

DOCTORAL THESIS

The effect of a health videogame with story immersion for childhood obesity prevention among Hong Kong Chinese children

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The Effect of a Health Videogame with Story Immersion for Childhood Obesity
Prevention among Hong Kong Chinese Children

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A thesis submitted in partial fulfillment of the requirements
for the degree of
Doctor of Philosophy

Principle Supervisor: Prof. LAU Wing Chung, Patrick

HONG KONG BAPTIST UNIVERSITY

September 2015

DECLARATION

I hereby declare that this thesis represents my own work which has been conducted after registration for the degree of PhD at Hong Kong Baptist University, and has not been previously included in a thesis or a dissertation submitted to this or any other institution for a degree, diploma or other qualifications.

Signature: _____

Date: September 2015

ABSTRACT

Introduction: Video game is an emerging technology with potential to overcome many of the current barriers to behavior change. Video game playing is now woven into the fabric of children's life and has been developed to educate individuals in health-related areas. Story immersion refers to the experience of being fully absorbed within a story in the game and is a key factor that contributes to the mechanism of behavior change. "Escape from Diab (Diab)" is a health videogame designed to lower the risk of obesity and type 2 diabetes through behavior change components that were integrated into activities within the game storyline. This thesis was designed to investigate the effect of Diab for childhood obesity prevention among Hong Kong Chinese children.

Methods: A literature review was conducted. Subsequently, study one conducted the validation of the Physical Activity Questionnaire for Older Children (PAQ-C) with 469 Hong Kong Chinese children. Study two was a cross-sectional study to explore the associations of self-efficacy, motivation, preference with both self-reported and objective physical activity (PA) in 301 children. Study three consisted of two phases. Phase one conducted individual interviews with 34 Hong Kong Chinese children to gather their perceptions of Diab and to assess Diab's acceptability and applicability. Phase two examined the effect of playing nine episodes of Diab on children's health outcomes (i.e., motivation, self-efficacy, preference for diet and PA, and PA behavior) through a non-randomized intervention.

Results: The review demonstrated the effects of interventions by using health videogames on the psychological correlates. However, limited evidence is available to draw conclusions on the games' behavioral modification efficacy. In study one, good internal consistency and test-retest reliability suggest that the PAQ-C is an adequately reliable instrument for use among Chinese children. The significant moderate correlation between the PAQ-C score and accelerometer measured moderate-to-vigorous PA support the PAQ-C's acceptable validity. Study two revealed the important effects of self-efficacy and autonomous motivation in predicting PA. Differences were found between the prediction of self-reported PA and objective PA, which is likely due to self-reported error variance common to the PAQ-C and psychological correlates but not common to accelerometry. Study three indicated that Diab was perceived to be an immersive game by most of participating Hong Kong Chinese children. Four themes emerged from the interviews indicated that story immersion was a perceptible component and that Diab, developed for American children, was acceptable to the Hong Kong Chinese children. The pilot intervention study found short-term benefits after completing the game. However, the effects were not sustained at follow-up testing 8-10 weeks later.

Conclusion: The current thesis demonstrated the validity of PAQ-C and the important effects of self-efficacy and autonomous motivation in predicting PA, which could inform the development of efficacious interventions. Diab, a Health videogames with appealing characters and immersive stories, partially motivated children to improve their motivation, self-efficacy, and preference for diet and PA behaviors immediately after completing nine episodes of the game, however, the lasting effectiveness and mechanisms of change require more thorough investigation.

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