be to say "No" to offers of cigarettes, peer supporters' responses were mixed. For example, refusing cigarettes was straightforward for some peer supporters:

[I] hate the smell of cigarettes. No matter what people do, I will say I don't smoke. For me it's easy to say no

(Lita (girl) IS4).

Others, particularly boys, felt the training helped them and they were consequently more confident when refusing cigarettes. This increased confidence was gained even though:

Their friends encouraged them to smoke:

Before the training, it was a bit difficult because my friends forced me to try smoking. Now it is easy because if they offer me a cigarette I will say directly that I don't smoke, if they insist I'll ignore them and walk away

(Ben (boy) IS1).

Their friends put emotional pressure on them to act in similar ways:

It is easy now. Before this I have a friend who was upset and threatening not to be my friend forever if I don't smoke

(Bret (boy) IS3).

They classified themselves as a smoker prior to peer supporter training:

Before I was chosen as a peer educator, I was a smoker but now I already stopped. Some friends tried to persuade me to smoke but now I know ways to avoid smoking

(Wong (boy) IS1).

However, some boys said they did or would find it difficult to refuse cigarettes because:

They found themselves in situations in which friends offered them cigarettes:

It's difficult to say no [to smoking] [...] when our close friends force us to start smoking if we hang around in a group or environment where most of our friends are smokers

(Asraf IS4).

In common with their peers they were inquisitive and liked to experiment:

It is quite difficult because young people like to try [smoking]

(Aidi IS3).

Young people are curious and want to try new things

(Asraf IS4).

One boy was tempted to smoke even though he felt keenly that his parents did not want him to smoke and drew upon the sacrifices his parents made for him to reinforce this point:

It is difficult. I'm curious to try it [smoking] but I keep reminding myself to remember my parents' advice not to smoke. It is not easy for them to send me to school

(Arul IS3).

Smoking-related discussions

Most peer supporters had willingly discussed smoking-related issues after peer supporter training. Talking with peers rather than people from other age groups appeared the preferred option:

I feel it's difficult to talk or give an opinion about smoking to people who are much older or much younger than me, I feel more comfortable talking or advising my classmates who are the same age

(Arul (boy) IS3).

A few peer supporters were happy discussing smoking-related issues with people outside of school:

I am confident enough to talk to people in my village especially when sharing the information I got about the contents of cigarettes and their risks

(Noor (boy) IS3).

Focusing on facts about smoking was the most popular approach:

I have become braver about telling others not to start smoking because I got the information about the risks of smoking and the contents of cigarettes

(Richi (boy) IS4).

However, some peers found photographs of the effects of smoking unsettling:

I showed some pictures to my classmates, some of them were afraid, shocked, they don't want to see them, maybe they were frightened of dying early

(Ella (girl) IS3).

Occasionally peer supporters appeared to be a little punitive in their wish to promote non-smoking given that students caught smoking on school premises in Malaysia may potentially be suspended/expelled or subjected to corporal punishment:

I told the discipline teacher about our classmates who smoke and the places they used to smoke in school such as behind the resource centre and toilet

(Rey (boy) IS4).

Many peer supporters received support from their classmates and some were praised for their willingness to be peer supporters:

Some of my friends gave me compliments for being a peer educator

(Era (girl) IS1).

However, a few students were reluctant peer supporters because classmates mocked them.

I don't feel comfortable being a peer educator because sometimes my friends like to ridicule my role as a peer educator

(Kal (boy) IS1).

Other benefits arising from the peer supporter training

Several peer supporters felt the training helped them to develop as people outwith their role of non-smoking peer supporter particularly in relation to empathy:

Being a peer educator is really an eye and heart opening for me to understand the feelings of others. My relationship with friends is closer now

(Krista (boy) IS4).

I understand my classmates more when I help them

(Lidia (boy) IS4).

One peer supporter recounted that since the training she was happy to help others in areas of life that were unrelated to smoking such as schoolwork:

I gave advice to my classmates who were having problems with their studies. They like to share problems with me, I gave them support, I have become a listener to their problems. I'm happy they appreciate my opinion

(Ella (girl) IS3).

Another peer supporter's personal development had an internal focus:

As a peer educator, our roles are more than advising and educating our classmates [...]. We need to look at ourselves, we need to be a good role-model, improve ourselves first before we help others

(Bret (boy) IS3).

Peer supporter activity

Peer supporter activity was assessed through an analysis of diaries that peer supporters used to record their anti-smoking-related activities and follow-up questionnaire responses from all Form 1 students.

Peer supporters' diaries

Most peer supporters (n=49; 67 per cent) returned their diaries, as requested, six months after completing the peer supporter training. The rate of diary return varied between schools (IS1 6/12 (50 per cent); IS2 14/23 (61 per cent); IS3 16/19 (84 per cent); IS4 13/19 (68 per cent)). Girls (n=28; 80 per cent of girls) were more likely to return diaries than boys (n=21; 55 per cent of boys).

Reported peer supporter activity that targeted peers occurred on an individual basis (n=396; 42 per cent), in small groups of fewer than ten people (n=414; 44 per cent) and in groups with at least ten people (n=124; 13 per cent). Total activity was n=934 (396+414+124). Girls recorded more overall activity (n=618/934, 66 per cent) than boys (n=316/934, 34 per cent). In relation to helping classmates, girls again recorded greater activity (n=110) than boys (n=56). However, the recorded median scores for helping classmates were relatively small for both girls (n=3) and boys (n=2). These results indicate a few peer supporters undertook a sizeable proportion of reported occasions during which classmates were helped directly.

#### Form 1 students' experiences of smoking-related discussions

Follow-up questionnaire data indicated that students attending IS were significantly more likely to report they had smoking-related conversations with classmates (IS, n=428 (43 per cent); CS, n=339 (38 per cent)); (OR (95 per cent CI); 1.15 (1.03-1.28)). However, attending an intervention school did not significantly influence the likelihood of having discussed the disadvantages of smoking with classmates (IS, n=622 (63 per cent); CS, n=532 (59 per cent)); (OR (95 per cent CI); 1.06 (0.99-1.14)).

#### Discussion

The first eight schools that were approached agreed to participate in the pilot trial. Thus, school recruitment to the pilot trial was straightforward. Student recruitment to the pilot trial was also high. Implementing a pilot trial of a school-based peer-led anti-smoking intervention was consequently feasible and acceptable in Malaysia. These findings also indicate that Malaysian secondary school head teachers support anti-smoking health promotion interventions and recognise the importance of participating in trials to evaluate intervention effectiveness. Students were pleased to be selected for peer supporter training. Most peer supporters also enthusiastically engaged with the training programme, willingly undertook peer supporter-related activities and returned diaries. Additionally, some peer supporters reported that the peer supporter training facilitated their personal development outwith their role of non-smoking peer supporter. This pilot trial and accompanying process evaluation did, however, have study limitations that should be considered when implementing future trials of school-based peer-led anti-smoking interventions with embedded process evaluation in Malaysia. The MRC guidelines for process evaluation recommend that feasibility and pilot trials should focus on fidelity, dose, reach and context (Moore et al., 2014).

#### Fidelity

Fidelity focusses on whether the intervention was implemented as intended. The key issues regarding fidelity in this pilot trial were the peer supporter selection process, recruitment of male

peer supporters, peer supporter training and the views of teachers and students who were not peer supporters.

#### Peer supporter selection

Student polls were a key aspect of the intended selection process outlined to counselling teachers in this pilot trial. Even though all the head teachers in the IS supported a counselling teacher-administered student poll, no student poll was conducted in any intervention school. We did not anticipate this. Some students were reportedly unhappy they were omitted from the selection process.

A basic tenet of school-based peer-led interventions is that peer supporters are able to influence their peers and sway them towards non-smoking (Bloor et al., 1999). The successful peer supporter intervention that was adopted by the ASSIST trial drew upon student polls to identify the potential peer supporters on the basis that classmates considered them influential within the school context (Audrey et al., 2004). In contrast, counselling teachers in this pilot trial were instructed to draw upon the student poll results and select peer supporters who were pleasant, helpful, good communicators and had leadership qualities. These students may/may not have been influential within the school context. However, as highlighted by the ASSIST trial, the identification of influential students requires student input through, for example, student polls.

Organising student polls in Malaysia may have been too onerous for counselling teachers with heavy workloads. Students in the ASSIST trial were invited to nominate classmates for peer supporter training via researcher-administered baseline questionnaires (Audrey et al., 2004). Researchers then identified students with the most nominations in each school and worked with teachers to select students for peer supporter training.

Employing the ASSIST peer supporter selection procedure is, however, unlikely to be tenable in Malaysia because many students in a single school year have the same or similar names. Thus, identifying nominated students is unlikely to be straightforward. Teacher or researcher-administered class-level student polls are a possible way forward in Malaysia as fewer students per class poll would have the same or similar names.

#### The recruitment of male peer supporters

Unlike the ASSIST trial (Audrey et al., 2004), recruiting male peer supporters in this pilot trial was straightforward and more boys (n=38) than girls (n=35) were recruited. However, some boys in the second set of focus group discussions indicated they had found/would find it difficult to resist smoking and/or were uncomfortable undertaking peer supporter activities. Additionally, fewer boys (n=21; 55 per cent of boys) than girls (n=28; 80 per cent of girls) returned completed diaries. The reasons boys were less likely to return completed diaries were not identified. Some boys may have had informal smoking-related conversations and either forgotten to record them in their diaries or forgotten to return their diaries.



It is possible that female peer supporters may be able to influence their male peers on smoking-related issues. However, gender differences in adolescent smoking prevalence in Malaysia highlight the importance of recruiting male peer supporters. Based upon the return of peer supporter diaries, the majority of boys (n=21; 55 per cent per cent of boys) appeared to respond well to the peer supporter intervention. This view is supported by the observations that post-peer supporter training, only n=4 boys (11 per cent) had lower knowledge scores and only n=6 boys (16 per cent) had more negative pro-smoking attitudes. Thus, even though boys may be more likely to disengage from the peer supporter training and intervention than girls, this paper proposes that more boys than girls are trained as peer supporters in future trials in Malaysia.

This paper suggests that a minority of students may have failed to embrace the aims of the peer supporter training programme. This suggestion is based upon the observation that some students achieved lower knowledge scores post-training and more negative pro-smoking attitude scores post-training. These students were more likely to be boys (knowledge test, n=4 (11 per cent of boys); attitudes test, n=6 (16 per cent of boys) than girls (knowledge test, n=1 (3 per cent of girls); attitudes test, n=3 (9 per cent of girls). These students may have attended the peer supporter training for reasons related to adventure and derring-do and because the training course was different and they stayed away from school and home for three days with friends. Overcoming this potential problem in future trials may be difficult, especially if greater emphasis is placed on recruiting influential students who may/may not be reluctant to outline their reasons for attending the training course.

### The peer supporter training

The current peer supporter training course was rated very highly by peer supporters. Pre-training, approximately half of the peer supporters (n=35; 48 per cent) believed they were poor communicators. Perhaps unsurprisingly, therefore, the training programme session on communication skills was most frequently reported as useful.

It is likely, however, that modifying the current course would be beneficial. The reflection component aimed to reaffirm the students' commitment to their family and thereby potentially promote non-smoking. Students' families are commonly forces for sobriety. Teenagers who detach themselves from families and schooling may potentially seek support from youth cultures that are forces for experimentation and hedonism and these youth cultures may encourage teenagers to smoke (Markham, 2015). Focus group discussions in this pilot trial supported the view that some Malaysian youth cultures encourage experimentation with cigarettes. However, teenagers' sensitivity to different familial circumstances may have been underestimated in this pilot trial. Approximately one in five peer supporters (n=14; 19 per cent) reported in the evaluation of training questionnaire that they disliked the reflection component and focus group discussions highlighted concerns about this component. It is likely that as teenagers mature and develop their identities they need to be actively involved in the decisions about who and what they are committed to (Markham, 2015). This paper, therefore, proposes that the reflection session may have been too forceful and direct and recommends that it is not included in future training programmes.

Peer supporters' attitudes towards smoking were assessed immediately prior to the peer supporter training and immediately after the training was completed. Some of the attitude questions were inverted in intent so that "strongly agree" corresponded with a negative (pro-smoking) attitude but were reversed for scoring purposes. The pilot trial was conducted in 2011/2012. At that time, it was commonly believed that reversing some attitude questions would reduce or prevent response bias that was associated with self-report questionnaires (Baumgartner and Steenkamp, 2001). Response bias threatens the validity of participants' responses. However, van Sonderen et al. (2013) subsequently found that reversing questions in self-report questionnaires did not prevent response bias and recommended that questions should be expressed in the same direction. Therefore, this paper recommends that attitudes questions are not reversed in future trials.

#### Views of teachers and students who were not peer supporters regarding the intervention

Eliciting the views of teachers and students who were not selected to be peer supporters would have extended the research team's understanding of the acceptability and implementation of the intervention. Future trials could, therefore, usefully consider identifying these views as part of the accompanying process evaluation.

#### Dose (peer supporter recruitment)

Dose refers to number/proportion of Form 1 students trained as peer supporters. The planned peer supporter recruitment rate in this pilot trial was 7 per cent of class-registered students but the actual peer supporter recruitment rate was slightly lower (6.5 per cent). This paper proposes that running the training course at the weekend in Kota Kinabalu is a likely contributing factor to this lower than planned recruitment and recommends that future training courses are delivered during the school week.

Training costs per student in this pilot trial (approximately £36) and the ASSIST trial (£32) (Hollingworth et al., 2012) were similar. However, the ASSIST trial recommended that approximately 16 per cent of students should be trained as peer supporters (Audrey et al., 2004). Therefore, replicating the ASSIST trial peer supporter intensity guidelines would have required the training of approximately 45 peer supporters per average Malaysian secondary school. This would have increased overall peer supporter training costs as the provision of food for students was the largest contributor to these training costs. Training more peer supporters per training course could, however, potentially reduce student-level training costs through economies of scale.

This paper proposes that future trials in Malaysia could consider adopting the ASSIST trial peer supporter recruitment rate, providing, that is, the increased overall training costs are not prohibitive. Alternatively, future trials could consider conducting preliminary social network analysis. This type of analysis would identify the students who wielded the greatest social influence and would more accurately predict how many students would be needed to be trained as peer supporters. Conducting this type of analysis may even indicate that fewer than 16 per cent of students would need to be trained as peer supporters.

## Reach

Reach in this pilot trial refers to the informal smoking-related discussions between peer supporters and their Form 1 classmates. Prior to obtaining Form 1 students' responses in the follow-up questionnaire, it had been anticipated that the following questions were reasonable and would provide relevant information regarding peer supporters' reach: "Have you ever talked to your classmates about smoking issues?" and "Have you ever talked to your classmates about the disadvantages of smoking?". However, the number of reported discussions between peers on the disadvantages of smoking in both IS (n=622) and CS (n=532) were greater than the number of conversations between classmates about smoking-related issues (IS, n=428; CS, n=339), which was not anticipated. Rather, it had been expected that pupils would interpret the "Have you ever talked to your classmates about smoking issues?" question as focussing on smoking-related issues in general and there would be more of this type of conversation than conversations that focussed on the disadvantages of smoking. On reflection, this paper concludes that these questions are too ambiguous and should not be included in the process evaluation of future trials.

The hypothesised route through which the intervention influences teenagers' smoking-related behaviour is through informal communication between peer supporters and their classmates. Peer supporters may have these conversations with one or more classmates. Through these informal conversations peer supporters may help their peers to formulate strategies to resist coercive pressure from other people to smoke (Audrey et al., 2004), as identified in the logic model (Figure 2). Additionally, peer supporters may act as the agents for promoting non-smoking group norms and customs within an identified context by acting as role models for their peers (Audrey et al., 2004). Follow-up questionnaires in future trials should, this paper proposes, be amended to reflect the hypothesised routes. Potential questions could include: "Have you ever discussed how you might resist smoking with your classmates?"; "Have you ever discussed how you might resist smoking with people you know were trained as anti-smoking peer educators?"; "Thinking about the most influential people in your school year, would you say that the majority of these influential people smoke or that the majority of these influential people do not smoke?"; "Thinking about the people you know were trained as anti-smoking peer educators, would you say that the majority of them smoke or that the majority of them do not smoke?"

## Context

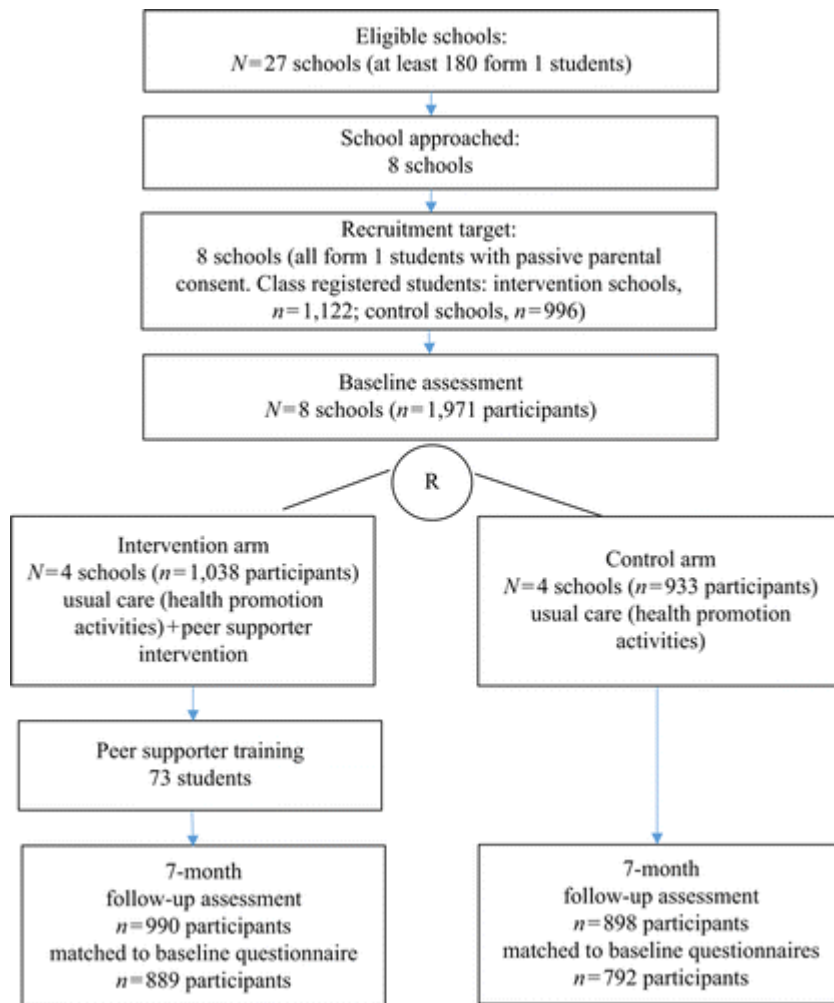
Context refers to the factors outside of the intervention that augment or diminish intervention effects. Contextual factors may affect the teenagers' decisions to smoke (Markham et al., 2009). Baseline smoking-related health promotion activity prior to the intervention was the only contextual factor that was assessed in this pilot trial. The research team were retrospectively made aware that the Malaysia National Anti-Drugs Agency delivered an anti-illegal drug programme in one intervention school in Kota Kinabalu during this pilot trial. Additionally, health promotion activities that constituted usual care were not monitored and assessed. Health promotion interventions and activities that are/are not part of usual care may potentially influence adolescent smoking and thus, the apparent effectiveness of peer supporter interventions. Hence, this paper proposes that future trials should monitor both additional health promotion activities that focus on substance use (drug use, alcohol and smoking) and usual care in order to identify variations across schools within and

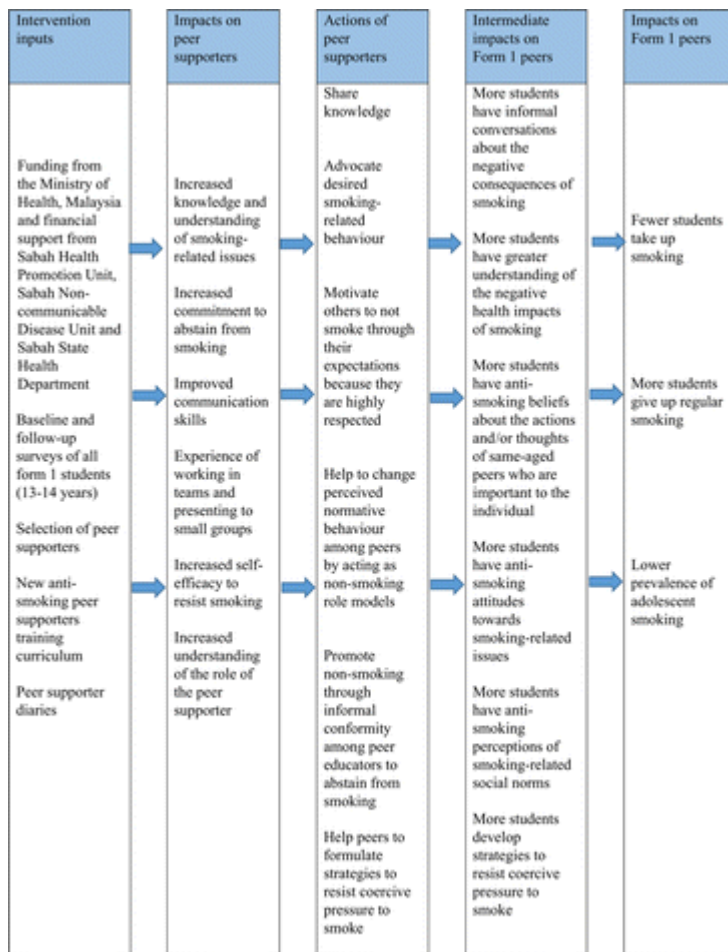
between districts. Subsequent analyses could then either adjust for any school-level differences and/or include post hoc sensitivity analyses.

Markham et al. (2009) reasoned that as a consequence of the influence of contextual factors, transferring similar adolescent anti-smoking interventions between countries may not be straightforward. Thus, the potential influence of contextual factors on intervention effectiveness may be usefully extended in future trials (Markham, 2015; Markham et al., 2009). Potentially important contextual factors include variations in the aims and values of schools (Weiner et al., 2009) and how well peer supporter interventions fit with these aims and values (Samdal and Rowling, 2011).

## Conclusion

A fully powered cluster randomised control trial of the intervention with embedded process evaluation and a follow-up of at least 12 months would be the next step. The findings from this pilot study would suggest that such a trial would be feasible and straightforward in Malaysia. However, this pilot trial and accompanying process evaluation has found that future trials may benefit from, modifications to the methods for selecting, recruiting and training peer supporters, modifications to assessments of the influence of the peer supporter training on participants' smoking-related attitudes and modifications to assessments of intervention acceptability, reach and context.





Sources: Drawn from Ajzen (1991), Bandura (1986), YPEER (2003), IPPF/WHR (2004); Peace Corps, Malaysian PROSTAR (2004)

<b>Assessment</b>	<b>Data sources</b>	<b>Providers of information</b>
Recruitment to pilot trial	Baseline questionnaire Follow-up questionnaire	All Form 1 students day of administration
Baseline smoking-related health promotion activity in schools	Baseline questionnaire	All Form 1 students day of administration
Implementation of the peer supporter training courses	Needs assessment questionnaire before the peer supporter training	Peer supporters
	Smoking-related knowledge questionnaire before and immediately after the peer supporter training	Peer supporters
	Smoking-related attitudes questionnaire before and immediately after the peer supporter training	Peer supporters
	Evaluation of the training questionnaire immediately after the peer supporter training	Peer supporters
	First set of single-gender focus group discussions immediately after the peer supporter training	Peer supporters
The implementation of the peer-led intervention	Second set of mixed gender focus group discussions three months after completing the training programme	Peer supporters
	Completed diaries six months after completing the peer supporters training	Peer supporters,
	Follow-up questionnaires	All Form 1 students day of administration

**Table I** Data sources for process evaluation

Aims	Objectives: by the end of the programme students would:	Example of activity
To facilitate increased understanding of smoking-related issues	Know the extent of tobacco use in Malaysia and worldwide Know the contents of cigarettes Have greater understanding of the short term impact of smoking Have greater insight into smoking-related diseases	Video of an experiment where cigarettes were boiled and their contents identified
To reaffirm commitment to not smoking	Recognise high-risk smoking-related situations Have learned strategies for rejecting offers of cigarettes	Role play where participants practised starting conversations in a variety of scenarios
To facilitate the development of communication skills	Have developed their verbal and non-verbal communication skills Have greater understanding of the different ways of giving and receiving information	Lecture on the basic communication process and important elements of communication, how to be a good listener
To facilitate personal development	Have experience of working in teams Be able to present in small groups and to the whole group	Assigning their small group of 6 or 7 members to create a small group slogan and slogan
To reaffirm commitment to family	Have reflected on their commitment to their family	Visualisation of each of their identified wishes and reflection on the wishes of their loved ones, the participant
To understand the role of peer supporter	Understand the activities of a peer supporter Be able to accurately complete diaries	Practise how to use the diaries

**Table II** Peer supporter training programme aims, objectives and examples of activities



## References

1.

Ajzen, I. (1991), "The theory of planned behaviour", *Organisational Behavior and Human Decision Processes*, Vol. 50 No. 2, pp. 179-211.

2.

Audrey, S., Cordall, K., Moore, L., Cohen, D. and Campbell, R. (2004), "The development and implementation of a peer-led intervention to prevent smoking among secondary school students using their established social networks", *Health Education Journal*, Vol. 63 No. 3, pp. 266-284.

3.

Bandura, A. (1977), *Social Learning Theory*, Prentice Hall, Englewood Cliffs, NJ.

4.

Baumgartner, H. and Steenkamp, J.B.E.M. (2001), "Response styles in marketing research: a cross-national investigation", *Journal of Marketing Research*, Vol. 38 No. 2, pp. 143-156.

5.

Bendassolli, P.F. (2013), "Theory building in qualitative research. Reconsidering the problem of induction", *Qualitative Social Research*, Vol. 14 No. 1, pp. 1-20.

6.

Bloor, M., Frankland, J., Parry-Langdon, N., Robinson, M., Allerston, S., Catherine, A., Cooper, L., Gibbs, L., Gibbs, N., Hamilton-Kirkwood, L., Jones, E., Smith, R.W. and Spragg, B. (1999), "A controlled evaluation of an intensive, peer-led, schools-based, anti-smoking programme", *Health Education Journal*, Vol. 58 No. 1, pp. 17-25.

7.

Campbell, R., Starkey, F., Holliday, J., Audrey, S., Bloor, M., Parry-Langdon, N., Hughes, R. and Moore, L. (2008), "An informal school-based peer-led intervention for smoking prevention in adolescence (ASSIST): a cluster randomised trial", *Lancet*, Vol. 371, pp. 1595-1602.

8.

Hammond, D., Foong, K., Prohmmo, A., Kungskulniti, N., Tan, Y.L., Sharma, S.K., Sirirassamee, B., Borland, R. and Fong, G.T. (2008), "Patterns of smoking among adolescents in Malaysia and Thailand: findings from the International Tobacco Control Southeast Asia Survey", *Asia Pacific Journal of Public Health*, Vol. 20 No. 3, pp. 193-203.

9.

Hollingworth, W., Cohen, D., Hawkins, J., Hughes, R.A., Moore, L., Holliday, J., Audrey, S., Starkey, F. and Campbell, R. (2012), "Reducing smoking in adolescents: cost-effectiveness results from the cluster randomized ASSIST (A Stop Smoking In Schools Trial)", *Nicotine and Tobacco Research*, Vol. 14 No. 2, pp. 161-168.

10.

IPPF/WHR (2004), *Peer to Peer: Creating Successful Peer Education Programs*, International Planned Parenthood Federation, Western Hemisphere Region.

11.

ISRCTN registry (2016), "ID ISRCTN98023400", available at: [www.isrctn.com/ISRCTN98023400](http://www.isrctn.com/ISRCTN98023400)

12.

Markham, W.A. (2015), "School culture and substance use amongst school students: a new conceptual and operational framework", *Educational Review*, Vol. 67 No. 3, pp. 282-299.

13.

Markham, W.A., Lopez, M.L., Aveyard, P., Herrero, P., Bridle, C., Comas, A., Charlton, A. and Thomas, H. (2009), "Mediated, moderated and direct effects of country of residence, age, and gender on the cognitive and social determinants of adolescent smoking in Spain and the UK: a cross-sectional study", *BMC Public Health*, Vol. 9, p. 173.

14.

Melson, E. (2014), "The development and evaluation of a school-based smoking prevention intervention for adolescents in Malaysia", unpublished manuscript, PhD thesis, University of Warwick, Coventry.

15.

Ministry of Education, Malaysia (1996), *Education Act*, Ministry of Education, Malaysia, Malaysia.

16.

Ministry of Health, Malaysia (2003), "Clinical practice guidelines on treatment of tobacco use and dependence", Ministry of Health, Malaysia.

17.

Ministry of Health, Malaysia (2010), *Country Health Plan: 10th Malaysia Plan 2011-2015*, Planning and Development Division.

18.

Mochizuki-Kobayashi, Y., Fishburn, B., Baptiste, J., El-Awa, F., Nikogosian, H., Peruga, A., Rahman, K., Warren, C.W., Jones, N.R., Asma, S. and McKnight, L.R. (2006), "Use of cigarettes & other tobacco products among students-aged 13-15 years worldwide, 1999-2005", *Morbidity and Mortality Weekly Report*, Center for Disease Control and Prevention, Vol. 55 No. 20, pp. 553-556.

19.

Moore, G.F., Audrey, S., Barker, M., Bond, L., Bonell, C., Hardeman, W., Moore, L., O'Cathain, A., Tinati, T., Wight, D. and Baird, J. (2014),

“Process evaluation of complex interventions”, Medical Research Council Guidance, Vol. 35.

20.

Peace Corps (2001), “Life Skills Manual”, Peace Corps.

21.

PROSTAR (2004), Training Module for Schools, Ministry of Health, Malaysia.

22.

Samdal, O. and Rowling, L. (2011), “Theoretical and empirical base for implementation components of health promoting schools”, Health Education, Vol. 111 No. 5, pp. 367-390.

23.

Sirichotiratana, N., Sovann, S., Aditama, T.Y., Krishnan, M., Kyaing, N.N., Miguel-Baquilod, M., Hai, P.T., Sinha, D.N., Warren, C.W. and Jones, N.R. (2008), “Linking data to tobacco control program action among students aged 13-15 in Association of Southeast Asian Nations (ASEAN) member states, 2000-2006”, Tobacco Control, Vol. 17 No. 6, pp. 372-378.

24.

Thomas, R.E., Lorenzetti, D.L. and Spragins, W. (2013), “Systematic review of mentoring to prevent or reduce tobacco use by adolescents”, Academic Pediatrics, Vol. 13 No. 4, pp. 300-307.

25.

van Sonderen, E., Sanderman, R. and Coyne, J.C. (2013), “Ineffectiveness of reverse wording of questionnaire: let’s learn from cows in the rain”, PLOS, Vol. 8 No. 7, pp. e68967.

26.

Warren, C.W., Jones, N.R., Peruga, A., Chauvin, J., Baptiste, J.P., Costa de Silva, V., el Awa, F., Tsouros, A., Rahman, K., Fishburn, B., Bettcher, D.W. and Asma, S. (2008), "Global Youth and Tobacco Surveillance, 2000-2007", Morbidity and Mortality Weekly Report, Center for Disease Control and Prevention Surveillance Summaries, Vol. 57 No. 1, pp. 1-28.

27.

Weiner, B.J., Lewis, M.A. and Linnan, L.A. (2009), "Using organization theory to understand the determinants of effective implementation of worksite health promotion programs", Health Education Research, Vol. 24 No. 2, pp. 292-305.

28.

YPEER (2003), Peer Education: Training of Trainers Manual, Joint Interagency Group on Young People's Health Development and Protection in Europe and Central Asia (IAG).