

ORIGINAL ARTICLE

A mixed methods approach to improving recruitment and engagement of emerging adults in behavioural weight loss programs

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Summary

Objective

Emerging adults ages 18–25 are at high risk for obesity, but are markedly underrepresented in behavioural weight loss (BWL) programs and experience lower engagement and retention relative to older adults.

Purpose

To utilize a mixed methods approach to inform future efforts to effectively recruit and engage this high-risk population in BWL programs.

Methods

We used a convergent parallel design in which quantitative and qualitative data were given equal priority. Study 1 ($N = 137$, age = 21.8 ± 2.2 , BMI = 30.1 ± 4.7) was a quantitative survey, conducted online to reduce known barriers and minimize bias. Study 2 ($N = 7$ groups, age = 22.3 ± 2.2 , BMI = 31.5 ± 4.6) was a qualitative study, consisting of in person focus groups to gain greater depth and identify contextual factors unable to be captured in Study 1.

Results

Weight loss was of interest, but weight itself was not a central motivation; an emphasis on overall lifestyle, self-improvement and fitness emerged as driving factors. Key barriers were time, motivation and money. Recruitment processes should be primarily online with messages tailored specifically to motivations and preferences of this age group. Preferences for a program were reduced intensity and brief, hybrid format with some in-person contact, individual level coaching, experiential learning and peer support. Key methods of promoting engagement and retention were autonomy and choice, money and creating an optimal default.

Conclusions

An individually tailored lifestyle intervention that addresses a spectrum of health behaviours, promotes autonomy and emphasizes activity and fitness may facilitate recruitment and engagement in this population better than traditional BWL protocols.

Keywords: Behavioural weight loss, emerging adults, treatment development, young adults.

Introduction

Emerging adulthood is a term used to describe a distinct period in the developmental life course that is characterized by transition, instability and identity self-exploration (1,2). Although the specific age at which an individual transitions in and out of emerging adulthood might vary, researchers have noted that this transitional developmental period is not unique to those enrolled in college or of a certain socioeconomic status, and that it typically lasts from at least 18 to 25 years of age (2). Of note, this transition from late adolescence into early adulthood represents a critical time for intervention to promote weight control and healthy lifestyle behaviours (3). Over 40% of 18–25 year olds already meet criteria for overweight or obesity, with rates exceeding 50% among African American/Black and Hispanic/Latino emerging adults (4). Moreover, obesity during these years is associated with an increased risk of diabetes, hypertension and hyperlipidemia (5).

Although there are empirically supported lifestyle interventions targeting children (6) and adolescents (7), individuals over age 18 are typically considered 'adults' and included in adult behavioural weight loss (BWL) programs. However, evidence suggests that adult programs are not meeting the needs of emerging adults. A secondary analysis of several large, NIH-funded BWL trials revealed young adults (18–35 years) were markedly underrepresented – of note, results were most striking for emerging adults 18–25 years of age, who represented less than 1% of participants (8). Moreover, data indicate that this age group (18–25 years) fares worse relative to older adults and even compared with young adults (i.e. up to 35 years) in terms of program engagement and weight losses (8,9). These data are not surprising given the developmental considerations and substantial life transitions unique to emerging adulthood. In fact, researchers have argued that it makes little sense to lump together individuals in their late teens and early twenties with those in their late twenties and early thirties, given the dynamic quality of the transition into adulthood and the considerable distinctions between the late teens/early twenties and the thirties in terms of education, work environment, marriage and family status (1,2).

The transition from late adolescence into young adulthood is associated with marked changes in behaviour and developmental needs (1,2,10,11) that are not typically addressed in adult BWL programs. For example, emerging adulthood is marked by an increased emphasis on assuming responsibility for one's choices and gaining autonomy, in addition to numerous role transitions that are generally accompanied by changes in the social and physical environment (1,2). Data also

indicate that this transition is associated with a host of unhealthy weight related behaviours (12–16). Additionally, research has documented high rates of perceived stress (17), depression (18) and substance abuse (19) during emerging adulthood. Thus, data suggest that this is a critical period for intervention to promote healthy lifestyle behaviours, and also underscore that standard adult BWL programs are likely poorly suited to meet the needs of this population.

Although this is increasingly recognized as a key time for intervention, limited work has been done in the area to date. Several pilot studies have targeted college students for weight gain prevention (20) or weight loss (21) with promising initial short-term outcomes. Additionally, NIH funded a consortium of ongoing studies (EARLY Trials) focused on weight control during young adulthood more broadly (18–35 years). (22) However, none of these trials focused on weight loss specifically for 18–25 year olds and limited their sample to this age range, and many of these trials focused on weight gain prevention as opposed to weight loss. Moreover, other than our own recent pilot work (23), to our knowledge, BWL programs specifically targeting emerging adults 18–25 years of age are lacking (24), and limited data exist to inform the development of a program that is suited to the unique needs of this population other than a formative study focused on physical activity and conducted in the UK (25). Although conducted with an older sample, formative data available from the EARLY Trials highlight the need to adapt recruitment strategies and messaging for younger populations relative to what is typically done for adults (26,27). However, to inform future efforts to adapt recruitment and treatment protocols for emerging adults specifically, additional work is needed to understand what may motivate this age group and how to attract them to programs initially. Moreover, efforts are needed to adapt intervention protocols to enhance program engagement and facilitate better weight losses in this population, particularly given data demonstrating high risk (4,5) and poorer outcomes even relative to young adults (8,9). To that end, the aim of the current study was to undertake a mixed methods approach to formative work with this population. The primary goal was to understand factors that may improve recruitment and facilitate program engagement among 18–25 year olds with overweight or obesity, so as to inform future efforts to intervene with this population.

Overall study design and rationale

Relatively little is known about why emerging adults are underrepresented in BWL programs or how best to adapt recruitment and treatment protocols to meet the unique

needs of this population. Thus, we sought to conduct in-depth formative work to guide our efforts to intervene with this high-risk age group. We selected a mixed methods approach given that a single data source was likely insufficient to make key decisions about treatment and protocol development, and because the use of qualitative methods would allow us to account for contextual factors and better understand how to promote engagement during this unique transitional period of development. Further, quantitative methods and qualitative methods each have inherent biases and weaknesses, and using both offered a stronger design in which these weaknesses were offset by strengths of the other approach and by mixing results to guide our interpretations and future directions. We employed a convergent parallel design in which both quantitative and qualitative data were given equal priority; the decision to use both approaches was determined at the outset of the research process. Each of the studies recruited unique participants; data were collected and analysed from each study, and interpretations were made using both data sources.

Study 1

The aim of Study 1 was to conduct a survey with 18–25 year olds to inform recruitment and treatment development efforts. Anonymous survey data collected using rigorous methods has the potential to maximize external validity and increases the likelihood that responses to key research questions are not influenced by others (e.g. an interviewer or other participants). The survey, rooted in the Health Belief Model (28), explored the following areas: (i) perceived susceptibility, benefits and behavioural intention; (ii) motivations for weight loss; (iii) barriers to healthy lifestyle behaviours and program participation; (iv) preferences for program format, duration and contact schedule and (v) current weight related behaviours.

Methods

Participants and procedure

Participants were recruited through a series of email blasts, Internet/print advertisements, and flyers posted at locations frequented by emerging adults (e.g. college campuses, local grocery stores and coffee houses). Ads targeted 18–25 year olds who were willing to participate in an online survey about their eating and activity behaviours. All recruitment materials included a web address to learn more about the study and web/email based ads included live links to direct interested individuals to the informational homepage.

Eligible participants were men and women between the ages of 18 and 25 of all racial/ethnic backgrounds. Participants reporting past or current diagnosis of anorexia nervosa or bulimia nervosa or with a BMI <25 or >45 kg m⁻² were excluded from the current analyses, as they do not represent the target population for a BWL program. To reduce known barriers to participation in this age group (e.g. time, transportation), participants completed questionnaires online via a secure website on their own computers. The study website provided more information about the study, including a detailed description of requirements and incentives, and a link to participate. After electronically consenting to participate, participants were redirected to complete the survey anonymously on a secure server. Average completion time was <30 min; the order in which questionnaires were presented was counterbalanced to control for order effects and fatigue. Upon completion, participants were redirected to another secure site and asked to enter their contact information to receive payment. Participants received \$10 for their participation and were entered into a raffle to win one of three iPods. Procedures were approved by the Institutional Review Board at The Miriam Hospital.

Measures

Demographics

Self-reported age, gender, ethnicity, race, education and work status.

Weight, height and body mass index

Participants reported their weight in pounds and height in feet and inches. BMI was calculated by converting pounds to kilograms, inches to metres, and performing the following computation: weight in kg/height in metres squared.

Perceived susceptibility, benefit and behavioural intention

Items included: (i) perceived weight status (*underweight, normal weight, overweight, obese*); (ii) perceived importance of weight control [*response options ranged from 'not important' (0) to 'extremely important' (7)*]; (iii) weight related goal for the next 3 months [*lose weight, maintain your current weight, gain weight*]; (iv) intention to lose weight within the next 3 months [*response options ranged from 'very unlikely' (0) to 'very likely' (4)*] and (v) willingness to join a program (yes/no).

Motivations for weight management

Participants were asked to indicate how important a variety of potential motivating factors were by responding to the following: 'Different people have different reasons for wanting to achieve a certain weight. We're interested in why managing your weight is important to you. Please indicate how important each of the reasons listed below are to you.' Participants rated items on a 5-point Likert type scale to indicate whether 9 items were 'not at all', 'slightly', 'moderately', 'very' or 'extremely' important.

Perceived barriers

Participants ranked the top three barriers to managing their weight (e.g. social eating, can't afford healthy foods, lack of time) and to participating in a BWL program (e.g. no programs available, lack of time, can't afford it, work/school responsibilities). An 'other' category was also provided with free text for additional barriers not listed.

Preferences for intervention

Participants indicated their preferences in terms of ideal length, contact schedule and format of a weight management program.

Current weight control behaviours

Participants indicated frequency of engaging in a variety of behaviours in the last 30 days on a 5-point Likert scale [ranging from 'never' to 'every day']. Items included evidence-based weight control strategies (keeping a food record, self-weighing, exercising >30 min per day), as well as eating behaviours related to weight control in this age group (eating breakfast, fast food consumption, sweetened beverage consumption).

Other health behaviours

Participants reported on several key health behaviours, including sedentary behaviour, screen time and alcohol use. Using items drawn from Add Health (29), participants were asked to report the number of hours/day spent watching television, on the computer and playing video games. Finally, participants reported their alcohol intake using items from the Daily Drinking Questionnaire (DDQ) (30).

Statistical analyses

Data are presented in frequencies, percentages and descriptives as appropriate. Tests for gender differences

used chi-square or analysis of variance for categorical and continuous variables, respectively. All analyses were conducted using SPSS version 21.

Results

A total of 137 emerging adults (mean age = 21.8) who met criteria for overweight (56.9%) or obesity (43.1%) completed the survey. The majority were female (65%), single (81.8%), non-Hispanic white (80.9%) and had at least some college education (87.6%). See Table 1 for demographics. Findings are consistent for men and women unless otherwise noted.

Perceived susceptibility, benefit and behavioural intention

A total of 55.5% of participants accurately classified themselves as either overweight or obese, based on their actual classification by BMI (BMI 25–29.9 = overweight and BMI >30 = obese). Findings varied by gender; a higher percentage of women than men accurately perceived and reported their weight status (66.3% vs. 35.4%) whereas more men underestimated their weight classification (64.6% vs. 32.6%, $p = .001$). On average, participants indicated that controlling their weight was very important (5.21 on a 7 point scale), with no gender differences ($p = .93$).

A majority of respondents (94.9%) reported that they would like to lose weight over the next 3 months, and a majority also indicated behavioural intention to lose weight in that time (84.7% responded 'likely' or 'very likely'). Of those participants who reported they would like to lose weight, 81.2% indicated they would be interested in a program to help meet their weight loss goal. Results differed by gender; a majority of both women and men indicated they would like to lose weight, but the proportion was higher among women (100% vs. 85.4%, $p < .001$). Similarly, women were more likely than men to indicate behavioural intention for weight loss in the next 3 months (91% vs. 73%, $p = .005$) and were more likely to express interest in joining a program to help them meet their goal (88.5% vs. 67.4%, $p = .01$).

Motivations for weight loss

A majority of participants ($n = 117$, 85.4%) rated 'improve my health' and 'improve my appearance' as very important or extremely important. The next two highest ranked motivations were 'improve my self-confidence' ($n = 102$, 74.5%) and 'prevent disease/illness' ($n = 101$, 73.7%). Similarly, 71.5% ($n = 98$) of participants rated 'increase my energy level' as very important or extremely important.

Table 1 Demographic characteristics

	Study 1: Formative Survey		Study 2: Focus Groups 7 Groups (N = 31)	
	Mean (SD)	%	Mean (SD)	%
Age	21.77 (2.23)		22.3 (2.2)	
BMI	30.12 (4.71)		31.5 (4.6)	
Weight category				
Overweight		56.9%		38.7%
Obese		43.1%		61.3%
Sex				
Male		35%		48%
Female		65%		52%
Race/ethnicity				
Non-Hispanic White		77.4%		68%
Racial/ethnic minority		22.6%		32%
Education				
High school or less		10.2%		13%
Technical/vocational training		2.2%		0%
Some college		44.5%		54.8%
College degree		33.6%		22.6%
Graduate/professional education		9.5%		9.7%
School/employment status				
Unemployed, not in school		2.2%		3.2%
Working full time		28.5%		19.4%
Working part time		10.2%		9.6%
Full time student		28.5%		16.1%
Part time student		0.7%		6.5%
Working and student		29.9%		45.2%
Marital status				
Single		81.8%		90.3%
Married		5.1%		9.7%
Unmarried, living w/partner		12.4%		0%

Fewer participants selected 'attract a boyfriend/girlfriend/partner/spouse' ($n = 53$, 38.7%), 'look good for my boyfriend/girlfriend/partner/spouse' ($n = 51$, 37.2%) and 'be a certain clothing size' ($n = 40$, 29.2%) as a very important or extremely important reason for weight loss. In general, women attributed greater importance to each motivation than did men, with some exceptions: men and women rated wanting both to improve health and look good for a significant other similarly ($p = .11$ and $.42$, respectively), and men assigned greater importance to attracting a significant other—although this difference was marginally significant (3.19 vs. 2.70, $p = .06$).

Perceived barriers

The most commonly reported barriers to weight management were 'lack of time,' 'lack of motivation' and 'not getting enough exercise' (cited by 45.2%, 35% and 32.9% of participants, respectively, as one of the top three barriers). The most commonly reported barriers to enrolling in a weight management program were 'lack of

motivation,' 'lack of time' and 'can't afford it' (cited by 62.7%, 57% and 46% of participants, respectively, as one of top three barriers).

Findings related to intervention structure

Standard adult BWL programs typically span 18 months (weekly group meetings for 6 months followed by biweekly group meetings for 12 months), but 51.9% of participants reported that they would not participate in a program with this structure. Rather, the majority (81.0%) of respondents reported that the ideal length of a weight loss program would be 6 months or less (16.1% selected 6 weeks, 38.7% selected 12 weeks, 26.3% selected 6 months). In terms of a preferred contact schedule for a program, a majority of participants (83.4%) indicated that either weekly or biweekly contact would be ideal (32.1% reported weekly, 26.3% reported weekly then bi-weekly, 25% reported bi-weekly throughout). When asked about willingness to participate in a variety of program formats, 60.3% reported they would attend or participate in a

technology delivered program, whereas 54.8% of participants reported willingness to attend in-person group meetings at a local research centre.

Diet and self-monitoring behaviours

A total of 45.9% of participants reported consuming fast food at least weekly, with no significant differences by gender ($p = .49$). More than half (55.4%) of participants indicated they consume sugar sweetened beverages at least weekly (35% on most or all days), with a trend such that men reported more frequent intake relative to women ($p = .09$). Further, a majority of participants (78.1%) reported at least some alcohol use in a typical week; for these, the average number of weekly drinks consumed was 7.5 (SD = 7.4). This was significantly higher for men (10.6, SD = 9.4) than women (5.8, SD = 5.4), $F(1, 106) = 11.4$, $p = .001$. Nearly a quarter (22.4%) of participants who typically drink alcohol reported at least one episode of binge drinking in a normal week. A majority of participants (73.7%) reported eating breakfast most days or daily, with no gender differences ($p = .83$). A total of 55.5% of participants reported they never tracked calories, 78.8% reported never tracking fat, and 78.1% indicated they had never kept any type of food record. More than half (51.1%) of participants reported self-weighing less than once or twice in the last month.

Activity-related behaviours

Most (63.5%) participants did not achieve the American Heart Association physical activity recommendation of at least 30 min of moderate-intensity activity on at least five days per week. However, 88.3% of respondents reported exercising for 30 min or more at least once in the past week. Participants engaged in sedentary activities during their free time (e.g. watching TV, sitting at a computer, playing video games) for an average of 4.1 h per day on weekdays and 4.9 h per day on the weekend.

Study 2

The aim of Study 2 was to gain a deeper understanding of how adult BWL protocols can be modified to better meet the needs of this age group. Cross-sectional survey data such as those obtained in Study 1 are one-dimensional – thus, contextual factors related to the research question may be missed that are critical in making decisions. Qualitative research methods allow for greater depth and understanding of key issues related to intervention development and adaptation. To that end, Study 2 conducted focus groups with 18–25 year olds who met BMI eligibility criteria for a BWL program. The agenda was

informed by Study 1 and by our overarching research question. The facilitator's guide was developed at the same time as the questions for the Study 1 survey based on a priori research questions guided by Health Belief Model (28) and Social Cognitive Theory (31), as well as extant data regarding high-risk weight related behaviours in this population. The agenda was divided into several sections and the facilitator's guide included open-ended lead questions and probes within each section. See additional details in the procedures section below.

Methods

Eligibility and recruitment

Participants were eligible if their age was 18–25 years, and BMI was 25–45 kg m⁻². Recruitment methods included emails to various listservs, on-air radio spots, print and web-based advertisements in college and local newspapers, university and intranet websites, and flyers posted at a variety of different locations within a 30-mile radius of the research centre. All ads were seeking 18–25 year olds who were willing to participate in a focus group study designed to help develop weight loss programs specifically for this age group. Interested participants completed a brief phone screen with study staff to determine their eligibility; eligible participants were invited to attend the next available focus group.

Procedure

This study was approved by the Institutional Review Board at The Miriam Hospital. Prior to participation, all participants provided written informed consent and demographic information. After the focus group was completed, height and weight were objectively measured in private by trained research staff. Participants received a \$30 honorarium for their time to participate, \$10 to cover associated transportation costs and a healthy meal. Groups lasted 90–120 min, excluding consent, and were facilitated by the PI (first author) and two other trained members of the research team (co-facilitator and note taker). A semi-structured focus group agenda developed by the investigators was used to facilitate consistent discussions across groups. The agenda was divided into five sections based on research aims: (i) importance of weight (loss) in participants' lives; (ii) barriers to weight management; (iii) treatment program preferences; (iv) effective methods of recruitment and (v) methods to promote engagement and retention. Focus groups were stratified by gender and conducted until theoretical saturation was achieved.

Data analysis

Groups were audio-recorded using digital voice recorders and transcribed verbatim using a HIPAA-compliant, independent transcriptionist. Transcripts were checked for accuracy against the audio recordings and read multiple times to ensure accuracy by both the PI and a research assistant. An initial codebook was developed based on the focus group agenda and a priori research questions, and inductive codes were added from the data through an iterative process when coding the transcripts. The initial two transcripts were coded independently by the PI, Co-I and two trained members of the research team; remaining transcripts were coded independently by the two trained members of the research team and reviewed for concordance. The entire team met for final review and discussion of each transcript to resolve any coding discrepancies and reach consensus. Given the goal to inform an adaptation of a treatment program, consensus was used as opposed to inter-rater reliability as it prioritizes meaning making and group discussion to come to agreement on the code. Data management and analysis were supported by QSR NVivo (OSR International, Melbourne, Australia). Data analysis and interpretation were conducted by the PI using constant comparison and thematic summarization.

Results

Participants

A total of 31 emerging adults participated across seven groups; all groups consisted of four to six participants and were stratified based on gender (four female groups and three male groups). Participants were predominantly non-Hispanic White (68%), with a mean age of 22.3 \pm 2.2 and mean BMI of 31.5 \pm 4.6. See Table 1 for additional demographic information.

Major themes identified

Themes are organized within lead section of the agenda below. Major themes are highlighted within each section, with sample quotations to illustrate the theme.

Importance of weight (loss) in participants' lives

This section of the agenda explored the role weight plays in participants' lives and sought to understand whether weight loss was seen as important. Consistent with our theoretical framework and a priori research questions, no assumptions were made that participants would perceive themselves as overweight or at risk. Rather, the

goal was to understand the extent to which this was an area of concern, and if so, to identify the contextual factors that made weight important and motivating factors for change.

Theme 1: Lifestyle over weight. A consistent theme that emerged across all (7/7) groups during this section was that while healthy lifestyle changes were viewed as important and weight as salient, the driving force for change was not about weight, per se. All groups discussed a desire to 'feel better' or 'to be more fit' and consistently noted that while weight change was desirable, it was not the focus – rather, engaging in healthy changes to improve overall lifestyle and quality of life was viewed as of paramount importance.

'An ideal program for my age group is not a "weight loss program" at all, but an interactive, accessible, personalized and easy program that helps make life better overall.'

'I think an ideal program would focus on more than just weight and healthy eating...about a healthy lifestyle overall.'

Theme 2: Perceived self is most important. Across all (7/7) groups, a common theme was that perception of self was more important than a number on the scale. Groups talked specifically about the importance of weight loss and expressed that 'weight status' and 'the number on the scale' were not as important, whereas factors like 'feeling good about the way I look' and 'being comfortable in my body' emerged quite often as key motivations for weight change. Notably, while this theme is consistent with an emphasis on body image and self-esteem, those specific words were never or rarely used in most groups.

Barriers to weight management

Theme 1: Lack of time. All (7/7) groups identified a lack of time as one of the most significant barriers to weight loss and healthy lifestyle behaviours. Although individual constraints on time varied, emerging adulthood was consistently described as a time wherein individuals have too many competing demands on their time, and these demands shift rapidly given all the transitions experienced during these years. Groups noted that these demands were often perceived as more immediate than engaging in healthy lifestyle behaviours.

'What is going on in my life, school and stress-related things, take away from what I want to do

with my health. The transition into adulthood is difficult. I need to learn how to maintain my weight in life right now.'

Theme 2: Emotional and motivational factors.

Across all (7/7) groups, lack of motivation and high perceived stress emerged as key barriers to weight control. Groups further noted that these areas would have to be addressed for a program to appeal to them. Motivation was described as peaking at certain times, primarily because of external reasons, and as waning quickly once stress and other competing demands crept into their routines. Groups noted a need for additional motivation or incentive to work at weight loss behaviours. Further, perceived barriers to healthy choices were exacerbated by stress. While these factors emerged in all groups, emotional factors were emphasized more by female groups than male groups.

'If you're more stressed, you eat more and exercise less. If I could learn to manage my stress, I could manage my eating'

'...ideal program would focus on increasing motivation...'

'...needs to have lots of rewards to motivate me.'

Theme 3: Social and environmental factors. A majority (6/7) of groups emphasized significant transitions during these years, resulting in a changed social/physical environment that is often unsupportive of healthy lifestyle choices. Discussions surrounded the importance of tailoring intervention materials to meet the specific needs of one's current environment – for example, buffet eating and eating after drinking alcohol when in college versus practical barriers related to money and time to cook when first living on your own. The tremendous heterogeneity within this age group in terms of social and environmental factors was noted, and groups reiterated the importance of a program that allowed for personalization to meet individual needs.

'...all the transitions I've been through in the last few years has just made it hard.'

'It's easier to work out in college because gym available and friends to go with...in the real world it's not as easy.'

'Groups and goals should be separated based on lifestyle and where you're at...college vs. being out of college.'

'The hardest part is social eating and social drinking that gets out of hand.'

Preferences for treatment programs

Theme 1: Individualized, flexible treatment. Groups (6/7) consistently noted a preference for individual-level treatment. Group contact was perceived as acceptable for experiential activities or social support, but individual contact was preferred for intervention itself. A consistent desire for one-on-one '*coaching*' was described, and a program that was '*designed just for me*' and could adapt to their unique needs and allow for individual tailoring based on their needs and preferences. Notably, among male groups discussions focused on a desire for less '*treatment*' or '*intervention*' and more focus on activity and being fit.

'You want something that is personal enough to make it feel like it just for you.'

'A program needs to have "realness." You want to feel a part of something, not just a number to a big corporation.'

'Physical activity groups would be good, but for goal setting I would like one on one meetings.'

Theme 2: Reduced intensity program with minimal face-to-face contact. All (7/7) groups expressed a preference for a reduced intensity program, preferably not more than 2 to 3 months for the initial program, with minimal in-person contact and the majority of intervention via a web or alternative technology platform. However, all groups noted that at least one in-person session initially was important to get started, and the idea to offer future *optional* in-person sessions was frequently noted. Additionally, it was consistently noted that in-person contact would be more desirable if it was experiential in nature (see Theme 4 below). Lack of time was also seen as a barrier to participation in a weight loss program, and it was made clear that flexibility in terms of time commitment and scheduling is important. Female groups were more interested in participating in face-to-face sessions than male groups, although the majority of female groups still emphasized the need for flexibility and a desire to augment in-person treatment with an alternative modality to reduce time barriers.

'Having something that would fit in my schedule, not me having to schedule my life around – because I mean, I don't really have much control over my work and my school schedule. So, being

able to have something that is scheduled by me is important.'

'Any face-to-face meetings need to be flexible except initial meeting – I need to have control over when I come...'

Theme 3: Central role of physical activity. Perhaps one of the most salient themes to emerge across all (7/7) groups was the importance of physical activity and fitness among this age group – evidenced by the fact that it was raised within each section of the agenda and across all male and female groups. In fact, when discussing the motivation for weight loss, the emphasis on lifestyle over weight was accompanied by the sentiment that being physically fit and able to engage in physical activity was of critical importance to their lifestyle, both in the short term in terms of *'how I feel about myself'* and *'being able to do the things I want to do,'* as well as in the long-term because of *'...all the health benefits of physical activity.'*

Theme 4: The importance of experiential learning. A consistent theme across groups (6/7) was the importance of offering hands-on, experiential learning opportunities instead of didactic groups. While the value of education surrounding nutrition and physical activity was noted, the perception was that this education should occur within a setting that was fun and interactive and helped participants to apply and practice skills.

'...getting together to work out, or having activity classes would be cool...'

'...make it fun, like rock climbing or something different...not the same ol', same ol'...'

'...knowing the number of calories to eat would be helpful, but so boring to just talk about it.'

'...have cooking demos where I am cooking too.'

Theme 5: The importance of peer support. Although individual-level accountability and goal setting with a coach was preferred, the importance of peer support was also discussed across a majority (5/7) of groups. Groups described the benefits of having a peer that was going through a similar process and could help provide support and accountability. In male groups, peer support and interaction were often described within the context of competition, and this was seen as an appealing way to enhance engagement, particularly surrounding physical activity.

'If someone is going through the same thing, you can tell them how you feel and they understand...'

Methods for improving recruitment

Theme 1: Focus on the future. All (7/7) groups noted that weight was important because of the perceived impact on their future goals. Despite variability among groups and individual participants as to what made weight important in the future, all (7/7) groups indicated weight was relevant to their future goals; further, groups consistently noted that what was important to them in the long-term could make weight more meaningful in the short-term and, therefore, may be powerful for recruitment messaging. Of note, male groups emphasized preventing future disease as a motivating factor more so than female groups.

Theme 2: Choose your words wisely. Across groups, it was clear that messages and specific words used in recruitment ads mattered. All (7/7) groups noted that messages should be gain-framed and positive, and should emphasize active, healthy living and feeling better – not 'weight loss.' Most groups (5/7) also suggested that ads would be more appealing if they highlight their volition and the active nature of behaviour change. Finally, all (7/7) groups indicated a preference for using the actual age range in ads instead of 'young adults' or 'emerging adults' and encouraged the use of words like 'free' or 'no cost' in ads to highlight that program is available free of charge to participants.

'I feel like weight loss is a dirty word. I mean yeah, I want weight loss, but I'd rather do the other things that will get me to weight loss...focus on the behaviors and activity.'

'...ads should make me feel empowered to do something and change my behavior'

Theme 3: Use authentic images that aren't all about weight. A majority (6/7) of groups stated that images could make or break an ad, and noted that much like the messages, images should not be explicitly focused on weight (e.g. a scale). Images that were reflective of living a healthy lifestyle and being active were preferred, and it was noted that if images of people are used they must feel authentic and be *'real people'*, not models and not too thin.

Theme 4: Make recruitment and screening available on my time. In line with other themes reflecting time as a barrier and the desire for individualization, groups (7/7) all

expressed a desire for a recruitment process that allowed them to access it at their convenience and based on their personal schedule and preference. Using websites and technology to facilitate getting information about the study and completing initial eligibility screening was uniformly well received, with all (7/7) groups noting they would prefer to access study information and complete initial screening questions online instead of via phone or coming into a research centre.

Methods for promoting engagement and retention

Theme 1: Autonomy and choice. Groups (6/7) expressed a desire for autonomy and choice in program structure and goals. Groups also noted a preference for flexibility surrounding behavioural goals and the ability to personalize the program based on their needs and preferences.

'...I don't want a program to tell me what to do. I want to be able to set my own goals and have a coach help me meet them.'

'...every week getting a new personalized goal.'

Theme 2: Money talks. Groups (7/7) reported that cost was a barrier to a healthy lifestyle, and money was often cited as the most powerful method of promoting engagement and retention. It was also mentioned as a powerful incentive for weight loss (i.e. outcome incentive).

'If you turn it into a team competition with a cash prize you would get major results...people want to win and get rewarded for hard work.'

'[If you want me to stick with it]...compensation for weight loss and sticking with the program.'

Theme 3: Create an optimal default. Groups highlighted that all the barriers and competing demands associated with this developmental period would have to be acknowledged and accounted for in order for a program to work. Discussions focused on the need to create an optimal default to promote engagement and retention – that is, 'make it easy for me to do it [use the program]' and design the program in a way that will allow for flexible scheduling and minimize time burden for assessments in order to enhance retention.

Overall discussion

Taken together, these studies provide rich data to inform the adaptation of BWL protocols specifically for emerging

adults. There were several key themes that emerged across both studies, which may serve to improve recruitment and engagement efforts with this age group. First, findings suggest that emerging adults are interested in weight loss and willing to join a program, but also reflect the need to adapt recruitment messages to capture the interest of this age group initially. Data indicate that recruitment messages should emphasize the potential for positive lifestyle changes across a variety of domains as opposed to a sole focus on weight loss. In particular, messages that focus on fitness, lifestyle and potential improvements in appearance and self-confidence might have broader appeal with this population. This finding is consistent with previous work conducted with young adults more broadly classified as ages 18–35 (mean age 27.4 years), in which health, social image and 'self' factors (e.g. self-esteem, confidence) were identified as particularly strong motivating factors for weight loss (27).

Further, data point to the need to make recruitment processes and screening technology driven to the extent possible, allowing for greater access when it is convenient for participants and eliminating the need for phone contacts. Given the reliance of emerging adults on email and mobile technologies (32), this is not surprising – future studies could employ recruitment websites and videos to provide additional information about the trial with links to secure online screening systems to streamline the recruitment and screening process and be responsive to preferences and time barriers. Focus groups conducted prior to the design of a clinical trial targeting young adults (age 18–35) for weight gain prevention yielded similar findings regarding online screening, which proved to be an efficient and successful strategy for recruitment in the resultant trial (26).

Consistent with existing data from cohort studies (11–16), findings also suggest a need for increased content and emphasis on high-risk behaviours such as alcohol, sugar sweetened beverages, fast food and sedentary behaviour. Alcohol and SSBs may be particularly important intervention targets for young men, as men in Study 1 reported higher intake of SSBs and alcohol intake more than double the average intake of women. Furthermore, data indicate that physical activity may be a gateway to capture interest initially and build early self-efficacy and engagement with this population. A majority of participants in Study 1 indicated they were already engaged in 30-min bouts of exercise at least once per week, and the importance of physical activity was a particularly salient theme in Study 2, which suggests that perhaps this is an area where building self-efficacy early on in a program may be possible. These findings echo previous work reporting that young adults ages 18–35

identified physical activity as one of the best strategies for weight loss (27). Thus, while dietary change is critical in achieving the energy imbalance necessary for weight loss, an increased focus on physical activity and fitness within weight loss programs targeting this population may improve engagement, and this may also promote more positive long-term weight outcomes (33,34).

Data reflect a clear desire for a brief, reduced-intensity program with minimal in-person or face-to-face contact, with continued intervention contact via an alternative modality (e.g. website, mobile phone). Moreover, a desire for individual level treatment contact and coaching also emerged as a critical consideration – the desire for individual-level treatment with minimal in-person contact and tailored goals speaks to the developmental need for increased autonomy and responsibility. However, the emphasis on individual as opposed to group-based delivery represents a departure from typical in-person BWL models (35), and significant personalization and individualized care could pose a challenge for cost and wide-scale implementation. Thus, future work should focus on striking a balance between the need for accountability and autonomy as well as identifying practical ways to allow for personalization, individual-level coaching and experiential learning while maintaining an eye toward scalability and dissemination. For example, efforts to engage this population should consider ways to utilize novel technologies to deliver core evidence-based BWL modules with content adapted specifically for this age group, in addition to tracking of key behaviours in real time so as to provide meaningful and deeply tailored feedback, which may enhance their sense of receiving a personalized experience and promote engagement, while retaining a sense of accountability in the absence of frequent in-person contact.

Peer support and the importance of having someone who was going through a similar journey were identified as important factors in Study 2. Offering optional group-based experiential activities may be one way to augment an otherwise individual-level intervention and incorporate peer support. This might be particularly important to consider in light of previous findings demonstrating that among emerging adults with overweight or obesity, having more social contacts trying to lose weight was associated with greater intention to lose weight (36). Moreover, previous research has demonstrated that young adult successful weight losers are more likely to cite the role of peer support specific to exercise in their weight loss efforts, relative to older successful weight losers (37). As such, incorporating peer support particularly around physical activity, which clearly plays a central role for this population, may hold appeal and could enhance engagement. Findings suggest that for young men, this might be

particularly effective if within the context of a competition with peers.

A central finding in these studies is that while adapting adult BWL protocols in terms of recruitment messages, program duration and mode of delivery is necessary to meet the needs of 18–25 year olds, it is likely not sufficient. It is probable that in order to successfully engage individuals in weight loss behaviours during the transition into young adulthood, appropriately addressing key developmental considerations (e.g. need for autonomy) and the heterogeneity of this age group (e.g. social and environmental factors, college vs. non-college) within the theoretical framework as well as the structure and design of the program is going to be of paramount importance. Data also indicate that an intervention program truly designed to meet the needs of this age group will address more than weight – a more comprehensive lifestyle intervention that emphasizes lifestyle behaviours across a spectrum (e.g. stress, motivation, time management) and that supports weight loss but emphasizes other key behavioural outcomes will likely be more appealing to this population and promote better engagement than a traditional BWL program. For example, stress was identified as an overarching factor contributing to lack of time and motivation and was described as contributing to an ‘unravelling’ of healthy lifestyle behaviours. As such, an increased emphasis on how to effectively manage stress and perhaps even framing other healthy behaviours, such as physical activity, as stress reduction techniques may create additional buy-in and assist emerging adults in overcoming perceived barriers.

How best to address the critical role of motivation as highlighted by emerging adults in these studies will also require careful consideration moving forward. Data reflect strong intrinsic motivations for lifestyle change such as wanting to feel better about themselves, enhance their fitness and prepare for their futures. At the same time, groups clearly expressed a need for external accountability and a desire to see financial incentives incorporated into a lifestyle intervention. Indeed, financial concerns were raised as a key barrier to healthy lifestyle behaviours, and money was consistently cited as the most powerful method of promoting program engagement and retention. This finding is in line with responses from young adults more broadly (ages 18–35), who highlighted incentives as an important motivator for study participation (27). While it is typical to offer participants in BWL programs a financial honorarium for completing assessment visits and rewards are a central tenet of behaviour theory, financial incentives are not generally offered to promote adherence and/or weight loss. Some weight loss trials using financial incentives for weight loss have reported impressive short-term weight losses (38,39),

although the potential for weight regain once incentives are removed remains a concern, and it is unclear how this type of an approach might be reconciled with the parallel desire for autonomy and enhanced motivation. One recently published trial demonstrated promising results using small monetary incentives to promote self-monitoring behaviours within the context of an internet-based BWL program (40). Future work should explore whether a similar model could be successful with emerging adults, and what the impact is on intrinsic motivation and longer-term outcomes. Offering incentives in a way that does not undermine intrinsic motivation or lead to substantial weight regain once the incentives are removed could pose a challenge. To that end, future research efforts to engage emerging adults in weight loss may want to consider novel approaches that combine principles from Self-Determination Theory (41), Motivational Interviewing (42) and Behavioural Economics (43) to facilitate early engagement while also attempting to enhance autonomous motivation and sustained behaviour change.

Limitations and conclusions

These findings should be considered in light of some limitations. Across studies, there may have been some bias in the sample because of those who were more interested in weight loss or eating and activity behaviours agreeing to participate. Both samples were also highly educated and racial/ethnic minority representation was somewhat limited. Further, the sample size for Study 1 was modest, and self-report height and weight were used. Strengths of Study 1 methods include the fact that recruitment advertisements were widely distributed via a variety of channels and settings and the survey was conducted online to decrease time and transportation barriers – both factors which should enhance external validity by reaching a sample who might not be willing to present in person, but who are representative of the target population. The in-person nature of the focus groups in Study 2 may have resulted in demand characteristics to some extent, and it is possible that individuals' responses could have been influenced by other members of the group. Measures taken to reduce these threats included assuring participants that their responses would not be associated with them as individuals, using first names/pseudonyms only, emphasizing our desire to learn from their personal experiences and opinions and the fact that there were no right or wrong responses, setting ground rules for respect and encouraging divergent views to be expressed and asking open-ended questions to allow groups to shape the conversation within the context of the agenda. Strengths of Study 2 include objective

measures of height and weight, stratified sample of young men and women and the opportunity to gain a deeper understanding of emerging adults' perceptions and needs, as well as rigorous coding and analysis procedures that lend credibility to interpretations. Indeed, the mixed methods approach employed here is a notable strength, and the redundancy of key findings across both studies underscores the potential impact and ability to inform future efforts to recruit and engage this high-risk population in BWL programs.

In sum, findings from these formative studies indicate that substantial tailoring of adult BWL protocols is warranted in order to appeal to emerging adults and meet their unique needs as they transition into early adulthood. Data indicate recruitment protocols should be adapted to enhance convenience, eliminate the need for phone contacts and minimize in-person visits, while recruitment messages should be positive and gain-framed with a focus on overall lifestyle and self-improvement as opposed to solely on weight loss. Further, adaptations should also include intervention format and duration – data indicate that a hybrid delivery system that combines some in-person contact with novel technologies that are ubiquitous in the lives of emerging adults may hold particular appeal. Perhaps most important is the need for an intervention framework and content that is thoughtfully designed in such a way to meet the developmental needs of this population – an individually tailored, comprehensive lifestyle intervention that emphasizes activity and fitness and promotes autonomy, while also providing a sense of accountability and social support, may promote better engagement in this population than traditional adult BWL programs.

Conflicts of interest

Dr. Tate serves on the Scientific Advisory Council for Weight Watchers. The other authors have no conflicts of interest to report.

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