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Creating a Healthier Campus: A Report on the Effectiveness of NSU's "Slimming with the Sharks" Wellness Program

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Cover Page Footnote
We thank Nova Southeastern University's Marcela Sandigo, M.B.A.; Marilyn Gordon, Ed.D., R.D.; and Andrew Kusienski, D.O., for physical, nutritional, and laboratory support, respectively.

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Creating a Healthier Campus: A Report on the Effectiveness of NSU's "Slimming with the Sharks" Wellness Program

By Corey A. Peacock, Tobin Silver, Pradeep Vanguri

With a recent increase in college obesity rates, it is imperative to assess the effectiveness of campus-wide fitness programs while encouraging other institutes of higher education to do so. It is presently uncertain whether these programs are advantageous or disadvantageous for improving campus-wide obesity rates; therefore, assessing campus-wide fitness programs and reporting results may bring awareness to college campus obesity rates and clarify a solution to the problem. NSU's RecPlex offered "Slimming with the Sharks," a structured, multiple-component, weight loss initiative available to all students, faculty, and staff. The following is a brief report of "Slimming with the Sharks" data within NSU faculty, staff, and students.

Objective

32.9 % of the US adult population is considered obese, with nearly 30% of the college-campus population affected by the disease (1). This may be due, in part, to inadequate physical activity opportunities and dietary choice habits (2,3). Reports on both the male and female college-campus populations have demonstrated these rates of obesity (3). In response to this trend, there is an increased popularity of campus-wide health and wellness programs targeting the obesity epidemic nationally. However, there is a lack of evidence and conclusiveness about the effectiveness of these programs (4). Therefore, it is imperative to determine the potential impact these programs may have on improving college student, faculty, and staff health. The purpose of this report is to assess the effectiveness of NSU's campus-wide fitness program "Slimming with the Sharks" while increasing the awareness of health-improving opportunities available within the NSU community.

Methods

Between 2011 and 2013 twenty-two obese (≥30 kg/m2) college students, faculty, and staff (14 females 35.7±10.9 yrs.; 8 males 35.7±12.9 yrs.) participated in and completed a 24-week, campus-wide,151-day "Slimming with the Sharks"

intervention. Program assessment was approved by the Nova Southeastern University IRB. The fitness program was comprised of multiple components of health and fitness initiatives based on previous research (**Table 1**).

The first of these components included aerobic exercise as multiple studies have effectively proven that aerobic activity at multiple modalities and intensities has encouraged weight loss in obese populations (5,6,7). The aerobic exercise component of the program also included multiple modalities of exercise to elicit a moderate to vigorous exercise response (i.e., > 3 MET's [metabolic equivalents]) including cycle ergometery, treadmill training, elliptical training, and group aerobics. Previous literature has found that the addition of diet interventions to aerobic training, instead of aerobic exercise alone, can further improve an individual's health and accelerate weight loss (5,7). In accordance with previous successful interventions, an included second component was an optional educational session to stimulate improvements in obesity rates and adipose tissue (8). The educational sessions focused on a variety of dietary tips and wellness topics to better educate obese individual about healthy weight loss. A third component, in conjunction with aerobic exercise and education, was the inclusion of resistance and mobility training.

Table 1. "Slimming with the Sharks" fitness program, 2011-2013

Mode	Frequency	Duration	Intensity
Aerobics, Walking and Cycling Training	3 days/week	25-45 min	> 3 METS
Anaerobic Resistance and Mobility Training	3 days/week	20-40 min	55 – 85% 1-RM
Educational Sessions (optional)	1 days/week	60 min	General

Abbreviations: METS, Metabolic Equivalents; reps, Repetitions; 55 - 85% of 1-RM, 5-15 repetitions at Fifty-five to Eighty-five Percent of a One Repetition Maximum

Resistance training currently isn't prescribed for the obese population, but may prove effective. The resistance training was programmed at 55-85% intensity of 1-RM estimates and included a range of 5-15 repetitions. Motivational strategies have been successful at improving exercise habits (9,10); therefore, trainers incorporated cognitive cues of motivation during resistance and mobility training periods. The components were programmed between all personal, group and educational training sessions. All health indicators data was analyzed utilizing a two time-point (pre, post) repeated measures ANOVA with gender as a covariate. Post-hoc analyses of any significant main effects of condition were performed utilizing T-tests with the Benjamini and Hochberg False Discovery Rate correction for multiple comparisons. Means and variability were calculated for all variables. All statistical analyses were completed using SPSS for Windows (version 19.0, SPSS Inc., Evanston, IL).

Results

The data analysis verified that the 22-subject population of campus students, faculty, and staff that participated in "Slimming with the Sharks" improved their body composition (body fat %), muscular strength and endurance (push-up test, curl-up test), flexibility (sit and reach), body mass index (BMI), and blood pressure (resting systolic/resting diastolic) (**Table 2**).

Table 2. A Pre- and Post- Assessment of "Slimming with the Sharks" on Health Indicator of an Obese Population

Variable	Pre-intervention	Post-intervention	p-valuea
Body Fat %, Mean (SD)	43.7 ± (0.1)	37.7 ± (0.1)	p = 0.001
Curl-Up Test reps, Mean (SD)	16.8 ± (8.9)	23.7 ± (3.0)	p = 0.001
Push-Up Test reps, Mean (SD)	7.0 ± (6.1)	16.6 ± (10.2)	p = 0.001
Sit and Reach cm., Mean (SD)	22.0 ± (15.0)	29.3 ± (10.2)	p = 0.001
BMI kg/m2, Mean (SD)	36.8 ± (3.6)	32.9 ± (4.3)	p = 0.001
Systolic BP mmHg, Mean (SD)	124.7 ± (6.8)	115.3 ± (6.8)	p = 0.001
Diastolic BP mmHg, Mean (SD)	82.6 ± (6.7)	78.1 ± (11.5)	p = 0.012

Abbreviations: SD, Standard Deviation; Reps, Repetitions; cm. Centimeters; kg/m2, Kilograms per Meter Squared; BP, Blood Pressure; mmHG, Millimeters of Mercury adenotes 95% confidence significance ($p \leq 0.05$).

Overall, participants improved body fat percentage by 6% and BMI by 3.9 kg/m2 (**Figure 1a**). Additionally, participants improved push-up and curl-ups by 9.6 and 6.9 repetitions, respectively. Flexibility measured sit and reach increased 7.3 cm following the fitness program (**Figure 1b**). Lastly, systolic and diastolic blood pressure decreased 9.4 mmHg and 4.5 mmHg, respectively. A significant main effect for gender as a covariate was found only for sit and reach results ($p = 0.012$) demonstrating greater flexibility improvements in females, all other main effects for gender were non-significant ($p \geq 0.050$).

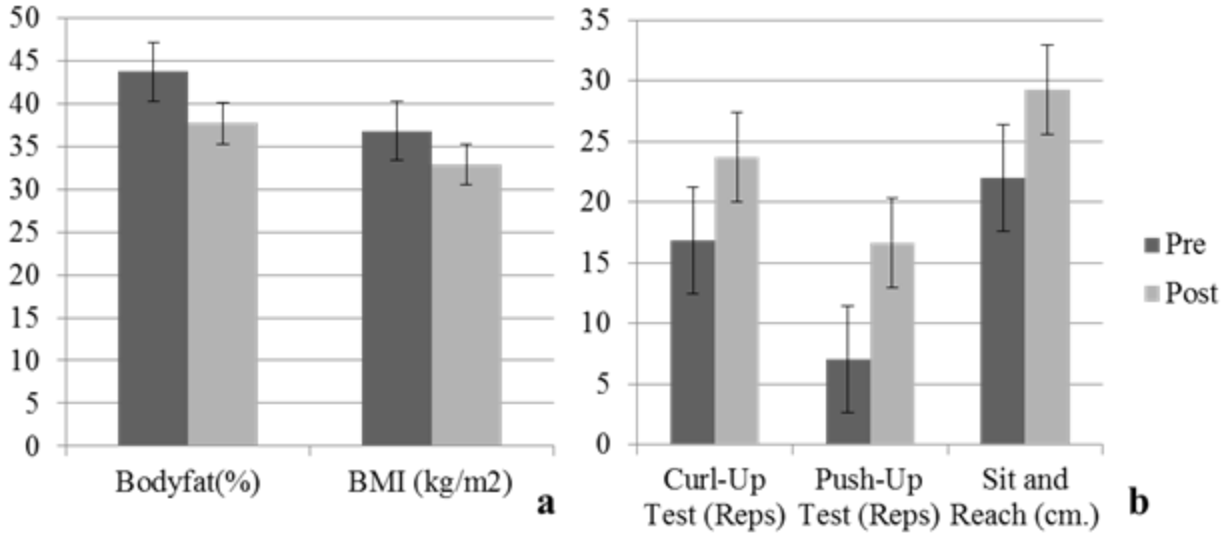

Figure 1: Improvements in Body Composition (a) and Physical Fitness (b) following "Slimming with the Sharks."

Discussion

As obesity rates increase, the potential popularity of campus-wide fitness programs aimed towards weight-loss initiatives and healthier campus lifestyles will also increase. The aforementioned fitness program "Slimming with the Sharks" provided the participating NSU members with an effective lifestyle improvement opportunity towards health and obesity. Similar to recent lifestyle literature, the data demonstrated improvements in obesity health factors such as body composition (5,6,7), strength, endurance, flexibility, BMI, and blood pressure. Although other programs exist nationwide, there is no published literature regarding the effectiveness of these programs or results achieved. Any reported significant evidence in regards to health indicator effects (i.e. cardiovascular endurance, body composition, muscular strength and endurance, flexibility, BMI, and blood pressure) may better contribute clarity to the existing literature targeting campus obesity rates. Therefore, it is critical to evaluate these programs as it is necessary to know whether they are advantageous or disadvantageous to achieve a healthier campus. As seen with the evaluation of NSU's "Slimming with the Sharks," this particular program was significantly advantageous to those who took advantage of the program offering. Further programs and research here at NSU should explore adherence and retention rates for fitness program participants. Determining both the acute and chronic benefits of existing programs could improve our knowledge of adherence and retention trends in the obese population. The current results demonstrate significant value to the campus-wide fitness program "Slimming with the Sharks," as this will contribute and bring awareness to the NSU campus obesity rates. With this awareness, hopefully, together we can make NSU a healthier campus.

Acknowledgments

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