

# Effects of Nicotine-Free E-Cigarettes on Urges to Smoke and Cigarette Withdrawal Symptoms: A Randomised Cross-Over Study

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## Abstract

**Objective:** Nicotine-free electronic cigarettes (EC) alleviate cigarette withdrawal symptoms in the short-term. This is likely due to mimicking sensations of smoking, but could be a simple distraction effect. To test this, effects of EC were compared to effects of a distraction tool (a stress ball; SB) on ratings of cigarette withdrawal symptoms following overnight abstinence and following a day of abstinence.

**Method:** Thirty-seven smokers (18 years; at least 10 cigarettes per day, smoking within an hour of waking) participated in a randomised cross-over trial, with two conditions (EC and SB) following overnight abstinence, on two separate days. Measures were completed in the morning and again in the evening following EC and SB use throughout the day while trying to abstain from smoking. The primary outcome was changes in urge-to-smoke (11-point scale) from baseline to 10-minutes after product use, following overnight abstinence; secondary outcomes included ratings of cigarette withdrawal symptoms after product use over 1 hour in the morning, and again in the evening following abstinence over the day.

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	Abstainers (N=17)				Whole sample (N=37)*			
	EC	SB	Mean difference (EC-SB)	Sig (95%CI)	EC	SB	Mean difference (EC-SB)	Sig (95%CI)
	Mean (SD)				Mean (SD)			
MPSS score**	2.52 (0.76)	2.51 (0.68)	0.01	0.933 (-0.28-0.31)	2.37 (0.78)	2.46 (0.77)	-0.09	0.149 (-0.27- 0.09)
Urge to smoke	3.26 (0.71)	3.65 (1.14)	-0.39	0.038 (-0.74- -0.02)	3.28 (0.89)	3.82 (1.68)	-0.54	0.001 (-0.81- -0.27)
Urge to smoke strength	3.18 (0.81)	3.59 (1.18)	-0.41	0.052 (-0.82-0.01)	3.19 (0.91)	3.78 (1.21)	-0.59	<0.001 (-0.87- -0.32)
Urge to smoke frequency	3.35 (1.00)	3.71 (1.21)	-0.36	0.109 (-0.80- 0.09)	3.38 (1.06)	3.86 (1.25)	-0.48	0.015 (-0.84- -0.14)

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