

UNIVERSITI PUTRA MALAYSIA

PEER-LED BEHAVIOURAL INTERVENTION TO PREVENT CIGARETTE AND WATER PIPE USE AMONG PUBLIC HIGH SCHOOL CHILDREN IN SANANDAJ, IRAN

MAHTAB MOHAMMADI

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By

MAHTAB MOHAMMADI

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

February 2016

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in Fulfilment of the Requirement for the Degree of Doctor of Philosophy

PEER-LED BEHAVIOURAL INTERVENTION TO PREVENT CIGARETTE AND WATER PIPE USE AMONG PUBLIC HIGH SCHOOL CHILDREN IN SANANDAJ, IRAN

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MAHTAB MOHAMMADI

February 2016

Chairman: Professor Lekhraj Rampal, MBBS, MPH, DrPH, FAMM, FAMS, FPHMM Faculty: Medicine and Health Sciences

Tobacco use among adolescents is one of the major public health concerns worldwide. In Iran, about 3.0 percent and 26.6 percent of adolescents aged 13 to 15 currently smoke cigarette and water pipe, respectively. The increase in adolescent's tobacco use and subsequent health, social and economic impact associated with smoking reveals a need for more effective and empirically prevention strategies. The objective of this study was to develop, implement and evaluate the effectiveness of a peer-led behavioural intervention programme to prevent cigarette smoking and water pipe use among public high schoolchildren.

A cluster randomized controlled trial design was used in this study. Out of 37 public high schools in Sanandaj City, 4 male and 4 female public high schools were randomly selected and allocated into intervention or control group. All students in grade one to three (corresponding to 14-17 years old) in selected schools were included. Data were collected using three sections questionnaire. A self-administered validated questionnaire was used to measure smoking behaviour, intention to cigarette and water pipe use and determinant factors related to cigarette and water pipe use of respondents. It was administered at baseline and 6 month post-intervention. Four-hour integrated tobacco prevention program comprising of four structured modules was developed and delivered to the intervention group by trained peer educator. Data were analyzed using IBM SPSS Statistics 21. Chi-square analyses and independent sample t-tests were used to test group equivalence between intervention and control group at baseline for categorical and continues data, respectively. Generalized estimating equations (GEE) were applied to assess the effectiveness of the intervention. Cohen's d effect size (ES) and the odds ratio (OR) was used to interpret the results. The outcome measures were assessed at baseline and 6 months post-intervention.



Data were collected from 1807 public high schoolchildren aged 14 to 17 years old. 949 participants randomized to the intervention and 934 participants to the control group. Results were based on controlling for cluster effects of schools and demographic factors. The results showed that there was significant decrease in intention to cigarette smoking (p=<0.001) and water pipe use (p=<0.001) observed after intervention. The intervention module was also effective in improving smoking knowledge (p=<0.001), normative believes with regard to perceived prevalence of cigarette smoking (p=<0.001), normative believes with regard to perceived prevalence of water pipe use (p=<0.001), self-esteem (p=<0.001) and refusal skill (p=0.035), but not for attitude toward smoking (p=0.307) and assertiveness skill (p=0.496) in intervention group six months post intervention. However, the peer-led cigarette and water pipe use prevention program used in this study, had no significant effect on smoking cigarette (p=0.264) and water pipe use (p=0.232) six months post intervention.

In conclusion, peer-led behavioural intervention program developed in this study was effective to decrease the intention to cigarette and water pipe use. It was also effective in improving knowledge, normative believes with regard to perceived prevalence of cigarette and water pipe use, self-esteem and refusal skill. However, module developed, was not effective to reduce cigarette and water pipe use at 6 months post intervention among high schoolchildren in Sanandaj, Iran.

Keywords: Cigarette and water pipe use, Peer-led intervention, High schoolchildren.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah.

INTERVENSI TINGKAH LAKU YANG DIPIMPIN RAKAN SEBAYA UNTUK MENCEGAH PENGGUNAAN TEMBAKAU DAN SISHA DI KALANGAN PELAJAR SEKOLAH BERUMUR DI SEKOLAH TINGGI AWAM DI SANANDAJ, IRAN

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Penggunaan tembakau di kalangan remaja adalah satu daripada masalah kesihatan awam yang utama di seluruh dunia. Di Iran, kira-kira 3.0 peratus dan 26.6 peratus remaja yang masing-masing berumur 13 hingga 15 tahun kini menghisap rokok dan shisha. Peningkatan dalam penggunaan tembakau di kalangan remaja dan kesan terhadap kesihatan, sosial dan ekonomi yang berkaitan dengan aktiviti merokok telah membawa kepada keperluan untuk mempunyai satu strategi pencegahan secara empirikal yang lebih berkesan. Objektif kajian ini adalah untuk membangunkan, melaksanakan dan menilai keberkesanan program intervensi tingkah laku yang dipimpin rakan sebaya untuk mencegah penggunaan tembakau dan sisha di kalangan pelajar sekolah tinggi awam.

Kajian ini menggunakan kaedah rekabentuk kajian terkawal secara rawak dan berkelompok. Sebanyak 4 buah sekolah tinggi awam lelaki dan 4 buah sekolah tinggi awam perempuan telah dipilih secara rawak daripada 37 buah sekolah di bandar Sanandaj dan ditetapkan ke dalam kumpulan intervensi atau kawalan. Kesemua pelajar yang terlibat adalah dalam gred satu hingga tiga (sepadan dengan umur 14-17 tahun) daripada sekolah yang terpilih. Data dikumpulkan dengan menggunakan soal selidik yang mempunyai tiga bahagian. Soal selidik yang dijawab sendiri serta mempunyai kesahihan telah digunakan untuk menilai tingkah laku merokok, niat untuk penggunaan tembakau dan shisa dan faktor-faktor penentu yang berkaitan dengan penggunaan tembakau dan shisha di kalangan responden. Ia diberikan pada garis dasar dan 6 bulan selepas intervensi. Program pencegahan tembakau bersepadu selama empat jam yang terdiri daripada empat modul berstruktur telah dibangunkan dan dijalankan oleh rakan sebaya yang terlatih kepada kumpulan intervensi.



Data telah dianalisa menggunakan IBM SPSS Statistics 21. Analisis khi-kuasa dua dan ujian t-bebas bagi sampel digunakan untuk menguji kesetaraan antara kumpulan intervensi dan kumpulan kawalan pada garis dasar bagi data yang berbentuk kategori dan berterusan. Ujian *Generalized Estimating Equations* (GEE) telah digunakan untuk menilai keberkesanan intervensi. Penilaian efek saiz adalah menggunakan *Cohen's d* (ES) dan *odds ratio* (*OR*) digunakan untuk mentafsir keputusan. Pengukuran keputusan telah dinilai pada garis dasar dan 6 bulan selepas intervensi.

Data dikumpulkan daripada 1807 pelajar sekolah tinggi awam yang berumur antara 14 hingga 17 tahun. 949 peserta yang dipilih secara rawak bagi kumpulan intervensi dan 934 peserta dipilh bagi kumpulan kawalan. Keputusan adalah berdasarkan kepada pengawalan kesan berkelompok bagi sekolah-sekolah dan beberapa faktor demografi. Hasil kajian menunjukkan bahawa terdapat penurunan yang signifikan dalam niat untuk merokok (p=<0.001) dan penggunaan shisha (p=<0.001) selepas intervensi. Modul intervensi juga berkesan dalam meningkatkan pengetahuan tentang merokok (p= <0.001), kepercayaan normatif mengenai kelaziman tanggapan terhadap merokok (p= <0.001), kepercayaan normatif mengenai kelaziman tanggapan terhadap penggunaan shisha (p =<0.001), harga diri (p=<0.001), kemahiran penolakan (p = 0.035), tetapi tidak bagi sikap terhadap penggunaan tembakau (p=0.307) dan kemahiran asertif (p=0.496) dalam kumpulan intervensi enam bulan selepas intervensi dijalankan. Walau bagaimanapun, modul itu tidak berkesan dalam mengurangkan penggunaan tembakau. Program mencegah penggunaan tembakau yang dipimpin rakan sebaya dalam kajian ini tidak mempunyai kesan signifikan terhadap merokok (p=0.264) dan penggunaan shisha (p=0.232) selepas enam bulan intervensi.

Kesimpulannya, program intervensi tingkah laku yang dipimpin rakan sebaya dalam kajian ini berkesan mengurangkan niat untuk menggunakan tembakau (rokok dan shisha). Ia juga berkesan dalam meningkatkan pengetahuan, kepercayaan normatif mengenai kelaziman tanggapan terhadap merokok dan shisha, harga diri dan kemahiran penolakan.Walau bagaimanapun, tidak berkesan mengurangkan penggunaan tembakau (rokok dan shisha) pada 6 bulan selepas intervensi dijalankan di kalangan pelajar sekolah tinggi awam di Sanandaj, Iran.

Kata kunci: Penggunaan rokok dan shisha, Intervensi yang dipimpin rakan sebaya, pelajar sekolah tinggi

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I certify that a Thesis Examination Committee has met on 26 February 2016 to conduct the final examination of Mahtab Mohammadi on her thesis entitled "Peer-Led Behavioral Intervention to Prevent Cigarette and Water Pipe use among Public High School Children in Sanandaj, Iran" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

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LIST OF ABBREVIATIONS

AD	Alzheimer's Disease
ALO	At Least One
ASSIST	A Stop Smoking in School Trial
EDDRA	The Exchange on Drug Demand Reduction Action
EMRO	Eastern Mediterranean Region
FGD	Focus Group Discussion
GEE	Generalized Estimating Equations
GYTS	Global Youth Tobacco Survey
МОНМЕ	Ministry Of Health and Medical Education
NCI	National Cancer Institute U.S
OR	Odds Ratio
POR	Prevalence Odds Ratio
RCT	Randomized Controlled Trial
SD	Standard deviation
USDHHS	United States Department of Health and Human Services
WHO	World Health Organization

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CHAPTER 1

INTRODUCTION

This chapter discusses about the introduction of the study which is consist of background of study, significance of study, problem statement, research objectives, and hypothesis.

1.1 Background

Tobacco use is a major health hazard that contributes significantly to preventable morbidity and mortality (WHO, 2011). It is an important risk factor for cardiovascular disease, ischemic heart disease, lower respiratory tract infection, chronic obstructive pulmonary disease, tuberculosis, Alzheimer's disease (AD), and cancer of trachea, bronchus, lungs, mouth and oesophagus (WHO, 2009; Cataldo *et al.*, 2010; Hernan et al., 2008). Tobacco products use is a serious health matter globally. Tobacco kills up to half of its users. Worldwide, tobacco use causes about 6 million deaths per year, and current trends show that tobacco use will cause more than 8 million deaths annually by 2030. Nearly 80% of these deaths are in low and middle-income countries (WHO, 2013).

There are 1.3 billion smokers among the global population of 6 billion, of which more than 50% are young people. Worldwide, between 80,000 and 100,000 children (aged 13 to 15) start smoking every day - roughly half of whom live in Asia (WHO, 2013). Although the overall prevalence of smoking has decreased globally for both men and women since 1980, the number of smokers increased significantly due to population growth (Ng *et al.*, 2014).

The increasing use of water pipe by is a burgeoning public health crisis. Currently, it is estimated that worldwide, totally 100 million people use water pipe to smoke tobacco every day (Gatrad, *et al.*, 2007). In the past decades, a considerable rise has seen in the popularity of water pipe smoking among young people living in the Middle East, Southwest Asia, Africa, Europe, Canada, and the U.S. (Knishkowy and Amitai, 2005, Akl et al., 2011). Water pipe smoking is becoming the most common type of tobacco smoking after cigarettes among U.S. young adults (Primack et al., 2013). Reports have shown a 40% increase from 2005 to 2008 (Smith et al., 2011). This rise is a major concern in the U.S. and globally (Maziak, 2011).

In Iran, prevalence of smoking any tobacco product among male and female aged more than 15 years old is 24.6% and 3.3%, respectively. Prevalence of smoking any tobacco product among adolescents male and female aged 13–15 years old is 33% and 20%, respectively. Out of these, 5.1% of male and 0.9% of female are current tobacco smoking. Males have much higher rates of being current cigarette smoking than females (WHO, 2014). Out of 11 million cigarette and water-pipe smokers in Iran, 5

million are cigarette smokers, meanwhile 6 million are water pipe smokers. The popularity of smoking cigarette is much more among Iranian men in comparing with other tobacco products. However, among Iranian women use of water-pipe is the most common form of tobacco consumption (Ministry of Health and Medical Education Iran, 2014).

Tobacco is perceived a "gateway" drug which increases the probability that individual will eventually progress to be addicted to other drugs (Mathers et al., 2006; Li *et al.*, 2014). "Adolescence is a period of time in which the cognitive and physical change, individuation, and experimentation occurred. During this progressive stage, teenagers attend to get experience with different behaviours and lifestyle choices in which they conflict to find their independence and self-awareness". Adolescents become addicted to tobacco products faster than adults because, developmentally, their brains are more sensitive to nicotine (Belluzzi *et al.*, 2005). Early initiation and regular use of cigarettes are important predictors of substance use problems in young adulthood (Riala *et al.*, 2004). Many adult smokers initiate the smoking habit during adolescence or as young adults (Rachiotis et al., 2008).

Many factors influence adolescents' decisions to tobacco use initiation. These factors including some individual characteristics, such as stress (Fields *et al.*, 2009), low selfesteem (O'Loughlin *et al.*, 2009; Kokkevi *et al.*, 2007), perceived norms and prevalence of smoking (Guo *et al.*, 2007) but also social characteristics, such as smoking by parents (Gilman *et al.*, 2009), siblings and friends (O'Loughlin *et al.*, 2009).

Social influences are among the most important factors associated with adolescent smoking. Social characteristics, such as low assertiveness skill (Ando *et al.*, 2007; Jafari & Shahidi, 2009), refusal skill, refusal self-efficacy and poor ability of resistance to social pressure (Epstein *et al.*, 2007; Stigler *et al.*, 2011) can also affect smoking initiation among adolescents and intentions to use tobacco.

Adolescents may be particularly susceptible to social influences given their developmental stage (Steinberg & Monahan, 2007). Adolescents smoking initiation can be under the effect of exposure and susceptibility to tobacco advertising (Hanewinkel *et al.*, 2011). Most adult smokers began to smoke regularly during their teenage years (Tolstrup et al., 2014); thus, understanding the factors that predict smoking uptake during this period can be helpful to implement effectiveness prevention programs among them.

C

Over several decades, many researches on the efficacy of schools-based smoking prevention programs in different countries around the world have been carried out, and a number of reviews of the evidence including meta-analyses (Thomas et al., 2015) and systematic reviews (Thomas & Perera, 2006; Thomas et al., 2013; Faggiano *et al*, 2008) have been published. Thomas *et al.*, (2013) from review of one hundred and thirty-four schools-based prevention programs studies found that prevention programs based on the combination of social competence and social influences interventions have a greater impact on smoking behaviour than those that focus only on knowledge.

In a systematic review of studies examining the efficacy of three groups of schoolbased prevention intervention programs (skills, affective and knowledge focused), skill based intervention significantly appear to have a positive effect on knowledge, decision-making, self-esteem and peer pressure resistance and final outcomes compare to affective and knowledge focused programs (Faggiano *et al.*, 2008).

Peer education has been proposed as a potentially effective method of undertaking smoking prevention work with adolescents because of the documented influence of peers on adolescent smoking behaviour (Hoffman et al., 2006). The rationale for using peer-led methods includes the idea that peer education taps into adolescents' naturally occurring information-sharing processes and uses the influence of social networks on young people's behaviour for positive results (Wilton *et al.*, 1995). It was found that influential peers can act as role models and leaders, stimulating behaviour change (Miller-Day et al., 2014). The health benefits of preventing smoking among adolescents have an extensive impact to community.

1.2 Problem Statement

There is sufficient evidence that use of any different forms of tobacco, is a risk factor for chronic illnesses. For decades, tobacco use among adolescents has been viewed as a significant public issue based on health effects, dependency, and failed cessation. Studies were consistent in noting that early age initiation of smoking often acts as the gateway drug to illicit drugs and future problem behaviours (Kelishadi et al., 2006). Several tobacco products was associated with daily smoking, which led to dependency and continued use into adulthood, thereby making it difficult to quit (Chen et al, 2006).

Increasing prevalence of smoking in Iranian adolescents is a major concern for public health. According to the global youth tobacco survey (GYTS) in 2007, about 32.9% male and 19.5% female of Iranian adolescents aged 13-15 years old have used any type of tobacco. Meanwhile, in 2003, about 17.6% male and 8.9% female of Iranian adolescents aged 13-15 years old currently used any type of tobacco (WHO, 2015). Recent studies indicated an increasing trend in cigarette smoking and water pipe use among children and adolescents (Azaripour, 2007).

A study in Iran showed that the prevalence of self- reported cigarette smoking in ages 11-18 years was 18.5% in boys and 10.1% in girls with the mean initiation age of 13.2 +/- 2.5 year years old (Kelishadi et al., 2006). The results of meta-analysis showed that 27% and 7% of Iranian high school student were experimental or regular smokers, respectively (Nazarzadeh et al., 2013). A study on the cardiovascular risk factors in a sample of adolescents aged (11-18 years) in Tehran showed that 55% of adolescents (63% of boys and 47% of girls) had experienced water pipe smoking (Azizi et al, 2004).

As the most adults begin smoking in their teen years, schools have been used as appropriate setting for anti-smoking programs for teenagers. Many studies showed that the earlier adolescents begin smoking cigarettes, the more likely they are to become



addicted to nicotine (CDC, 2010). A focus on the prevention of smoking in adolescents is of particular importance as the majority of smokers initiate smoking or become habitual smokers prior to the age of 18 and are less likely to give up smoking than those who start later in life (Richardson et al., 2009). Youth who do not use tobacco before or during the teenage years are much more likely to stay smoke-free in future (BMA Board of Science., 2007).

1.3 Significance of the Study

Tobacco use among adolescents continues to be a harm to society, economically and health wise (Fiore, 2012). Tobacco use often starts in adolescence (Arrazola et al., 2012; Rodgers, 2012) thus; prevention of initiation of tobacco use is of great impact in controlling the tobacco epidemic, especially among adolescents. Primary prevention in the school setting is considered to be one of the most proper strategies to prevent smoking, as well as because schools systematically and efficiently reach a large number of young people.

The effective tobacco use prevention program among adolescents was recognized as a best strategy that can reduce the initiation and reduce tobacco use rates. It will ultimately lead to the decrease of the consequences of long term public health and medical costs associated with the negative effects of tobacco use. Results from this study will be useful in the field of adolescent's health in Sanandaj. It will contribute to promote high school children toward changing their smoking behaviour, increasing smoking-related knowledge, clarify their misconception about cigarette and water pipe, and improve student's self-esteem and skills to resist peer pressure.

At the national level, Information acquired from the evaluation will enable the education and health authorities to create the best possible program, to make modifications as necessary, and to monitor progress towards the program goal and objectives. Theory-based peer- led behavioural intervention program can contribute to health policy makers to develop practical intervention strategies targeting high school children. The research study provides useful information to schools and community organizations planning to establish a prevention program for high school children in term of cigarette and water pipe use.

1.4 Research Questions

- i. What is the cigarette and waterpipe smoking behaviour of public high school children aged 14-17 years in Sanandaj City?
- ii. Is the peer-led behavioural intervention program effective in reducing cigarette and water pipe use among high school children aged 14-17 years in Sanandaj City?

iii. Is the peer-led behavioural intervention program effective in reducing intention to cigarette and water pipe use among high school children aged 14-17 years in Sanandaj City?

1.5 Study Objective (s)

1.5.1 General Objective

To develop, implement, and evaluate effectiveness of peer-led behavioural intervention programme to prevent cigarette and water pipe use among high school children in Sanandaj, Iran.

1.5.2 Specific Objectives

- i. To determine baseline information on socio-demographic factors, smoking behaviour (cigarette and water pipe use), intention to tobacco use, smoking-related knowledge, attitudes, normative believes, self-esteem, refusal skill and assertiveness of high school children in Sanandaj, Iran.
- ii. To develop and implement peer-led behavioural intervention program to reduce cigarette and water pipe use for high school children in Sanandaj, Iran.
- iii. To evaluate the effectiveness of a peer-led behavioural intervention program to reduce cigarette and water pipe use and intention to use at 6 month post intervention among high school children in Sanandaj, Iran.
- iv. To evaluate the effectiveness of a peer-led behavioural intervention program to improve knowledge, attitude, normative believes, self-esteem, assertiveness and refusal skill related to smoking at 6 month post intervention among high school children in Sanandaj, Iran.

1.6 Research Hypothesis

i.

- The intervention group has a significant decrease in cigarette and water pipe use as compared to the control group.
- ii. The intervention group has a significant decrease in intention to cigarette and water pipe use as compared to the control group.
- iii. The intervention group has a significant improvement in knowledge, attitude, normative believes, self-esteem, refusal skill and assertiveness as compared to the control group.

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