

Elevating a Community to Wellness: An Evidence-Based Approach

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Author Note

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### Abstract

This paper is a report summarizing the Health Improvement Program (HIP) that was implemented during the 2018-2019 academic year at Clarion University of Pennsylvania. The HIP is a 12-week program conducted by members of the Student Wellness Ambassador Team (SWAT) using peer-to-peer coaching with a focus on nutrition, physical activity, and lifestyle modification to achieve subjective and objective improvements in health and wellness. SWAT consists of 10 undergraduate students who became NASPA (National Association of Student Personnel Administrators) certified peer-educators. Additionally, all SWAT members received on-going training in nutrition, physical activity, behavior change, and coaching. A total of 61 students were recruited for the HIP, 36 students completed the HIP, and 24 students completed all screenings and assessments. Students who completed all screenings and assessments showed statistically significant reductions in hemoglobin A1c (HbA1c), waist circumference, waist-to-hip ratios, body weight, and diastolic blood pressure at  $p < .05$ .

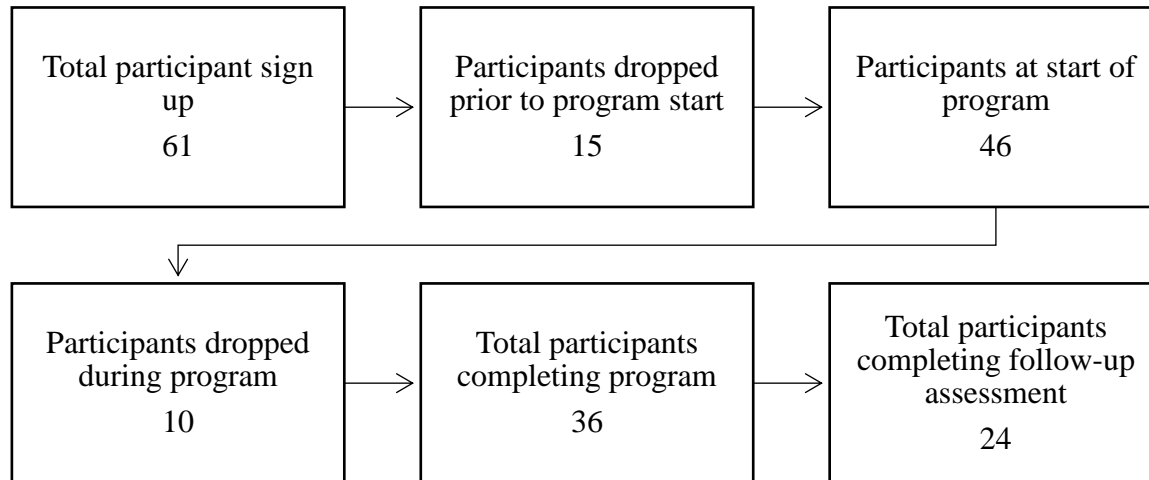
*Keywords:* wellness, health, peer-education, diabetes, coaching, college, university

### Elevating a Community to Wellness: An Evidence-Based Approach

The generous funding from the American College Health Foundations' Gallagher Koster award has allowed Clarion University's Student Wellness Ambassador Team (SWAT) to implement the Health Improvement Program (HIP) during the 2018-2019 academic year. SWAT set out to mirror the HIP based on the Centers for Disease Control and Prevention (CDC) Diabetes Prevention Program <sup>TM</sup> (DPP), a 12-month long intervention addressing nutrition, physical activity and lifestyle modification improvements for those with or at risk of diabetes. Due to the nature of higher education and academic calendars, we quickly learned we would need to modify aspects of the DPP to serve our students better. The major change in our program structure was condensing the HIP down to three months, or, one academic semester. This modification allowed SWAT to conduct two separate programs, one during each semester. These changes to the program can be viewed in Appendix A.

Figure 1 below provides a breakdown of our recruitment and retention numbers. Please find the recruitment material and pre-post screening material in Appendix B.

Figure 1. Combined recruitment and retention numbers for the 2018-19 academic year Health Improvement Program.



SWAT set out to recruit a minimum of 30 students for the one academic year program with the expectation that there would be significant attrition. Figure 1 above illustrates we exceeded that goal by recruiting 61 students. Thirty-six students were recruited during the first semester and 25 during the second semester for a total of 61. Of those 61 students expressing interest in the program, 46 completed the prescreening phase (Lifestyle and Health History Questionnaire, Exercise History and Attitude Questionnaire, and Biochemical, Biometric and Body-composition Questionnaire. See Appendix B). During the program, 15 students completely withdrew from the program (withdraw consisted of direct statements of inability to continue or a lack of follow-up with their wellness coach for three consecutive weeks).

## Program Goals

### Primary Goals

1. Decrease body-weight (non-functional mass) by  $\geq 7\%$
2. Complete 150 minutes of moderate to vigorous physical activity each week

## Secondary Goals

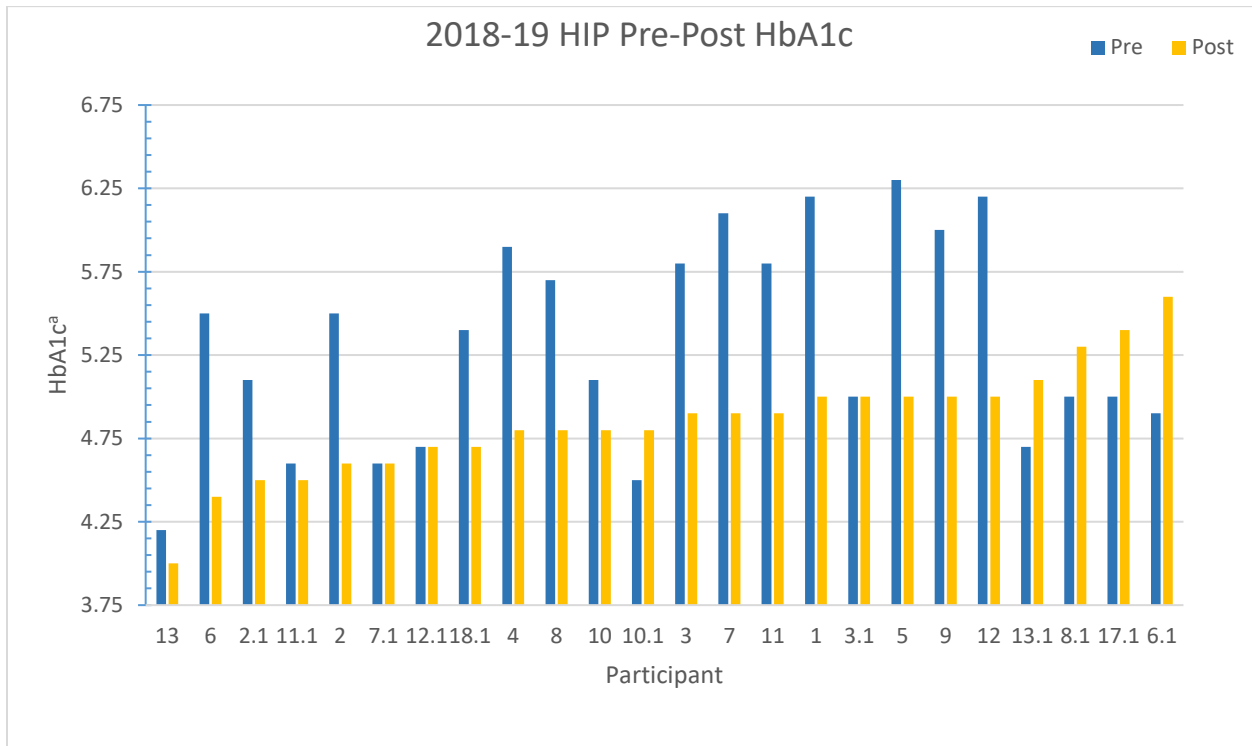
1. Increase HDL cholesterol ( $> 40$  mg/dL in men &  $> 50$  mg/dL in women)
2. Decrease waist circumference ( $< 40$  inches in men &  $< 35$  inches in women)
3. Decrease blood pressure ( $< 130$  (sys) and/or  $< 85$  (dia))
4. Decrease triglycerides ( $< 150$  mg/dL)
5. Decrease HbA1c ( $\leq 5.6$ ) or FBG ( $< 100$ )

## Outcomes

The primary goals outlined in the HIP were adopted from the DPP™. The secondary goals were set forth by SWAT and developed with metabolic syndrome in mind. Due to the nature of the HIP being condensed from one year to three months, the body weight reduction was no longer set as a priority but was still discussed as a long-term goal for program participants.

Although we had 36 participants complete the program without a formal withdraw or lack of follow-up, only 24 completed all of the post-screenings (see Program Challenges in the Discussion section). Based on the pre and post data of these 24 participants, the HIP demonstrated statistically significant reductions in HbA1c, waist-circumference, waist-to-hip ratio, weight, and diastolic blood pressure at  $p < .05$ .

Figure 2 illustrates the pre-post HbA1c scores of the participants who completed the program. Nine of the 24 participants began the program with an HbA1c of  $\geq 5.7\%$ , placing them in the prediabetes classification category (National Institutes of Health [NIH], 2018). Of those nine who tested  $\geq 5.7\%$  at the start of the program, 100% of them reduced their HbA1c below 5.7% with many achieving a  $\geq 1\%$  reduction. For the 24 participants ending the program who completed follow-up testing, 100% of them had HbA1c scores of  $\leq 5.6\%$  classifying them as having normal blood sugar levels (NIH, 2018).



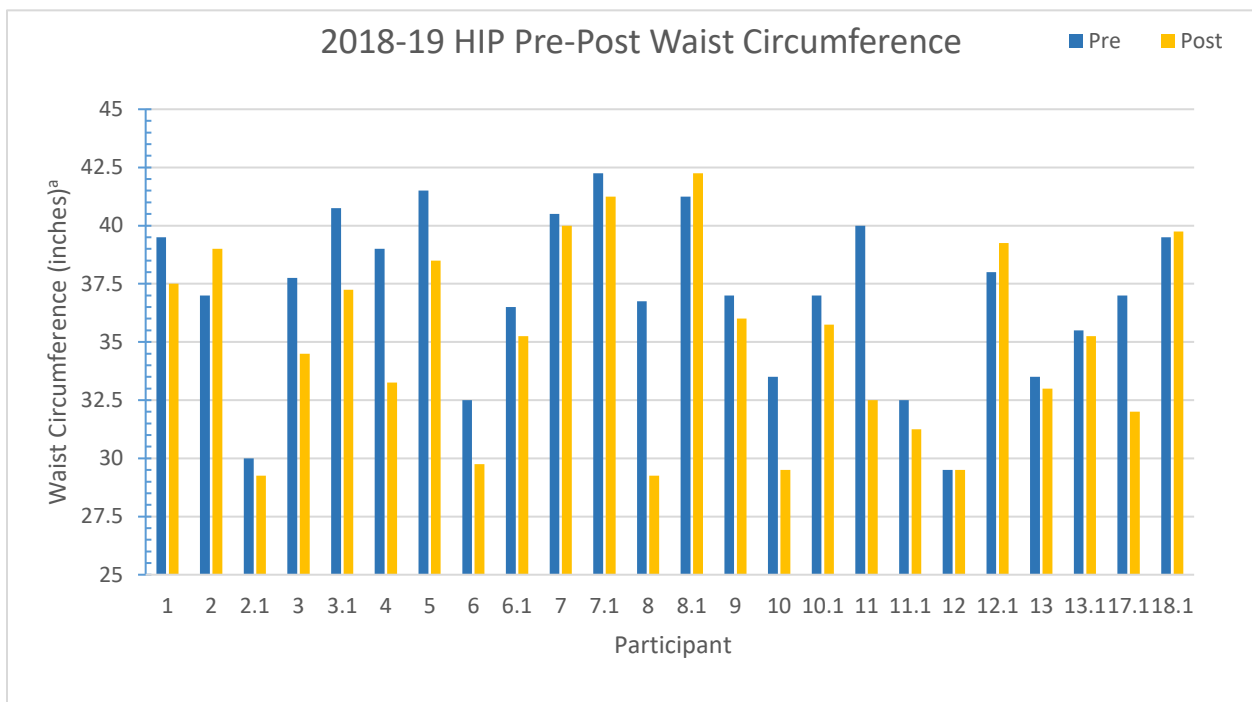
t-Test: Paired Two Sample for Means

	<i>Pre</i>	<i>Post</i>
Mean	5.325	4.845833333
Variance	0.387173913	0.113025362
Observations	24	24
Pearson Correlation	0.24577195	
Hypothesized Mean Difference	0	
df	23	
t Stat	3.723856517	
P(T<=t) one-tail	0.000556961	
t Critical one-tail	1.713871528	
<b>P(T&lt;=t) two-tail</b>	<b>0.001113922</b>	
t Critical two-tail	2.06865761	

Figure 2. Pre-post HbA1c levels of the 2018-2019 HIP program participants who completed the follow-up assessment.

<sup>a</sup> A hemoglobin A1c (HbA1c) test measures the amount of blood sugar (glucose) attached to hemoglobin. An HbA1c test shows what the average amount of glucose attached to hemoglobin has been over the past three months (NIH, 2018)

Figures 3, 4, 5, and 6 illustrates the pre-post waist circumference measurements, body weight measurements, waist-to-hip ratios, and diastolic blood pressures, respectively, of our participants. Statistically significant reductions are seen in all of these measurements,  $p < .05$  with a strong, positive correlation among weight and waist circumference  $r = 0.85$ . These results are of no surprise to our team given increased visceral fat often results in increased waist-circumference and weight.



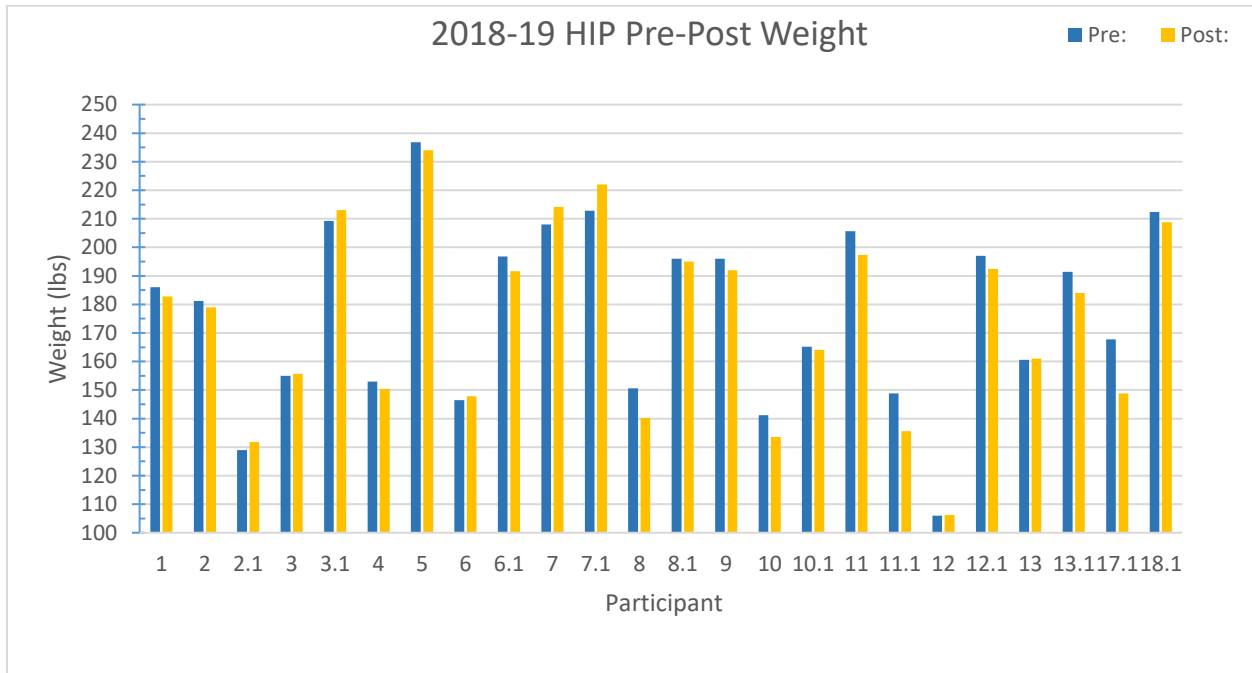
t-Test: Paired Two Sample for Means

	<i>Pre</i>	<i>Post</i>
Mean	37.01041667	35.03125
Variance	12.69825634	16.92561141
Observations	24	24
Pearson Correlation	0.787371484	
Hypothesized Mean Difference	0	
df	23	
t Stat	3.792094305	
P(T<=t) one-tail	0.000470702	
t Critical one-tail	1.713871528	
<b>P(T&lt;=t) two-tail</b>	<b>0.000941404</b>	

t Critical two-tail 2.06865761

Figure 3. Pre-post waist circumference measurements (in inches) of the 2018-2019 HIP program participants who completed the follow-up assessment.

<sup>a</sup> Waist-circumference as measured at the midpoint between the lowest ribs and the iliac crest.

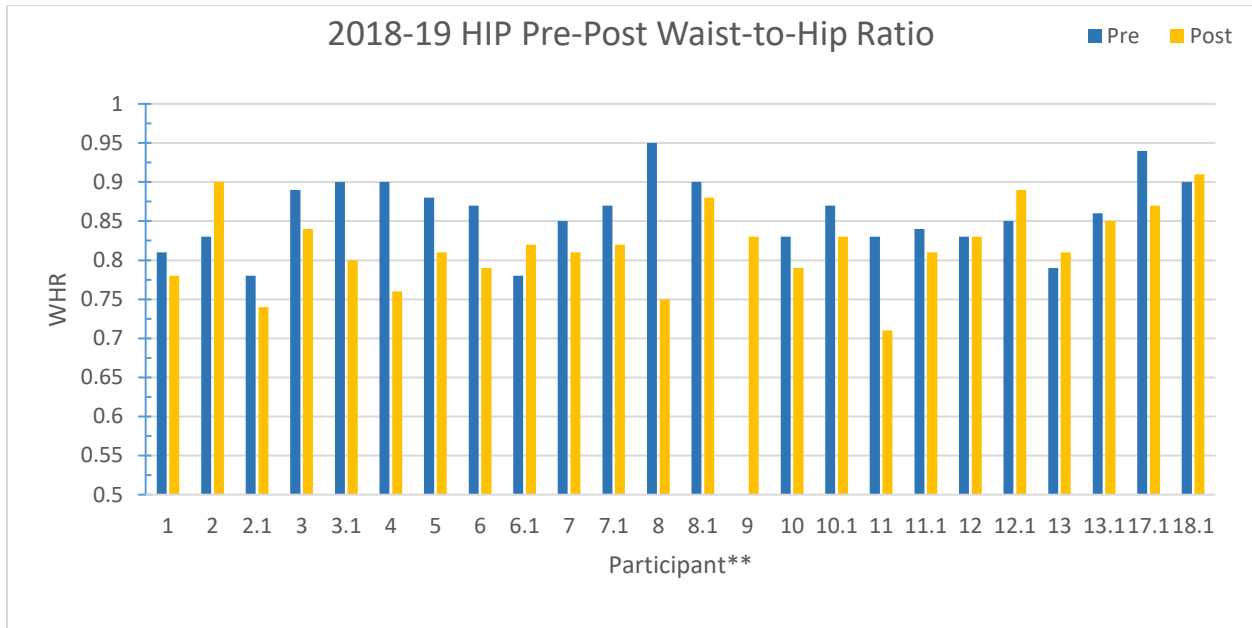


t-Test: Paired Two Sample for Means

	Pre:	Post:
Mean	177.2	174.2166667
Variance	1015.38087	1109.874493
Observations	24	24
Pearson Correlation	0.983241227	
Hypothesized Mean Difference	0	
df	23	
t Stat	2.380858476	
P(T<=t) one-tail	0.012969446	
t Critical one-tail	1.713871528	
<b>P(T&lt;=t) two-tail</b>	<b>0.025938892</b>	
t Critical two-tail	2.06865761	

Figure 4. Pre-post weight measurements (in pounds) of the 2018-2019 HIP program participants who completed the follow-up assessment.



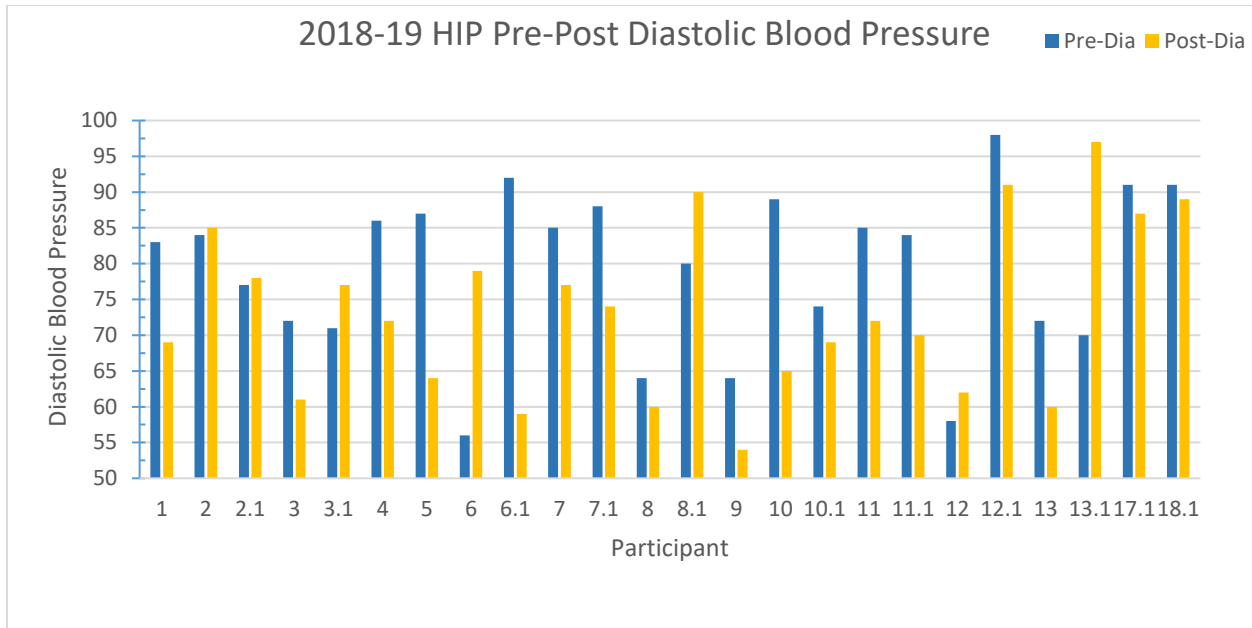


t-Test: Paired Two Sample for Means

	<i>Pre</i>	<i>Post</i>
Mean	0.858695652	0.817391304
Variance	0.00213004	0.00263834
Observations	23	23
Pearson Correlation	0.207498602	
Hypothesized Mean Difference	0	
df	22	
t Stat	3.219960592	
P(T<=t) one-tail	0.001971066	
t Critical one-tail	1.717144374	
<b>P(T&lt;=t) two-tail</b>	<b>0.003942131</b>	
t Critical two-tail	2.073873068	

Figure 5. Pre-post waist-to-hip ratios of the 2018-2019 HIP program participants who completed the follow-up assessment.

\*\*Pre-assessment data on WHR for participant 9 was unavailable and therefore excluded from the analysis.



t-Test: Paired Two Sample for Means

	Pre-Dias	Post-Dia
Mean	79.20833333	73.375
Variance	127.9112319	140.1576087
Observations	24	24
Pearson Correlation	0.305927144	
Hypothesized Mean Difference	0	
df	23	
t Stat	2.094579322	
P(T<=t) one-tail	0.023710716	
t Critical one-tail	1.713871528	
<b>P(T&lt;=t) two-tail</b>	<b>0.047421432</b>	
t Critical two-tail	2.06865761	

Figure 6. Pre-post diastolic blood pressure measurements (mmHg) of the 2018-2019 HIP program participants who completed the follow-up assessment.

### Discussion

#### Program Challenges:

Major challenges in the first year of the HIP consisted primarily of participant follow-up of post-program screening. We believe this was due primarily to finals week occurring at the same time as our follow-up testing in the Fall 2018 semester. We improved this in the Spring 2019 semester by scheduling participants early in the program. Making this change resulted in

73% of participants completing the post-screening in the Spring 2019 semester as compared to 62% of participants in the Fall 2018 semester.

Participant attendance to weekly program meetings was good for the majority of the program (about 50% participation on average). However, participants in the Fall 2018 program expressed in post-program screenings that some of the material felt too much like a lecture, and they would have preferred more hands-on training. To remedy this, SWAT partnered with the Student Recreation Center to hold all physical activity meetings in the recreation center and include hands-on exercise training. These meetings were very well attended ( $\geq 85\%$ ) and received positive reviews. We also included other hands-on activities in the Spring 2019 semester, such as a do-it-yourself medicine ball activity.

The last major challenge was that participants in the Fall 2018 semester fell into one of two camps. Participants either increased physical activity without much change to diet or changed their diet without much concern for physical activity. During the Spring 2019 semester, we included more discussion on the benefits of doing both during the weekly meetings. We also added several quizzes on prior knowledge learned in previous meetings, such as the benefits of physical activity and healthier dietary choices, through fun, interactive, mobile gameplay with prizes given to the top performers. We also incorporated creative ways of providing students with more options to engage in physical activity, e.g., using the GroupMe mobile app and having all program participants sign-up and communicate daily when they are attending the recreation center in case other participants or coaches wished to tag along. Also, one of our coaches is a certified yoga instructor and held yoga classes which participants could attend.

**Program Continuation:**

As of writing this report, there are plans to continue the Health Improvement Program during the Spring 2020 semester and subsequent Spring semesters. SWAT has decided that using the Fall semesters to train coaches and spend more time focusing on training will benefit the Spring implementation of the HIP. Also, we believe having the program in the Spring will allow for more student involvement, motivation, and retention because of several factors including New Year's resolutions, weather changing from colder temperatures to warmer temperatures, and students seeming more motivated to improve their health for spring break and summer. We currently have two students who participated in the HIP interested in joining SWAT and becoming coaches making them the second and third coaches to join SWAT following participation in the HIP, the first having joined SWAT as a coach following her involvement in the Fall 2018 program.

**Program Highlights:**

During the Fall 2018 semester program, the Student Wellness Ambassador Team was recognized by the Clarion University Board of Trustee's for their outstanding service to students through the implementation of the Health Improvement Program. Two of our Health Coaches, Tiffany Bunch and Nicole Shreve, were invited to attend the Board of Trustee's meeting to highlight their efforts in addressing major health concerns among the Clarion University student body.

Funds provided by the ACHF allowed for the purchase of an on-site cholesterol screening tool. This tool is housed in our Health Services center and can be used by Health Services staff to expand services to non-HIP participants. Fees generated by this service will allow for continued funding for the HIP and the certification of our SWAT Health Coaches. There has

also been interest from faculty members in the Nutrition and Fitness degree program in providing screenings to their students as an educational activity.

The Health Improvement Program was featured in the American College Health Foundations' quarterly newsletter, *The Impact*, in their May 2019 edition.

References

National Institutes of Health. (2018). Hemoglobin A1c (HbA1c) Test. Retrieved from [www.medlineplus.gov](http://www.medlineplus.gov)

## Appendix A

## Program Modifications

	<b>Focus:</b>	<b>DPP-GLB Sessions:</b>
1	Introduction To Program	1
2	Physical Activity I	4
3	Nutrition I	2,3 & 5
4	Lifestyle Management I	6 & 7
5	Physical Activity II	8
6	Lifestyle Management II	9
7	Nutrition II	10
8	Nutrition III	15 & 18
9	Physical Activity III	13 & 17
10	Lifestyle Management III	11 & 12
11	Lifestyle Management IV	14 & 16
12	Conclusion Of Program	

Appendix B

Recruitment, Pre and Post Screening Material

\*Material supplied in a separate document.



## Appendix C

## Gallagher Koster Award Funds Budgetary Breakdown

<b>Item</b>	<b>Quantity</b>	<b>Price</b>
CardioChek® Plus analyzer Product Code: 2700PTS	1	\$749.00
PTS Diagnostics Lipid Panel Test Strips	8 (15 strips per pack)	\$1120.00 (\$140.00 ea.)
PTS Collection Device 40ul. 16/bag	8	\$44.00 (5.50 ea.)
CardioChek Controls HDL	1	\$47.44
CardioChek Controls Glucose, TG, TC	1	\$29.94
Letufit fitness tracker	55	\$1485.00 (27.00 ea.)
<b>**Total</b>		\$3,475.38

\*\*Total may be different due to S&H