TEENS HELPING TEENS TO PROMOTE POSITIVE BODY IMAGE AND TO PREVENT EATING DISORDERS

By Kelly Staves, Matt Kurtis, Alex Kurtis, Devin Majkut, Kristin DeRose, Daria Harper, Hilde Holgate, Kara Koenig, Lauren Flynn, Emmy Russell and Alexandra Binder.

June 2004

We are a team of 11 high school students who developed a teenage peer to peer program of education to prevent negative body image and other risk factors for developing eating disorders. With an estimated 15% of teen girls and a growing number of teen boys having abnormal eating attitudes and behaviors, this issue has clearly become a major societal health problem. As the epidemic of obesity collides with the negative societal prejudices and stereotypes associated with being overweight, more and more teens are developing poor body images and resorting to dieting and abnormal eating behaviors. We believe that eating disorders are just the tip of the iceberg. The body of that iceberg is composed of negative self esteem caused by the pressures to conform to our society's narrow definition of beauty. We developed a curriculum to educate and arm our high school peers with the knowledge, the motivation and the concrete action options necessary to resist social pressures to be thin. We sought to change the social norms and values of a 10th grade peer group by empowering students to reach out to their affected friends. Our intent was to show them how they can promote an environment that judges people on who they are rather than by how they look. We believe that by educating and involving high school students, we can encourage them to create a school environment that is sensitive and respectful, where every student can be a part of the solution.

Background and Rationale for the Study:

In order to design prevention program we reviewed the literature to see what approaches had been tried, hoping to build on previous successes. The first thing we learned is that improving knowledge alone does not work. Prevention programs need to address fundamental attitudes. There are three basic types of prevention models that have been developed: One focuses on addressing psychological issues: coping skills and self esteem.[8] This was not an appropriate model to use on a general in a classroom setting and overall has not been shown to be very effective. (This approach is better used one on one with students already identified as being high risk for eating disorders.) A second model focuses on addressing issues which predispose people to feeling bad about their bodies. Prevention programs in this category emphasize body image, weight and shape concerns, resisting cultural factors and the risks for eating disorders and the dangers of eating disorders.[8] Many projects have used this model but only about 20% have shown long term benefits.[8] The third and latest model is the Ecological model which tries to change the norms of the social environment. This model tries to also address peer, family and teacher expectations. The theory is that you need to work on all the sociocultural factors that contribute to beliefs that influence behaviors.

We chose to use a combination of model two and three. We designed the content of our curriculum around model two but we chose a unique intervention method that emphasized sociocultural change through peer education. Of note is that we found almost no programs using peer educators. There is an extensive body of literature that strongly suggests that peer assisted learning is a powerful tool when it comes to developing crucial life skill. We took advantage of this by using high school and college students to deliver our curriculum and to lead open discussions on a topic which is of universal interest to every high school student: our body image. Additionally we believed that we could enlist every student hearing our message to play a role in changing the environment in which they and their peers interact. We believed that we could teach them to be more sensitive and respectful of body differences and that they could play a role in reaching out to friends struggling with body issues. For this reason, we chose to include both males and females. Although eating disorders are more common amongst girls, we believe that their male peers can play a major role in decreasing pressures to fit a physical stereotype. We were fortunate to be backed by an organization called What Kids Can Do who believes in empowering students to address issues which affect their student communities. They provided us with a generous grant from the Bill and Melinda Gates Foundation which made our project possible.

In order to measure whether or not our program was successful, we extensively researched the existing literature on eating disorders in order to find validated questionnaires. It is hard to measure things like attitude changes, body image and risk reduction for developing eating disorders. Luckily a lot of research has been done in the field and we were able to use the existing literature to develop various subscales to measure if our program improved attitudes and body image. We asked two main questions:

1. ***Can a peer education program reduce negative body images amongst high school Students****?* As body image is mostly tied into concerns about one's weight and shape, we chose research tools that measure weight and shape concerns, hypothesizing that our program would lead to a statistically significant decrease in both subscales.

Rationale:

- An important part of body image in our society revolves around our weight. Killen et al. developed a questionnaire called "Weight Concerns." [4,5] .This looks at a person's attitude towards their weight. (For example: "compared to other things in your life, how important is your weight to you?" or "Over the past 4 weeks, have you felt fat?") They were able to show that girls who scored 57 or higher on the Weight Concerns scale were at higher risk for developing an eating disorder. This was 86% sensitive and 63% specific. Attitude towards one's weight matters: the literature indicates that reducing the levels of weight concerns correlates with decreasing the risk of developing eating disorders (Note: As the weight concerns questionnaire was designed for a female audience, we also developed an additional separate question designed to look at whether or not males were unhappy with their weight. As the male ideal is heavily muscled, we asked "over the past 4 weeks have you felt scrawny?")
- In order to look at shape concerns we chose to focus on five questions from the shape concern subscale of the extensively studied and validated 12th Edition of the Eating Disorder Examination.[2] This included questions like "Over the past four weeks, have you been dissatisfied with your shape?" and "Over the past

four weeks, has your shape been important in influencing how you feel about yourself as a person?"

2. ***Can a peer education program decrease known risk factors for the development of eating disorders?*** To answer this we chose to use the Eating Concern Subscale and the Eating Disorder Risks Subscale, hypothesizing again that our intervention would lead to a statistically significant decrease in these subscales.

   Rationale:
   - The Eating Concern Subscale is another subscale from the well respected Eating Disorder Examination[2] that measures unhealthy attitudes towards eating. Some examples of the questions include "Over the past 4 weeks, have you felt guilty after eating?" and "Over the past 4 weeks, have you been afraid of losing control over eating?"
   - Our Eating Disorder Risks Subscale was developed using questions from the Eating Disorder Inventory, one of the gold standards in the research literature. This is a highly respected questionnaire which is designed to measure a variety of psychological and behavioral characteristics common amongst people with or at risk for eating disorders.[3] We chose some of their questions used to screen for bulimia and anorexia nervosa. They were asked to rate themselves on statements such as: "I am preoccupied with the desire to be thinner" or "After eating, I have the thought of trying to vomit or taking laxatives in order to keep from gaining weight." (It should be noted that as we used only some of their questions so we cannot rule out that some of the validity has been compromised).

Additionally we wanted to look at various other issues for which we developed our own survey questions. (Although unvalidated, we felt they would be important to help us develop even more effective programs in the future.) We asked:

- **Can a peer education program increase the number of students reaching out to friends who they fear are at risk for an eating disorder?** We hypothesized that there would be a statistically significant increase in the number of students recognizing they have friend(s) at risk and of those, there would be an increase in the number of students intending to act on that concern.
- **Can a peer education program increase the self identification of high school students recognizing that they themselves have risk factors for developing eating disorders?** We hypothesized that there would be a statistically significant increase in the number of students recognizing that they have risk factors for developing eating disorders and of those, there would be a increase in the number of students intending to act on that concern.
- **Does playing competitive sports or dance play a role in body dissatisfaction and weight concerns? Are student athletes more likely to feel pressured about their weight?** We hypothesized that students playing competitive sports would be statistically more likely to score higher on the Weight Concerns and the Shape Concern Subscales and that students playing competitive sports would be statistically more likely to report Pressure to Maintain Weight on the screen than students not involved in competitive sports.

- **Are students using exercise in an unhealthy manner in an attempt to improve their body shape?** To get at this we developed a “Commitment to Exercise” scale. We adapted this from the validated questionnaire developed by *Davis et al.*[1] *(*We selected 3 of their 8 questions and developed our own combined scoring method. This is meant to be a screen for over-exercising compulsively to control weight. It has not been validated as a measurement tool. We asked things like “Do you feel guilty that you have somehow let yourself down when you miss your exercise session?” We hypothesized that students would be statistically less likely to use exercise in an unhealthy manner after our intervention as measured by our “Commitment to Exercise” scale.
- **Feedback questionnaire:** Our final level of analysis was to obtain feedback from the students and their teachers in order to guide us in improving the program for the future.

Our Approach and Methods

Team Building:

Upon receiving the generous grant from the Bill and Melinda Gates foundation through the What Kids Can Do Program, we were able to recruit a team of 11 students at Sehome High School. They were chosen for their leadership qualities, communication skills and scientific/computer skills. We were fortunate to be able to get input and advice from many talented adults both at school and in the community. These included teachers, counselors, the school administration, three PhD’s with expertise in treating eating disorders, an MD/MPH with knowledge in research design, some wonderful people at Western Washington University, and the Whatcom Coalition for Eating Disorders. Additionally, well known researchers at Stanford University and Harvard University shared curriculum materials and measurement tools with us. We are very grateful for all this generous outpouring of assistance and support. (Please see the Acknowledgements)

Study design: The primary design was based on a survey instrument which we developed. This was administered prior to the intervention and again one month after the intervention to Sehome High School students. It was also administered to the control high school (Squalicum) which did not receive the intervention. Objectives were clearly defined and expressed in measurable terms. We are grateful to Michael Levine and Niva Piran for their excellent chapter in Eating Disorders: Innovative Directions in Research and Practice[8] which provided an overall approach to designing our prevention program.

Target Population:

We chose to aim our intervention at students primarily in the l0th grade, taking Health and Honors Biology. We wanted to try to reach as many students as possible within a peer group. As most friendships tend to form between students within the same class, we hoped it would improve our chances of really causing changes in group norms.
Sehome High School is a 1600 student high school in Bellingham, Washington (88% White, 1% black, 2% Am.Indian, 6% Asian, 3% Hispanic). We chose 5 classes of Health and 5

classes of Honors Biology, all courses which enroll primarily sophomores. Our sample size was 235. The mean age was 15.78 (+/- .97); the mean BMI (Body Mass Index) was 22.4 (+/- 3.64.) Our control school was Squalicum High School, also in Bellingham, Washington (84%white, 1.5% black, 1.5% Am. Indian, 7% Asian, 6% Hispanic.) We also chose Health and Biology classes, again predominantly sophomores. Their average age was 15.76 (+/-.67) with a sample size of 124 and a mean BMI of 22.12 (+/- 3.61). At baseline, there was no statistically significant difference between the Sehome and Squalicum controls by age, BMI, weight concern, shape concern, eating concern or eating disorders risks subscales.

Assessment measures:

As discussed earlier, we used a questionnaire consisting of multiple validated subscales supplemented with a few of our own unvalidated questions. Scoring methods and interpretation for these various subscales are included in appendix B. For the actual questions used, see Appendix A.

BMI (Body Mass Index) was calculated using self reported weights (shown to correlate well with actual weight[14,10]) A normal BMI is 18 to 25.

The questionnaire was completely anonymous and carefully reviewed by several experts and by the administration. Careful standardized instructions were developed for administering the questionnaire in an attempt to ensure students were able to be open and honest about their answers, rather than trying to give the "correct" answer. We extensively researched and carefully followed the code of federal regulation which involves the protection of human subjects.[16]

Statistical Analyses:

We performed an analysis to see if there were any statistically significant differences at baseline between our target population at Sehome high school and the control school Squalicum. (p value was set at .05). As all of our measures were non parametric except for BMI, we used the Mann Whitney 2 tailed non parametric test for unpaired groups using the GraphPad InStat Statistical program.[25,23] We showed that there was no statistically significant difference between our intervention group and the control group at baseline when it came to age, BMI, weight concern, shape concern, eating concern or eating disorders risks subscales. Then using the same statistical test we went on to compare Sehome students before and 1 month after the intervention looking for statistically significant changes in our outcomes measures. (As we were unable to compare the before and after answers by individuals for privacy reasons, we analyzed the before and after data as if they were unpaired groups). Please see the results section.

Development of the Curriculum:

We reviewed multiple existing educational materials including existing curriculum such as the Go Girl curriculum[19], The 5 day Lesson Plan on Eating Disorders[21], educational materials of the National Eating Disorders Association[20], various websites, books[7,8,13,15] and Power Point presentations generously provided to us by Western Washington University and Dr. Levine at Harvard. We also are grateful to the Harvard Eating Disorders Center for sharing their curriculum "Full of Ourselves"[18] for free and to Drs. Taylor and Winzelberg at Stanford University Medical School for allowing us to view their computer assisted psycho-educational program called Student Bodies. We are also thankful for the makers of the outstanding video called "Beyond Killing Us Softly". With the help of our three experts in the

field of eating disorders, we were able to use these rich materials to develop two one hour presentations involving a combination of lecture, power point presentations, audio-visual aids, video clips and open classroom discussion. We covered the risks of dieting eating disorders, pressures to conform to ideal body stereotypes by both men and women, cultural messages that influence the image we have of our bodies, media influences, strategies to resist those messages, fighting weightism, what can you do to help prevent eating disorders, how you can reach out to friends with poor body image or suspected eating issues, and finally how to access resources. We tried to make the curriculum relevant to all and to focus on empowering each student. We wanted them to feel they could make a difference in their school and for their friends.

Once the curriculum was approved by our experts and by the administration, we formed four teams of 2-3 students and underwent training in presentation/discussion skills by two teachers and a psychologist. The first two one hour presentations were run by these teams.

The third one hour session was given by the Positive Body Image group from Western Washington University. These college students presented their well known interactive program which focuses on skills to resist social pressures and messages and emphasizes how to have a positive body image.

Development of the Website:

In order to spread the word beyond our school, we developed a website, based on materials taken from our curriculum. We have reviewed many existing websites and linked together those resources that we found to be relevant to a high school aged population. We hope over time to contact many of these websites and ask them to also link into our site. We temporarily can be found at: http://www.geocities.com/mkurtis1/eatingdisorders.html. A permanent website URL is under construction.

Mobilizing Support:

We have been invited to present our findings to the school district administration. It is our hope that we can get them to agree to make our curriculum part of the permanent Health curriculum at the three local high schools. We have built a strong support for this amongst the health and biology teachers at both high schools and amongst several members of the administration. We hope that the school district will continue to support students interested in continuing this work next year by perhaps allowing them to expand the peer education program to middle schools in the area. We have already had three middle schools express an interest. We'd also like to see them reach out to also involve the faculty at large, coaches and parents to magnify the attempt to change the social environment in which high school students form their body image. Finally we hope to publish our results and to get the word out about our model program to the many existing organization in this country that are trying to make a difference for teens suffering from poor body image and disordered eating.

RESULTS

Descriptive Data: (See Table # 1)

Sehome High School: (Intervention group): A remarkable 44.6% of females reported having dieted in the past year as compared to 13.8% of the males. 32.3% of females reported feeling moderately to markedly dissatisfied with their shape as compared to 10.8% of males. 57.5% of females reported feeling fat (sometimes, often, always) over the past four weeks versus l7.7% of males. (See table 1 for more interesting gender differences to selected questions)
Of the 217 students, 18 scored over 57 on the weight concerns scale (14 females, 4 males) which has been shown to be 86% sensitive for eating disorders and 63% specific. Again, there were large gender differences. 14% of females scored over 57 (14 out of 102) compared to only 3% of males. After the intervention, there was no statistical significant change.

Squalicum High School (Control Group): There were no statistically significant differences in baseline scores on the Weight Concern subscale, the Shape Concern subscale, the Eating concern subscale or the Eating Disorder Risk subscale when comparing with the Sehome group.

Table # 1: Gender Differences in Responses to Selected Questions

Selected Question	Sehome Before		Sehome After
	Females	Males	Females
% actually overweight by BMI (BMI>25)	14.7%	21%	NC
% dieted in past year	44.6%	13.8%	NC
Over past 4 weeks felt fat (sometimes, often, always)	57.7%	17.7%	59.1%
Over the past 4 weeks I have felt scrawny (sometimes, often , always)	12.3%	16.9%	NC
Felt definitely self conscious about my body	23%	6.9%	14.8%
Dissatisfied with my shape (mod or marked)	32.3%	10.8%	46.6%
Shape influence how I feel about myself (moderate to very important)	21.5%	7.7%	21.6%
Think about dieting (often, usually, always)	33.8%	10.8%	NC
Worry more than my friends about weight	23%	11.5%	NC
Pre-occupied with a desire to be thinner (often, usually, always)	16.2%	2.3%	NC
Think I might have risks for eating disorders	26%	3%	NC

NC= not calculated

Program Evaluation:
80% of Sehome students reported that they found the program worthwhile. Of those, on third said it made a difference in their attitudes. 22% reported feeling more able to resist social pressures to conform to physical standards. 55% felt the message was more impactful coming from peer educators, 29% had no opinion. Only 16% thought adult educators would have been more impactful. 27% expressed interest in becoming peer educators on the topic next year.

Research Question 1:
Can a peer education program reduce the level or weight concerns and negative body images in high school students?
Hypothesis:
There will be a statistically significant decrease in weight concerns as measured by the Weight Concern subscale (range of subscale is 0-100) .(Questions 1-5)
There will be a statistically significant decrease in shape concerns as measured by the Shape Concern subscale. Range of subscale is 0-6). (Questions 6-10)
Results: See Table # 2
Conclusion: The hypothesis is rejected. There was no statistically significant difference in either the Weight Concerns subscale or the Shape Concern subscale after the intervention, even when the data was broken down by female sex. It appears our program did not affect body image.

TABLE #2: Body Image Before and After: Weight Concern Subscale and Shape Concern Subscale

	Mean +/- S.D (N= Sample Size)	**Statistical Test Used**	***Conclusion***
Sehome Pre-Intervention Weight Concern Subscale (scale 0-100)	25.18 +/- *21.8* (N=217)	Non parametric Mann-Whitney 2 tailed test	*P=.43 NO statistically significant difference*
Sehome Post-Intervention Weight Concern Subscale (scale 0-100)	24.0 +/- *22.4* (N= 199)		
Sehome Females Pre Intervention Weight Concern Subscale (Scale 0-100)	35.6 +/- *22.9* (N=102)	Non parametric Mann-Whitney 2 tailed test	*P=.70 NO statistically significant difference*
Sehome Females	34.65 +/- *23.9*		

Post- Intervention Weight Concern Subscale (Scale 0-100)	(N= 88)		
Sehome Females Pre-Intervention Shape Concern Subscale (Scale 0-6)	2.13 +/- *1.38* (median 1.6) (N= 99)	Non parametric Man-Whitney 2 tailed test	*p=.71 NO statistically significant difference*
Sehome Females Post Intervention Shape Concern Subscale (Scale 0-6)	2.17 +/- *1.32 (Median 2) (N=89)*		

Research Question 2:
Can a peer education program decrease known risk factors for the development of eating disorders?
Hypotheses:

There will be a statistically significant decrease in eating concerns as measured by the Eating Concern subscale. (Questions 11-14)

There will be a statistically significant decrease in unhealthy weight management behaviors as measured by the Eating Disorder Risks Subscale (Questions 2, 15-18)

Results: See Table 3

Conclusion: Although there was no statistical difference in attitude towards eating before and after, there was a statistically significant drop in unhealthy attitudes and behavioral characteristics common in people at risk for eating disorders. This drop was **not** seen in the Squalicum control group.

TABLE # 3: Risk Factors for the development of eating disorders, Before and After

	Mean +/- S.D (N= Sample Size)	**Statistical Test Used**	***Conclusion***
Sehome Females Pre-Intervention Eating Concern Subscale (scale 0-6)	.92 +/- *1.22* Median .5 (N-99)	Non parametric Mann-Whitney 2 tailed test	*p=.71. NO statistically significant difference*
Sehome Females Post-Intervention Eating Concern Subscale	.89 +/- *1.11* Median .5 (N=89)		

(scale 0-6)			
Sehome Females Pre Intervention Eating Disorder Risks Subscale (Scale 0-3)	.45 +/- *.56* (N=99)	Non parametric Mann-Whitney 2 tailed test	*p=.03 There was a statistically significant difference in unhealthy attitudes and behavioral characteristics*
Sehome Females Post- Intervention Eating disorder Risks Subscale (Scale 0-3*)*	.35 +/- *.60 (N=89)*		

Research Question 3:
Can a peer education program increase the number of students reaching out to friends who they fear are at risk for an eating disorder?
Hypothesis:

There will be a statistically significant increase in the number of students recognizing that they have friend(s) at risk for developing eating disorders, and of those, there will be an increase in the number of students intending to act on that concern. (Question 23)

Results:
Before the intervention: 27% of Sehome students (59 out of 217) report having a friend they think is at risk for an eating disorder. 39% of these students felt equipped to help and 41 out of the 59 planned to act (69%).
After the Intervention: 23% of Sehome students (45 out of 199) reported having a friend they though was at risk for an eating disorder. Now 60% felt equipped to help and 71% planned on acting. Of those planning on acting, more were planning on talking directly to their friend rather than reporting that they intended to learn more to try to figure out how to help. (This did not achieve statistical significance however)
Conclusion: After the program, significantly more students felt equipped to help their affected friend(s) and planned on reaching out to them.

Research Question 4
Can a peer education program increase the self identification of high school students recognizing that they themselves have risk factors for developing eating disorders?
Hypothesis:

There will be a statistically significant increase in the number of students recognizing that they have risk factors for developing eating disorders and of those, there will be a increase in the number of students intending to act on that concern. (Question 24)

Results:
Pre-Intervention: At Sehome 26% (27 out of 102) and 3% males (4 out of 115) self identified themselves as being at risk for developing eating disorders. Only 22.6% (7) planned to act on it (all females). (Interestingly, of the 16 girls that we identified as at risk by the weight concern scores, only 7 of them reported feeling at risk).

Post-Intervention: At Sehome, 26% (23 out of 88) and 4% of males (5 out of 110) self identified themselves as being at risk for developing eating disorders. Now 35.7% (10) now planned to act (7 females, 3 males). This positive trend did not achieve statistical significance however

Conclusion: Even before the intervention, a large percent of girls already recognized that they have risk factors for eating disorders. After the intervention, more appeared to express an interest in seeking help for this but this did not achieve statistical significance.

Our program also did appear to increase the likelihood of the few affected males seeking help but the numbers were too small to draw any conclusions.

Ancillary Questions:

Does playing competitive sports or dance play a role in body dissatisfaction and weight concerns? Are student athletes more likely to feel pressured about their weight? (questions 20-22)

Hypothesis:

Students playing competitive sports will be statistically more likely to score higher on the Weight Concerns and Shape concern subscales

Students playing competitive sports will be statistically more likely to report Pressure to Maintain Weight on the screen as than students not involved in competitive sports.

Results:

Unfortunately we were unable analyze weight and shape concern subscales for athletes versus non athletes due to a design problem in our questionnaire. We however found the following:

18% of student athletes report being pressured (often, usually or always) to gain or lose weight to perform better in their activity. Furthermore 14 % of these students report continuing to feel pressured even post season (often, usually or always)

18% report their coach had asked them to diet or lose weight.

Conclusions:

18% of athletes feel pressured about their weight.

Are students using exercise in an unhealthy manner in an attempt to improve their body shape? (Question 19)

Hypothesis:

Students are statistically less likely to use exercise in an unhealthy manner after our intervention as measured by our Commitment to Exercise scale. A score of 2 or more was considered to be "at risk"

Results: 13% (15 females, 7 males) scored 2 or more, and therefore were considered to be possibly at risk for using excessive exercise as an unhealthy weight management tool. After the intervention, only 7.5% scored in the at risk category. ($p=.13$ by Chi Squared test)

Conclusion:

There was a strong trend towards decrease in unhealthy weight management behavior through excessive exercise. This did not however achieve statistical significance. This drop was not seen in the Squalicum control group.

Conclusions:

Our study confirms that there is a substantial problem with body image amongst our high school's girls. In our study population, 57.7% of girls reported feeling fat (sometimes, often, always) over the past 4 weeks when by BMI, actually only 14.7% are considered overweight. 44.6% reported dieting sometime in the past year and 33.8% said they often, usually or always think about dieting. 16.2% felt pre-occupied with a desire to be thinner. 23% reported feeling definitely self conscious about their body and almost a third said they were dissatisfied with their body shape.

Overall, body image issues appeared to be less important to the males but, as is being reported in the literature, it is a growing issue and more and more males are reporting dissatisfaction with their bodies. In our study 17.7% reported feeling fat (sometimes, often or always) in the past 4 weeks which happened to correspond more accurately to reality. (21% had BMI's over 25). However another 16.9% reported feeling scrawny despite the fact that only 6.1% had BMI's under 18. (We believe this reflects the growing social pressures to have a very muscular upper body build.) However it appears that body image is not as likely to influence how they feel about themselves. Only 7.7% of males reported that their shape was important in how they felt about themselves as compared to 21.5% of the females.

Our study also confirmed that there are a substantial number of high school girls at risk for eating disorders. 18.5% scored over 57 on the weight concern subscale which is considered 86% sensitive and 63% specific for identifying students with eating disorders. This is consistent with the literature. Interestingly, an even higher number of girls (26%) self reported that they thought they had risks for eating disorders. (This was even before the intervention, suggesting that students are already very aware of the issue, although only 22.6% planned on doing anything about it).

We had hoped that our 3 part intervention program would improve body image and decrease known risk factors for the development of eating disorders. Instead we found little change in body image, yet we did find a significant drop in unhealthy attitudes and behavioral characteristics which are known risk factors for eating disorders. (This was statistically significant by our Eating Disorder risk subscale but did not achieve significance in our Eating Concern subscale) This drop was not seen in the control group. We believe these are true drops and not secondary to just a decreased likelihood of admitting to attitudes and behaviors identified as unhealthy. (We were impressed with the open honesty reflected in the questionnaires and the genuine interest in the Sehome students to participate in this student run study. We believe their answers to be honest and valid.) We don't know if these changes in unhealthy attitudes towards weight and weight management are likely to persist given the lack of a significant change in personal body image. This was disappointing and it may be that we need to address much younger students *before* their body image is fully formed. Of four well known studies in the literature on prevention in high school students[8], only one reported a long term change in attitude, suggesting that things like body image may already be too "set in stone" by the teen years.

On the positive side, we felt very happy with the content of the curriculum that we developed. 80% of students reported that they found the program worthwhile and of those, 1/3 said it made a difference in their attitudes. 22% reported feeling more able to resist social pressures to conform to physical standards. A majority felt that the message had more impact coming from peer educators. It is possible that a seed has been planted and that we have perhaps set the stage to foster a social environment amongst 10th graders which will allow healthier self image to evolve over time. We worked hard to promote the message that each and every student can play a crucial role in creating a supportive environment that is respectful of body differences by valuing people for who they are and not how they look. After our intervention, 60% of students felt equipped to help a friend at risk for an eating disorder as compared to only 39% before. 71% of them planned on acting. If they follow through on their intention, over time they may magnify the impact of the intervention and lead to delayed improvements in attitude and sustained improvement in unhealthy weight management behaviors. They may also be able to encourage at risk students to reach out for help. Of the 26% of students who felt they themselves were at risk, more intended to act after our intervention (33.7% as compared to 22.6% before) Their friends may play a very important role in encouraging them to actually act on their intentions.

It is our hope that we have laid the groundwork for change in the social environment of Sehome High School's 10th graders. We hope that we have made them more able to resist the outside negative cultural influences like the media. We also hope that we have inspired them to be more open and supportive of their fellow students and to look past the superficial. If enough act in this manner, more and more students will feel an easing of the fear of being judged by how they look. They will have succeeded in creating healthier values and norms in their peer community. Ideally this group should be followed over time through their next 2 years of high school with periodic brief refresher messages and annual repeats of the questionnaire assessment tool. We would like to see the program expand to educate and enlist other key players in the complex social environment that we as students live in: teachers, the administration, parents and coaches (18% of our students report feeling pressured to gain or lose weight to perform better in their activity. 18% reported their coach had asked them to diet or lose weight.) These represent other potential avenues for interrupting the prejudicial message that it's okay to judge a person by how they look. We are hopeful that future student groups will continue this important exciting research. We are also hopeful that other groups of students will take our curriculum and present it to middle schools throughout our community. A remarkable 27% of students who went through our intervention expressed an interest in becoming peer educators for the following year, validating our belief that students are willing and able to reach out and make a difference on topics that they really care about. Several middle schools have already expressed an interest and our team has been invited to present our findings to the school district where we hope to convince them to make this a permanent part of the l0th grade health curriculum throughout the school district.

What Kids Can Do believes that students are a valuable community resource that has been greatly under-tapped. By believing in us, and providing us with a generous grant from the Bill and Melinda Gates Foundation, we hope that we have passed on their empowering message to our fellow students. We hope to reach students beyond our school with this same message by actively linking our new website to other existing sites on body image, eating disorders, teens and peer education. We plan on sharing our full curriculum on this website, hoping others will use it to reach out to their peers in their own school settings.

Conclusions

"Never doubt that a small group of thoughtful committed citizens can change the world. Indeed, it's the only thing that ever has."

Margaret Mead

Acknowledgements:
Our sincere thanks to the What Kids Can Do organization and the Bill and Melinda Gates Foundation for making this experience possible. A special thank you to our advisor Peggy Taylor and to teachers Craig Ferguson and Kim Cobb for all their generous support throughout the year. A big thank you also to our community advisors Dr. Deena Rathkamp, Dr. Diane Staves, Dr. Djuna Harper, and Dr. Melissa McCreery. We couldn't have done this without you. We'd also like to thank Squalicum teachers Mrs. Lawson, Mrs. Knudsen and Mrs. Laas at Squalicum, the tech support staff and approval team from the Bellingham school district and the Sehome administration. We also would like to thank the Whatcom Coalition for Eating Disorders, the Harvard Eating Disorder Center, Drs Taylor, Winzelberg and Killen from Stanford University Medical School.

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Appendix A

Includes:
1. Main questionnaire
2. Post intervention program feedback form for Sehome students only

Instructions:

We are a group of high school students who are working together on a project about how teens perceive issues related to body image. This is a completely confidential survey so do not put your name on any of the pages. We need you to feel comfortable in putting down your honest answers. Remember, there are no right or wrong answers, we just want your honest opinions. We are trying to measure attitudes, feelings and behaviors related to perceptions about our bodies. Read each question and pick one answer which applies best for you. Please answer each question very carefully. Thank you.

Date:

Age:

Sex:

Height: feet inches

Weight:

What do you consider your ideal weight to be:

(1) How much *more* or *less* do you feel you worry about your weight and body shape than other students your age?

I worry a lot less than other students

I worry a little less than other students

I worry a about the same as other students

I worry a little more than other students

I worry a lot more than other students

(2) How afraid are you of gaining 3 pounds?

Not afraid of gaining

Slightly afraid of gaining

Moderately afraid of gaining

Very afraid of gaining

Terrified of gaining

(3) When was the last time you went on a diet?

I've never been on a diet

I was on a diet about one year ago

I was on a diet about 6 months ago

I was on a diet about 3 months ago

I was on a diet about 1 month ago

I was on a diet less than one month ago

I am now on a diet

(4) Compared to other things in your life, how important is your weight to you?

My weight is not important compared to other things in my life

My weight is a little more important than some other things

My weight is more important than most, but not all things in my life

My weight is the most important thing in my life

(5) Over the past 4 weeks, have you felt fat?

Never

Rarely

Sometimes

Often

Always

(5a) Over the past 4 weeks have you felt scrawny?

Never

Rarely

Sometimes

Often

Always

(6) Over the past 4 weeks, have you felt uncomfortable about others seeing your body during certain activities or when wearing clothes that show your shape?

No discomfort about others seeing my body

Some discomfort about others seeing my body

Definite discomfort about others seeing my body

Definite discomfort about others seeing my body to the point where I attempt to avoid certain activities or refuse to wear clothes which show my shape.

(7) Over the past 4 weeks, have you felt uncomfortable seeing your body in the mirror?

No discomfort about seeing my body

Some discomfort about seeing my body

Definite discomfort about seeing my body

Definite discomfort about seeing my body to the point I attempt to avoid all such occasions

(8) Over the past 4 weeks, have you been dissatisfied with your shape?

No dissatisfaction with shape

Slight dissatisfaction with shape but it doesn't upset me

Moderate dissatisfaction with shape to the point that it upsets me at times

Marked dissatisfaction with shape which is difficult for me emotionally in general

(9) Over the past 4 weeks have you had a definite desire to have a flat stomach?

No definite desire to have a flat stomach

Definite desire to have a flat stomach on less than half the days

Definite desire to have flat stomach on more than half the days

Definite desire to have a flat stomach every day

(10) Over the past 4 weeks, has your shape been important in influencing how you feel about yourself as a person?

No importance

Some importance (definitely an aspect of how I think and feel about myself)

Moderate importance (definitely one of the main aspects of how I think and feel about myself)

Very important (it is the most important factor in how I think and feel about myself)

(11) Over the past 4 weeks, have you felt guilty after eating?

No guilt after eating

Occasionally have felt guilty after eating

Often have felt guilty after eating

Always felt guilty after eating

(12) Over the past 4 weeks, have you been concerned about other people seeing you eat?

No concern about being seen eating by others

Have felt slight concern about being seen eating but I don't avoid such occasions

Have felt definite concern about being seen eating and occasionally avoid some such occasions

Have felt definite concern and go out of my way to avoid having other people see me eating

(13) Over the past 4 weeks, have you eaten in secret?

Have not eaten in secret

Have eaten in secret on less than half the days

Have eaten in secret on more than half the days

Have eaten in secret every day

(14) Over the past 4 weeks, have you been afraid of losing control over eating?

No fear of losing control

Fear of losing control present on less than half the days

Fear of losing control present on more than half the days

Fear of losing control present every day

(15) I eat when I am upset.

Never

Rarely

Sometimes

Often

Usually

Always

(16) I think about dieting.

Never

Rarely

Sometimes

Often

Usually

Always

(17) I am preoccupied with the desire to be thinner.

Never

Rarely

Sometimes

Often

Usually

Always

(18) After eating, I have the thought of trying to vomit or taking laxatives in order to lose weight or keep from gaining weight.

Never

Rarely

Sometimes

Often

Usually

Always

(19) Do you exercise regularly?

No

Yes. Number of times per week? [ ]

If you answered yes, please answer the following three questions.

(A) In the past 4 weeks, has it upset you if for one reason or another you were unable to exercise?

No

Occasionally

Usually

Always

(B) In the past 4 weeks, have you continued to exercise at times when you felt tired, unwell or had an injury?

No

Occasionally

Usually

Always

(C) Do you feel "guilty" that you have somehow "let yourself down" when you miss your exercise session?

No

Occasionally

Usually

Always

IF you are involved in an extra-curricular activity on or off campus answer the following three questions: If you are NOT involved in an extra-curricular activity then skip these three questions.

(20) Have you ever been pressured to gain or lose weight to perform better in your activity?

Never

Rarely

Sometimes

Often

Usually

Always

(21) Do you continue to feel pressured to gain or lose weight to perform better in your activity even after the season or activity is over?

Never

Rarely

Sometimes

Often

Usually

Always

(22) Has your coach ever asked you to diet or lose weight?

Yes

No

All Students: Answer all of the following *applicable* questions.

(23) Do you have a friend who you worry might have an eating disorder or is at risk for an eating disorder?

No

Yes. If You answered yes, answer the following questions:

A) Do you feel equipped to know how to help your friend?

No

Yes

B) Do you intend to talk to your friend about your concerns?

No

Yes

C) Do you intend to talk to an adult about your concerns?

No

Yes

D) Do you intend to learn more to try to figure out how to help?

No

Yes

(24) Do you think you might have risk factors for developing an eating disorder?

No

Yes. If you answered yes, answer the following questions:

A) Do you intend to talk to a friend or family member for advice?

No

Yes

B) Do you intend to talk to a professional for advice?

No

Yes

C) Do you intend to learn more on your own to try to help yourself?

No

Yes

Submit

PREVENTING NEGATIVE BODY IMAGE AND EATING DISORDERS: PROGRAM EVALUATION

Please help us improve our curriculum for the future. Thank you for helping us!

1. Do you think that the series of programs on promoting positive body image and preventing risk factors for eating disorders was worthwhile?

   a. Yes, I found it interesting and feel it has made a positive difference in my attitudes towards body weight and shape issues.
   b. Yes, I found it interesting but it really hasn't changed my attitudes.
   c. It was OK.
   d. It was a waste of time.

2. Do you feel more or less able to resist social pressures to be thin or muscular since hearing the various presentations?

   e. More able to resist social pressure
   f. No change
   g. The program made me more aware of social pressures and as a consequence, I worry it will make it even ***harder*** for me to resist the pressures to be thin or built.

3. This program used high school and college aged peers to deliver the message. What fits your opinion best?

   h. The message has more impact coming from peers
   i. The message is has less impact coming from peers. Adult presenters would likely have been better.
   j. No opinion.

4. Would you be willing to be a peer educator next year and help pass on what you have learned to others in the high school or middle school setting?

   k. Yes
   l. No

5. Feel free to write in any comments or suggestions for the program in the space below

APPENDIX B

SCORING THE SUBSCALES AND THEIR INTERPRETATION:

Weight Concern Subscale: (questions 1-5)

Developed and extensively validated by Killen et al[5]. Question 5a was added by us as research shows that boys who are unhappy with their weight often feel that they are too thin and not muscular enough. As our audience was approximately 50% males, we wanted to make sure to take this into consideration.

Scoring: Was scored out of 100 based on answers to 1 through 5. Each variable was scaled so that each ranged from 0-100, then we took an average of all 5 variables. A score of over 57 is 86% sensitive for eating disorders and 63% specific. We reported the percent of students scoring over 57 ("at risk") and also compared scores before and after the intervention. As Question 5a has been added by us, we analyzed it separately and reported both the percent of students who state they feel fat (sometimes, often, always) and the percent of students who state they feel scrawny (sometimes, often, always). These were broken down by gender to more accurately reflect differences in weight concerns between the sexes. Additionally we looked at the BMI of those reporting being unhappy with their weight to get a sense of the accuracy of their self perception.

Shape Concern Subscale: Questions 6-10

Derived from the extensively studied and validated subscale of the 12th Edition of the Eating Disorder Examination[2]

Scoring: Each question has 4 answers which can be grossly broken into: No, Some, Moderate, A Lot. Score 0 for no, 2 for some, 4 for moderate, and 6 for A Lot. We added the scores for questions 6-10 and divided by 5 to get the student's composite score for the Shape Concern Subscale.

The Eating Concern Subscale: Questions 11-14.

This was also derived from the Eating Disorder Examination (see above). (Of note is that many of the questions are considered screens for bulimia risk factors in the extensively used Eating Disorder Inventory)

Scoring: See above. We added scores for questions 11-14 and divided by 4.

The Eating Disorder Risks Subscale. (Questions 2, 15-18)

We developed this by incorporating some of the questions used to screen for bulimia and anorexia nervosa in the Eating Disorder Inventory, a widely respected and validated questionnaire used extensively in many research studies. It should be noted that as we have used only some of their questions and added one of our own (question 19), we cannot rule out that some of the validity has been compromised.[3]

Scoring:

Questions 2: (a) and (b) zero points, (c) one point, (d) 2 points, (e) 3 points

Questions 15-18 (a) (b) & (c) zero points, (d) one point, (e) 2 points, (f) 3 points

We added the scores from questions 2, 15-18, and then divided by 5.

The Commitment to Exercise Scale: (Question 19 a-c)

We adapted this from the validated questionnaire developed by Davis et al[1]. We selected 3 of their 8 questions and developed our own combined scoring method. This was meant to be a screen for over-exercising compulsively to control weight (a form of unhealthy weight management practice). It has not been validated as a measurement tool.

Scoring: (a) (b) zero points (c) 2pts (d) 4pts. We totaled the points for the three sub questions and divided by three. Scores of 2 or more were considered to be potentially at risk.

Recognizing Friends at Risk: Question 23, 23a-d:

This question was developed by us.

For those answering "Yes", an intention to act score was calculated: One point each was given for yes answers to questions b-d. These points were then added together to give the "intention to act score".

Recognizing Self at Risk: Question 24.24a-c:

This question was developed by us

For those answering "yes", an intention to act score was calculated: One point each was given for yes answers to question 24a-c. These points were then added together to give the "intention to act score" for this question.

Pressure to Maintain Weight Screen: (Questions 21-23)

This was developed by us to attempt to discern if athletics plays a role in students feeling pressured about their weight. It is not derived from any existing validated screens.

No group scoring was used in this subscale. The results were analyzed individually