

Dietary and Behavioral Factors Influencing First-Year Weight Gain

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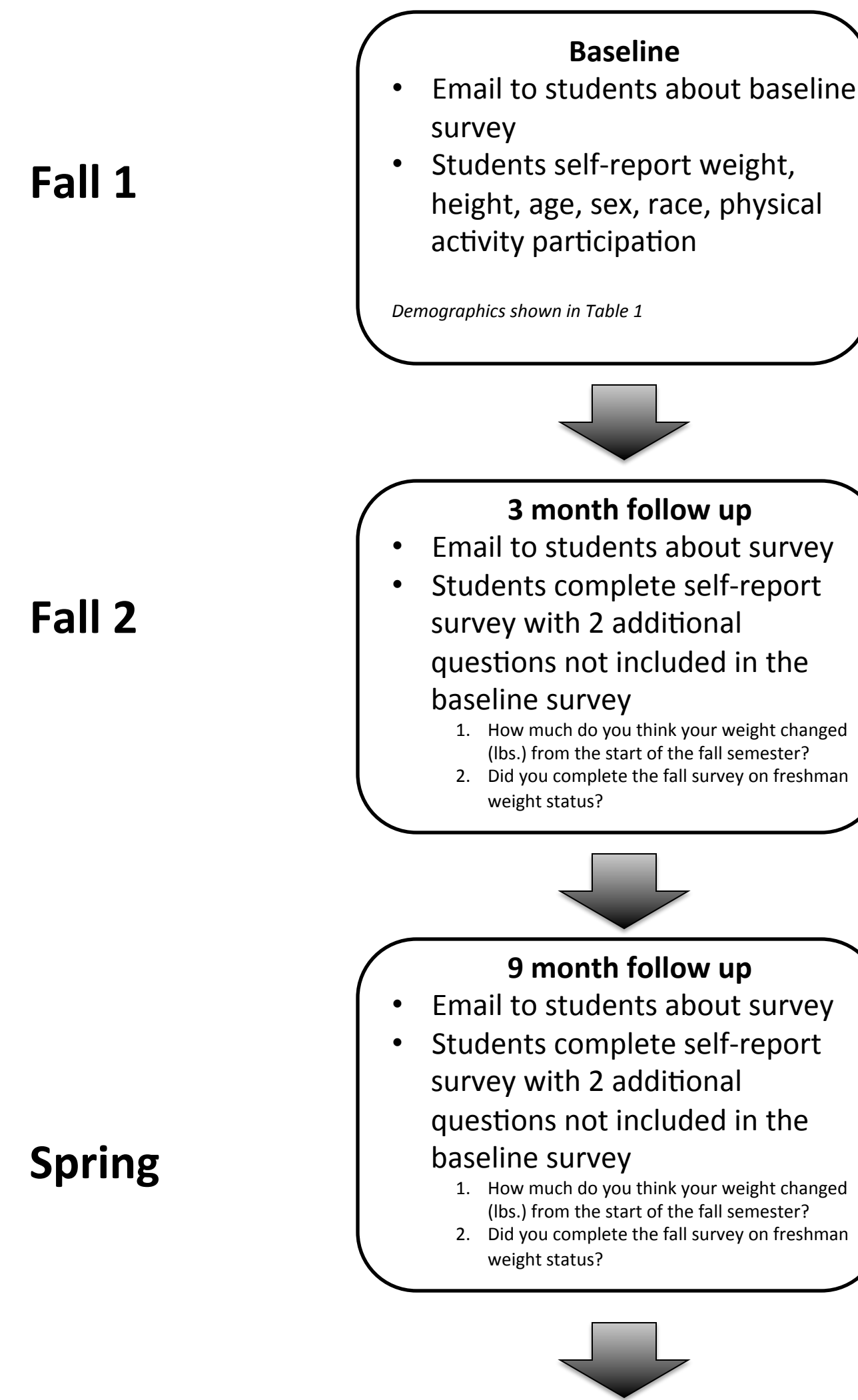
ABSTRACT

First-year college students are faced with many lifestyle changes affecting behavior. Modifications in eating and physical activity are among the most common changes dealing with weight gain. The freshman fifteen is a widely used term that references individual weight gain during freshman year of college. This study measured changes in behavior and weight among first-year college students to further study the freshman fifteen phenomenon. The participants were 114 (63.7% female) first-year students at Gardner-Webb University. **Methods:** Using a web-based survey, the researchers gained information on nutrition and physical activity in relation to weight status. Students were to complete the survey twice throughout the fall and once during the spring semester. Understanding first-year weight status and behavioral changes can help in implementing strategies to promote self-regulation in college students during this transition in life. **Results:** More than half (56.25%) of respondents reported a weight gain between 0.45 – 13.61 kg from baseline to 9 month follow up. Weight gainers reported an overall average weight gain of 4.20 kg. Initial mean BMI was 25.83, by 3 month follow-up mean BMI rose to 26.17, and by 9 month follow-up mean BMI was 26.35. By 9 month follow up more than half of participants were not meeting minimal ACSM guidelines for CRF (59.5%) and strength (53.2%). **Conclusion:** First-year of college is a critical period for weight status. Interventions should be implemented for all first- year students, regardless of BMI status at enrollment.

INTRODUCTION

- Nearly two-thirds of the US adult population is overweight
- Obesity affects one-third of the US adult population at an estimated cost of \$147 billion annually¹.
- Expected yearly weight gain for an American adult has been reported at 0.36 kg²
 - Evidence for critical periods throughout development where rapid weight gain is more likely³
 - First-year of college has been found to be one of those critical periods⁴.
 - Early weight gain can have prolonged negative affects on an individual throughout adulthood⁶.
- American College of Sports Medicine (ACSM)⁷ recommends that healthy adults engage
 - Moderate-intensity cardiorespiratory exercise training for ≥ 30 min·d⁻¹ on ≥ 5 d·wk⁻¹ or vigorous-intensity cardiorespiratory exercise training for ≥ 20 min·d⁻¹ on ≥ 3 d·wk⁻¹
 - Resistance exercises for each of the major muscle groups on 2-3 d·wk⁻¹.
- Physical activity (PA) has been found to decrease from adolescence into young adulthood.
 - One in three college students are sedentary, and rates of sedentarism increase throughout the college years^{5,8-11}.
- Purpose of this study was to document and analyze weight and PA change from baseline to 3 month and 9 month follow up across the first-year of college.
 - Recorded self reported
 - Weight status during the first-year of college
 - CRF and strength activity status in relationship to the minimum guidelines for PA by the ACSM⁷.
 - Tested the hypothesis that physical activity level would influence weight change.
 - Weight gain would be observed during the first-year of college.
 - Low levels of PA would be independently associated with weight change.

METHODOLOGY



Fall 1

Fall 2

Spring

Dependent Variables

Body Mass Index (BMI)

- < 25 as *desirable*
- ≥ 25 as *overweight*

Weight (kg)

Weight Change (kg)

Physical Activity (ACSM, 2011)

- How many times in the past week did you participate in activities for 30 minutes that did not make you sweat?)
 - How many times in the past week did you participate in strength-training activities?
- 0 (no activity sessions per week) to 7 (activity every day of the week).

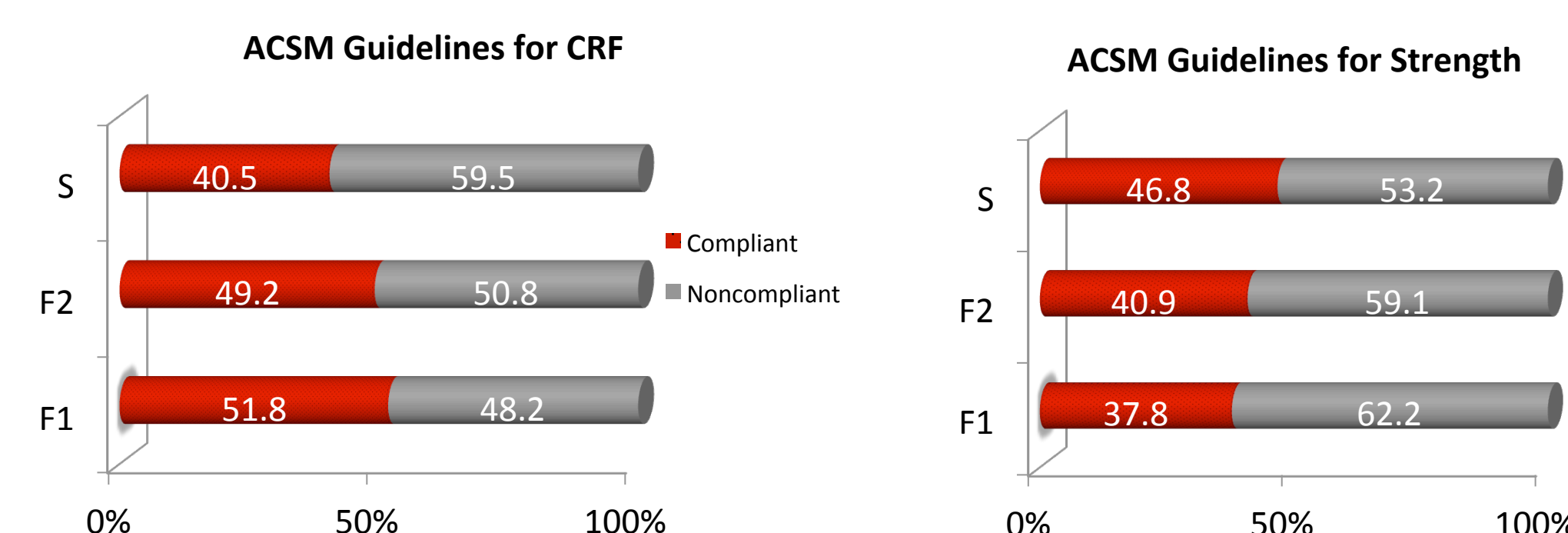
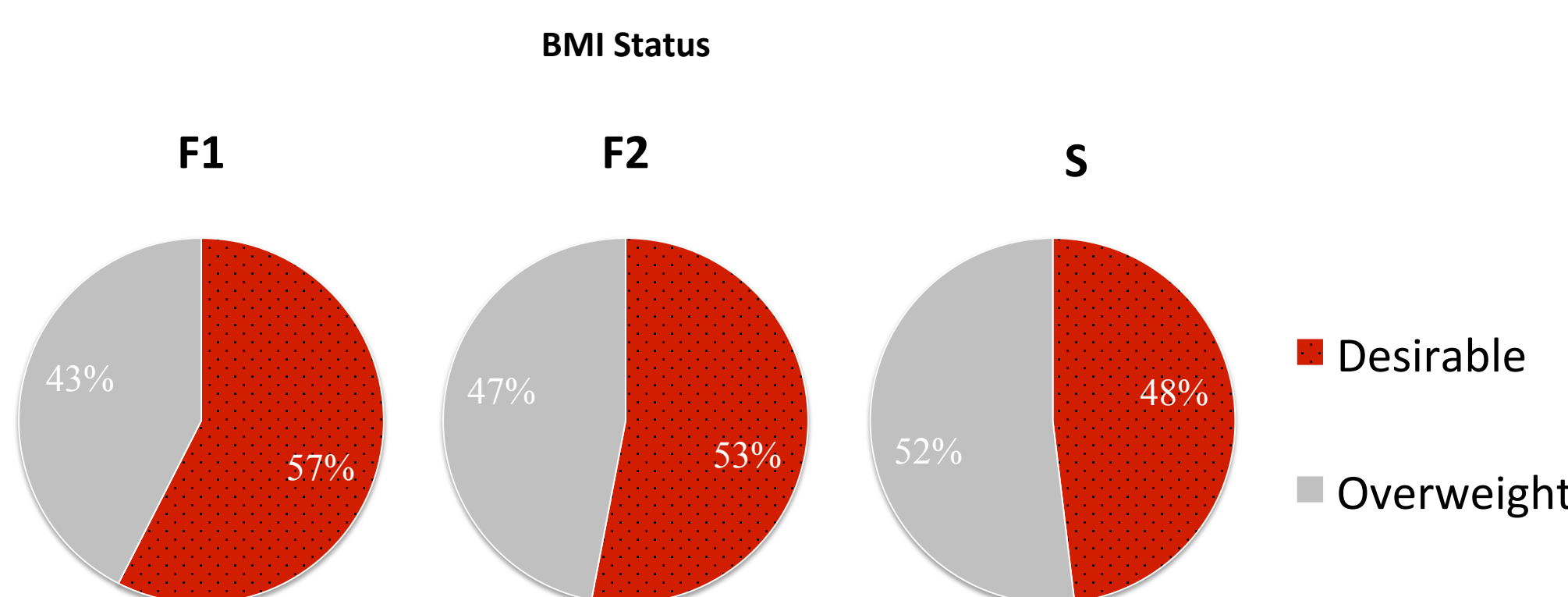
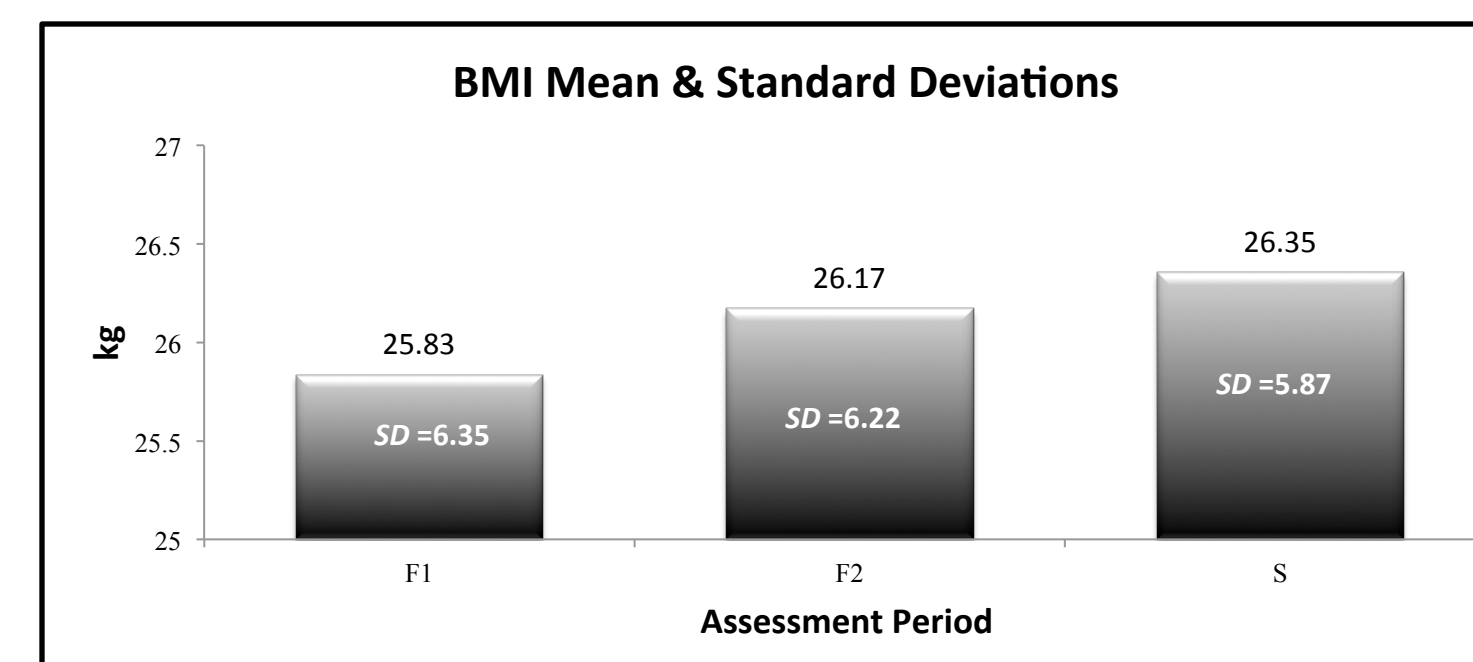
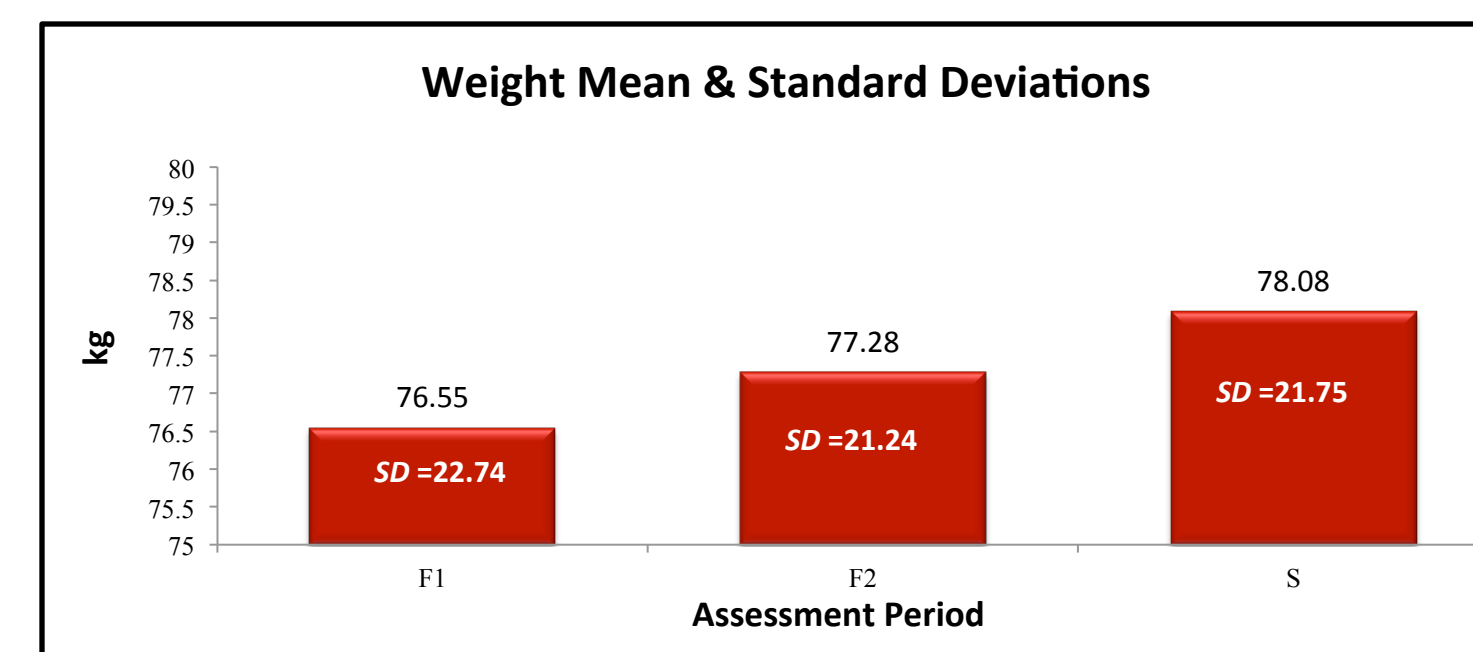
Data Analyses

- Means & SD calculated for weight, height, age, and BMI at baseline, 3 and 9 months (SPSS Inc, Chicago, IL).
- Sample sizes were reduced from baseline ($n = 113$) for 3 ($n = 66$) and 9 month ($n = 81$) follow up. Baseline scores on PA and strength training were compared at baseline, 3 and 9 months using independent t -tests.
 - There were no significant differences on any measure so subsequent analyses included all participants who provided data up to the final survey in the study.
- ANOVAs conducted to compare baseline BMI, 3 month and 9 month BMI, and ungrouped weight change.
- A one-way ANOVA compared baseline BMI for the groups of weight gain, weight loss, and no weight change.

RESULTS

TABLE 1. Demographics of First Year College Student Participants

Demographics	Fall 1 N=114	%	Fall 2 N=94	%	Spring N=84	%
Sex						
Male	41	36.3	30	31.9	29	34.5
Female	72	63.7	64	68.1	55	65.5
Race						
White	87	77.7	72	76.6	63	75.0
Black/African American	17	15.2	16	17	11	13.1
Other	8	7.2	6	6.4	10	11.9
Residency						
On Campus	100	89.3	86	91.5	74	88.1
Off campus	12	10.7	8	8.5	10	11.9
Meal plan						
University	104	92.9	89	94.7	76	90.5
None	8	7.1	5	5.3	8	9.5
Body mass index (kg/m²)						
< 25 (desirable)	65	57.5	35	53.0	39	48.1
≥ 25 (overweight)	48	42.5	31	47.0	42	51.9



DISCUSSION

- Main objective: examine weight change of first-year college students; and identify CRF and strength training patterns that may influence weight gain.
- Results supported previous findings that first-year students gain weight in the first 3 months of transition to college.
- Results extended previous findings by demonstrating continued weight gain at 9 month follow-up.
- Considerable variability in weight change, ranging from -4.54 to +9.07 kg at 3 months and -13.61 to +13.61 kg at 9 months.
- Respondents starting with a healthy BMI (< 25) reported a percent weight change 4 times that of respondents starting with an unhealthy BMI (≥ 25) at the 3 month follow up and 1.5 times at the 9 month follow up.
 - Mifsud, Duval, and Doucet¹² explained similar findings by suggesting that those with the most unhealthy BMIs at the start of college may experience less change in lifestyle choice as a result of already having been consuming excess calories and engaging in less PA prior to enrollment than those starting with a healthy BMI.
- BMI does not differentiate between fat mass (FM) and fat free mass (FFM)
 - Could be argued that changes in BMI could be result of increases in FFM.
- Low levels of CRF and strength training reported by both groups would suggest that increases in BMI were not due to increases in FFM but to an increase in FM.
- Conclusion:** results suggest a clear and present need for lifestyle interventions on college campuses
 - Focusing on the importance of regular PA for weight maintenance, starting in the first-year of matriculation.
- The majority of first-year college students are not meeting the current ACSM minimal recommendations for CRF and strength training⁷.
- College first-year students are gaining weight at rates that far outpace those of the American adult population.
 - Overweight BMI students outpace normal weight BMI students in weight gain.

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