

1 **Theoretical examination of behavioural feedback in the application of**
2 **teledietetics on weight reduction**

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11

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12

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13

1 **Abstract**

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3 *Introduction:* Behavioural feedback can be attained through electronic self-monitoring with
4 teledietetics. This study examined the theoretical framework of the theory of planned
5 behaviour, which suggests that behavioural feedback contributes to the intention to initiate
6 and maintain weight loss.

7 *Methods:* A quasi-experiment involving adults aged 20–50 years with a body mass index
8 greater than 23 kg/m² was conducted. The experimental group (EG) comprised 25
9 participants who used electronic dietary records for self-monitoring. The control group (CG)
10 comprised 25 participants who used paper-format dietary records for self-monitoring. Data
11 pertaining to the theory of planned behaviour were obtained using a self-administered
12 questionnaire. After an initial measurement, each participant's body weight was measured
13 again at Week 12 and at Week 24, following a 12-week observation period. Hierarchical
14 regression analyses of planned behaviour components were conducted for each power to
15 predict the participants' intentions to lose 10% of their body weight. Logistic regression
16 analysis was performed to investigate the odds ratio of intention, perceived behavioural
17 control (PBC), and the group effect (CG vs. EG) for predicting the initiation and maintenance
18 of 10% weight loss.

19 *Results:* At Week 12, the odds ratios for intention, the PBC, and the group effect were 2.154,
20 0.330, and 0.654, respectively, and those at Week 24 were 3.255, 0.499, and 24.592,
21 respectively. The group effect contributed significantly to weight-loss maintenance at Week
22 24.

23 *Discussion:* Behavioural feedback through electronic self-monitoring improved the intention
24 to achieve weight-loss maintenance, which may indicate the importance of behaviour
25 reflection in weight-loss maintenance.

26

1 Keywords: behavioural feedback, self-monitoring, weight loss maintenance, the theory of
2 planned behaviour (TPB), electronic dietary records

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1 **Introduction**

2 Both initial and sustained weight loss are challenging, and people commonly lose a
3 certain amount of body weight before reaching a plateau.¹ Although many treatments have
4 exhibited high efficacy in facilitating weight loss, the rates of weight regain are high.²⁻⁴
5 Scholars have explained how continued weight loss influences the body's lean mass, reducing
6 its energy expenditure and triggering hormone mechanisms that alter appetite. This process
7 consists of a sequence of physiological alterations that promote adverse behaviour in weight
8 loss maintenance.⁵⁻⁸ Sciamanna⁹ suggested that people who achieve initial weight loss and
9 those who consistently maintain weight loss exhibit different clusters of behaviour. People
10 who engage in consistent physical activity or who choose low-fat protein were more likely to
11 achieve weight loss maintenance but not necessarily weight loss. On the contrary, people who
12 participate in a variety of exercises or earlier planning of meals were more likely to achieve
13 weight loss but not weight loss maintenance. Therefore, the key component to maintaining
14 weight loss is the establishment of self-management, which transforms weight maintenance
15 into autonomic and habitual behaviour.⁸

16 Electronic self-monitoring has been applied to improve the consistency of dietary
17 changes made during the weight loss process.¹⁰⁻¹² The benefits of such monitoring outweigh
18 the inconvenience of using paper-based self-monitoring because an electronic dietary
19 recording system could be easily accessed by the users with mobile devices or handheld
20 tablet computers. With the current highly connected infrastructure of wireless technology,
21 users can record their diet using their smartphones, which are directly connected to the
22 web-based system. The input of dietary records can occur from anywhere and at anytime. It is
23 more common for people to bring smartphones and tablets with them than to bring a pen and
24 pencil during daily activities; a web-based dietary recording system thus fosters higher
25 accessibility for users. In addition, various forms of support can be tailored to reinforce the
26 motivation required to achieve changes in eating behaviour and to provide the user with

1 instantaneous, individual feedback. Such electronic self-monitoring and feedback facilitate
2 transforming temporary eating behaviour into permanent eating habits.¹³ Chung, Law, Fong
3 et al.¹⁴ defined individual feedback as behavioural feedback. This refers to an individual's
4 previous eating behaviour as recorded and evaluated by experts as well as feedback to the
5 individual that can inform them to adjust their present eating behaviour according to the
6 provided feedback. Behavioural feedback enables people to establish an adaptive cycle of
7 eating behaviour by adjusting their eating behaviour progressively, thereby reducing the
8 difficulty of adopting healthy food choices and proper portion sizes in a short period of time.
9 Eating habits are not modified through counselling sessions or seminar-led nutrition
10 education^{15,16}; instead, people must correct their behaviour based on repeated trial and error.

11

12 Applications of electronic dietary monitoring in teledietetics are migrating from the
13 stage of clinical trials to community practices due to the benefits of its convenience and
14 cost-effectiveness in weight reduction maintenance.¹⁷ However, the innovative application of
15 teledietetics still lacks theoretical support; therefore, this study aimed to examine the
16 evidence of behavioural feedback in weight loss and weight loss maintenance by applying
17 teledietetics.

18

19 **Theoretical Framework**

20 The theory of planned behaviour (TPB) is commonly employed to explain and predict
21 human health behaviour.^{18,19} Its central principle addresses the intention of a person to
22 engage in a particular behaviour and suggests that several salient beliefs be treated as
23 determinants of this intention. Attitude, subjective feelings regarding social norms, and
24 perceived behavioural control (PBC) are the three immediate beliefs that facilitate or hinder
25 the attainment of behaviour. The TPB has provided extensive explanations of beliefs in
26 behavioural outcome evaluations and other behaviour-influencing beliefs. In addition,

1 understanding the normative beliefs and motivation to comply of people who experience the
2 perceived social pressure to perform a target behaviour is valuable. Finally, control beliefs
3 and perceived barriers can be attributed to the extent to which people perceive themselves as
4 being able to perform a behaviour easily.

5 Although the TPB has been applied extensively to health behaviour topics such as
6 human immunodeficiency virus protection, human papillomavirus vaccination, smoking
7 cessation, and fruit and vegetable consumption,²⁰⁻²⁴ its use in explaining weight loss and
8 weight loss maintenance has been limited.²⁵⁻²⁸ To assess the applicability of the TPB in
9 measuring the intention to lose weight, this study evaluated whether the aforementioned three
10 salient beliefs (attitude, subjective norms, and PBC) explain weight loss behaviour. In
11 addition, this study examined the role of PBC in relation to weight loss and weight loss
12 maintenance. In response to the rising trend of electronic self-monitoring applications,
13 instant-learning objects such as online reports could be built in such applications. Gradually,
14 this learning process enabled the participants to change their eating habits. The feedback from
15 previous reports initiated reflective learning among the participants that they then applied
16 every time they decided what and how much to eat.²⁹ The study here proposes that
17 behavioural feedback is integral to the electronic platform compared with conventional paper
18 and pen recording processes and can provide users with higher intention to engage in and
19 maintain weight loss.

20

21 **Method**

22 This study was part of a quasi-experiment conducted between January 2013 and
23 February 2014. Another study describing cost-effectiveness and weight loss effect was
24 published previously.¹⁷ The focus of this study was to examine how behavioural feedback
25 explained the variance in weight loss and weight loss maintenance.

26

1 **Sampling**

2 Adults aged 20–50 years with a body mass index greater than 23 kg/m² were recruited
3 using a convenience sampling method through a community health centre and a community
4 dietetics clinic in Hong Kong. The participants were required to live in Hong Kong, be
5 literate in Chinese, and be able to use the Internet. Participants with mental illnesses that
6 might hinder their dietary input or the comprehensibility of their reports were excluded. Fifty
7 adults meeting the inclusion criteria were recruited. The 25 participants recruited through the
8 community health centre were assigned to the experimental group (EG) and used electronic
9 dietary records to self-monitor their progress. The 25 participants recruited through the
10 dietetic clinic were assigned to the control group (CG) and employed paper-format dietary
11 records to self-monitor their progress.

12

13 **Intervention**

14 The participants in both groups engaged in a 12-week weight-reduction programme
15 that included dietary counselling, nutritional education, and dietary recording. The
16 participants were asked to review the dieticians' advice and then modify their food choices or
17 portion sizes to meet the energy requirements according with the principles of a balanced diet.
18 This self-monitoring was crucial for the participants' ability to work towards their
19 weight-reduction goals. The participants in the EG input their daily dietary records using a
20 web-based system that generated calorie and nutrient reports tailored to each participant. The
21 reports were considered "tailored" because the participants' physical parameters were input
22 into the system. Furthermore, the participants input their daily activity level each time they
23 recorded their diet in the system. The energy reports indicated the daily energy requirements
24 and the actual intake of energy from food. The participants received daily nutrient reports,
25 listing the energy and nutrient details of each food item; these reports helped educate the
26 participants about high-energy and low-nutrient food items.

1 The participants in the CG recorded their diet on paper on a log sheet and then
2 emailed the log sheet to a research assistant who was directed to seek comments from
3 dietitians. Dietitians reviewed the participants' dietary records and provided written feedback
4 on the log sheet; then, they emailed their comments to the research assistant, who then sent
5 back the comments to the participants by e-mail on a weekly basis. The participants adjusted
6 their food choices or portion sizes based on the professional feedback. The difference
7 between the EG and CG was that the EG received behavioural feedback generated by the
8 electronic dietary recording system, whereas the CG did not (Figure 1).

9

10 **Measurements**

11 Demographic data and TPB components were measured using self-administered
12 questionnaires. All participants in both groups completed the same paper questionnaire before
13 the study. The TPB components were the intention to lose weight, attitude, PBC, subjective
14 norms, and behaviour. The statements measuring the participants' intention, attitude, PBC,
15 and subjective norms were adopted from Povey, Conner, Sparks, et al. ³⁰, whose evaluation of
16 the application of the TPB to healthy eating exhibits similarities to the use of the TPB in this
17 study. The TPB measure is composed of different subscales, so internal consistency of the
18 items in each subscale was evaluated separately. This ensured that all items in the subscales
19 reflected the same attributes or homogeneity.

20

21 **Behaviour**

22 Body height and weight were measured using a standing scale. Body height was
23 measured to the nearest 1 cm. Body weight was measured to the nearest 0.1 kg. Each
24 participant's body weight was measured at baseline (Week 0), after the weight loss
25 programme (Week 12), and after the 12-week observation period (Week 24). During the
26 observation period, no dietary record was conducted by any participant and thus no feedback

1 was given to them. The observation period would be a follow-up to investigate whether the
2 participants continued their dietary control with their reflective learning gained from previous
3 12 weeks' feedback. The participants' weight loss percentages were calculated at Weeks 12
4 and 24, and the baseline measurements were used as a reference. Two measures of behaviour
5 were obtained. They were 10% weight loss and maintained 10% weight loss. The participants
6 who achieved 10% weight loss by Week 12 were coded "1", and those who did not were
7 coded "0"; code "1" represented success. The same coding and interpretation were applied at
8 Week 24. In the context of this study, 10% weight loss in relation to the initial body weight
9 may not be sufficient to regard a patient as having re-established a normal body size.
10 However, 10% weight loss has been evidenced to produce substantial improvements in health,
11 such as reductions in the risk of cardiovascular diseases and diabetes.^{2,31}

12

13 **Attitude**

14 The participants' attitudes towards reducing their body weight were measured using a
15 5-point semantic differential scale that measured the response to the prompt "attitude towards
16 weight reduction." The scales were anchored with the statements "extremely harmful" to
17 "extremely beneficial," "extremely foolish" to "extremely wise," "extremely bad" to
18 "extremely good," "extremely unenjoyable" to "extremely enjoyable," and "extremely
19 unpleasant" to "extremely pleasant," each ranging from a score of -2 to a score of +2,
20 respectively. The overall measure of attitude was calculated by computing the mean of the
21 responses to the five statements. Cronbach's alpha for the five statements was 0.880.

22

23 **Subjective Norms**

24 Subjective norms were measured using four statements ranked on 5-point scales. The
25 four statements were "People who are important to me think I should lose weight," "People
26 who are important to me would approve/disapprove of me losing weight," "People who are

1 important to me want me to lose weight,” and “I feel social pressure to lose weight.” The
2 responses were provided on a fully labelled scale, scored from “strongly agree” (+2) to
3 “strongly disagree” (-2). An overall measure of subjective norms was calculated for each
4 participant by computing the mean of the four responses. Cronbach’s alpha for these four
5 statements was 0.755.

6

7 **Perceived Behavioural Control**

8 PBC was measured using three items and applying 5-point response formats that were
9 fully labelled. The first item was “How easy or difficult would it be for you to lose weight in
10 the next 6 months?,” and it was scored from “very difficult” (+1) to “very easy” (+5). The
11 second item was “Whether I lose weight in the next 6 months is entirely up to me,” and it was
12 scored from “not at all” (+1) to “to an extremely great extent” (+5). The third item was “How
13 much control do you feel you have over losing weight over the next 6 months?,” and it was
14 scored from “no control” (+1) to “complete control” (+5). Cronbach’s alpha for the three
15 items was 0.718, and the overall measure of PBC was calculated by computing the mean of
16 the three responses of each participant.

17

18 **Intention**

19 The participants’ intention to reduce their body weight was measured using two
20 statements: “I intend to lose weight in the next 6 months” and “I plan to lose weight in the
21 next 6 months.” The first statement described the participants’ desires to lose weight in the
22 next 6 months, and the second statement determined whether the participants had any action
23 plan for losing weight in the next 6 months. Explanation of the operational definitions was
24 made in footnotes to the questionnaire. The responses were measured on 5-point scales
25 ranging from “definitely agree” (+2) to “definitely do not agree” (-2). An overall measure of
26 intention was calculated by computing the mean of the two responses. Cronbach’s alpha for

1 the two statements was 0.928.

2

3 **Procedure**

4 The protocol used was approved by the human ethics committee at the Hong Kong
5 Institute of Education before the study commenced. The participants were provided with a
6 document describing the study's objectives, details on the weight management program, and
7 an overview of the required tasks. People who expressed interest in joining the study were
8 provided with a consent form and the TPB questionnaires. Mann-Whitney U-tests of TPB
9 components were used to determine significant differences between the groups. Hierarchical
10 regression analyses of TPB components were conducted for each power to predict the
11 participants' intention to lose 10% of their body weight. Finally, a logistic regression analysis
12 was performed to investigate the odds ratios of intention, the PBC, and the group effect (CG
13 vs. EG) for predicting 10% weight loss and maintained 10% weight loss.

14

15 **Results**

16 Fifty adults who were overweight participated in this study. The overweight cut-off
17 was based on the definition from the World Health Organization for Asian populations.³² One
18 participant in the CG withdrew before completing the weight reduction programme due to
19 pregnancy. Twenty-four and 25 of the participants in the CG and EG, respectively, completed
20 the 12-week programme and returned for weight measurements at Week 24.

21 The median scores for the attitude and subjective norms of the participants in the EG
22 were higher than those of the participants in the CG, whereas the median score for PBC of the
23 participants in the CG were higher than that of the participants in the EG. The median scores
24 of intention, however, were the same in the two groups. However, at the beginning of the
25 study, no significant difference in attitude, subjective norms, PBC, or intention was observed
26 between the two groups (Table 1).

1

2 **Theory of Planned Behaviour as an Indicator of Intention to Lose Body Weight**

3 A hierarchical multiple regression analysis was conducted to determine the influence
4 of the TPB variables on the intention to reduce body weight. Step 1 assessed the contribution
5 of attitude, subjective norms, and PBC to intention. The overall model explained 43.7% of
6 the variance in intention ($R^2 = 0.400$, $F_{3,45} = 11.660$, $p < .001$) and was significant. When
7 subjective norms were removed in Step 2 of the regression analysis, the overall model was
8 not significant and explained 41.2% of the variance in intention ($R^2 = 0.412$, $F_{1,45} = 0.061$, p
9 $= .806$). When subjective norms and attitude were removed in Step 3, the variation in
10 intention to lose body weight decreased by 1.4% ($R^2 = 0.398$, $F_{1,45} = 2.140$, $p = .150$); this
11 reduction did not constitute a significant R^2 change. In the three models, PBC was the only
12 unique significant predictor of intention to reduce body weight.

13

14 **Ten Percent Weight Loss Between Groups**

15 Immediately after the intervention (Week 12), similar percentages of the participants
16 in the CG ($n = 4$, 18.2%) and EG ($n = 4$, 16.0%) achieved a 10% reduction in their initial
17 body weight ($p = .573$). Twelve weeks after the intervention (Week 24), the percentage of
18 participants who had achieved or maintained a 10% reduction of their initial body weight was
19 significantly higher in the EG ($n = 22$, 88.0%) than in the CG ($n = 6$, 25.0%) ($p < .001$).

20

21 **Predictors of Ten Percent Weight Loss**

22 Logistic regression analysis was conducted to determine whether the TPB variables
23 could be employed as predictors for the differences in 10% weight loss between the two
24 groups. Because PBC provided unique contributions to the intention to reduce weight in the
25 hierarchical regression analysis, the predictive values of PBC, intention, and the group effect
26 were investigated further.

1 At Week 12, the first logistic regression analysis was conducted to determine the
2 relationship between intention and immediate 10% weight loss (as behaviour; $\chi^2 = 0.058$; p
3 = .809). The statistical model contributed to 0.1% of the variation in immediate 10% weight
4 loss and correctly classified 83% of the cases. Intention was determined to be an insignificant
5 predictor of immediate 10% weight loss. The second analysis was conducted to determine the
6 influence of PBC when controlling for intention. This statistical model contributed to 3.6% of
7 the variation in the desired behaviour and correctly classified 83% of the cases ($\chi^2 = 1.680$; p
8 = .195). Neither intention nor PBC were significant predictors of immediate 10% weight loss.
9 Finally, the group effect was added to investigate its contribution to the desired behaviour.
10 Intention, PBC, and the group effect jointly accounted for 4.2% of the variation in behaviour,
11 and the percentage of cases correctly classified the remaining 83% ($\chi^2 = 0.263$; $p = .608$).
12 Again, neither variable was a unique significant predictor of immediate 10% weight loss. The
13 odds ratio of the group effect in this step was lower than that of intention (Table 2).

14 At Week 24, the first logistic regression analysis was conducted to determine the
15 relationship between intention and maintained 10% weight loss (as behaviour; $\chi^2 = 0.023$; p
16 = .879). The statistical model accounted for less than 0.1% of the variation in the desired
17 behaviour and correctly classified 57.1% of the cases. Here, intention was not shown to be a
18 significant predictor of behaviour. The second analysis was conducted to determine the
19 influence of PBC when controlling for intention, and this statistical model contributed to
20 3.8% of the variation in the desired behaviour and correctly classified 59.2% of the cases.
21 Again, neither variable was a unique significant predictor of maintained 10% weight loss.
22 Finally, the group effect was added to investigate the contribution of behavioural feedback to
23 maintained 10% weight loss. Intention, PBC, and the group effect jointly accounted for
24 37.7% of the variation in behaviour and could be used to correctly classify 81.6% of the cases.
25 Here, the group effect was determined to be a significant predictor of the desired behaviour (p
26 < .001). The odds ratio of the group effect in this step was higher than those of intention and

1 PBC (Table 2).

2

3 **Discussion**

4 Insignificant differences in the scores between groups at the baseline confirmed that
5 all of the participants reported similar attitude, subjective norms, PBC, and intention towards
6 successful weight loss. Hierarchical regression analyses of intention revealed that attitude and
7 subjective norms only slightly improved predictions of the participants' weight loss behaviour,
8 indicating that PBC was the major significant predictor in the TPB framework for weight
9 reduction. Our findings support those of previous studies conducted by Schifter and Ajzen²⁵
10 and Povey et al.³⁰, who measured weight loss behaviour by employing self-reported
11 questionnaires. The objective measurement uniquely adopted in this study confirmed that
12 PBC significantly contributes to the intention to reduce body weight. The results indicated
13 that PBC strongly determined either the intention to lose weight or weight loss behaviour, as
14 proposed in the TPB framework.

15 Although behavioural feedback is not a new concept and has been applied to
16 behavioural change in many studies, those focusing on how prior behaviour guides future
17 actions cannot draw a framework with a similar concept.³³ Cognitive activity has been
18 determined to influence participants' decisions based on the consequences of behaviour. In
19 this study, feedback regarding past behaviour directly affected the participants' attitudes and
20 their final behavioural decisions. In the EG, participants reflected on their previous eating
21 decisions from online reports. Although dieticians produced energy profiles and nutrient
22 profiles for analysis, they did not provide face-to-face feedback. The participants in the EG
23 had more autonomy in the review process and reflected on their own eating problems to try to
24 determine a balanced diet that fit the diet approach. It was hypothesized that this user-centred
25 reflective process would strengthen the modification of the participants' eating habits and be
26 established as long-term eating behaviour after the observation period. For the participants in

1 the CG, dietary feedback was also provided by dietitians; however, the participants may have
2 taken less ownership in reflecting on their own eating problems, which were identified by the
3 dietitians. The participants in the CG were less involved in thinking of how to modify their
4 food choices, and it took longer for them to achieve balanced eating habits than the
5 participants in the EG. Therefore, our results agree with those obtained using the Albarracin
6 and Wyer model³³ and indicate that positive and negative feedback influence participants'
7 actions and can lead to desired behavioural consequences.

8 Behavioural feedback was the main factor that revealed the difference between the
9 two groups. Thus, the behavioural feedback, as demonstrated in the group effect, was
10 proposed to elicit a difference in cognitive activity during self-monitoring. After Week 12, the
11 results indicated that intention was the strongest predictor of immediate weight loss; however,
12 the odds ratios of intention in Steps 2 and 3 were greater than 2, which suggests that the
13 participants with greater intention to lose weight were twice as likely to be successful.
14 Regarding immediate successful weight loss, although behavioural feedback did not appear to
15 exert an effect, it significantly indicated a difference in weight loss maintenance at Week 24.
16 The odds ratios of intention increased in Steps 1, 2, and 3, suggesting that the intention to
17 reduce weight increased when PBC and the group effect were added. This observation can be
18 explained based on the findings in previous studies that indicate that PBC is highly correlated
19 with intention or based on the inclusion of behavioural feedback in the electronic dietary
20 records applied in the EG. The participants in the EG learned how to modify their food
21 choices and portion sizes during the 24 week period, and this reflective learning during
22 self-monitoring reinforced their newly acquired healthy eating habits. In addition, the
23 participants in the EG received suggestions in their reports stating that if they exercised more,
24 then they could increase their energy intake from food. This reflects the various alterations in
25 energy intake and output that the participants could experience through the electronic dietary
26 recording system. The same effect was not shown in 12-week weight loss. This outcome

1 indicated that reflection on eating advice and healthy food choice required time to be
2 internalized. In this finding, users with higher PBC demonstrated higher capability for
3 achieving weight loss maintenance supported by behavioural feedback. This dietary recording
4 system is a suitable knowledge transfer system for educating people with obesity in how to
5 modify their eating behaviour and exercise patterns to achieve weight loss goals. The odds
6 ratio of the group effect strongly indicated that the behavioural feedback of the electronic
7 dietary recording system was 24 times more likely to lead to maintenance of weight loss in 24
8 weeks than paper self-monitoring.

9

10 **Limitation and Implications**

11 This is the first study to establish theoretical support for weight loss by applying
12 teledietetics. The TPB framework was applied to explore the effect of behavioural feedback
13 on weight loss and weight loss maintenance, providing valuable findings regarding the
14 application of this framework of self-monitoring with the features of behavioural feedback.
15 However, two limitations in the research design may warrant caution. One limitation is the
16 difference in the dietician feedback given to the participants. The feedback given to the EG
17 occurred on a daily basis, whereas the feedback given to the CG occurred on a weekly basis.
18 This difference in the present study was due to the consideration of efficient email
19 communication between the participants and the research assistant. If the feedback in the CG
20 was made daily, the participants may feel too busy to send and receive email messages daily.
21 Therefore, the observed variance in the group difference could be a result from the
22 behavioural feedback plus a more frequent dietician feedback in the EG group. Another
23 limitation is the statistical analysis in this study. Logistic regression is commonly adopted for
24 the TPB framework but cannot make causal determinations. Statistical models such as path
25 analysis and computational simulations such as artificial neural networks merit further

1 investigation as they may facilitate recognizing patterns in how behavioural feedback
2 influences PBC, intention, weight loss, and weight loss maintenance.

3

4 **Conclusion**

5 As demonstrated by the electronic dietary recording and self-monitoring system
6 examined in this study, behavioural feedback improved weight loss maintenance over a
7 24-week period. However, no significant improvement in weight loss success was observed
8 over a 12-week period.

9

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7

Figure 1: Schematic representation of the current and proposed predictors in the theory of planned behaviour

Figure 1: Schematic representation of the current and proposed predictor in the Theory of Planned Behavior.

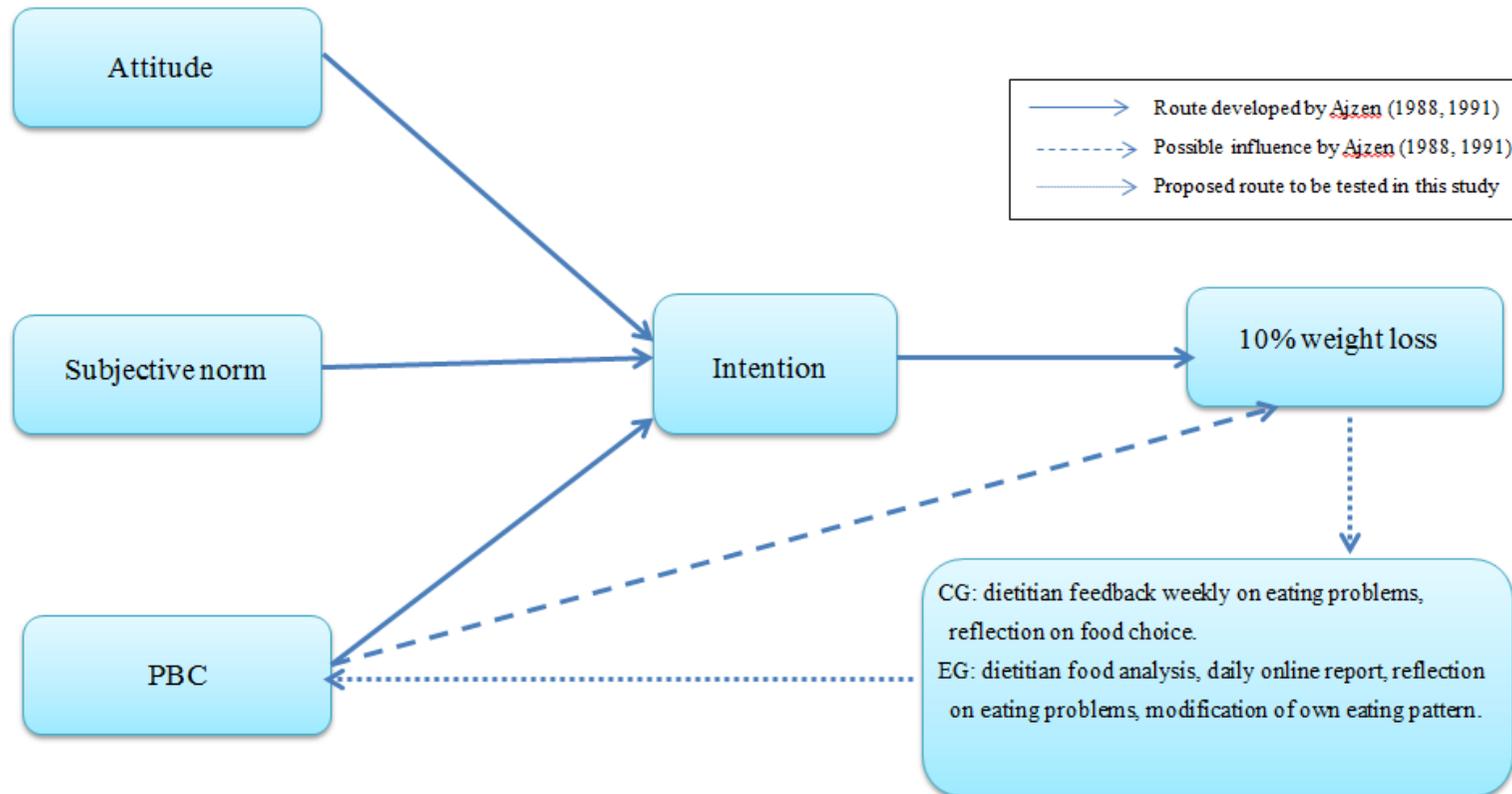


Table 1: Mann—Whitney U-test on group differences in TPB variables

| | CG participants | EG participants | | |
|-----------------|------------------------|--------------------------|----------------|----------------|
| | N = 24 | N = 25 | <i>U value</i> | <i>p value</i> |
| | Median (IQR) | Median (IQR) | | |
| Attitude | 1.00 (1.00) | 1.30 (1.20) | 269.0 | 0.395 |
| Subjective norm | 0.25 (1.38) | 0.88 (1.19) [†] | 232.0 | 0.171 |
| PBC | 3.67 (0.67) | 3.50 (1.00) | 257.0 | 0.275 |
| Intention | 5.00 (1.00) | 5.00 (1.00) | 271.0 | 0.363 |

[†] One participant in the teledietetic group did not respond to the subjective norm; IQR:interquartile Range

Table 2: Logistic regression analyses: predicting $\geq 10\%$ weight loss at 12 and 24 weeks

| | | B | S.E. | <i>p</i> value | Odds Ratio | 95% Confidence Interval | |
|-----------------|-----------|----------|-------------|-----------------------|-------------------|--------------------------------|----------------|
| | | | | | | (lower) | (upper) |
| 12 weeks | | | | | | | |
| Step 1 | Intention | -0.171 | 0.703 | 0.808 | 0.843 | 0.213 | 3.344 |
| | Constant | -0.812 | 3.193 | 0.799 | 0.444 | | |
| Step 2 | Intention | 0.732 | 1.016 | 0.471 | 2.080 | 0.284 | 15.225 |
| | PBC | -1.009 | 0.790 | 0.202 | 0.364 | 0.077 | 1.716 |
| | Constant | -1.508 | 3.292 | 0.647 | 0.221 | | |
| Step 3 | Intention | 0.767 | 1.017 | 0.451 | 2.154 | 0.293 | 15.814 |
| | PBC | -1.109 | 0.824 | 0.178 | 0.330 | 0.066 | 1.659 |
| | Group | -0.425 | 0.832 | 0.610 | 0.654 | 0.128 | 3.340 |
| | Constant | -1.114 | 3.380 | 0.742 | 0.328 | | |
| 24 weeks | | | | | | | |
| Step 1 | Intention | 0.081 | 0.533 | 0.879 | 1.085 | 0.381 | 3.085 |
| | Constant | | | | | | |
| Step 2 | Intention | 0.760 | 0.746 | 0.308 | 2.139 | 0.496 | 9.227 |
| | PBC | -0.814 | 0.611 | 0.183 | 0.443 | 0.134 | 1.467 |
| | Constant | | | | | | |
| Step 3 | Intention | 1.180 | 0.971 | 0.224 | 3.255 | 0.485 | 21.830 |
| | PBC | -0.695 | 0.807 | 0.389 | 0.499 | 0.103 | 2.425 |
| | Group | 3.202 | 0.828 | <0.001 | 24.592 | 4.857 | 124.531 |
| | Constant | | | | | | |