Online Factorial Experimental Study Testing the Effectiveness of Pictorial Waterpipe-specific Health Warning Labels Compared with Text-only Labels in the United States of America

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Abstract : Waterpipe (WP) smoking (a.k.a. hookah) has increased dramatically in the US mainly due to the misperception that it is safer than cigarette smoking. Mounting evidence show that WP smoking is addictive and harmful. Health warning labels (HWLs) are effective in communicating smoking-related risks. Currently, the FDA requires that WP tobacco packages have a textual HWL about nicotine. While this represents a good step, it is inadequate given the established harm of WP smoking beyond addiction and the superior performance of pictorial HWLs over text-only ones. We developed 24 WP pictorial HWLs in a Delphi study among international expert panel. HWLs were grouped into 6 themes: addiction, harm compared to cigarettes, harm to others, health effects, quitting, and specific harms. This study aims to compare the effect of the pictorial HWLs compared to the FDA HWL, and 2) the effect of pictorial HWLs between the 6 themes. A 2x7 between/within subject online factorial experimental study was conducted among a national convenience sample of 300 (50% current WP smokers; 50% nonsmokers) US adults (females 71.1%; mean age of 31.1±3.41 years) in March 2022. The first factor varied WP smoking status (smokers, nonsmokers). The second factor varied the HWL theme and type (text, pictorial). Participants were randomized to view and rate 7 HWLs: 1 FDA text HWL (control) and 6 HWLs, one from each of the 6 themes, all presented in random order. HWLs were rated based on the message impact framework into five categories: attention, reaction (believability, relevance, fear), perceived effectiveness, intentions to quit WP among current smokers, and intention to not initiate WP among nonsmokers. measures were assessed on a 5-point Likert scale (1=not at all to 5=very much) for attention and reaction and on a 7-point Likert scale (1=not at all to 7=very much) for the perceived effectiveness and intentions to quit or not initiate WP smoking. Means and SDs of outcome measures for each HWL type and theme were calculated. Planned comparisons using Friedman test followed by pairwise Wilcoxon signed-rank test for multiple comparisons were used to examine distributional differences of outcomes between the HWL type and themes. Approximately 74.4 % of participants were non-Hispanic Whites, 68.4% had college degrees, and 41.5% were under the poverty level. Participants reported starting WTS on average at 20.3±8.19 years. Compared with the FDA text HWL, pictorial HWLs elicited higher attention (p<0.0001), fear (p<0.0001), harm perception (p<0.0003), perceived effectiveness (p<0.0001), and intentions to quit (p=0.0014) and not initiate WP smoking (p<0.0003). HWLs in theme 3 (harm to others) achieved the highest rating in attention (4.14±1), believability (4.15±0.95), overall perceived effectiveness (7.60±2.35), harm perception (7.53±2.43), and intentions to quit (7.35±2.57). HWLs in theme 2 (WP harm compared to cigarettes) achieved the highest rating in discouraging WP smoking initiation (7.32±2.54). Pictorial HWLs were superior to the FDA text-only for several communication outcomes. Pictorial HWLs related to WP harm to others and WP harm compared to cigarette are promising. These findings provide strong evidence for the potential implementation of WP-specific pictorial HWLs.

Keywords : health communication, waterpipe smoking, factorial experiment, reaction, harm perception, tobacco regulations