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COMMENTARY

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Commentary on Ussher *et al.*: Duration and magnitude of postpartum financial incentives for the maintenance of cigarette smoking abstinence

When designing postpartum incentives to maintain abstinence from cigarette smoking among people who had quit during pregnancy with incentives, carefully considering the duration of incentives in concert with their magnitude may help achieve more robust and reliable effects.

Ussher *et al.* [1] have brought well-deserved attention to the important issue of postpartum smoking relapse. There is high-certainty evidence that financial incentives delivered to pregnant participants contingent on biochemically-validated abstinence promotes antepartum smoking cessation [2]. Ussher *et al.* [1] hypothesized that continuing to provide incentives postpartum to participants who had successfully quit smoking when offered incentives antepartum would maintain abstinence. In their report, they cautiously highlight the potential efficacy of continuing incentives for up to 12 months postpartum on abstinence measured at that time, compared with postpartum incentives for 3 months, and a usual care (no-postpartum-incentive) condition. There was strong evidence for the superiority of 12-month over 3-month incentives and weak evidence for 12-month incentives over usual care. Surprisingly, 3-month incentives were ineffective relative to usual care. Reviews of incentives for drug abstinence also report mixed findings regarding the moderating effect of incentive duration [3–6] although intuitively, incentives offered for longer durations should be more efficacious. However, two analyses by our group that have considered duration in relation to magnitude (i.e. maximum possible earnings during the intervention divided by number of days in the intervention period) strongly suggest that the ratio of these two factors moderates effect size [3, 6]. We think this is likely because incentive magnitude and duration are inherently confounded in incentive interventions; that is, how much is offered and over what time period interact to influence efficacy. In one of those reviews [6], we grouped 30 studies according to this ratio and showed that <$5 per day was associated with small effect sizes and higher amounts with medium effect sizes. Turning back to Ussher *et al.* [1], their interventions essentially offered a fixed magnitude of £20 (US $25) per month or £0.67 (US$0.85) per day, which is quite low compared to other incentive interventions with demonstrated efficacy (e.g. Higgins *et al.*) [7]. This may help explain why the 3-month incentive condition was not superior to usual care and the evidence for 12-month incentives not stronger. Going forward, we recommend investigators carefully consider duration in concert with the magnitude of the incentives offered to produce more robust and reliable effects.

Although not an explicit study aim, we also note that the control condition in the Ussher *et al.* [1] trial provides additional insight into postpartum abstinence outcomes among participants who achieve antepartum abstinence with incentives, but no further intervention. There is little information about this group in the literature because most trials of incentives during pregnancy either have not reported postpartum abstinence or continued to offer incentives into postpartum. In the Ussher *et al.* [1] trial, almost half of control condition participants were still abstinent at 3 months postpartum and more than a quarter at 12 months postpartum. These results are more favourable than the only other estimates of which we are aware from Tappin *et al.* [8, 9], where ~15% of those who had successfully quit smoking when offered antepartum incentives were still abstinent at 6 months postpartum. Although these estimates are only roughly concordant, they all signal greater postpartum abstinence among those who quit with incentives during pregnancy as compared to those not offered incentives (e.g. 9% at 3 months and 7% at 6 months postpartum) [7], suggesting that the benefits of incentives offered solely during pregnancy persist for at least 6 months postpartum. The United Kingdom (UK) government's recently announced plan to offer financial incentives to all pregnant people who smoke in England [10] should provide a remarkable opportunity to refine these estimates using real-world data.

The policy of the United Kingdom should also provide numerous opportunities to further test the feasibility and efficacy of postpartum incentives as well as harm reduction interventions. For instance, as evidence continues to build in support of the use of e-cigarettes for smoking cessation [11], the provision of or access to these devices could complement financial incentives to reinforce initiation or maintenance of abstinence in postpartum people, even with minimal support [12]. Use of the devices postpartum could prompt less concern among health practitioners who remain cautious about e-cigarette use during pregnancy [13].

In closing, we commend Ussher *et al.* [1] for raising awareness about postpartum smoking relapse and look forward to future innovative research addressing this important topic by them and others.

KEYWORDS

cigarette abstinence, contingency management, financial incentives, postpartum, pregnancy, relapse prevention

AUTHOR CONTRIBUTIONS

Loren S. Kock: Conceptualization (lead); writing—original draft (lead); writing—review and editing (equal). **Stephen T. Higgins:** Writing—review and editing (supporting). **Sarah H. Heil:** Conceptualization (supporting); supervision (lead); writing—original draft (supporting); writing—review and editing (equal).

DECLARATION OF INTERESTS

No financial or other relevant links to companies with an interest in the topic of this article.

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