THE EFFECTIVE OF BRISK WALKING TO REDUCE SMOKING BEHAVIOR AMONG ABORIGINALS IN TAIWAN- A PRELIMINARY STUDY

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ABSTRACT

Background: Exercise appears to reduce smoking behavior, but no study has investigated the effects of exercise on aborigines. Smoking is a significant precipitant of health problems in the aboriginal population. The risk factors for smoking are critical issues nowadays. Therefore, it is crucial to provide health strategy so as to empower their ability of lessen smoking behavior to prevent lung cancer.

Purpose: The purpose of this study was to explore the effectiveness of brisk walking intervention program reducing smoking behaviors among aboriginals.

Methods: A quasi-experimental study design with a one-group purposeful sampling was employed. A total of 72 aboriginal subjects were recruited from aboriginal tribes in northern Taiwan. Participation criteria excluded subjects who exercised regularly. Each subject underwent pre-test in order to set baseline, and obtained 7-weeks the brisk walking intervention program (30 minutes a day, 3days a week). Data was analyzed by using descriptive statistics, and time effects were tested using generalized estimating equations (GEEs). A *p* value of less

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than .05 was considered statistically significant.

Results: After 7-week exercise training program, after controlling the confounding variables, the results indicate that as the brisk walking progressed, the smoking behavior differed significantly as time decreases ($p < .0001$).

Conclusion and implications for practice: The findings of this study revealed that the brisk walking intervention program effectively reduces smoking behavior and waist circumference in aborigines. These findings can provide useful information as reference regarding of aboriginal health promotion to health providers. It is imperative that anti-smoking be reinforced for these regular smokers to prevent induced lung cancer.

Key words: brisk walking intervention, smoking behaviors, aboriginals, generalized estimating equations

Introduction

Tobacco use is the leading cause of lung cancer worldwide, smoking increases a person's risk for diseases such as heart disease, cancer, and chronic obstructive pulmonary disease (Hoyt, 2013; World Health Organization, 2011). Smoked tobacco contains additional harmful constituents and chemicals, which have detrimental effects on the respiratory system (Amann, 2012). Smoking can lead to the development of respiratory, cardiovascular, and skin diseases as well as a number of tobacco-related cancers (Taioli, 2008). Furthermore, lung cancer are the causes of tobacco-related deaths (Schroeder, 2012). Loyha1et al. (2012) investigated 104 oral cancer cases in Northeast Thailand, finding that tobacco smoking increase risk of oral cancer, and that the risk increases with duration and amount smoked. Schulte et al. (2014) investigated 705 pancreatic cancer patients and 711 controls from Queensland Pancreatic Cancer Study. They found that Compared to never-smokers, current smokers had an increased risk of pancreatic cancer (OR = 3.4; 95% CI 2.4–5.0) after adjustment for age, sex, education, alcohol intake and birth country. Of the various smoking dimensions, smoking duration and time since quitting had a greater effect on OR estimates (OR 1.3; 95% CI 1.1–1.4 and OR 0.8; 95% CI 0.7–0.8) than smoking intensity (OR 1.1; 95% CI 0.9–1.2), once ever-smoking was accounted for.

Fortunately, one's smoking behavior can be modified (MacPherson et al., 2006).. Within the smoking population there are now fewer heavy smokers and more light smokers (Schroeder, 2012). Exercise has recommended as an aid to smoking cessation, exercise may also play an important role in the acute management of tobacco withdrawal symptoms (Piasechki et al., 2000). Harper et al. (2012) investigated 178 female smokers who undertaking a 14-week exercise-aided nicotine replacement therapy cessation. They found that significant reductions in cigarette craving were demonstrated following exercise at week 5, 11, and 13. An acute bout of moderate

intensity exercise can alleviate cravings as well as psychological and sedation withdrawal symptoms in quitters.

Brief isometric exercise has potential for offering immediate relief from a desire to smoke (Ussher et al., 2006). A 15-min brisk walk not only reduced cigarette cravings and withdrawal symptoms but also could attenuate increases in cue-elicited cravings and withdrawal symptoms, and increase the time between cigarettes smoked (Taylor et al., 2005). A systematic review of studies concluded that moderate intensity physical activity (equivalent to a brisk walk) reduced cravings in abstinent smokers (Taylor et al., 2007). Therefore, Brisk walk reduces urges to smoke and there is some evidence it increases cessation rates(Ussher et al., 2008).

A major cultural shift has occurred in the social class attributes of smokers, so that now smoking is disproportionately concentrated among those with lower education and lower income (Schroeder, 2012). Studies have demonstrated that smoking is a significant precipitant of health problems in the aboriginal population (CDC, 2008). How to accelerate quitting is a major challenge for clinicians and public health workers (Schroeder, 2012),, and it was critical for the health educator to apply a health education theory to help those aborigines to promote healthy behavior. Although both the local health bureau and the public health clinic play a role in providing health education, success is limited due to the limitation of time, manpower, and financial support(Rudatsikiral et al., 2008). The purpose of this study was to reduce smoking behavior and promote healthier behavior for those aborigines through a proper brisk walking intervention program to prevent lung cancer.

Methods

Design and Sampling

The study follows a quasi-experimental study design with a one-group repeat measure was used. The study was carried out on a community in in the northern region of Taiwan using convenience

sampling. A total of 72 aboriginal subjects were invited to participate. Participation criteria excluded subjects who exercised regularly. Before brisk walking intervention occurred, each subject underwent pre-test in order to set baseline, and obtained the brisk walking intervention program (30 minutes a day, 3days a week) during a 7 week period.

Instrumentation and Brisk Walking Intervention

Identical measures were used in all participate. At the first visit, demographics, and smoking characteristics were recorded. Following brisk walking day, at every visit, cigarettes smoked during the week were recorded. Demographic including gender, based on single-item survey question. Age was calculated and assigned to each person according to the date of birth. Respondents were asked if they currently smoke cigarettes, cigars, pipes, or tobacco. If they did smoke, they were asked to recorded the amount of tobacco smoked before and after the brisk walking day. Participants were instructed to briskly walk as if to catch a bus, but not to the point of breathlessness (Taylor et al., 2005). Subjects obtained the brisk walking intervention program (30 minutes a day, 3days a week) during a 7 week period.

Data Analysis

The statistics application SPSS/Windows 17.0 (SPSS, Inc., Chicago, IL) was used for data archiving and statistical analysis. Descriptive statistics of percentage, average and standard deviations were performed. In order to determine the effects of brisk walking, time effects were tested using generalized estimating equations (GEEs). A *p* value of less than .05 was considered statistically significant.

Results

This study included 72 subjects, 43 (59.7%) females and 29 (40.3%) males. The average age of subjects was 48.47±15.46 years (range 13-78 years). The average score of the baseline for was smoking behavior 2.22 (SD= 6.20), the maximum and minimum was 30, 2.22,

respectively. The average score of the Time $_1$, Time $_2$, Time $_3$, Time $_4$, Time $_5$, and Time $_6$ for smoking behavior are shown in Table 1.

Table 1. Descriptive Statistics

Variable		n (%)	M	SD	Maximum	Minimum
Gender	male	29(40.3)				
	female	43(59.7)				
age			48.47	15.46	78	13
Smoking Behavior	Time $_0$		2.22	6.20	30	2.22
	Time $_1$		5.00	10.38	30	5.00
	Time $_2$		4.50	9.30	25	4.50
	Time $_3$		3.75	7.75	20	3.75
	Time $_4$		3.00	6.36	20	3.00
	Time $_5$		2.25	4.72	15	2.25
	Time $_6$		1.90	3.91	10	1.90
Frequency of brisk walking	Time $_1$		2.15	1.39	4	1
	Time $_2$		2.15	1.30	4	1
	Time $_3$		2.25	1.41	4	1
	Time $_4$		2.30	1.03	4	1
	Time $_5$		2.35	.93	4	1
	Time $_6$		3.50	1.31	5	1

Note. Time $_0$: baseline data ; Time $_1$: post the 1st brisk walking score ; Time $_2$: post the 2nd brisk walking score; Time $_3$: post the 3rd brisk walking score; Time $_4$: post the 4th brisk

walking score; Time $_5$: post the 5th brisk walking score; Time $_6$: post the 6th brisk walking score.

Our primary interest was in the role of brisk walking in reducing responses to smoking behavior . Table 2 shows the time effect on smoking behavior ($p < 0.001$). In other words, the smoking behavior differed significantly as time decreases. The average/mean smoking behavior decreased by .5 at post the 2nd brisk walking (Wald χ^2= 459.95, p = .0001), 1.25 measure at post the 3rd brisk walking (Wald χ^2= 2876.64, p = .0001), 2.00 measure at post the 4th brisk walking (Wald χ^2=7365.44 p = .0001), 2.75 measure at post the 5th brisk walking (Wald χ^2= 13926.35 p = .0001) and 3.10 measure at post the 6th brisk walking(Wald χ^2= 17697.22, p = .0001).

Table 2. GEE analysis for repeated measurements of smoking behavior score[a]

(N = 72)

Parameter	B	SE	95% CI		Wald χ^2	p
Time						
T_1 vs. T_0	0	.02	-.04	to .04	0	.99
T_2 vs. T_0	-.50	.02	-.54	to -.45	459.95	.0001
T_3 vs. T_0	-1.25	.02	-1.29	to -1.20	2876.64	.0001
T_4vs. T_0	-2.00	.02	-2.04	to -1.95	7365.44	.0001
T_5 vs. T_0	-2.75	.02	-2.79	to -2.70	13926.35	.0001
T_6 vs. T_0	-3.10	.02	-3.05	to -3.05	17697.22	.0001

Note. GEE = generalized estimating equation; CI = confidence interval.

[a] Model was assessed using the GEE and adjusted for the following factors: gender; Note. Time $_0$: baseline data ; Time $_1$: post the 1st brisk walking score ; Time $_2$: post the 2nd brisk walking score; Time $_3$: post the 3rd brisk walking score; Time $_4$: post the 4th brisk walking score; Time $_5$: post the 5th brisk walking score; Time $_6$: post the 6th brisk walking score.

Discussion

There was no significant difference in smoking behavior at time 1 brisk walking. This finding differs from Lin et al. (2013) which found that the immediate and delayed effects on smoking behavior were significantly improved by participating in the education intervention. Furthermore, this finding was contradictory with a study by Taylor et al. (2007), which reported 15 min of exercise of low- to- moderate intensity not only reduced absolute craving but also attenuated increases in some craving and withdrawal symptom responses to a smoking cue. The reason may be the different status in which participants were recruited (regular smoker versus non-regular smoker).

The results of this study revealed that the smoking behavior significant change with time. We did find significant differences in smoking behavior at post the 2nd, the 3rd , the 4th, the 5th and the 6th brisk walking, indicative of an interaction between time. The finding was congruent with some previous studies (Adrew et al. 2001; Cornuz et al., 2002; William et al., 2001) , which the delayed effect on smoking behavior was improved by an educational intervention program. We did find significant smoking behavior was decreased by .5 at post the 2nd brisk walking, by 1.25 measure at post the 3rd brisk walking, by 2.00 measure at post the 4th brisk walking, 2.75 measure at post the 5th brisk walking, and 3.10 measure at post the 6th brisk walking. This finding was congruent with some studies(Harper et al., 2012; Taylor et al., 2010;

Usser et al., 2006).

Nevertheless, the finding was contradictory with a study by Garrett et al. (2004), which reported stage of change for fruit and vegetable consumption and physical activity are not strong predictors of stage of change for smoking. Exercise appears to reduce smoking behavior, but no study has investigated the initiate effective time of the brisk walking. Our study provided seven weekly brisk walking, which indicated the smoking behavior differed significantly as time decreases. The finding was similar with a study that claimed six weekly intervention help weight management, reduced cigarette cravings and increased confidence for quitting (Ussher et al., 2008).

Conclusion

In summary, there were significant changes in smoking behavior measures with time. Walking is a convenient form of exercise and this may provide a popular low-effort and cheap option to reduce urges to smoking during cessation. Our findings suggest that brisk walking intervention is feasible and acceptable as an aid to reduce smoking. Thus, health care providers have to critically assess the risk factors, and then provided proper intervention to who attempting to quit smoking. Based on the results of this study, a larger sample size is recommended to strengthen the significance of the finding s. Also, subjects equally recruited from different aboriginal area populations are requited. Moreover, utilizing an objective instrument such as CO concentration equipment for further study. Objective measurement can effectively record the smoking behavior to validate the subjective information provided by the subjects, and reinforce the significance of the study. A longitudinal study with physiologic analysis is recommended for further study to find the effective of brisk walking intervention. The result of this research is beneficial for those devoted to lung cancer prevention research.

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