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A Pragmatic Trial of E-Cigarettes, Incentives, and Drugs for Smoking Cessation

Abstract

In a trial examining five approaches to smoking cessation among over 6,000 U.S. employees, financial incentives combined with free cessation aids were more effective at getting employees to stop smoking than free cessation aids alone. Specifically, the most effective intervention (free cessation aids plus \$600 in redeemable funds) helped 2.9% of participants stop smoking through six months after their target quit date; this rate jumped to 12.7% among participants who actively engaged in the trial and were more motivated to quit. For employees with access to usual care (information and a free motivational text messaging service), offering free cessation aids or electronic cigarettes (e-cigarettes) did not help them quit smoking.

Keywords

smoking cessation, employee wellness, smoking cessation aids, e-cigarettes, electronic cigarettes

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Research BRIEF

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A PRAGMATIC TRIAL OF E-CIGARETTES, INCENTIVES, AND DRUGS FOR SMOKING CESSATION

Scott D. Halpern, Michael O. Harhay, Kathryn Saulsgiver, Christine Brophy, Andrea B. Troxel, and Kevin G. Volpp

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KEY FINDINGS

In a trial examining five approaches to smoking cessation among over 6,000 U.S. employees, financial incentives combined with free cessation aids were more effective at getting employees to stop smoking than free cessation aids alone. Specifically, the most effective intervention (free cessation aids plus \$600 in redeemable funds) helped 2.9% of participants stop smoking through six months after their target quit date; this rate jumped to 12.7% among participants who actively engaged in the trial and were more motivated to quit. For employees with access to usual care (information and a free motivational text messaging service), offering free cessation aids or electronic cigarettes (e-cigarettes) did not help them quit smoking.

THE QUESTION

Recognizing the health and economic costs of employees who smoke, most large U.S. companies offer smoking-cessation programs, nearly half of which are paired with financial incentives for employees who successfully stop smoking. However, the benefits offered by workplace smoking-cessation programs vary considerably, and there is limited evidence about the optimal design of smoking cessation interventions.

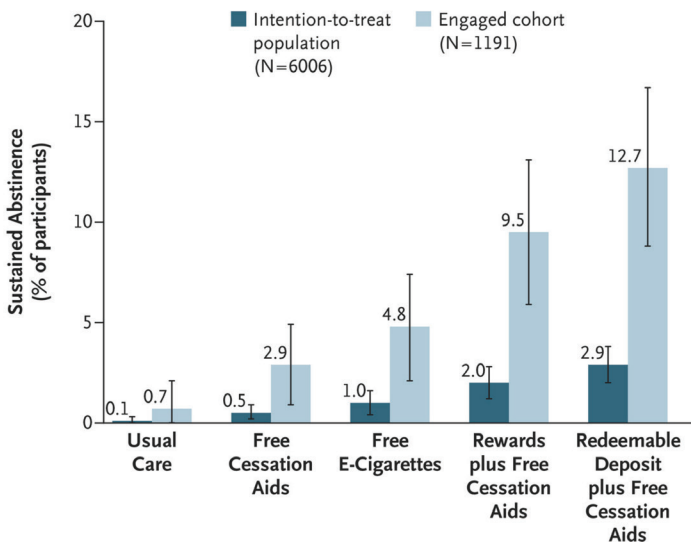
The authors conducted a five-group randomized, controlled trial to compare usual care (access to information regarding the benefits of smoking cessation and a motivational text-messaging service) with four smoking-cessation interventions to determine which is most effective at helping employees stop smoking. The four interventions were free cessation aids (nicotine-replacement therapy or pharmacotherapy, with

e-cigarettes if standard therapies failed); free e-cigarettes, without a requirement that standard therapies had been tried; free cessation aids plus \$600 in rewards for sustained abstinence, and; free cessation aids plus \$600 in redeemable funds, deposited in a separate account for each participant, with money removed from the account if cessation milestones were not met. They compared quit rates between groups and the costs associated with each intervention.

THE FINDINGS

Among 6,131 smokers from 54 companies invited to enroll, 6,006 enrolled and were randomized to usual care or one of the four intervention groups (125 opted out). Of the enrollees, 1,191 (19.8%) were “engaged,” meaning they logged into the trial website at least once during the program. Engaged participants were more educated, more motivated to quit, more likely to be female, and more often past or present users of e-cigarettes than participants who did not actively engage in the trial.

Figure 1.
Sustained Smoking Abstinence at 6 Months after the Target Quit Date



Source: *New England Journal of Medicine*

Overall, 80 (1.3%) participants stopped smoking through six months after their target quit date. The rate of sustained smoking abstinence was 0.1% in the group that received usual care, 0.5% in the free cessation aids group, 1.0% in the free e-cigarettes group, 2.0% in the rewards group, and 2.9% in the redeemable deposit group (Figure 1). The authors found three meaningful comparisons between groups: redeemable deposits combined with free cessation aids were more effective than either free cessation aids or free e-cigarettes alone, and rewards combined with free cessation aids were more effective than free cessation aids alone. Important to note are the negative findings: free cessation aids and free e-cigarettes were no more effective than usual care. About half of the participants who stopped smoking for six months after their target quit date were also smoke-free at 12 months (six months after interventions ended).

Engaged participants had sustained smoking abstinence rates that were four to six times as those who did not actively engage: 2.9% in the free cessation aids group, 4.8% in the free e-cigarettes group, 9.5% in the rewards group, and 12.7% in the redeemable deposit group (Figure 1). The relative effectiveness of the interventions also applied to engaged participants.

The average cost per participant was lowest in the usual care group (<\$1) and highest in the redeemable deposit group (\$101). The cost per successful quit was lower in the rewards (\$3,623) and redeemable deposit (\$3,461) groups than in the free e-cigarettes (\$5,416) or free cessation aids (\$7,798) group.

THE IMPLICATIONS

Previous randomized, controlled trials included employees who were interested in quitting smoking. This trial examined the success of smoking cessation interventions when offered to all smokers, not just those interested in quitting. This study design produced lower cessation rates overall compared to previous workplace studies on employees who were motivated to quit (though found comparable results among engaged participants). Despite low rates overall, incentive programs may still be useful for employers, as most costs are incurred only if employees successfully quit, and overall costs are lower than the extra cost of employing smokers.

An important finding is that free cessation aids, a cornerstone of many employer wellness programs, did not significantly improve quit rates. This trial also provided robust evidence that offering free e-cigarettes did not result in higher quit rates than traditional smoking cessation aids, nor improve quit rates among employees offered information and access to a motivational text messaging service. The authors did not assess efficacy of the use of these products, or the possibility that e-cigarettes reduce the harms associated with conventional smoking. However, a recent expert [report](#) suggests that e-cigarettes would only reduce short-term adverse health effects of smoking if they lead to complete smoking cessation.

This trial showed that financial incentives promoted smoking cessation even when free cessation aids were routinely available. These results, considered alongside those from previous trials, suggest that incentives at least triple cessation rates regardless of whether free cessation aids are offered. The authors found that redeemable deposit contracts, in which participants would lose incentives if they continued smoking, were not significantly better than incentive programs structured as pure rewards. Nonetheless, the observation that this loss framing produced nominally higher rates of quitting at nominally lower costs per quit may motivate employers that are planning incentive programs to consider the use of loss framing.

THE STUDY

This study was done in partnership with the Vitality group, a health and wellness company (a subsidiary of Discovery, the South African Insurance Company). Eligible participants were employees and their spouses at 54 companies that used Vitality as part of their wellness programs, were at least 18 years old, and reported current smoking on health risk assessment within the previous year. Enrollment proceeded in two phases: 2,229 eligible participants were identified from nine companies in the first phase, and 3,902 eligible participants from 45 companies were identified in the second phase.

Potential participants were notified by email on at least four occasions that they had been selected to participate. If participants didn't opt out, they were enrolled and randomly assigned to usual care or to

an intervention. All participants were informed of usual care resources (information and access to a free motivational text-messaging program); those randomized to intervention groups were also offered one of four additional programs.

The authors measured the rate of sustained smoking abstinence at six months after the target quit date for each group. Successful smoking abstinence required that participants report smoking cessation on a survey at 1, 3, and 6 months, which was biochemically confirmed with a urine or blood sample. Participants assigned to the rewards and redeemable deposit groups were eligible to earn \$100, \$200, and \$300 at 1, 3, and 6 months after the quit date, respectively, if their samples were negative for nicotine metabolites. The authors compared quit rates between groups, designating the free cessation aids group as the primary comparator against which the other four groups were compared. Four other between-group contrasts were done, resulting in eight total comparisons. They calculated and compared each intervention's cost (including incentives disbursed, evaluation and payment for blood and urine samples, and cessation aids).

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