

# Negative affect, message reactance and perceived risk: how do pictorial cigarette pack warnings change quit intentions?

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## Abstract

**Objective** Pictorial warnings on cigarette packs increase motivation to quit smoking. We sought to examine the potential mediating role of negative affect, message reactance (ie, an oppositional reaction to a message) and perceived risk in shaping quit intentions.

**Methods** In 2014 and 2015, we randomly assigned 2149 adult US smokers to receive either pictorial warnings or text-only warnings applied to their cigarette packs for 4 weeks. Analyses used structural equation modelling with bootstrapped SEs to test our theorised mediational model.

**Findings** Pictorial warnings increased negative affect, message reactance and quit intentions (all  $P < 0.001$ ), but not perceived risk (ie, perceived likelihood and severity of harms of smoking). Negative affect mediated the impact of pictorial warnings on quit intentions (mediated effect=0.16,  $P < 0.001$ ). Message reactance weakened the impact of pictorial warnings on quit intentions, although the effect was small (mediated effect=-0.04,  $P < 0.001$ ). Although pictorial warnings did not directly influence perceived risk, the model showed additional small mediation effects on quit intentions through negative affect and its *positive* association with perceived risk (mediated effect=0.02,  $P < 0.001$ ), as well as reactance and its *negative* association with perceived risk (mediated effect=-0.01,  $P < 0.001$ ).

**Conclusions** Pictorial cigarette pack warnings increased quit intentions by increasing negative affect. Message reactance partially attenuated this increase in intentions. The opposing associations of negative affect and reactance on perceived risk may explain why pictorial warnings did not lead to observable changes in perceived risk.