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Exploration of Likely Engagement with Monetary Contingency Contracts for Weight Loss: A
Questionnaire Study.

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Abstract

Monetary Contingency Contracts (MCCs) are schemes that ask individuals to pledge money that is returned contingent on behaviour change. In relation to weight loss, this study explored likely levels of engagement with MCCs, how much individuals would be willing to pay into an MCC, and how these amounts vary under different contract conditions. Fifty-six individuals with BMI above 25 who were motivated to lose weight were recruited. The majority of participants (87.5%) indicated that they would be willing to engage with weight loss MCCs, but showed more reluctance to subscribe to pair-based MCCs which offered; (a) refunds contingent on the weight loss of a weight loss partner, and (b) 'all or nothing refunds' in which no reward is given for any weight loss below the target weight loss goal. This study provides preliminary evidence that individuals motivated to lose weight may be willing to engage with weight loss MCCs. Further research is needed to explore reasons for reluctance to subscribe to MCCs with certain conditions, to inform the design of future experimental studies testing the efficacy of MCCs as part of an intervention for weight loss.

Keywords: Obesity; Weight Loss; Monetary Contingency Contracts; Incentives

Using financial incentives to aid weight loss has been explored (e.g., John, Loewenstein, & Volpp, 2012), but poses ethical and moral concerns including issues of coercion and fairness (Lunze & Paasche-Orlow, 2013), and the financial sustainability of offering incentives is questionable given that weight loss and maintenance is a long term process (Ciao, Latner, & Durso, 2012). Monetary Contingency Contracts (MCCs), involving an individual depositing money which is returned contingent on weight loss, represent an alternative technique that may alleviate some of these concerns. A recent review (Sykes-Muskett, Prestwich, Lawton, & Armitage, 2015) suggested MCCs produce small-to-medium sized effects on weight loss and retention during treatment but effects were heterogeneous.

Firstly, Sykes-Muskett et al. found that ‘collaborative MCCs’, whereby refunds are contingent on average group performance (groups of ≈ 15 individuals), resulted in significantly more weight loss compared to individual MCCs (Jeffery, Gerber, Rosenthal, & Lindquist, 1983). The use of pairs of individuals may also be effective due to the provision of social support from a weight loss partner (Gorin et al., 2005) and less chance of ‘social loafing’ (Karau & Williams, 1995). Within the review, only one study was identified investigating pair-based MCCs (Zitter & Fremouw, 1978), and this study suggested they may actually result in less weight loss than individual MCCs. However, the familiarity between partners was suggested as a primary cause for lack of efficacy. More recently, using pairs of strangers for MCCs has been found to be particularly effective for reducing adiposity (Sykes-Muskett, Prestwich, Lawton, & Armitage, 2017). Whether pair-based MCCs based on pairings of strangers, are as acceptable as individual-based MCCs needs to be investigated.

Concurrently, Sykes-Muskett et al.’s review found that all or nothing refunds (in which a refund is offered only on achievement of the full weight loss goal), may be more effective

than performance based refunds (in which individuals receive a proportion of the refund according to the proportion of the weight loss goal they have achieved) in reducing attrition. However, as all or nothing refunds require individuals to achieve the full goal in order to receive any refund, participants may be more reluctant to enter into this type of MCC in the first place.

Thirdly, Sykes-Muskett et al. found only one study that has previously investigated the effect of providing refunds for weight loss maintenance (Kramer, Jeffery, Snell, & Forster, 1986), which did not find maintenance MCCs to be effective. As the refund would depend on weight loss and maintenance, individuals may be less willing to enter into a maintenance MCC compared to an MCC contingent on weight loss only.

Aims

To our knowledge, no previous studies have examined how variations in weight loss-based MCCs may influence willingness to pay. It is important to consider variants of weight loss MCCs that individuals are willing to pay into to inform future trials of weight loss-based MCCs.

Method

Design

Full factorial design with three within-persons variables: weight loss type (individual weight loss versus pair-based weight loss), refund type (all or nothing versus performance based), and maintenance (weight loss without maintenance versus weight loss with maintenance).

Participant Eligibility

Participants recruited from a university campus, a council office and a gymnasium via recruitment posters and emails were eligible if: they were aged over 18 years; had a body mass index (BMI) above 25; and identified themselves as motivated to lose weight.

Participants were entered into a prize draw to win a shopping voucher.

Procedure

The study was approved by a university ethics committee and all participants provided informed consent. During individual participant sessions the researcher measured the participants' height and weight and entered the hypothetical target weight loss into a 'Target Weight Loss' box on the questionnaire. Target weight losses were set at 10% of a participant's current weight, up to a maximum of 18lbs. After reading an explanation of MCCs for weight loss, participants indicated, on a paper-based questionnaire, how much (if anything) they would be prepared to pay if they were offered this intervention to lose their personalised weight loss target under eight conditions: type of weight loss (individual weight loss versus pair-based weight loss), type of refund (all or nothing versus performance based) and maintenance (weight loss only versus weight loss plus maintenance). All participants were debriefed.

Method of Analysis

Differences between the proportion of individuals willing to pay into MCCs under specific conditions (i.e., individual weight loss versus pair-based weight loss, all or nothing versus performance based refunds, weight loss only versus weight loss plus maintenance) were tested with Wilcoxon's signed ranks tests. Differences in willingness to pay amounts between conditions, were assessed with a 3-way repeated measures ANOVA. For the main analyses, 7 outliers were identified across 5 outcome measures (using Z-scores with cut off ± 3) and these individual cases were excluded for relevant analyses. Overall values for specific

Monetary Contingency Contracts

contract conditions (i.e., individual weight loss, pair-based weight loss, all or nothing refund, performance based refund, weight loss without maintenance, weight loss with maintenance), were determined by calculating the mean amount each individual indicated they would be willing to pay across the four questions that included this contract condition. Chi-square analyses and MANOVA were conducted to explore differences in the proportion of individuals willing to pay in and willingness to pay amounts for specific MCC conditions between males and females, and between participants recruited from the three sites.

Results

The sample consisted of 56 participants and was predominantly female (71.4%); in either full or part time employment (78.6%). 23.2% reported their highest qualification as a university degree and 12.5% as a Masters degree. The sample had a mean weight of 87.8kg (SD 14kg), mean annual personal income of £24848 (range £2000-£60000) and mean annual household income of £43886.40 (range £6000-£100000).

Descriptive data for willingness to pay values are shown in Table 1. Forty-nine participants (87.5%) were willing to pay into at least one of the 8 MCCs, 5 participants (8.9%) were not willing to pay into any MCC, and 1 participant (1.8%) did not respond. There were no significant differences in the proportion of participants willing to pay into MCCs under specific conditions (i.e., individual versus pair-based weight loss; all or nothing versus performance based refund; weight loss only versus weight loss plus maintenance).

However, participants were willing to pay significantly more for individual weight loss than for pair-based weight loss, $F(1,52) = 10.97$, $p < .01$, $\eta_p^2 = .17$, and significantly more for a performance based refund than an all or nothing refund, $F(1,52) = 9.85$, $p < .01$, $\eta_p^2 = .16$. However, there was no main effect of maintenance, $F(1,52) = 0.09$, $p = .76$, $\eta_p^2 = < .01$. The only significant interaction was between type of weight loss and type of refund, $F(1,52) = 7.17$, $p < .05$, $\eta_p^2 = .12$, with participants willing to pay significantly more for a performance based refund only when the weight loss was individual. No significant differences in the proportion of individuals willing to pay in or willingness to pay amounts for any contract conditions were found between males and females, or between individuals recruited from the three sites (all p 's $> .05$).

Discussion

This study estimated the likely levels of engagement with MCCs for weight loss and the amounts that individuals would be willing to pay under different contract conditions. Only 8.9% were not willing to pay into any type of MCC, suggesting individuals motivated to lose weight may be willing to engage with MCCs. Overall willingness to pay amounts ranged from £56.57 to £91.51 across the six contract conditions across a 12 week weight loss period.

For individual weight loss MCCs, individuals were willing to pay more for a 'performance based' than an all or nothing refund, suggesting being rewarded for effort towards the goal is more attractive. Including a period of weight loss maintenance to the MCC did not influence willingness to pay amounts. Individuals were willing to pay less into pair-based MCCs compared to individual MCCs, indicating greater reluctance to engage with a pair-based MCC.

Limitations include the small sample size and thus limited power, and the use of hypothetical scenarios, which may produce inflated willingness to pay amounts (List & Gallet, 2001). However, the deposit amounts were relatively low compared to studies involving real deposits (Sykes-Muskett et al., 2015), suggesting this was not the case. Moreover, hypothetical scenarios should still be useful for relative comparisons between MCC variations and have been found to be predictive of actual behaviour in other fields (e.g., shopping behaviour: Chang, Lusk, & Norwood, 2009).

As other types of incentives have been explored by the NHS in the UK (Relton, Strong, & Li, 2011) and are used by large employers in the US (National Business Group on Health & Towers Watson, 2011), there is scope for MCCs to be utilised as part of a health behaviour change intervention. Establishing optimal conditions for delivery, through experimental

trials, may lead to the development and implementation of a financially sustainable intervention for policy makers attempting to reduce overweight and obesity rates.

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Monetary Contingency Contracts

Table 1

Descriptive statistics for overall WTP values for each contract condition

Contract Condition	n	Percentage willing to pay ^a	Mean per kg of weight loss (SD) (£)	Mean percentage of income willing to pay (SD)	Overall Mean (SD) (£)	Overall Median (£)	Overall Minimum (£) ^b	Overall Maximum (£) ^b
WTP Individual Weight Loss ^b	54	82.1	11.78 (13.22)	0.48 (0.64)	91.51 (101.92)	61.25	5.00	375.25
WTP Pair-based Weight Loss ^c	53	75	7.28 (8.44)	0.33 (0.66)	56.57 (65.05)	30.00	3.75	250
WTP All or Nothing Refund ^c	53	75	8.81 (9.16)	0.39 (0.71)	68.30 (69.74)	45.00	2.50	250
WTP Performance Based Refund ^c	53	75	10.44 (10.87)	0.42 (0.55)	81.32 (84.05)	55.00	2.50	320
WTP Weight loss without Maintenance ^b	54	75	9.63 (9.78)	0.42 (0.63)	74.85 (74.87)	50.00	2.50	300
WTP Weight Loss Plus Maintenance ^c	53	73.2	9.57 (10.03)	0.40 (0.62)	74.40 (77.20)	45.00	2.50	270

^a Percentage willing to pay indicates percentage of participants WTP into all 4 MCCs presented with each condition. ^b For minimum and maximum values, zero responses were excluded.

Monetary Contingency Contracts