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Exploring the Influence of Impending Exercise on Eating Behaviour

Project Title: Influence of Impending Exercise on Eating Behaviour

Supervisor: Asst Prof Cheon Bobby Kyungbeom

Abstract

- Compensatory Health Belief (CBH) model: one may unknowingly increase their calorie intake in the face of an impending exercise session.
- Preliminary correlational results show that participants who consumed more snacks in the impending exercise (IE) condition also had a higher energy balance.
- In other words, those participants may not have expended enough energy during the exercise session to account for their increased energy intake.
- Hence, health professionals should take into account this contradictory relationship between impending exercise and increased food intake when developing solutions to combat obesity.

Background & Hypothesis

- Impending exercise may make one more susceptible to snack on high-calorie food. This is because anticipated effectiveness of future exercise is more prone to overly optimistic expectations than past exercise.
- Meaning that individuals may snack more as a reward for an IE session or because they believe their exercise session can offset the extra calories consumed. Hence, these inaccurate evaluations may lead to behaviours consistent with overeating.
- Surprisingly, in that same study that reported a difference between participants’ effectiveness expectations, the authors did not find any difference in calorie intake between the eating before exercise condition as compared to the exercising before eating and no exercise condition.
- This could be due to the limitations associated with their study design: (1) between-subjects design, (2) only female participants, (3) BMI of 18.5 – 25, (4) no meal standardization, (5) pre-determined exercise duration and intensity.
- As such, the purpose of the present repeated measures study aims to re-examine the effects of impending exercise on eating behaviours while addressing the limitations of previous research.

H1: Participants will consume more calories in the impending exercise condition as compared to the no exercise condition.

H2: Participants will overestimate the effectiveness of their upcoming exercise leading them to consume more calories than they expend.

Methodology

Participants

- 9 healthy inactive overweight male participants (age: 24.11 ±1.69 years; body mass index (BMI): 26.48 ±1.53 kg/m², VO₂max: 30.08 ±3.49 mL/kg/min) were recruited from the National University of Singapore (NUS).

Procedures

- Following a screening, baseline and familiarization (SBF) session, participants underwent two randomly counterbalanced experimental sessions: meal before exercise (ME) and meal only (MO) conditions.

Screening Questionnaires

- General Health Q
- Inl Physical Activity Q- (IPAQ)®
- Behavioural Regulation on Exercise Q II (BREQ)®
- Dutch Eating Behaviour Q (DREB)®
- Hedonic taste test

Figure 1. Procedures associated with the SBF session.

Baseline Measurements

- Aerobic fitness test
- Rating of Perceived Exertion

Figure 2. Procedures associated with the MO and ME session.

- Appetite and blood pressure were measured during the ME and MO sessions at 3 time points (red and blue coloured arrows).
- A physical activity enjoyment scale was also given after the ME workout session.

Preliminary Results

- In line with H₂, the average calories consumed in the ME session is higher than the MO session.
- However, the paired t-test showed that the difference did not reach significance, t(8) = 68, p = .513.
- The difference in caloric consumption was significantly correlated with the energy balance in the ME session (calories consumed – calories expended), r(7) = .089, p = .008.
- Consistent with H₂, more calories were consumed than expended thus leading to a positive energy balance.
- However, a paired t-test was marginally significant, t(8) = 2.21, p = .058.
- The enjoyment associated with physical activity was also highly correlated with energy expended during the exercise session, r(7) = .886, p = .001.

Discussion & Conclusion

- As the study is still on-going, the small sample size may result in low statistical power and contributed to the non-significant t-test.
- Although the difference between the energy consumed and expended (247 kcal) is non-significant, this difference is clinically meaningful as it has been reported that an increase of 100 kcal/day re-establishes one’s energy balance at the new, slightly higher, body weight. Hence, with a constant positive energy balance of approx. 247 kcal, one’s body weight will increase over time.
- The correlation between the differences in energy consumption and energy balance shows that participants compensated for the impending exercise by snacking more and also overestimated the effectiveness of their impending exercise session.
- The influence of IE on food intake may be a mediator for rising obesity levels in Singapore despite programs to promote physical activity (e.g. National Physical Fitness Award [NAPFA], Holistic Health Framework (HHF)).
- Future initiatives to promote physical activity for weight loss should take the CBH model into account and ensure the activity is enjoyable as it seems to be important for increasing energy expended during physical activity.

References:


www.ntu.edu.sg/ureca