Behavioral Economics-Based Financial And Social Incentives For Weight Loss In Adults With Newly Diagnosed Type 2 Diabetes: A Randomized Control Trial

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Background

Type 2 diabetes mellitus have imposed a heavy global health and economic burden on public health. In Hong Kong and China, its prevalence among adults has already exceeded 10% and the total costs of diabetes were predicted to reach 460.4 billion in 2030.

Body weight is strongly associated with the risk of developing type 2 diabetes mellitus. As outlined in the Standards of Care in Diabetes 2024, a 3 to 7% of weight loss is recommended for overweight or obese patients with type 2 diabetes to improve their glycemic and lipid control. With increasing evidences supporting the effectiveness of behavioral economic interventions in enhancing patients' disease management, it is important to consider that developing new habits may be best facilitated by presenting incentives at moment when an individual is most likely to act.

Aims

To investigate the effect of behavioral economic intervention on weight reduction in Chinese adults with newly diagnosed type 2 diabetes.

Objectives

1. To investigate the effect of financial and non-financial incentives based on behavioral economic principles on weight loss at 6-months and 9-months for people with newly diagnosed type 2 diabetes.
2. To examine the sustainability of walking habits at 9-months following the withdrawal of incentives for people with newly diagnosed type 2 diabetes
3. To study the effect of incentives based on behavioral economic principles on HbA1c level (glycated hemoglobin) for people with newly diagnosed type 2 diabetes.

Methods

A randomized control trial was conducted on adults with newly diagnosed type 2 diabetes recruited from public primary care clinics from June2021 to December2023. Participants were randomly assigned to three groups to incentive increased physical activity: (A) financial incentive, (B) financial and social incentive, and (C) control.

Participants in the incentive groups received personalized weekly step targets along with loss-framed financial incentives starting at $128 USD. Participants lost $5 USD each week if their step target was not met. For the social incentive, participant weekly step performance was shared with their nominated supporters to provide peer encouragement.

Intent-to-treat analysis using weighted generalized estimating equations (WGEE) was performed to assess changes in body weight and other outcome measures.

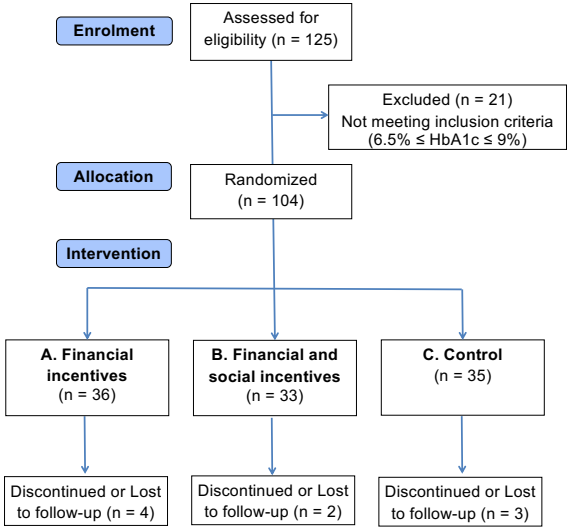

Figure 1. Flow diagram of participants from screening, randomization, to interventions.
HbA1c, glycated hemoglobin.

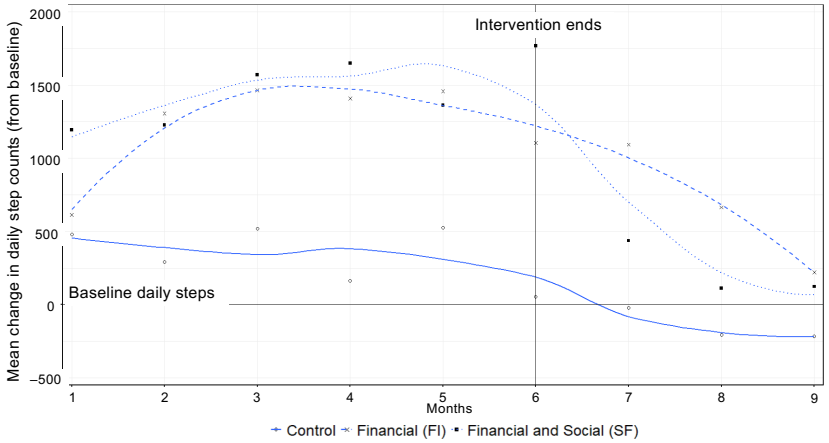

Figure 2. Daily changes in monthly step count compared to baseline over 9-months study period

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Results

Weight

- Decreases in weight in all groups over the intervention period.
- Significant weight loss occurred at 6-months in the financial and social incentive group (-2.41 kg, p=0.015) compared to the control group.

Time	Control	Financial incentives	Financial and social incentives
	Mean weight (SD), kg		
Baseline	69.23 (18.0)	76.39 (20.0)	72.21 (22.2)
6-months	68.04 (18.4)	74.98 (19.2)	69.42 (17.5)

Table 1. Mean weight at baseline and 6-months.

Time	Financial incentives vs Control		Financial and social incentives vs Control	
	Adjusted Mean Difference (95% CI)	p-value	Adjusted Mean Difference (95% CI)	p-value
Baseline vs 6-months	−0.46 (−1.73 to 0.82)	0.481	−2.41 (−4.36 to −0.46)	0.015**

Table 2. Mean changes in weight from baseline to 6-months

Step count

- Participants in both incentive groups had non-significant increases in daily step counts (financial incentive: 907 steps/day, financial and social incentive: 1752 steps/day) compared to control.

HbA1c level

- No statistically significant differences between groups.

Conclusions

Financial incentives with peer support can achieve weight loss in patients newly diagnosed with type 2 diabetes.

Acknowledgements

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