Addictive Behaviors 35 (2010) 46–48

Contents lists available at ScienceDirect

Addictive Behaviors

Short communication

Intervention effects on tobacco use in Arab and non-Arab American adolescents

Virginia H. Rice [a,b,*], Linda S. Weglicki [a], Thomas Templin [a], Hikmet Jamil [c], Adnan Hammad [d]

[a] Wayne State University College of Nursing, United States
[b] Karmanos Cancer Institute, United States
[c] Arab Community Center for Economic and Social Services (ACCESS), United States
[d] Wayne State University School of Medicine, United States

ARTICLE INFO

Keywords:
Cigarette smoking
Adolescents
Project TNT
Intervention
Water pipe smoking

ABSTRACT

A quasi-experimental design was used to test a modified Project Towards No Tobacco (TNT) use program on cigarette smoking in 380 Arab American and 236 non-Arab American 9th graders in the Midwest. Tenth grade Non-Arab American students given the intervention as 9th graders were 23% less likely to experiment (Odds Ratio = 1.31, 95% CI: 1.05, 1.64) or to have smoked cigarettes in the past 30 days (Odd Ratio = 1.43 times, 95% CI: 1.03, 2.01) compared to Arab American youth. Arab American students reported greater experimentation with water pipe smoking than cigarettes (38% vs. 22%), and more current (16% vs. 6%) and regular (7% vs. 3%) use of water pipes than cigarettes, respectively. The intervention designed to focus on cigarette smoking had non-significant effects on water pipe smoking. These findings provide support for a school-based intervention revised to focus on prevention as well as cessation and to be culturally consistent. They also call for further research and intervention tailoring to address the problem of water pipe smoking in a growing Arab American adolescent population.

1. Introduction

Adolescent tobacco use continues to be a significant problem in the United States (Centers for Disease Control and Prevention [CDC], 2006) and around the world (World Health Organization [WHO], 2008). A venue that is offering some success in smoking prevention (Thomas & Perera, 2007) and cessation (Grimshaw & Stanton, 2006) is the school. Dobbins, DeCorby, Manske, and Goldblatt (2008) noted that there was a considerable consensus among evidence sources that school-based tobacco prevention programs are effective in reducing smoking prevalence. Multiculturally, Project Towards No Tobacco (TNT) use, a program delivered in schools, produced significantly lower cigarette smoking rates among Hispanics, Latinos, and Asian Americans (Sun, Miyano, Rohrback, Dent, & Sussman, 2007; Sussman, Dent, Burton, Stacy, & Flay, 1995), supporting its consideration for use with another ethnic group, the Arab Americans.

Arab Americans number almost four million and are one of the fastest growing ethnic groups in the U.S. (Arab Americans, 2006). Many come from Middle Eastern countries where cigarette smoking is high. On average, 45% of the men and 5% of the women smoke cigarettes; among youth (15–18 years), the rates are as high as 47.6% (World Health Organization Tobacco Free Initiative, 2004).

A 2004 Global Youth Tobacco Survey found cigarette smoking among 13 to 15 year old males and females in the Eastern Mediterranean region to be 35% and 4%, respectively, and indicated a pattern of increasing tobacco use as students get older. In recent assessments, Lebanon's cigarette smoking rates were 45.5% for boys and 39.6% for girls (WHO, 2008). Other forms of tobacco use including water pipes are growing in popularity among youth as well. The water pipe, also known as narghileh, argileh, hubble-bubble, hookah, shisha, and goza (with variations in spelling and pronunciation) is a traditional form of tobacco use in the Middle East, Southeast Asia, and North Africa. Usually associated with older adult male use, it has undergone a renaissance in recent years and is growing in popularity among adolescents and young adults around the world (World Health Organization Study Group on Tobacco Regulation, 2005).

Although there are no national or regional tobacco use data for Arab Americans as an ethnic group, studies in a predominately Arab American community in the Midwest provide some direction. Rice and Kulwicki (1992) found 40.6% of the men and 38.2% of the women in their community-based, randomly selected sample of adults were cigarette smokers; 97% had been born in the Middle East. A survey in the same community years later revealed similar findings (Aswad, 2001). Jamil, Rice, Hammad, Jamil and Pass (2006) reported a 28% cigarette smoking rate in a community-based convenience sample of 6164 Arab American adults. A 25% cigarette smoking rate was documented for a convenience sample of 119 Arab American high school youth (Rice, Templin, & Kulwicki, 2003). Noted in the current study was the number of teens who indicated that they did not smoke cigarettes, but did smoke a water pipe. Researchers in the Middle East and the U.S. are just beginning to evaluate this behavior among the young, but no interventions have been tested as yet (Maziak, Ward, & Eissenberg, 2007; Rice et al., 2006).

* Corresponding author. Wayne State University, United States.
E-mail address: vrice@wayne.edu (V.H. Rice).

0306-4603/$ – see front matter © 2009 Elsevier Ltd. All rights reserved.
doi:10.1016/j.addbeh.2009.07.005

In 2007 twenty per cent (20%) of the high school students (19% females and 21% males) nationally were *current* cigarette smokers and almost 50% reported *ever* trying cigarettes (CDC, 2008). The purpose of this pilot study was to evaluate the effects of a modified Project TNT intervention given in the 9th grade on cigarette smoking in 10th grade Arab and non-Arab American students.

2. Methods

A non-equivalent three-group posttest only design was used. See Table 1. In the Fall and Spring of the 2002 school year, tobacco use data were collected from 700 tenth grade students attending one of two local high schools in a predominately Arab American community; this is the Cohort Control Group I. During the same period, 616 ninth graders from the same two high schools were given the modified TNT intervention; a posttest only measure assessed these students one year later (2003) when they were 10th graders. This is the Cohort Intervention Group. Lastly, a group of 781 tenth graders (Cohort Control Group II) were surveyed in the 2004 academic year as a second comparison group to control for historic effects.

The three cohorts of students were similar in gender, age, and ethnicity. The mean age of the intervention participants in the 10th grade was 15.2 years (Standard Deviation [SD] = 0.62). They were 55.1% male, and 61.7% self-identified as Arab American. Mean age of the comparison group (Cohort Control Groups 1 and 2 together) was 15.2 years (SD = 0.63); 52% were male and 66.2% were Arab American.

Based on focus group input (Kulwicki & Rice, 2003), there was a redesign and tailoring (Al-Faouri et al., 2005) of the original TNT program (Sussman et al., 1995). Modifications included: a) the addition of "smoking prevention" material to the smoking cessation content (as 9th grade classrooms had both smokers and nonsmokers); b) development of the program in PowerPoint® with animation, clip art, and video clips, to make the program more appropriate and engaging to the youth; c) offering the revised program in both Arabic and English; and d) featuring both Middle Eastern and non-Middle Eastern figures. Specially trained bilingual (English/Arabic) health educators delivered the modified TNT intervention to 2002 ninth graders during four (4) regularly scheduled, one-hour health classes over a four-week period. It should be noted that the focus of the intervention was on cigarette smoking only, although both cigarette and water pipe smoking were assessed. Overall students reported high satisfaction with the modified TNT program; 85% indicated it was helpful to very helpful on a ten-point scale. Less than 15% reported it as "not helpful at all."

Participants completed a Tobacco Use Questionnaire (TUQ) (Al-Faouri et al., 2005; Rice et al., 2003). It asked for age, school grade, gender, ethnic identity, country of birth and a detailed smoking history. Items that assessed cigarette smoking – *ever*, *current*, and *regular* – were adopted from the Youth Risk Behavior Surveillance Survey (YRBSS) (Brener et al., 2004). *Ever* smoking was defined as ever using cigarettes, even one or two puffs. *Current* use was defined as smoking one or more cigarettes in the previous 30 days, and *regular* smoking was defined as smoking one or more cigarettes on each of the past 30 days. (A parallel set of questions using the same YRBSS stem items were added to ask about water pipe smoking.) Test–retest for selected items on the TUQ resulted in a coefficient of .96. The Wayne State University Institutional Review Board approved the study methodology and protocol (#0409000112).

Each cigarette and water pipe smoking behavior was examined separately using logistic regression. The initial models included group, ethnicity, and gender and the interactions among these variables. Gender did not interact with group in predicting smoking behavior; it was removed from the model. The second set of regressions contained group, ethnicity, and the group by ethnicity interaction; the group by ethnicity interaction was not significant in these models. The final models were estimated with only main effects for group and ethnicity. Level of significance for all analyses was $p = <.05$.

3. Results

As shown in Table 1, 30.5% (Cohort 1) and 26.2% (Cohort 3) of the 10th graders reported having "ever tried cigarette smoking, even a few puffs" sometime in the past. Tenth graders given the intervention in the prior year reported a significantly lower rate of *ever* use at 23.3% (Odds Ratio [OR] = 1.31, 95% CI: 1.05, 1.64). Students who had received the intervention were 1.43 times (95% CI: 1.03, 2.01) less likely to have smoked in the past 30 days. The effect of the intervention on regular use was in the predicted direction, but the difference was not significant. The main effects for ethnicity were significant for cigarettes and water pipe smoking (*ever*, *current*, and *regular*). Non-Arab students were 2 to 4 times more likely to engage in cigarette smoking than their Arab American counterparts [OR = 1.97, 3.25, and 4.10 for *ever*, *current*, and *regular* smoking, respectively ($p < .05$)]. These differences can be seen in Fig. 1 below.

4. Discussion

This lower rate in experimentation by TNT intervention students is interpreted as a prevention effect as it represents the percentage of youth who did not initiate smoking during the 9th grade or over the summer prior to entering the 10th grade as a result of their participation in TNT. In addition, students given the intervention were less likely to have smoked in the past 30 days. The effect of the intervention on regular use was in the predicted direction, but not significant. The findings of a reduction in *ever* and *current* use of cigarettes in this study are consistent with those reported by Sun et al. (2007), Dobbins et al. (2008), and Grimshaw and Stanton (2006) following their systematic reviews of school-based intervention research. Botvin and Griffin (2007) noted that the most effective

Table 1
Study design and cigarette smoking behavior outcomes.

Year enrolled in 9th Grade	Cohort group	Data collection schedule			Cigarette smoking behavior outcomes					
		2002 school year	2003 school year	2004 school year	Ever		Current		Regular	
					%	SD	%	SD	%	SD
2001	Control ($N = 700$)	10th grade prevalence			30.5	46.1	10.6	30.9	7.3	26.0
2002	NT[a] intervention ($N = 616$)		10th grade intervention follow up		23.3	42.3	8.1	27.4	5.6	22.9
2003	Control ($N = 781$)			10th grade prevalence	26.2	44.0	11.3	31.7	6.5	24.6
Odds ratio (95% CI) for intervention effect[b]						1.31 (1.05, 1.64)		1.43 (1.03. 2.01)		1.29 (0.86, 1.94)

[a] TNT = Towards No Tobacco use.
[b] Odds ratio is based on comparison of intervention group vs. average of both control groups.

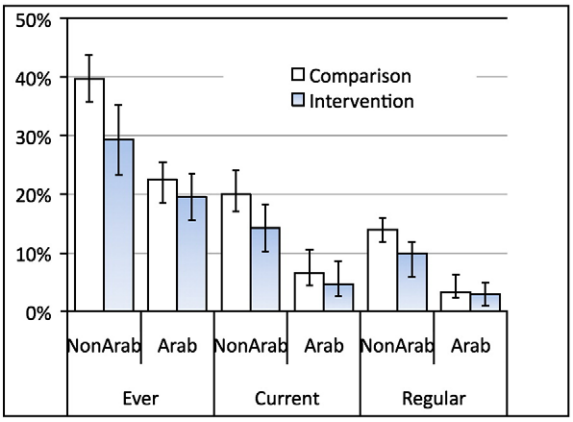

Fig. 1. Cigarette smoking behavior outcomes for Arab American and non-Arab American students (Bars are standard error of percentage.).

school-based programs were those delivered interactively and with teaching skill. This was the approach strongly emphasized in this study. The relative consistency of the intervention effect (as evidenced by lack of any group by ethnicity interaction) for Arab and non-Arab youth is also apparent; this was expected because the intervention was modified to be appropriate for Arab as well as non-Arab American youth. The need to modify standard tobacco control curriculum and to culturally tailor it for diverse populations and age groups has been well documented (e.g., Mitschke, Matsunaga, Loebi, Tatafu, & Robinett, 2008).

Although Arab American youth were smoking cigarettes in this study, they indicated higher experimentation (38% vs. 22%), current use (16% vs. 6%), and regular use (7% vs. 3%) of water pipe vs. cigarette smoking, respectively. Given the prevalence of water pipe smoking reported by these students, it is now important for researchers to identify the 1) predictors, patterns, and trajectories of such use, 2) perceptions of harm, and 3) dose effects in relation to health outcomes for those smoking water pipes alone or in combination with cigarettes. Once identified, appropriate interventions must be designed to reduce the growing use of this behavior in the United States, the Middle East, and around the world (World Health Organization Study Group on Tobacco Regulation, 2005). As mentioned earlier, there have been no intervention studies of water pipe smoking as yet (Maziak et al., 2007).

Our results support the use of the modified Project TNT in reducing experimentation and current cigarette smoking in both Arab American and non-Arab American youth. These findings are consistent with those reported by Sussman (2001) and others. Schools still present an excellent venue for tobacco use cessation and prevention, although means to reaching youth that are not in schools must be developed. A major strength of this study is that we were able to evaluate this growing ethnic group in the Midwest and to test out an intervention. We were also able to document water pipe smoking in non-Arab American students, which suggests peer sharing and a spread of this behavior cross-culturally in the same high schools. Study limitations include surveying only youth attending school, self-reports, and lack of biochemical validation of reported behavior.

Acknowledgements

We gratefully acknowledge the teaching and research contributions of Drs. Hasan Al-Omran, Omar Baker, and Ibrahim Al-Faouri, all nursing doctoral students from Jordan at the time of this study. In addition, we acknowledge Health Educators Dr. Sharifa Abou-Mediene and Ms. Mona Farroukh from the Arab American Center for Economic and Social Services (ACCESS), Dearborn, Michigan for their outstanding assistance. Funding from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (HD374980) supported this research.

References

Al-Faouri, I., Weglicki, L., Kulwicki, A., Jamil, H., Baker, O., Al-Omran, H., et al. (2005). Culturally sensitive smoking cessation intervention program redesign for Arab-American youth.*Ethnicity and Disease*, *15*(Suppl 1) S1-62-64.

Arab Americans. (2006). Washington, DC: Arab American Institute. Retrieved January 10, 2009 from http://www.aaiusa.org/arab-americans/22/demographics

Aswad, A. (2001). *Health survey of the Arab, Muslim, and Chaldean American communities in Michigan.* Lansing: Michigan Department of Community Health.

Botvin, G., & Griffin, K. (2007). School-based programmes to prevent alcohol, tobacco, and other drug use. *International Review of Psychiatry*, *19*(6), 607—615.

Brener, N. D., Kann, L., Kinchen, S. A., Grunbaum, J. A., Whalen, L., Eaton, D., et al. (2004). Methodology of the youth risk behavior surveillance system. *Morbidity and Mortality Weekly Reports*, *53*(12), 1—13.

Centers for Disease Control and Prevention (CDC). (2006). Smoking and tobacco use: National Youth Tobacco Survey, 2006 NYTS data and documentation. Retrieved February 14, 2009 from http://www.cdc.gov/tobacco/data_statistics/surveys/NYTS/#NYTS2006

Centers for Disease Control and Prevention (CDC). (2008). Cigarette use among high school students—United States, 1991–2007. Morbidity and Mortality Weekly Report [serial online]. 2008: 57(25): 686–688. Retrieved January 20, 2009 from http://www.cdc.gov/tobacco/data_statistics/fact_sheets/youth_data/youth_tobacco.htm

Dobbins, M., DeCorby, K., Manske, S., & Goldblatt, E. (2008). Effective practices for school-based tobacco use prevention. *Preventive Medicine*, *46*(4), 289—297.

Grimshaw, G.M., & Stanton, A. (2006). Tobacco cessation interventions for young people. *Cochrane Database of Systematic Reviews*, Issue 4. Art. No.: D003289. DOI: 10.1002/14651858.CD003289.pub4.

Jamil, H., Rice, V. H., Hammad, A., Jamil, L., & Pass, H. (2006). Tobacco use of Arab American adults in Southeast Detroit. *Iraqi Medical Journal*, *52*(1), 56—61.

Kulwicki, A., & Rice, V. H. (2003). Arab American adolescent perceptions and experiences with smoking. *Public Health Nursing*, *20*(3), 177—183.

Maziak, W., Ward, K., & Eissenberg, T. (2007). Interventions for waterpipe smoking cessation. *Cochrane Database of Systematic Reviews*, Issue 4. Art. No.: CD005549.

Mitschke, D., Matsunaga, D., Loebi, K., Tatafu, E., & Robinett, H. (2008). Multi-ethnic adolescents' attitudes toward smoking: A focus group analysis. *American Journal of Health Promotion*, *22*(6), 393—399.

Rice, V. H., & Kulwicki, A. (1992). Cigarette use among Arab Americans in the Detroit Metropolitan Area. *Public Health Reports*, *107*(5), 589—594.

Rice, V. H., Templin, T., & Kulwicki, A. (2003). Arab-American adolescent tobacco use: Four pilot studies. *Preventative Medicine*, *37*(5), 492—498.

Rice, V. H., Weglicki, L., Templin, T., Hammad, A., Jamil, H., & Kulwicki, A. (2006). Tobacco use and its predictors for Arab American adolescents. *Merrill-Palmer Quarterly*, *52*(2), 27—342.

Sun, P., Miyano, J., Rohrback, L., Dent, C., & Sussman, S. (2007). Short-term effects of Project EX-4: A classroom-based smoking prevention and cessation intervention program. *Addictive Behaviors*, *32*(2), 342—350.

Sussman, S. (2001). School-based tobacco use prevention and cessation: Where are we going? *American Journal of Health Behavior*, *25*(3), 191—199.

Sussman, S., Dent, C. W., Burton, D., Stacy, A. W., & Flay, B. R. (1995). *Developing school-based tobacco use prevention and cessation programs.* Thousand Oaks, CA: Sage.

Thomas, R.E., & Perera, R. (2007). School-based programmes for preventing smoking. *Cochrane Database of Systematic Reviews*, Issue 3. Art. No.: CD001293. DOI: 10.1002/14651858.CD001293.pub2.

World Health Organization [WHO] (2008). WHO report on the global tobacco epidemic. *The mpower package* (pp. 14—21). Geneva: World Health Organization9789241596282.

World Health Organization Study Group on Tobacco Regulation (2005). Water pipe smoking: Health effects, research needs, and recommended actions by regulators. Retrieved June 10, 2006 from http://repositories.cdlib.org/tc/whotcp/waterpipe

World Health Organization Tobacco Free Initiative [WHO TFI]. (2004). Regional databases: Eastern Mediterranean region. Retrieved January 10, 2005 from http://www.emro.who.int/tfi/gtss_reports.htm