Waterpipe (Hookah) Smoking Effects and Study Design

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**Background**

Waterpipe (Hookah) smoking has increased in popularity among young adults due in part to the misconception that it is a safer alternative to cigarette smoking. Little is known about hookah smoking behaviors and how these behaviors may lead to later dependent smoking behavior.

**Objectives**

Waterpipe smoking has emerged in the U.S. as a popular social activity, particularly with young adults. Waterpipe smoking is widely perceived as healthier to cigarette smoking and as a potential tool smoking cessation. The purpose of this study is to describe waterpipe smoking behaviors in intermittent smokers.

**Methods**

This study utilized a within subject design with four conditions: nicotine conditions were placebo tobacco (0g) and nicotine tobacco (15g) and exposure conditions were low exposure (40L) and high exposure (80L) (Table 1). Eligible participants were between 18-30 years old, smoked <3x/week and did not use any other form of tobacco.

Twenty-four participants completed four 45 minute smoking sessions and 2 follow-up visits. Smoking sessions were randomly assigned. Abstinence from smoking was assessed by CO<7ppm.

Physiological and subjective data were obtained at pre-, during, and post-smoking and at follow-ups (at 24 h and 48h). Physiological measures included salivary cotinine, carbon monoxide levels, oxygen saturation, heart rate and blood pressure.

Subjective measures included Visual Analog Scales, Adapted Direct Effects, Minnesota Withdrawal Scale-R, QSU-Brief, and LWDS-11.

Puff topography was measured using the hookah topography system (Figure 1). Puff topography results indicated that high volume nicotine smokers took the longest to reach target volume (44 minutes). When compared to the high volume non-nicotine smokers, duration of puffs (3sec vs. 4sec) were shorter, average puff volume (0.5 L vs. 0.9L) was less, and interpuff intervals (17 vs. 14sec) were longer (Table 3). A similar pattern existed when comparing the low conditions.

**Results**

Twenty four intermittent hookah smokers who only smoked hookah infrequently participated in this study. Table 2 describes the characteristics of the study sample. The majority of the participants were young, male, and Caucasian.

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**Conclusion**

Smoking behaviors differed depending on whether individuals smoked nicotine or non-nicotine tobacco. When smoking nicotine containing hookah participants took more time and more puffs compared to their non-nicotine hookah smoking. However, the nicotine containing hookah smoked the least volume per puff. This may indicate self-regulation of smoking behavior.

Further investigation of these behaviors may help our understanding of the transition into dependent smoking behaviors.

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