Addictive Behaviors 66 (2017) 41–47

Contents lists available at ScienceDirect

Addictive Behaviors

journal homepage: www.elsevier.com/locate/addictbeh

Now is the time to advocate for interventions designed specifically to prevent and control waterpipe tobacco smoking

A.A. Lopez, Ph.D. [a,b], T. Eissenberg, Ph.D. [a,b], M. JaafarM.P.H. [c], R. Afifi, Ph.D. [c,*]

[a] Center for the Study of Tobacco Products, Virginia Commonwealth University, USA
[b] Department of Psychology, Virginia Commonwealth University, USA
[c] Department of Health Promotion and Community Health, American University of Beirut, Lebanon

HIGHLIGHTS

- Waterpipe use is spreading worldwide, surpassing cigarette use in many areas.
- Waterpipes and cigarettes are forms of tobacco use and have grave health effects.
- Little evidence exists of effective interventions for waterpipe prevention/control.
- Cigarette and waterpipe use differ in toxicant exposure, patterns of use and norms.
- These differences suggest the need to adapt not adopt cigarette interventions.

ARTICLE INFO

Article history:
Received 5 July 2016
Received in revised form 30 October 2016
Accepted 10 November 2016
Available online 11 November 2016

Key words:
Waterpipe
Interventions
Cigarette
Evidence

ABSTRACT

Waterpipe tobacco usage is spreading rapidly worldwide, with reports of more youth being waterpipe users compared to adults. In many areas of the world, waterpipe usage surpasses cigarette smoking. Waterpipes and cigarettes are both mechanisms for inhalation of tobacco smoke and therefore have serious health consequences. However, because of the many differences between the two products, prevention and control strategies that have proven effective for cigarettes may not transfer readily to waterpipe. This report highlights the differences between waterpipes and cigarettes in toxicant exposure and physiologic effects, patterns of use, social norms, the extent of evidence, and the policy environment. There is little evidence to date around effective interventions for waterpipe prevention and control. The current state of evidence for intervention to curb or control waterpipe is at ground zero and critically needs attention from both scientists and policy makers. National and global efforts aimed at cigarette prevention have succeeded, particularly in developed countries. We suggest the time has come to harness what we know works for cigarette prevention and control and adapt it to tackle the growing epidemic of waterpipe tobacco use.

Contents

* Corresponding author at: Department of Health Promotion and Community Health, Faculty of Health Sciences, American University of Beirut, Van Dyck Building, PO Box 11-0236, Beirut, Lebanon.
E-mail address: ra15@aub.edu.lb (R. Afifi).

http://dx.doi.org/10.1016/j.addbeh.2016.11.008
0306-4603/

1. Introduction

Waterpipe tobacco smoking (WTS; Maziak, Ward, Soweid, & Eissenberg, 2004) is spreading rapidly worldwide, particularly among youth (Maziak, 2015; Maziak, Ben Taleb, et al., 2015). A waterpipe, also known as arghile, hookah, narghile, or shisha, is composed of the head where the tobacco is placed, a body, a water bowl, a hose and a mouthpiece (Fig. 1; see also Maziak et al., 2004). The instrument's design allows smoke to pass through the water or other liquid before reaching the smoker [World Health Organization (WHO), 2015a]. In many countries, WTS prevalence among youth surpasses prevalence among adults (Akl et al., 2011; Maziak, Ben Taleb, et al., 2015). In addition, WTS prevalence often exceeds cigarette smoking prevalence among youth globally (Maziak, 2011; Warren, Lea, Lee, et al., 2009; Barnett, Smith, He, et al., 2013; Jawad, Lee, & Millett, 2016). A recent analysis of Global Youth Tobacco Survey results among 13–15 year olds in 25 countries around the world has indicated rates of current WTS of over 20% in 6 countries (Jawad et al., 2016). Accumulating research indicates serious health effects associated with WTS (Bou Fakhreddine, Kanj, & Kanj, 2014; El Zaatari, Chami, & Zaatari, 2015; Akl et al., 2010; Jawad, McEwen, McNeill, et al., 2013; Ali Ali et al., 2015; WHO, 2015a). Clearly there is a need for urgent action to prevent and control WTS.

Cigarette tobacco smoking (CTS), though historically a more recent type of tobacco use, has garnered much more attention due to its relatively high prevalence worldwide and clearly documented increases in cigarette-caused dependence, disease, disability, and death (U.S. Department of Health and Human Services, 2014; WHO, 2015b). Effective interventions have been identified to prevent and control CTS at the individual, interpersonal, organizational, community, and policy level [U.S. Department of Health and Human Services (USDHHS), 2014; WHO, 2015b] culminating with the implementation of the first world health treaty in 2003: the Framework Convention on Tobacco Control (FCTC; WHO, 2003). The FCTC sets out evidence-based policy interventions to control tobacco use generally, but its specific guidelines are for the most part particular to cigarettes. For example, Article 16.3 of the FCTC states that "Each Party shall endeavor to prohibit the sale of cigarettes individually or in small packets which increase the affordability of such products to minors," thus aiming to discourage the purchase and consumption of cigarettes among minors.

CTS and WTS are both mechanisms for inhalation of tobacco smoke and both therefore have serious health consequences. Both behaviors are a result of a variety of factors at the individual psychosocial, interpersonal, organizational, community normative, and policy levels (Fong et al., 2006; Nakkash, Khalil, & Afifi, 2011; Akl et al., 2015; Jawad, Bakir, Ali, Grant, 2015; Jawad, Nakkash, et al., 2015). Although previous reviews of WTS have focused on its epidemiology and determinants, and often compared aspects of those to CTS, none have addressed specifically how the differences between these two methods of tobacco use affect intervention development and implementation. Because of the many differences between the two products, CTS prevention and control strategies may not transfer readily to WTS. Instead, the interventions that have proven effective at the various ecological levels for CTS prevention and control will need to be adapted to address WTS specifically. Below we highlight the differences between CTS and WTS in toxicant exposure and physiologic effects, patterns of use, social norms, the extent of evidence, and the policy environment. We then suggest how these differences indicate the necessity for a distinctive approach to WTS prevention and control.

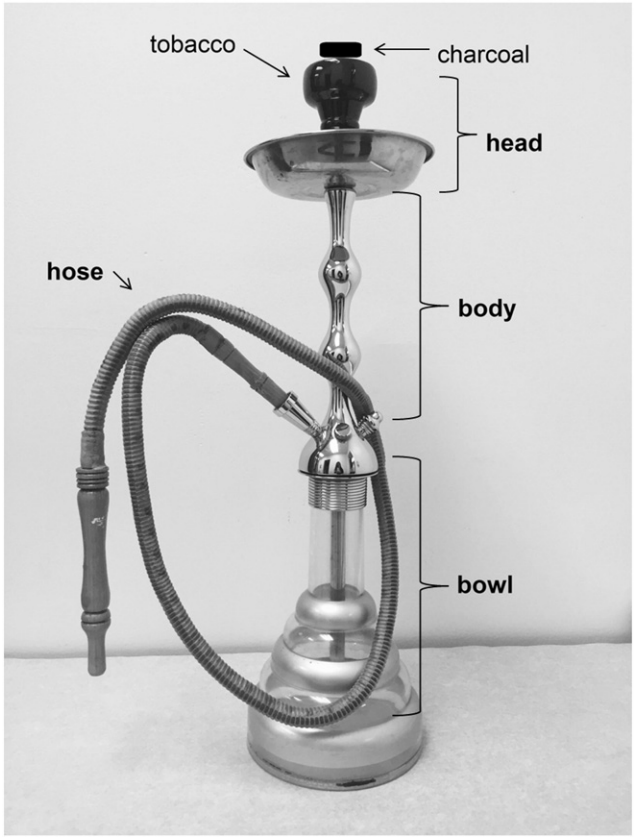

Fig. 1. Narghile/Waterpipe (shisha, hookah).

2. Toxicant exposure & physiological effects

A waterpipe emits many of the same toxicants as a cigarette does and, due to the large volume of smoke inhaled in a single waterpipe use session, the amount of these toxicants in waterpipe smoke is often many times more than the amount found in the smoke of a single cigarette (Shihadeh et al., 2015). The volume of smoke is greater due to the cooler temperature of the smoke and lower draw resistance of the waterpipe: the volume from a single puff from a waterpipe can range from approximately 500 to 900 mL, compared to a volume from a single puff on a cigarette ranging from 50 to 100 mL (e.g., Cobb et al., 2011; Blank et al., 2011; Brinkman et al., 2016). Within a 45-minute WTS episode, users take 50 or more puffs, while a single cigarette is consumed in approximately 10 puffs, meaning that WTS involves inhalation of 25 or more L of smoke, as compared to about 1 L for a single tobacco cigarette (e.g., Cobb et al., 2011; Maziak et al., 2009; Brinkman et al., 2016).

Like cigarette smoke, waterpipe smoke contains "tar" and carbon monoxide (CO). The tar is composed of at least 82 toxicants, including carcinogenic polyaromatic hydrocarbons (PAH) and tobacco-specific nitrosamines (TSNA), as well as carbonyl compounds and volatile organic compounds that can contribute to pulmonary disease (Shihadeh et al., 2015). Intake of PAH differed between cigarette and waterpipe smokers, with the greater molecular weight PAHs being higher in waterpipe smoke, suggesting a higher risk for cancer in such smokers (Jacob et al., 2013). Exposure to TSNA in waterpipe smokers was similar to that of pack-a-day cigarette smokers (et al. et al., 2015). Metabolites of