Monetary incentives for smoking cessation in workplaces

Published Online
October 17, 2018
http://dx.doi.org/10.1016/S2468-2667(18)30212-3

See Articles page e536

In *The Lancet Public Health*, Floor van den Brand and colleagues[1] add to the growing literature on the effectiveness of monetary incentives for smoking cessation in workplaces while addressing some of the shortcomings of previous work. In 2015, a Cochrane review[2] of randomised controlled trials of monetary incentives for smoking cessation concluded that more evidence is needed on their effectiveness. One critical review noted that many previous studies had small sample sizes, high attrition rates, and small incentive amounts.[3]

van den Brand and colleagues have produced a well conducted trial with several strengths. The study benefits from a cluster-randomised design of 61 companies with 604 participating smokers, a sample size that exceeds sample sizes in most other studies. Random assignment by company limits interference between participants in the intervention group and those in the control group. Another major strength of the study is the extraordinarily high retention rate, mitigating any concerns of attrition bias that has plagued past studies. The authors deserve commendation for collecting outcome measurements from 98% of the sample at 12 months.

van den Brand and colleagues[1] found that monetary incentives totalling €350 over 12 months, combined with intensive group-based smoking cessation training, increased smoking abstinence at 12 months compared with training alone (131 [41%] of 319 *vs* 75 [26%] of 284; adjusted odds ratio 1·93, 95% CI 1·31–2·85, p=0·0009). This absolute effect size of 15 points is larger than for most similar studies in the Cochrane review.[2] The strong effect is consistent with findings from two recent randomised controlled trials of incentives for smoking cessation in workplaces. In a 2015 study, Halpern and colleagues[4] found that, in a sample of 1500 employees from a single company, reward-based incentives of US$800 tripled sustained abstinence at 6 months compared with usual care. In a 2018 study, Halpern and colleagues[5] found that, in a sample of 6000 employees from 54 companies, free cessation aids plus US$600 in incentives substantially increased sustained abstinence compared with usual care, free cessation aids, and free e-cigarettes. Taken together, these three studies suggest that incentives can constitute a key component of workplace-based programmes.

van den Brand and colleagues[1] adopted a straightforward incentive design, offering payments for abstinence of €50 at the end of the training programme, €50 3 months after completion of the programme, €50 6 months after, and €200 12 months after. The incentive amount (about US$400) is more modest than that in Halpern and colleagues' trials and other large trials.[6] This study therefore provides valuable evidence that incentives need not be large to have a meaningful impact on abstinence, consistent with the broader incentive literature.[7] This finding also bolsters the case for the cost-effectiveness of incentives. More high-quality trials are needed to test incentive magnitude as a potential moderator. Further work could also elucidate how best to design incentives to promote behavioural change. Researchers have experimented with lotteries, deposits, team incentives, framing, and delivery schedules, but systematic evidence is scarce on which types of behavioural incentives can improve on simpler designs. Behavioural incentives can also be leveraged to test competing theories of what determines smoking behaviour and how to change it.

The study by van den Brand and colleagues[1] raises interesting questions about how best to verify abstinence in incentive-based trials. The authors followed the Russell Standard for biochemical verification of smoking status in smoking cessation trials, which advocates exhaled-air carbon monoxide (CO) measurement.[8] CO testing has the virtue of distinguishing between use of cigarettes and nicotine replacement therapy or e-cigarettes. However, it is limited by a 60% sensitivity to detect even 24-h abstinence at the standard CO cutoff,[9] introducing unique challenges for incentive-based trials. In incentive-based studies, participants have financial motivation to abstain on testing day only, or to try to cheat. It is unknown whether transitory abstinence to claim the incentives is a substantial problem, although false reporting and cheating appear to be uncommon.[10]

Researchers have typically incorporated two general features to address the potential for cheating and transitory abstinence on test day in incentive-based trials. To capture more sustained abstinence, several trials have verified abstinence with urine or salivary cotinine testing, both of which have longer detection periods than CO testing.[4–6] Moreover, several trials

have attempted to measure carry-over effects after the incentives ended, a point at which incentivised participants no longer have a differential financial motivation to abstain relative to participants in the control group. Although van den Brand and colleagues[1] showed that incentives had a long-lasting effect on participants' smoking abstinence, the authors could not truly evaluate the long-term effects of incentives without an assessment of carry-over effects.

A final key aspect of the trial by van den Brand and colleagues is its use of incentives as an adjunct to intensive group-based training. The training programme probably contributed to much higher abstinence in the intervention group than has been observed in studies that offered incentives as a standalone intervention.[5,6] A promising direction for future research would be to understand how incentives interact with different types of smoking cessation programmes. The most successful workplace programmes are likely to bring together health economists, behavioural researchers, and smoking cessation experts.

Justin S White
Philip R Lee Institute for Health Policy Studies and Department of Epidemiology and Biostatistics, School of Medicine, University of California, San Francisco, San Francisco, CA 94118, USA
justin.white@ucsf.edu

I declare no competing interests.

1 van den Brand FA, Nagelhout GE, Winkens B, Chavannes NH, van Schayck OCP. Effect of a workplace-based group training programme combined with financial incentives on smoking cessation: a cluster-randomised controlled trial. *Lancet Public Health* 2018; published online Oct 17. http://dx.doi.org/10.1016/S2468-2667(18)30185-3.
2 Cahill K, Hartmann-Boyce J, Perera R. Incentives for smoking cessation. *Cochrane Database Syst Rev* 2015; **5:** CD004307.
3 Troxel AB, Volpp KG. Effectiveness of financial incentives for longer-term smoking cessation: evidence of absence or absence of evidence? *Am J Health Promot* 2012; **26:** 204–07.
4 Halpern SD, French B, Small DS, et al. Randomized trial of four financial-incentive programs for smoking cessation. *N Engl J Med* 2015; **372:** 2108–17.
5 Halpern SD, Harhay MO, Saulsgiver K, Brophy C, Troxel AB, Volpp KG. A pragmatic trial of e-cigarettes, incentives, and drugs for smoking cessation. *N Engl J Med* 2018; **378:** 2302–10.
6 Volpp KG, Troxel AB, Pauly MV, et al. A randomized, controlled trial of financial incentives for smoking cessation. *N Engl J Med* 2009; **360:** 699–709.
7 Mantzari E, Vogt F, Shemilt I, Wei Y, Higgins JPT, Marteau TM. Personal financial incentives for changing habitual health-related behaviors: a systematic review and meta-analysis. *Prev Med* 2015; **75:** 75–85.
8 West R, Hajek P, Stead L, Stapleton J. Outcome criteria in smoking cessation trials: proposal for a common standard. *Addiction* 2005; **100:** 299–303.
9 Perkins KA, Karelitz JL, Jao NC. Optimal carbon monoxide criteria to confirm 24-hr smoking abstinence. *Nicotine Tob Res* 2012; **15:** 978–82.
10 Ierfino D, Mantzari E, Hirst J, Jones T, Aveyard P, Marteau TM. Financial incentives for smoking cessation in pregnancy: a single-arm intervention study assessing cessation and gaming. *Addiction* 2015; **110:** 680–88.