

The CHANGE Program: Methodology for comparing interactive Co-Active coaching with a prescriptive lifestyle treatment for obesity

Erin S. Pearson, Faculty of Health & Behavioural Sciences, Lakehead University, Ontario, Canada

Jennifer D. Irwin, Faculty of Health Sciences, Western University, Ontario, Canada

Don Morrow, Faculty of Health Sciences, Western University, Ontario, Canada

Contact Email: jenirwin@uwo.ca

Abstract

Studies incorporating Motivational Interviewing via Co-Active life coaching (MI-via-CALC) have elicited positive results among obese adults; however there is a paucity of *comprehensive* MI-via-CALC-obesity research that includes sufficient statistical power and a validated comparison group. The purpose of this study was to compare two telephone-based interventions for obesity. University students were randomized to either a 12-week: (a) personalized MI-via-CALC program whereby a coach worked with participants to achieve goals; or (b) prescriptive education-based lifestyle treatment following the LEARN Program. This paper contains a detailed methodological account of the study with a view to informing the development of prospective coaching-based programs.

Keywords: Behavioural Intervention; Obesity; Motivational Interviewing; Life Coaching; Students

Introduction

Obesity is a rapidly escalating epidemic that has been described as the most prevalent nutritional problem worldwide (Lau et al., 2007). In 2008, the World Health Organization (WHO) estimated that there were more than 1.5 billion overweight adults globally, 500 million of whom were defined as obese (WHO, 2011a). The consequences of this “globesity” (WHO, 2011b) are gargantuan; obesity has been identified as a risk factor for a multitude of chronic and non-communicable diseases, not to mention the exorbitant socio-economic costs that are incurred as a result (Lau et al., 2007; Statistics Canada, 2006; WHO, 2011a). Mirroring this worldwide trend, in Canada, a significant increase in obesity has been observed in recent years (Statistics Canada, 2006; Shields, Carroll, & Ogden, 2011; Tremblay, Katzmarzyk, & Willms, 2002); data indicate that 24.1% of the population, more than 5.5 million adults, are now obese (i.e., Body Mass Index [BMI] $\geq 30\text{kg/m}^2$; Shields et al., 2011). Researchers have attributed the etiology of the epidemic in large part to an increased consumption of energy-dense foods low in essential nutrients and high in sugar and fat content, in combination with reduced levels of physical activity (Lau et al., 2007; Hill & Peters, 1998; WHO, 2011a). Thus, exploring behavioural strategies aimed at attenuating these rates has been recommended and is warranted (Strychar, 2004).

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Post-secondary educational attainment has grown steadily since 1990, with the percentage of individuals holding a bachelor's degree almost doubling between 1990 and 2006 (Canadian Council on Learning, 2006). Young adults reporting some post-secondary education have been identified as especially vulnerable with respect to weight gain during this transitional period due to a number of environmental, occupational, and behavioural changes that occur and influence subsequent lifestyle choices (Crombie, Ilich, Dutton, Panton, & Abood, 2009). In fact, among those ages 18 to 24, nearly one in four can be classified as obese (Statistics Canada, 2006). Given this is a critical time where many lifestyle and behavioural patterns are established, it is imperative that health promotion intervention strategies which seek to slow and reverse this alarming epidemic be examined with a view towards enabling these students to become healthy adults (Katzmarzyk, 2007; Lau et al., 2007; Perusse-Lachance, Tremblay, & Drapeau, 2010).

Goal Setting and the Behavioural Treatment of Obesity

The Ottawa Charter (WHO, 1986) states that health is a positive concept emphasizing social and personal resources in addition to physical capabilities. The crux of this concept is based on the notion that enabling individuals to improve and increase control over their own health is paramount (WHO, 1986). Congruent with these tenets, approaching the treatment of obesity from a behavioural perspective involves helping individuals to develop a set of skills that they can apply to achieve a healthier weight (Foster, Makris, & Bailer, 2005). Through a goal directed process, individuals are helped not only in deciding what to change; they are helped to identify how to change in a manner that works for them (Foster et al., 2005; Whitworth, Kimsey-House, Kimsey-House, & Sandahl, 2007). According to Locke and Latham (2006), goals refer to valued future outcomes, while goal setting implies a state of discontent with a current situation and desire to attain an alternative outcome. Goal setting has been established as an accessible and empowering tool used effectively in different settings to evoke health behaviour changes in various populations (Bodenheimer & Handley, 2009; Cullen, Baronowski, & Smith, 2001; Pearson, 2012; Shilts, Horowitz, & Townsend, 2004; Strecher et al., 1995).

A recent systematic literature review examined 18 studies that used goal setting as a behaviour change strategy specific to diet and physical activity among adults with overweight and obesity in community-based settings. As a function of applying the START Evaluation Criteria, which were developed for the purposes of the review and considered the Specificity, Timing, Acquisition, Rewards and feedback, and Tools used when setting a goal, it was determined that goals set in close proximity, with a desired distal outcome, including the participant in acquisition, and incorporating regular feedback were common features in these study contexts (Pearson, 2012). Moreover, educating participants and integrating a self-monitoring component were also identified as important inclusions. Positive results experienced among participants varied and included decreases in weight and BMI levels, lowered food and unhealthy beverage consumption, increased energy expenditure, and greater health behaviour intentions (Pearson, 2012). In light of these findings, when seeking to address obesity from a behavioural perspective, it stands to reason that the inclusion of a goal setting component could prove to impact prospective measures positively and should therefore be considered as part of the intervention methodology.

Motivational Interviewing Applied using Co-Active Life Coaching Tools

Health-related coaching is a fast growing area of research in the health promotion arena and has been utilized effectively in ameliorating many conditions and diseases, including but not limited to: depression, attention deficit hyperactivity disorder, asthma, diabetes, cancer, and poor cardiovascular

health (Newnham-Kanas, Gorczynski, Irwin, & Morrow, 2009). A number of different coach-training schools and conceptualizations about the underlying premises of each style exist. Thus, when aiming to evoke significant behavioural change, it is essential to operationalize the method being applied (Irwin & Morrow, 2005). One such individualized, goal-setting based approach that is being used increasingly to effectuate improvements in health and health behaviours is Motivational Interviewing (MI) applied using Co-Active Life Coaching (CALC) tools, which are referred to herein as MI-via-CALC (Newnham-Kanas, Morrow, & Irwin, 2010; Rollnick & Miller, 1995; Whitworth et al., 2007). Encompassing the tenets of Motivational Interviewing, a client-centred counselling style that helps people to explore and resolve their ambivalence for change (Miller & Rollnick, 2002; Rollnick & Miller, 1995), the Co-Active model is a specific style of life coaching that ultimately seeks to deepen the client's learning and/or forward the client towards some action of his or her choosing (Newnham-Kanas et al., 2010; Whitworth et al., 2007).

Through MI-via-CALC, a proactive alliance between a qualified coach and client is established whereby specific goals are set by the client in order to reach enhanced levels of performance, learning, growth, or fulfillment (International Coach Federation [ICF], 2011; Whitworth et al., 2007). This dynamic relationship is created to meet the client's needs, and is established through continuous dialogue. According to this model, clients are considered the experts in their lives and recognized as having the answers to their own questions (Irwin & Morrow, 2005; Whitworth et al., 2007); the client is in control of the coach-client relationship and responsible for establishing the discussion topic or agenda of each session (Whitworth et al., 2007). Within the MI-via-CALC model, the role of the coach is to: engage in a supportive manner to elicit answers from within the client; facilitate exploration of the goal(s) which s/he wants to achieve; and work with the client to brainstorm and identify solutions for goal attainment. Responsibilities of the coach involve listening, offering reflective summaries, asking meaningful questions, and empowering the client as opposed to advising (ICF, 2011; Whitworth et al., 2007). Co-Active coaches are trained to use and integrate numerous skills (e.g., curiosity, articulating, challenging, acknowledgement); the types of techniques and tools applied are personalized and dependent on the particular needs of the client and the context of each session (Whitworth et al., 2007). Coaching sessions are usually conducted over the telephone for a pre-determined length of time (ICF, 2011) and in service of achieving personal goals, the client is often asked to perform specific actions or complete assignments between coaching sessions (a complete description of the CALC method is included in Whitworth et al. 2007).

There is compelling evidence that interventions targeting health behaviour change should be based on validated theories (Brug, Oenema, & Ferreira, 2005; Fishbein & Yzer, 2003; Rothman, 2004). The Co-Active model has been grounded in several well-established behavioural theories including: Social Cognitive Theory; the Theory of Reasoned Action; the Theory of Planned Behaviour; and Self-Determination Theory (Irwin & Morrow, 2005; Pearson, 2011). Elements of these theories (e.g., expectations, self-efficacy, reinforcement, autonomy) serve to explicate the utility of MI-via-CALC as an evidence-based practice and provide a framework for promoting behaviour change through the application of CALC-specific tools and strategies. Researchers examining optimal treatment conditions for altering health behaviours have shown that promoting autonomy and empowerment while fostering intrinsic motivation (i.e., that which comes from within the individual) is essential when seeking to elicit and *sustain* behaviour change successfully in at-risk populations (Ryan, Patrick, Deci, & Williams, 2008). The Co-Active model aims to establish these conditions through its inherent principles and client-centered methodology (Pearson, 2011; Whitworth et al., 2007).

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Considerable obesity documentation in Canada exists; however, research aimed at critically evaluating innovative behaviour change methods from a health promotion perspective are lacking. Moreover, given that health-related coaching is, at present, one of the fastest growing fields of research (Newnham-Kanas et al., 2009), documented accounts of rigorous empirical studies are needed. Previous small-scale MI-via-CALC-obesity studies (i.e., sample size ≤ 20) in adult populations have indicated that physical and psychological indices are amenable (e.g., reduced waist circumference, body weight, and BMI; enhanced self-esteem; improved health status) and respond well to a MI-via-CALC-based treatment (Newnham-Kanas, Irwin, & Morrow, 2008; Newnham-Kanas, Irwin, Morrow, & Battram, 2011; van Zandvoort, Irwin, & Morrow, 2008, 2009). What has become evident and recommended from these previous studies is that there is a paucity of much needed large-scale MI-via-CALC-obesity research that includes: a priori identification of outcome measures including psycho-social and physiological dimensions; sufficient statistical power; and the use of a comparison group. Informed by this body of research, a large-scale MI-via-CALC-obesity study for university students was developed (i.e., the CHANGE Study). In line with previous reports (e.g., Martin et al., 2009) describing research methods and procedures undertaken in service of assisting researchers and health professionals, the purpose of the present paper is to provide a detailed methodological account of this intervention. It is our hope that the information provided will inform the development of prospective coaching programs aimed at attenuating obesity rates and health sequelae in this at-risk population.

Methodology

The CHANGE Study

The CHANGE (Coaching towards Healthy Actions Naturally through Goal-related Empowerment) study is a 12-week, telephone-based behavioural intervention incorporating goal setting that is aimed at improving physiological and psychological markers among university students with obesity. The purpose of CHANGE is to consolidate the aforementioned components (i.e., a priori outcome measures, large sample size, and a comparison group) to evaluate comparatively, the effectiveness of an interactive, personalized MI-via-CALC treatment, with a validated, gold-standard, education-based lifestyle modification program incorporating the LEARN (Lifestyle, Exercise, Attitudes, Relationships, Nutrition) Program for Weight Management (Brownell, 2004; described in detail below). The LEARN program was chosen based on its demonstrated efficacy as reported in a number of impactful journals (e.g., The New England Journal of Medicine) and, as can be ascertained via basic Internet searches, its widespread commercial-based use among health care practitioners, researchers, and the general public.

Participants were assigned randomly to the MI-via-CALC or LEARN condition upon enrollment and received one treatment per week with varied content depending on their allocation. In light of the positive outcomes observed in previous small-scale MI-via-CALC-obesity studies encouraging health behaviour change through dialogue, it was hypothesized that there would be a desirable change in level of obesity accompanied by positive changes in physical activity, nutritional intake, health status, physiological and psychological markers in the MI-via-CALC group, and that these improvements would be maintained and compare favourably with outcomes experienced in the LEARN group post-test.

The Co-Active Life Coaching (CALC) ‘Treatment’

The Coaches. Volunteer certified Co-Active Professional Life Coaches (CPCCs) were recruited via e-mail between April 2010 and March 2011 through the Co-Active Network: an international website affiliated with the Coaches Training Institute (2011). CPCC training is recognized by the International

Coach Federation as meeting standards for international certification. Eligibility criteria for study involvement required that each individual be certified as a CPCC through the Coaches Training Institute, and able to commit to coaching at least two participants *pro bono* over the duration of the study. In total, 49 inquiries were made by interested CPCCs from countries including Canada, The United States, Sweden, Germany, and England. Because the intervention was intended to occur by telephone, it was determined that coaches who were eligible and wishing to be involved in the study reside in North America in order to limit barriers such as extensive time differences and potential miscommunications due to accents and differential semantic interpretations. After initial contact was made by e-mail, a phone consultation was arranged between the interested CPCC and the Project Coordinator to discuss the coaches' credentials and involvement interests, as well as detail the study protocol and volunteer commitment requirements. All coaches involved were advised that they would not be involved in any other aspect of the study beyond the twelve coaching sessions per client. Full recognition on all subsequent published materials was offered in exchange for their coaching services. As a result, sixteen coaches were enrolled in the CHANGE study to deliver the MI-via-CALC intervention (from Canada, $n = 7$; from the United States, $n = 9$). Three withdrew after commencing involvement due to scheduling conflicts and personal issues; participants assigned to these particular CPCCs were reassigned to continue their treatment with another coach.

The MI-via-CALC Intervention. Participants assigned to the MI-via-CALC-intervention group were to receive 12, 30-45 minute, life coaching sessions with a randomly assigned CPCC. Coaches and participants were matched based on the enrollment timeframe and the availability of both parties (e.g., a student beginning the study in January would be assigned to a coach who was able to take on a participant at that time based on his/her coaching practice, schedule, additional participant load, etc.). All sessions were completed over the telephone, as is typical with this style of coaching. The participant was entirely responsible for calling the coach weekly at a pre-arranged time, with a specific topic he or she wished to discuss. For participants whose coaches lived outside of the local calling area, a phone card was provided and they were instructed to use this for study-related purposes only. During the sessions, the CPCC and participant explored what changes the participant wanted to make in his/her life, and how to make the desired changes a reality. All coaches involved in the study were instructed to conduct the sessions in accordance with their CPCC training (i.e., discussion topics are determined solely by the participant) whereby a variety of techniques are employed including: designing an alliance; asking powerful questions; dancing in the moment with the participant; championing the participant and his or her actions; challenging the participant to attain desired goals, and holding the him/her accountable to those actions. Although each participant was prescribed the same number of MI-via-CALC sessions, what was discussed and the skills used within each session varied depending upon each individual's needs. The content of the calls remained private between the coach and participant exclusively.

The LEARN Program for Weight Management Treatment

The LEARN Program for Weight Management (Brownell, 2004). The LEARN Program for Weight Management (10th Edition) consists of 12, step-by-step lessons for modifying behaviours and feelings in relation to five key principles: lifestyle, exercise, attitudes, relationships, and nutrition. Through the tools and strategies provided, the objective of the program is to assist people with developing the confidence and skills necessary to not only lose weight, but to maintain this loss over time. The program itself begins with an overview of foundational knowledge pertaining to health, diet, and physical activity. Over the course of the lessons, the content becomes more advanced and includes detailed information on these constructs, in addition to problem solving strategies and cognitive restructuring techniques.

Cumulatively, this information serves to complement the lifestyle modification exercises that are included throughout the program material. As part of their involvement, participants are encouraged to individualize the program recommendations to their unique circumstances through self-monitoring (e.g., keeping daily records of food and caloric intake as well as physical activity), form completion, and various assignments, the purpose of which is to enable greater self-awareness on both personal and habitual levels. Because the intervention was delivered over the telephone and each lesson was read verbatim to participants, the material was modified to fall within the pre-determined time frame (i.e., 30-45 minutes), and also included personifiers (i.e., the participant's name) during delivery. Segue phrases were also added to enhance the flow of each section during delivery (e.g., "Now we're going to talk about..."). Dietary recommendations in the LEARN manual are based on the American Food Guide Pyramid and were thus tailored to reflect Canada's Food Guide to Healthy Eating (Health Canada, 2007).

The LEARN Specialists. Undergraduate upper year university students (i.e., third year students or beyond) enrolled in a science or health science-based program were recruited via e-mail and web-based postings by the Project Coordinator and Principal Investigator. One volunteer and three research assistants were hired to administer the LEARN Program over the telephone to participants. All specialists were provided with the program material upon confirming involvement and were encouraged to practice reading each lesson several times in advance to enable the smooth delivery of information when calling their assigned participants. In order to maintain treatment consistency across the individuals assigned to this particular condition, Specialists were instructed to answer questions pertaining to the material to the best of their knowledge and using the information provided through the LEARN lessons. They were also advised to minimize discussions irrelevant to the focus of the session wherever possible. Participants were informed upon enrolment that the specialists were hired for the study specifically, and information pertaining to their roles as university students was not relayed.

The LEARN Intervention. LEARN group participants were to receive 12 education-based lessons pertaining to topics such as setting goals; barriers and facilitators to living healthy; the relationship between calories and weight; the role of social support; becoming more active; and self-monitoring. All sessions were completed over the telephone which, to our knowledge, is a new form of delivery for this particular program. That is, the LEARN Program has typically been delivered in person or independently using a self-help format (e.g., Wadden et al., 2005; Womble et al., 2004). Specialists were required to call their assigned participants weekly from the university health promotion laboratory at a pre-determined, mutually convenient time. During each session, step-by step, scripted educational lessons were provided to participants. Each session consisted primarily of LEARN program material being read to the participant by the specialist; a brief "check-in" also occurred at the beginning and end of each session to determine if the participant had any questions pertaining to the lesson. As part of the LEARN protocol, participants were trained in record keeping and monitoring skills and asked to keep detailed logs of food intake and physical activity. In order to facilitate temporal consistency for participants and provide an entitled break for the university student specialists delivering the intervention, a two week hiatus from treatment occurred during the holiday exam period in December 2010; a one week break also took place in February 2011 to coincide with the university mandated "reading week."

Participants and Recruitment

This study targeted male and female undergraduate and graduate university students with obesity (i.e., defined as a BMI \geq 30kg/m²), aged 18-24. Participants were recruited via poster advertisements circulated throughout the university and via campus-wide e-mail "blasts" distributed to the entire student

body. The latter proved to be the most successful means of recruitment as more than 600 interested individuals made contact with the research team via e-mail or telephone between September 2010 and May 2011 to inquire about the program. Once contact was made, the researcher explained the study and asked several questions to determine eligibility. Inclusion criteria for acceptance required that potential participants: have a BMI of 30 kg/m² or greater, reported that their weight had not fluctuated by more than 5 pounds in the previous six months, did not have type I diabetes or a condition contraindicated for exercise, and could speak English fluently.

As part of the MI-via-CALC method (Whitworth et al., 2007) to achieve participant buy-in as well as facilitate adherence to the program and its requirements (e.g., showing up for sessions on time; following through on personal goals and commitments; Newnham-Kanas et al., 2011), participants were asked to pay \$10.00 for each session that they were to receive regardless of group allocation. Although it was pre-determined that these funds would be returned to participants upon completion of the study, this was not relayed. If a student was unable to pay the \$120.00, an arrangement was made based on their personal financial circumstances in order to facilitate accessibility (e.g., charging half the price). Common reasons for declining involvement or ineligibility among those who made inquiries included a BMI \leq 30kg/m²; unable or unwilling to pay for treatment; older than 24 years of age; not a student enrolled at the university; or the presence of a medical condition or medication known to influence weight outcomes. Once inclusion criteria were met and a participant stated that s/he wanted to move forward, a baseline assessment meeting was arranged with the Project Coordinator at a mutually convenient time. A total of 78 individuals meeting these criteria were enrolled in the program between September 2010 and May 2011. Ethical approval for the study was obtained through the Health Sciences Research Ethics Board at the University where the study took place and all participants provided signed written consent prior to commencing involvement.

Design

A parallel group randomized trial design with between and within subject variables was employed to enable comparisons between baseline data and subsequent assessment time-points (i.e., mid-intervention at 6-weeks; post-intervention at 12-weeks; 3-months post-intervention; 6-months post intervention) with regard to changes in the pre-determined physiological and psychological measures. A sample size calculation was conducted using the Horatio Computer Software Program, Version 3.0 (Lee, 2004). The inclusion of eighty participants was deemed sufficient in order to detect a medium effect ($r^2 = .12$) of a two-level between-groups independent variable 90.4 percent of the time using a .05 alpha level.

Measures

In order to obtain personal information, participants were asked to complete a demographic information form at the initial meeting with the researcher (e.g., name, address, telephone number, age, ethnicity, education and program, etc.). Because an increase in physical activity level was an anticipated study outcome, each individual was also required to complete the Physical Activity Readiness Questionnaire (PAR-Q; Canadian Society for Exercise Physiology [CSEP], 2002) to ensure that (s)he had no health conditions precluding exercise. Individuals who passed the PAR-Q and wished to move forward were then allocated to one of the two treatment groups based on a randomization code generated by SPSS.

The Short Form 36-item Functional Health Status Scale (SF-36; Ware, 2008) – The SF-36 Health Survey is a validated, multi-purpose generic measure of functional physical health, mental health, and

well-being. Applicable to both general and specific populations, it has been utilized to compare the burden of disease and to decipher the varying health benefits produced by a range of treatment modalities (Ware, 2008). The 36-items on the questionnaire comprise eight scales and two summary measures; questions are answered on a 5-point Likert-type scale. Previous research supports the reliability of these structures (Cronbach's α 's $\geq .70$; Ware, 2008).

The International Physical Activity Questionnaire (IPAQ; Craig et al., 2003). Participants completed the 7-item validated self-report measure which is used to assess the amount of time spent doing multiple types of physical activity over a 7-day period (Craig et al., 2003). Individuals provided information pertaining to activities performed in relation to work, as part of house and yard work, to get from place to place, and in their spare time for recreation, exercise, or sport. Activities include: vigorous (activities that take hard physical effort and make you breathe much harder than normal), and moderate (activities that take moderate physical effort and make you breathe somewhat harder than normal) physical activity, as well as walking, and sitting. Previous research has deemed the IPAQ to be a reliable measure (Craig et al., 2003; Rosenberg, Bull, Marshall, Sallis, & Bauman, 2008).

The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965). The RSES is a validated, general measure of self-esteem that assesses various feelings about oneself pertaining to facets such as self-respect and personal worth. Participants responded to statements such as "I certainly feel useless at times" on the 10-item questionnaire using a 4-point scale anchored at the extremes by (1) Strongly agree and (4) Strongly disagree. Individual items are summed and averaged to provide a total score. The reliability of the RSES has been demonstrated previously (Cronbach's $\alpha \geq .77$; Blascovich & Tomaka, 1993; Rosenberg, 1989).

Self-efficacy for Overcoming Barriers (McAuley & Mihalko, 1998). Self-efficacy for performing behaviours specific to physical activity and nutrition was captured using three questionnaires based on the work of McAuley and Mihalko (1998). Self-efficacy for physical activity is a 12-item measure rated on a scale of 0 to 100%, assessing how confident individuals are of overcoming barriers to being physically active. For example, participants responded to items such as: "I believe that I can be moderately physically active 5 times per week if...the weather is very bad (hot, rainy, cold)." Task self-efficacy was assessed via a four-item questionnaire where participants indicated their confidence for completing activity-related tasks of increasing difficulty. Similarly, participants also completed an 11-item measure using a scale ranging from 0 ("No Confidence at All") to 100 ("Completely Confident") to assess barriers to eating a well-balanced diet including predominately healthful foods and reduced junk food (e.g., traveling, eating at a restaurant). Previous research supports the reliability of the subscales with alpha coefficients ranging from 0.73 to 0.95 (McAuley & Mihalko, 1998; Newnham-Kanas, 2011).

Treatment Self-Regulation Questionnaires (TSRQ; Williams, Grow, Freedman, Ryan, & Deci, 1996). The TSRQ assesses the autonomous and controlled reasons people choose to engage in some healthy behaviour, try to change an unhealthy one, or follow a treatment protocol (e.g., a weight-loss program). In this instance, the 18-item, four stemmed questionnaire was administered to assess motivation for entering the CHANGE Study; participants responded to statements using a 7-point Likert format ranging from 1 (Not true at all) to 7 (Very true). Presented with items such as "I decided to enter this weight-loss program because..." or "I plan to lose weight because..." participants were asked to respond based on options that varied in their degree of autonomy. A second version of the TSRQ (labeled TSRQ-C) containing 13 items and two stems was then administered midway through the intervention

(i.e., 6-weeks) to assess motivation for continuing to participate in the program. Finally, in order to assess motivation upon program completion (i.e., at 12-weeks), a third version of the TSRQ was created for the purposes of this study based on the 13-item version. Responses on each version of the TSRQ are averaged at each administration time-point to form an autonomous and controlled regulation score. The TSRQ has been validated previously with acceptable internal consistency (e.g., $\alpha \geq .73$; Levesque et al., 2007), and established as a useful assessment tool across various settings and for different health behaviours.

Perceived Competence Scale (PCS; Williams & Deci, 1996; Williams, Freedman, & Deci, 1998). The PCS is used to determine how competent individuals perceive themselves to be with respect to performing a particular behaviour. The PCS was developed originally as a short, 4-item questionnaire to assess: (a) glucose levels among diabetes patients (Williams et al., 1998); and (b) how competent medical students felt towards learning the material in an interviewing course (Williams & Deci, 1996). The version used in the present study was modified to encompass both of these face valid instruments. That is, participants were assessed pertaining to their perceived competence for a healthy body weight (i.e., 4 items) as well as their competence regarding the CHANGE study learnings (i.e., 4 items). Previous research has demonstrated acceptable internal consistency for perceived competence using the PCS (i.e., $\alpha > 0.80$; Williams et al., 1998; Williams & Deci, 1996).

Dietary Intake (One-day Food Record, Middlesex-London Health Unit, 2010). In order to assess food intake, a 24-hour dietary recall was administered to capture consumption for the day preceding each assessment. The 24-hour recall is often utilized to obtain mean dietary intakes due to its cost-effectiveness and low responder/interviewer burden (Biro, Hulshof, Ovesen, & Cruz, 2002). According to previous research, one day is sufficient to enable an accurate representation of an individual's usual energy and nutrient intake behaviours (National Cancer Institute, 2011).

Anthropometry and Physiological Measures. Waist circumference measurements were obtained following Heart and Stroke Foundation (2010) guidelines whereby the measuring tape is placed at midpoint between the bottom of the ribcage and the iliac crest along the ancillary line. In order to enhance reliability, the same tape was used for all participants at each measurement time-point (Newnham-Kanas et al., 2008). Weight and height were measured using the Tanita BWB-800S Digital Scale and HR-200 Height Rod. This specific scale is noted for its fast, accurate results. Moreover, the movable platform allows for placement in a spacious location which is an important consideration for patients requiring excess room when weighing-in. In order to measure obesity-related physiological determinants, a blood specimen, which included a lipid profile (i.e., cholesterol, triglyceride, and HDL/LDL) and fasting glucose, was obtained. Given the high correlation between excess adiposity and hypertension (Lau et al., 2007), participants were also asked to have their blood pressure and pulse taken.

Procedures

Initial Meeting: Once eligibility was confirmed and individuals agreed to participate, an introductory baseline assessment was scheduled for each participant with the Project Coordinator at a mutually convenient time in the health promotion laboratory. Upon meeting, the participant was provided with a detailed letter of information whereby the nature of the study was explained in addition to the criteria of voluntary participation, anonymity, and confidentiality. Once written informed consent was acquired, participants were asked to complete the PAR-Q, a demographic information form, and a series of the aforementioned questionnaires. Honesty demands (Bates, 1992) were used during questionnaire

distribution in order to limit the effects of social desirability. With the exception of the demographic form, 24-hour food recall, and the PAR-Q, all questionnaires were completed on-line using Survey Monkey[®]. Following questionnaire completion, height, weight, and waist circumference were measured. If it was determined at this initial meeting that height and weight measurements did not result in a BMI \geq 30kg/m² as was self-reported previously, (s)he was not enrolled in the study. Once the anthropometric measurements were acquired, participants were given additional instructions pertaining to the protocol for their bloodwork and blood pressure/pulse measures. The method of payment was also determined and exchanged at this time, followed by the provision of Canada's Food Guide to Healthy Eating (Health Canada, 2007), and Canada's Physical Activity Guide to Healthy Active Living (Health Canada, 1998). Participants were instructed to have their bloodwork and blood pressure measures taken within three business days, after which, they were asked to make arrangements with the Project Coordinator to return to the health promotion laboratory briefly so that their group allocation could be disclosed and any necessary materials pertaining to this assignment could be provided.

Dietary Recall. Participants were instructed to list everything that they ate and drank for the day prior to their assessment including all meals, beverages, and snacks. They were also asked to indicate how the food was prepared (e.g., fried, baked, grilled, etc.), whether it was fresh, frozen, or canned, any brand names and known ingredients, as well as the time and location where the food and drinks were consumed. Standardized measuring utensils (e.g., cups and spoons) were provided to assist with portion size estimations. Upon completion, the participant reviewed the food record with the Project Coordinator or research assistant to confirm the items, clarify, and add details wherever necessary.

Physiological Measures. Once the initial meeting with the researcher was complete, participants were given instructions pertaining to collection of their physiological measures. For the bloodwork, participants were provided with a requisition and directed to the hospital which was located on campus and within walking distance from the health promotion lab. Because the nature of the specimen required that participants fast from midnight the night prior to collection, and due to the fact that the hospital lab test centre was open during business hours only, individuals were asked to check-in to have their blood taken between 8 and 11am on a weekday. Participants were invited to drink water the morning of their specimen collection and advised to bring a snack for afterwards.

In order to obtain a blood pressure and pulse measure, participants were directed to the blood pressure machine located within the pharmacy section of a local drug store chain. Participants were asked to record both the top and the bottom number on the sheet provided. In addition, participants were asked to have their blood pressure taken under the same circumstances and by the same blood pressure machine at each assessment time-point.

Intervention Assignment and Commencement: Following acquisition of the physiological measures, participants contacted the Project Coordinator via e-mail or text to schedule a drop-in session so that s/he could ascertain his/her group assignment and pick-up any pertinent materials. In the interim, the Project Coordinator contacted the CPCC or specialist assigned to the participant in order to advise that a match had been made, and provide the necessary contact information. Upon returning to the health promotion lab for this five-minute meeting, individuals assigned to the MI-via-CALC group were provided with a very brief explanation regarding the Co-Active condition (i.e., that they would be working with a CPCC to explore their goals and determine how to go about achieving them) and asked to think in advance about an area in their lives where they wanted to make a change. They then received the

contact information for their coach (i.e., name, phone number, and e-mail address), a phone card if the coach did not live in the local calling area, and a tracking sheet to record the date and time of each phone call. Participants were asked to contact their coach within two days to arrange their first session and then notify the Project Coordinator with this date once it was confirmed so that an estimate of weekly progress could be made in service of booking future assessments. For participants assigned to the LEARN condition, an explanation was provided pertaining to the origin and purpose of the program and a workbook containing LEARN monitoring forms, charts, and worksheets was distributed. Participants were then given the contact information for their specialist which included his/her first name and a generic e-mail address created for the study. Similar to the MI-via-CALC group, participants were asked to contact the specialist within two days to arrange the first lesson and notify the Project Coordinator with this date once it was confirmed.

Follow-up Assessments: The protocol administered at the initial meeting was carried out for the subsequent assessments (i.e., mid-point at 6-weeks, post-intervention at 12-weeks, and at the 3 and 6 month follow-ups); all of the aforementioned measures were also collected at each time-point with the exception of height (baseline only), and bloodwork (collected at every time-point except for 6-weeks). Feedback was provided by participants via an open-ended questionnaire upon exiting the study to explore their experiences (i.e., pertaining to positive and negative attributes of each treatment and recommendations for future). This same open-ended format was also applied at the 3 and 6-month follow-up assessments.

Data Analysis

Primary analysis of the data will involve multiple 2 (Group) X 5 (Time) repeated measures ANOVAs. Group (MI-via-CALC, LEARN) will be a between subjects variable and time (baseline, mid, post-intervention, three and six month follow-up) will be a within subjects variable. The dependent variables will be the various physiological measures, as well as the scores on the psychological questionnaires. SPSS will be used to conduct these analyses. Inductive content analysis (Patton, 1987) will be employed to examine the open-ended feedback provided by participants upon exiting the study.

Discussion

Through this paper, a methodological account of a comprehensive study examining the impact of two goal-setting based treatments for obesity among university students has been detailed. To our knowledge, this is the first MI-via-CALC study to incorporate: a sufficiently powered sample size, specific measures of physiological obesity-determinants (i.e., a lipid panel, fasting glucose, and blood pressure), and the inclusion of a validated comparison group. Moreover, this study is also the first of its kind to adapt the LEARN Program for Weight Management to be delivered over the telephone. All of the pertinent information necessary to develop and implement a similar intervention has been addressed including the study design, treatment and population rationales, recruitment methods, outcome measure descriptions, and procedural details pertaining to the interventions themselves. Seventy-eight university students with obesity were enrolled in the CHANGE program. It is expected that results from the study will be available in 2013.

As noted previously, an important consideration when examining MI-via-CALC as a treatment for obesity is that it is typically delivered over the telephone. Not only is this convenient, but it allows individuals to obtain one-on-one support from a certified coach while remaining in the privacy of their

own homes when discussing personal issues which may be at the root of their weight struggles. Previous researchers in other areas of health, such as smoking cessation, have examined the impact of telephone counseling-based interventions for behaviour change in at-risk populations and found that they are cost-effective, beneficial for those looking to obtain help, and able to reach a wide range of individuals (e.g., Stead, Perara, & Lancaster, 2009). Given that this project is the first of its kind, i.e. it is a large-scale study examining the impact of MI-via-CALC in this at-risk population compared with a previously validated obesity intervention, it is hoped that this paper's detailed methodological account will contribute useful information to be leveraged by others engaged in this, or similar, areas of applied research. Further, the study's results can be utilized to inform the development of future population-based coaching approaches that are both accessible and warranted in order to address the growing obesity epidemic.

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Erin S. Pearson, PhD is an Assistant Professor in the Faculty of Health and Behavioural Sciences at Lakehead University and a trained Co-Active coach. Her research interests include health promotion and the impact of Motivational Interviewing administered via Co-Active coaching on health-related behaviours.

Jennifer D. Irwin, PhD is an Associate Professor in the Faculty of Health Sciences at Western University where she conducts research focused on obesity treatment and prevention and smoking cessation. Dr. Irwin is also a Certified Professional Co-Active Coach and a Professional Certified Coach with the International Coach Federation.

Don Morrow, PhD is a Professor in the Faculty of Health Sciences at Western University. Dr. Morrow served as the co-chair of the International Coach Federation's (ICF) Research and Education committee, and is a Certified Professional Co-Active Coach and Professional Certified Coach with the IFC.