



Champions for Change

Arizona Nutrition Network

Arizona Building Better Bones Program Evaluation

2008-2009

Prepared by
Shelley Kuklish
Epidemiologist

July 2009

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Table of Contents

Executive Summary3

Introduction.....5

Methods.....6

Results6

Arizona.....6

Coconino County.....11

Maricopa County15

Mohave County18

Navajo County.....23

Yuma County27

Washington Elementary School District.....31

Conclusions.....35

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Executive Summary

- The overall goal of the Building Better Bones Program (BBB) is to increase awareness of osteoporosis as a preventable disease by practicing healthy lifestyles including consuming a healthy diet high in calcium and engaging in regular weight bearing physical activity.
- During the 2008-2009 school year, an estimated 5,021 students participated in the BBB Program
 - There was a 2% increase in participation from the 2007-2008 school year.
 - The majority (98.8%) of participating schools were considered low income.
 - Most (96.0%) students were in fifth grade.
- All knowledge-related questions assessed in the tests showed a statistically significant increase between the pre and post tests.
 - Four of the nine questions showed a vast improvement between pre- and post-test:
 - Students were 23.8 times more likely to correctly answer the question “What percent Daily Value for calcium do students your age need?”
 - Students were 18.4 times more likely to correctly answer the question “Which activity does not build better bones?”
 - Students were 13.1 times more likely to correctly answer the question “What is osteoporosis?”
 - Students were 12.0 times more likely to correctly answer the question “90% of bone density will be built by what age?”
- Both of the behavior-related questions assessed in the tests showed a statistically significant increase between the pre and post tests.
 - Dairy Consumption
 - Almost half (46.9%) of students reported consuming three or more servings from the milk group the previous day on the post-test.
 - Students were 2.5 times more likely to have reported consuming three or more servings from the milk group on the previous day after completion of the BBB Program.
 - Two-thirds (65.9%) of students reported that they drank or ate more calcium foods after the BBB Program.
 - Physical Activity
 - Over one-third (35.2%) of students reported on the pre-test that they participated in 60 minutes or more of physical activity on the previous day on the pre-test, increasing to just over half (53.7%) after completion of the BBB Program.
 - Students were 2.1 times more likely to have reported participating in 60 or more minutes of physical activity on the previous day after completion of the BBB Program.

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

- Over three-quarters (77.3%) of students reported that the BBB Program has helped them become more physically active.

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Introduction

Building strong bones during adolescence and early adulthood is a key defense against the development of osteoporosis in later life. The overall goal of the Building Better Bones Program (BBB) is to increase awareness of osteoporosis as a preventable disease by practicing healthy lifestyles including consuming a healthy diet high in calcium and engaging in regular weight bearing physical activity.

Program Objectives

The BBB Program includes three interactive classroom lessons:

- Class 1: Identify appropriate dietary guidelines for maintenance of health.
- Class 2: Identify adequate amounts and sources of calcium.
- Class 3: Engage in daily weight bearing physical activity.

Arizona Nutrition Network Local Incentive Awards Projects were selected to develop and implement the three-class curriculum for the BBB Program. The BBB Program curriculum focuses on those behaviors that help to build and maintain bone mass.

This set of three classes is designed to deliver the osteoporosis prevention messages through interactive, age-appropriate methods. While some information is delivered through mini-lectures, other methods may include educational games, puzzles, word search, videos, and portable exhibits.

Upon completion of the curriculum the students will be able to:

1. Define osteoporosis.
2. Recognize 130% Daily Value as the goal for calcium intake.
3. Identify the Percent Daily Value for calcium on the Nutrition Facts Label.
4. Identify the number of daily servings to meet calcium needs.
5. Identify foods that contain calcium.
6. Identify the most important years for building denser, stronger bones.
7. Plan a meal that provides at least 40% Daily Value for calcium.
8. Recognize weight bearing and lifting activities as those that help build and preserve bone.
9. Participate in at least four activities that strengthen bone.
10. Prepare and keep a physical activity log for at least one week.
11. Identify the recommendation for physical activity: accumulate 60 minutes or more of physical activity at least five days per week, preferably every day of the week.
12. Evaluate the amount of calcium in a chosen meal.

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Methods

Each child who participated in the BBB Program was given a pre-test prior to the first session, and a post-test after completion of the third session. Pre-tests and post-tests were not matched as no identifying information regarding the respondent was collected on the test. The tests contain nine knowledge-related questions and two behavioral questions. The post-test contains two additional behavioral questions to assess if behaviors have changed after completion of the BBB Program. Odds ratios were calculated for each question in order to determine if there was a statistically significant increase in knowledge from pre-test to post-test. The odds ratios can be interpreted as the student was x times more likely to answer the question correctly on the post-test after attending the BBB lessons. Odds ratios less than one indicate that a student was less likely to have answered correctly on the post-test. For the purposes of this document, when discussing changes from pre- to post-test using odds ratios, a vast improvement is defined as an odds ratio of 10.0 or greater, and a large improvement is defined as an odds ratio of 5.0 or greater. P-values based on the odds ratios were calculated and were considered statistically significant at the <0.05 level. All tests were submitted to the Arizona Nutrition Network in the Bureau of USDA Nutrition Programs at the Arizona Department of Health Services. The tests were entered into Microsoft Access and analyzed using SPSS 16.0.

Results

Table 1. Characteristics of Arizona Students Participating in the Building Better Bones Program, 2008-2009		
Characteristic	Number of Students	Percent of Total
Test		
Pre-tests	5,037	50.2
Post-tests	5,004	49.8
Participating Schools		
	80	
Income		
Schools with more than 50% of students receiving a free or reduced lunch	79	98.8
Grade*		
1 st grade	1	0.0
3 rd grade	7	0.1
4 th grade	95	1.9
5 th grade	4,834	96.0
6 th grade	78	1.5
7 th grade	4	0.1
8 th grade	1	0.0
Undefined	17	0.3
Gender*		
Boy	2,557	50.8
Girl	2,461	48.9
Undefined	19	0.4
Total Pre-/Post-tests Received	10,041	

*Descriptive statistics are based on the highest number of students who took the pre- or post-test.

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

During the 2008-2009 school year, 10,041 pre and post tests were completed. This breaks down to 5,037 pre-tests and 5,004 post-tests. An estimated 5,021 students participated in the Building Better Bones lessons, reaching approximately 94 more students than the 2007-2008 school year. This translates into a 2% increase in participation. The majority (98.8%) of participating schools had at least 50% of students receiving a free or reduced lunch through the National School Lunch Program. Most (96.0%) students were in fifth grade, but the curriculum was also provided to some first through eighth graders (3.7%)

Knowledge

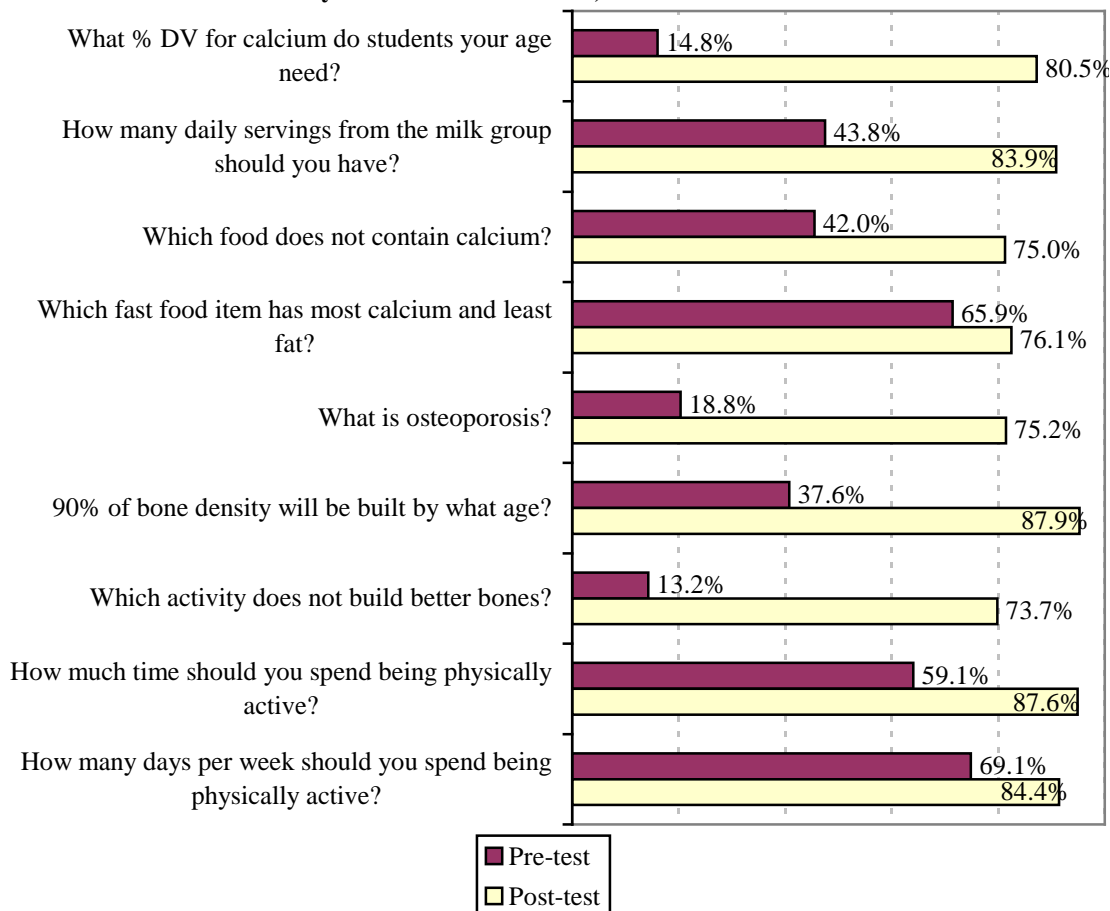
As Table 2 shows, all knowledge questions assessed in the tests showed a statistically significant increase between the pre and post tests. Four questions showed a vast improvement from pre- to post-test. Students were 23.8 times more likely to correctly answer the question “What percent Daily Value for calcium do students your age need?”, were 18.4 times more likely to correctly answer the question “Which activity does not build better bones?”, were 13.1 times more likely to correctly answer the question “What is osteoporosis?”, and were 12.0 times more likely to correctly answer the question “90% of bone density will be built by what age?” after completion of the BBB Program.

Table 2. Arizona Students' Knowledge Before and After Participating in the Building Better Bones Program, 2008-2009						
Question	Answered Correctly/Affirmatively				Odds Ratio	P-value
	Pre-test n=5,037 %		Post-test n=5,004 %			
What % DV for calcium do students your age need? (130%)	744	14.8	4,027	80.5	23.8	<0.0001
How many daily servings from the milk group should you have? (3 or more)	2,205	43.8	4,198	83.9	6.7	<0.0001
Which food does not contain calcium? (Chicken)	2,116	42.0	3,755	75.0	4.2	<0.0001
Which fast food item has most calcium and least fat? (Low fat chocolate milk)	3,319	65.9	3,809	76.1	1.7	<0.0001
What is osteoporosis? (Porous bones)	945	18.8	3,764	75.2	13.1	<0.0001
90% of bone density will be built by what age? (18 years)	1,893	37.6	4,397	87.9	12.0	<0.0001
Which activity does not build better bones? (Swimming)	665	13.2	3,689	73.7	18.4	<0.0001
How much time should you spend being physically active? (60 minutes or more)	2,979	59.1	4,383	87.6	4.9	<0.0001
How many days per week should you spend being physically active? (All or most days of the week)	3,483	69.1	4,223	84.4	2.4	<0.0001

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Figure 1 shows the percentage of students who correctly answered the knowledge questions from pre- to post-test. As the Figure demonstrates, the percentage of students who correctly answered each question increased from pre- to post-test.

Figure 1. Percentage of Students Who Answered Knowledge Questions Correctly From Pre- to Post-test, Arizona BBB 2008-2009



Behavior

As Table 3 shows, all behavioral questions assessed showed a statistically significant increase between the pre and post tests.

Dairy Consumption

Just over one-quarter (26.2%) of students reported on the pre-test that they consumed three or more servings of milk products on the previous day, increasing to just under half (46.9%) after completion of the BBB Program. Furthermore, students were 2.5 times more likely to have reported that they consumed the recommended amount of milk products after completion of the BBB Program. Although just under half of students reported consuming three or more servings of dairy products the previous day on the post-test, two-thirds (65.9%) reported that they drank or ate more calcium foods after the BBB Program.

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Physical Activity

The physical activity question has two answers that meet or exceed the minimum recommendations for physical activity: “60 minutes or more” and “2 hours or more”. Just over one-third (35.2%) of students reported on the pre-test that they participated in 60 minutes or more of physical activity on the previous day on the pre-test. This increased to just over half (53.7%) after completion of the BBB Program. Furthermore, students were 2.1 times more likely to have reported participating in 60 minutes or more of physical activity on the previous day. When combining the students who answered that they participated in physical activity for “60 minutes or more” with those who answered “2 hours or more” on the previous day, over two-thirds (71.1%) of students reported on the pre-test that they participated in adequate physical activity, increasing to 81.4 percent after completion of the BBB Program. Furthermore, students were 1.8 times more likely to have participated in 60 minutes or more, or two hours or more of physical activity after completion of the BBB Program. Just over three-quarters (77.3%) of students reported that the BBB Program has helped them become more physically active.

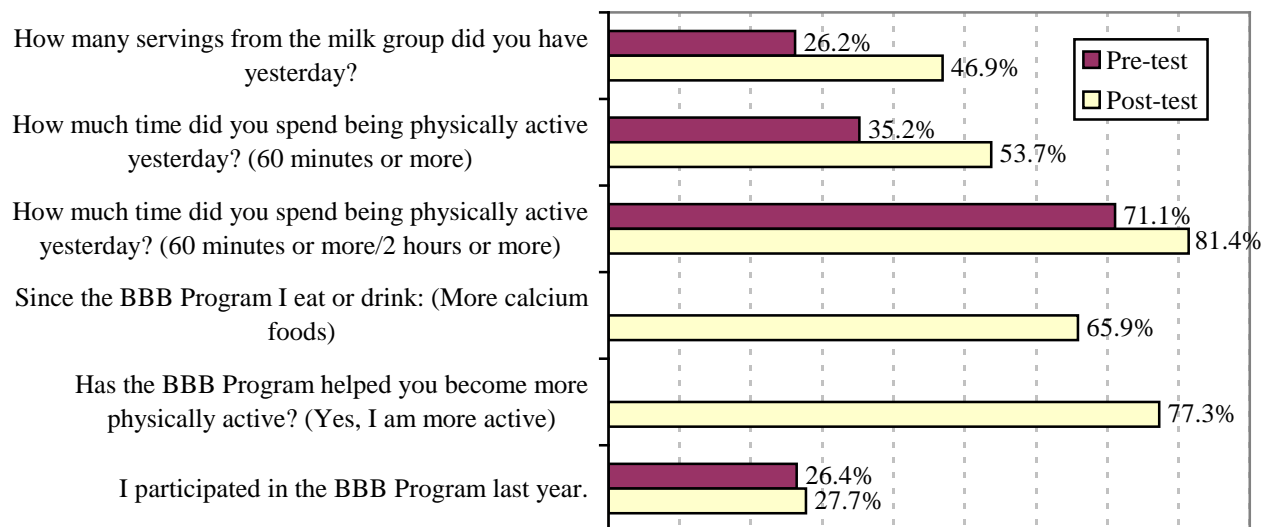
Table 3. Arizona Students’ Behavior Before and After Participating in the Building Better Bones Program, 2008-2009

Question	Answered Correctly/Affirmatively				Odds Ratio	P-value
	Pre-test n=5,037		Post-test n=5,004			
		%		%		
How many servings from the milk group did you have yesterday? (3 or more)	1,318	26.2	2,348	46.9	2.5	<0.0001
How much time did you spend being physically active yesterday? (60 minutes or more)	1,772	35.2	2,689	53.7	2.1	<0.0001
How much time did you spend being physically active yesterday? (60 minutes or more / 2 hours or more)	3,580	71.1	4,071	81.4	1.8	<0.0001
Since the BBB Program I eat or drink: (More calcium foods)			3,296	65.9		
Has the BBB Program helped you become more physically active? (Yes, I am more active)			3,870	77.3		
Did you attend the BBB Program last year? (Yes)	1,329	26.4	1,387	27.7		

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Figure 2 shows the percentage of students who reported meeting the recommendations for dairy consumption and physical activity from pre- to post-test. As the Figure demonstrates, the percentage of students who answered each question appropriately increased from pre- to post-test. The questions “Since the BBB Program I eat or drink:” and “Has the BBB Program helped you become more physically active?” were only asked on the post-test.

Figure 2. Behavioral Change of Students from Pre- to Post-test, Arizona BBB 2008-2009



Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Coconino County

Table 4. Characteristics of Coconino County Students Participating in the Building Better Bones Program, 2008-2009		
Characteristic	Number of Students	Percent of Total
Test		
Pre-tests	603	51.8
Post-tests	560	48.2
Participating Schools		
	12	
Income		
Schools with more than 50% of students receiving a free or reduced lunch	12	100.0
Grade*		
4 th grade	12	2.0
5 th grade	568	94.2
6 th grade	21	3.5
Undefined	2	0.3
Gender*		
Boy	300	49.8
Girl	303	50.2
Total Pre-/Post-tests Received	1,163	

*Descriptive statistics are based on the highest number of students who took the pre- or post-test.

During the 2008-2009 school year, 1,163 pre and post tests were completed in Coconino County. This breaks down to 603 pre-tests and 560 post-tests. An estimated 582 students participated in the Building Better Bones lessons, reaching approximately 94 more students than the 2007-2008 school year. This translates into a 19% increase in participation. All participating schools had at least 50% of students receiving a free or reduced lunch through the National School Lunch Program. Most (94.2%) students were in fifth grade, but the curriculum was also provided to some fourth and sixth graders (2.0% and 3.5% respectively).

Knowledge

As Table 5 shows, all knowledge questions assessed showed a statistically significant increase between the pre and post tests, and two questions showed a vast improvement between pre- and post-test. Students were 31.5 times more likely to correctly answer the question “What percent Daily Value for calcium do students your age need?”, and were 10.8 times more likely to correctly answer the question “What is osteoporosis?” after completion of the BBB Program.

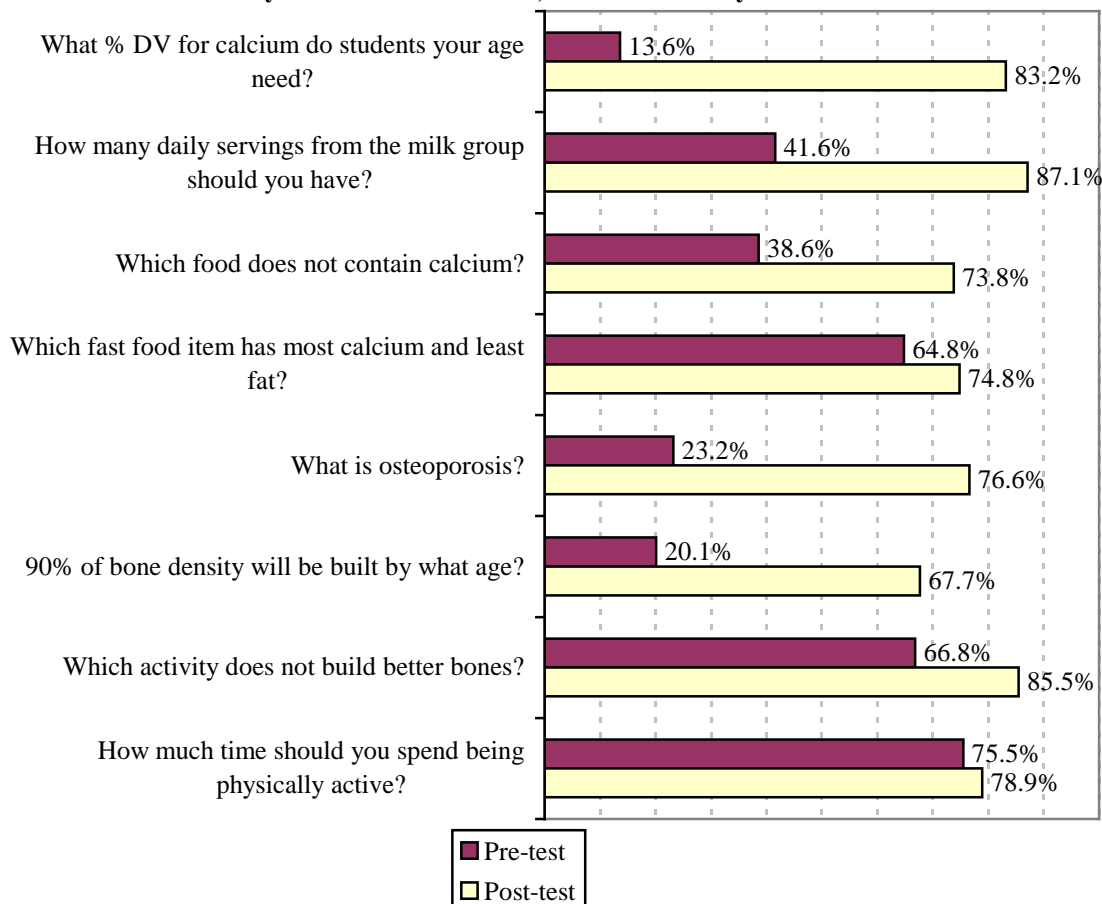
Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Table 5. Coconino County Students' Knowledge Before and After Participating in the Building Better Bones Program, 2008-2009						
Question	Answered Correctly/Affirmatively				Odds Ratio	P-value
	Pre-test n=603		Post-test n=560			
		%		%		
What % DV for calcium do students your age need? (130%)	82	13.6	466	83.2	31.5	<0.0001
How many daily servings from the milk group should you have? (3 or more)	251	41.6	488	87.1	9.5	<0.0001
Which food does not contain calcium? (Chicken)	233	38.6	413	73.8	4.5	<0.0001
Which fast food item has most calcium and least fat? (Low fat chocolate milk)	391	64.8	419	74.8	1.6	<0.0001
What is osteoporosis? (Porous bones)	140	23.2	429	76.6	10.8	<0.0001
90% of bone density will be built by what age? (18 years)	255	42.3	474	84.6	7.5	<0.0001
Which activity does not build better bones? (Swimming)	121	20.1	379	67.7	8.3	<0.0001
How much time should you spend being physically active? (60 minutes or more)	403	66.8	479	85.5	2.9	<0.0001
How many days per week should you spend being physically active? (All or most days of the week)	455	75.5	442	78.9	1.2	0.16

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Figure 3 shows the percentage of students who correctly answered the knowledge questions from pre- to post-test. As the Figure demonstrates, the percentage of students who correctly answered each question increased from pre- to post-test.

Figure 3. Percentage of Students Who Answered Knowledge Questions Correctly From Pre- to Post-test, Coconino County BBB 2008-2009



Behavior

As Table 6 shows, all of the behavioral questions assessed showed a statistically significant increase between the pre and post tests.

Dairy Consumption

Over one-quarter (26.4%) of students reported on the pre-test that they consumed three or more servings of milk products on the previous day, increasing to just under half (49.1%) after completing the BBB Program. Furthermore, students were 2.7 times more likely to have consumed the recommended amount of milk products after completion of the BBB Program. Although just under half (49.1) of students reported on the post-test that they consumed three or more servings of dairy products on the previous day, almost two-thirds (65.7%) of students reported that they drank or ate more calcium foods after the BBB Program.

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Physical Activity

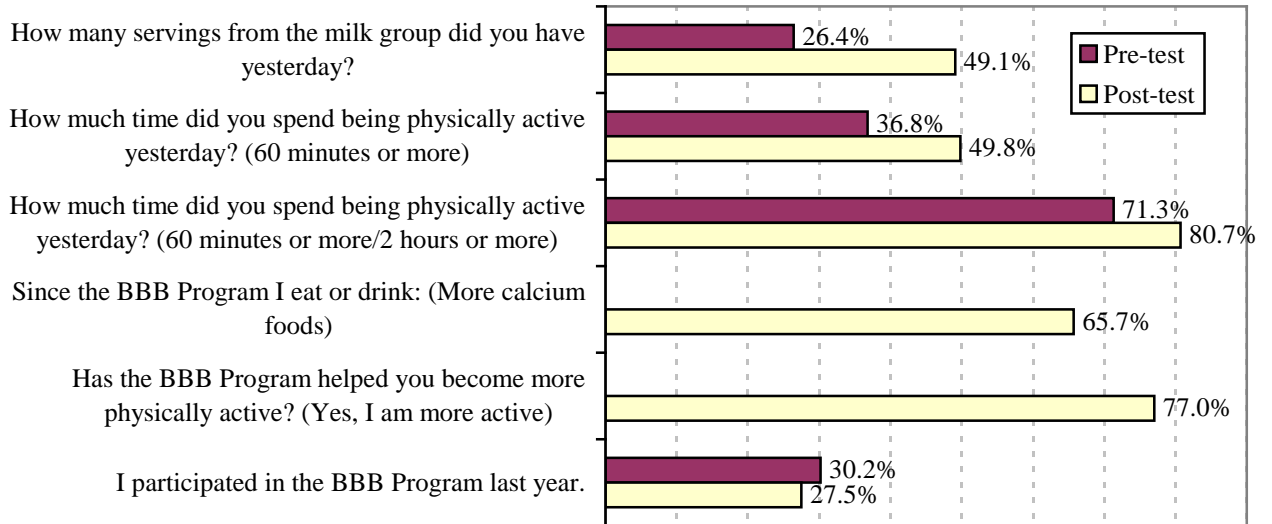
The physical activity question has two answers that meet or exceed the minimum recommendations for physical activity: “60 minutes or more” and “2 hours or more”. Just over one-third (36.8%) of students reported on the pre-test that they participated in 60 minutes or more of physical activity on the previous day. This increased to half (49.8%) after completing the BBB Program. Furthermore, students were 1.7 times more likely to have reported participating in 60 minutes or more of physical activity on the previous day. When combining the students who answered that they participated in physical activity for “60 minutes or more” with those who answered “2 hours or more” on the previous day, over two-thirds (71.3%) of students reported on the pre-test that they participated in adequate physical activity at pre-test, increasing to 80.7 percent after completion of the BBB Program. Furthermore, students were 1.7 times more likely to have participated in 60 minutes or more, or two hours or more of physical activity after completion of the BBB Program. Additionally, over three-quarters (77.0%) of students reported that the BBB Program has helped them become more physically active.

Table 6. Coconino County Students’ Behavior Before and After Participating in the Building Better Bones Program, 2008-2009						
Question	Answered Correctly/Affirmatively				Odds Ratio	P-value
	Pre-test n=603		Post-test n=560			
	n	%	n	%		
How many servings from the milk group did you have yesterday? (3 or more)	159	26.4	275	49.1	2.7	<0.0001
How much time did you spend being physically active yesterday? (60 minutes or more)	222	36.8	279	49.8	1.7	<0.0001
How much time did you spend being physically active yesterday? (60 minutes or more / 2 hours or more)	430	71.3	452	80.7	1.7	<0.0001
Since the BBB Program I eat or drink: (More calcium foods)			368	65.7		
Has the BBB Program helped you become more physically active? (Yes, I am more active)			431	77.0		
Did you attend the BBB Program last year? (Yes)	182	30.2	154	27.5		

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Figure 4 shows the percentage of students who reported meeting the recommendations for dairy consumption and physical activity questions from pre- to post-test. As the Figure demonstrates, the percentage of students who answered each question appropriately increased from pre- to post-test. The questions “Since the BBB Program I eat or drink:” and “Has the BBB Program helped you become more physically active?” were only asked on the post-test.

Figure 4. Behavioral Change of Students from Pre- to Post-test, Coconino County BBB 2008-2009



Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Maricopa County

Table 7. Characteristics of Maricopa County Students Participating in the Building Better Bones Program, 2008-2009		
Characteristic	Number of Students	Percent of Total
Test		
Pre-tests	294	49.2
Post-tests	303	50.8
Participating Schools		
	6	
Income		
Schools with more than 50% of students receiving a free or reduced lunch	6	100.0
Grade*		
4 th grade	7	2.3
5 th grade	286	94.4
6 th grade	1	0.3
Undefined	9	3.0
Gender*		
Boy	159	52.5
Girl	143	47.2
Undefined	1	0.3
Total Pre-/Post-tests Received	597	

*Descriptive statistics are based on the highest number of students who took the pre- or post-test.

During the 2008-2009 school year, 597 pre and post tests were completed in Maricopa County. This breaks down to 294 pre-tests and 303 post-tests. An estimated 299 students participated in the Building Better Bones lessons, reaching approximately 114 less students than the 2007-2008 school year. This translates into a 28% decrease in participation. All participating schools had at least 50% of students receiving a free or reduced lunch through the National School Lunch Program. Most (96.9%) students were in fifth grade, but the curriculum was also provided to some fourth and sixth graders (2.3% and 0.3% respectively).

Knowledge

As Table 8 shows, all of the knowledge questions assessed showed a statistically significant increase between the pre and post tests. Four questions showing a vast improvement between pre- and post-test. Students were 29.8 times more likely to correctly answer the question “What percent Daily Value for calcium do students your age need?”, were 13.3 times more likely to correctly answer the question “Which activity does not build better bones?”, were 10.4 times more likely to correctly answer the question “How many daily servings from the milk group should you have?”, and were 10.3 times more likely to correctly answer the question “What is osteoporosis?” after completion of the BBB Program.

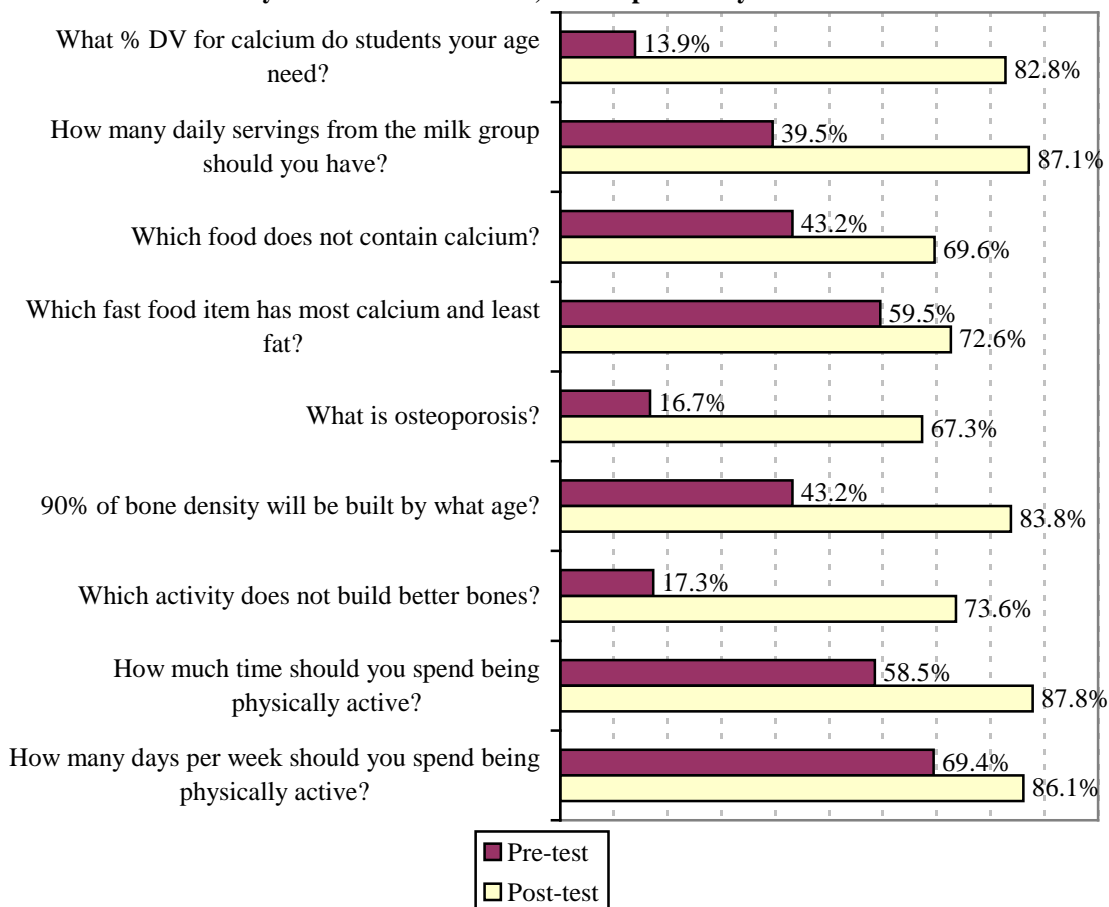
Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Table 8. Maricopa County Students' Knowledge Before and After Participating in the Building Better Bones Program, 2008-2009						
Question	Answered Correctly/Affirmatively				Odds Ratio	P-value
	Pre-test n=294		Post-test n=303			
		%		%		
What % DV for calcium do students your age need? (130%)	41	13.9	251	82.8	29.8	<0.0001
How many daily servings from the milk group should you have? (3 or more)	116	39.5	264	87.1	10.4	<0.0001
Which food does not contain calcium? (Chicken)	127	43.2	211	69.6	3.0	<0.0001
Which fast food item has most calcium and least fat? (Low fat chocolate milk)	175	59.5	220	72.6	1.8	<0.0001
What is osteoporosis? (Porous bones)	49	16.7	204	67.3	10.3	<0.0001
90% of bone density will be built by what age? (18 years)	127	43.2	254	83.8	6.8	<0.0001
Which activity does not build better bones? (Swimming)	51	17.3	223	73.6	13.3	<0.0001
How much time should you spend being physically active? (60 minutes or more)	172	58.5	266	87.8	5.1	<0.0001
How many days per week should you spend being physically active? (All or most days of the week)	204	69.4	261	86.1	2.7	<0.0001

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Figure 5 shows the percentage of students who correctly answered the knowledge questions from pre- to post-test. As the Figure demonstrates, the percentage of students who correctly answered each question increased from pre- to post-test.

Figure 5. Percentage of Students Who Answered Knowledge Questions Correctly From Pre- to Post-test, Maricopa County BBB 2008-2009



Behavior

As Table 9 shows, all behavioral questions assessed showed a statistically significant increase between the pre and post tests.

Dairy Consumption

Over one-fifth (22.4%) of students reported on the pre-test that they consumed three or more servings of milk products on the previous day, increasing to just under half (48.5%) after completion of the BBB Program. Furthermore, students were 3.3 times more likely to have consumed the recommended amount of milk products after completion of the BBB Program. Although just under half of students reported consuming three or more servings of dairy products on the previous day on the post-test, over two-thirds (68.0%) of students reported that they drank or ate more calcium foods after the BBB Program.

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Physical Activity

The physical activity question has two answers that meet or exceed the minimum recommendations for physical activity: “60 minutes or more” and “2 hours or more”. One-third (33.0%) of students reported on the pre-test that they participated in 60 minutes or more of physical activity on the previous day. This increased to half (49.5%) after completion of the BBB Program. Furthermore, students were 2.0 times more likely to have reported participating in 60 minutes or more of physical activity on the previous day. When combining the students who answered that they participated in physical activity for “60 minutes or more” with those who answered “2 hours or more” on the previous day, over two-thirds (70.1%) of students reported on the pre-test that they participated in adequate physical activity, increasing to just under 80 percent after completion of the BBB Program. Students were 1.5 times more likely to have participated in 60 minutes or more, or two hours or more of physical activity after completion of the BBB Program. Additionally, the majority (80.5%) of students reported that the BBB Program has helped them become more physically active.

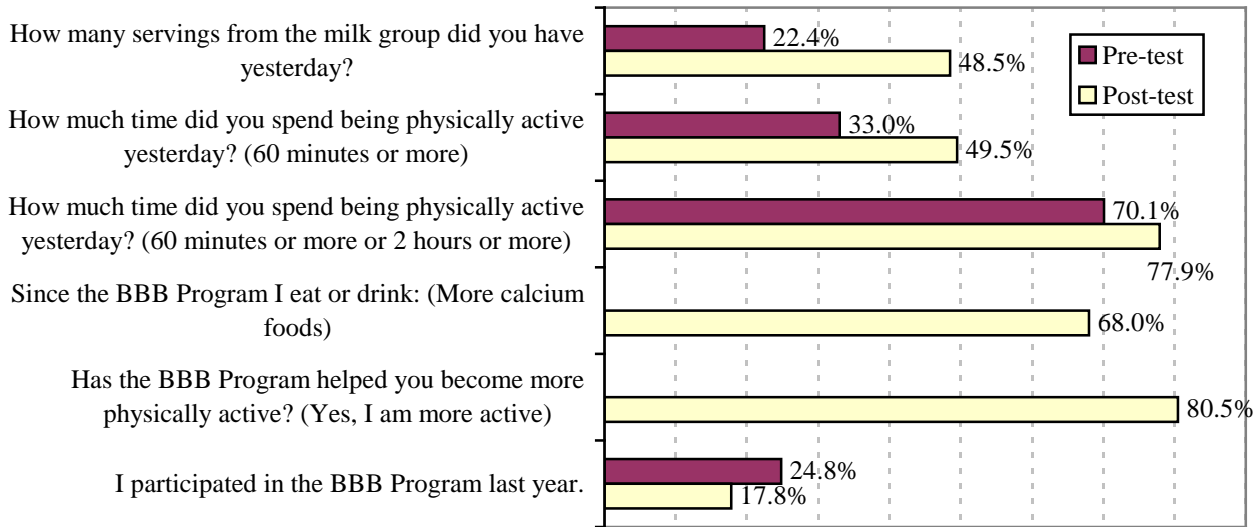
Table 9. Maricopa County Students’ Behavior Before and After Participating in the Building Better Bones Program, 2008-2009

Question	Answered Correctly/Affirmatively				Odds Ratio	P-value
	Pre-test n=294		Post-test n=303			
		%		%		
How many servings from the milk group did you have yesterday? (3 or more)	66	22.4	147	48.5	3.3	<0.0001
How much time did you spend being physically active yesterday? (60 minutes or more)	97	33.0	150	49.5	2.0	<0.0001
How much time did you spend being physically active yesterday? (60 minutes or more / 2 hours or more)	206	70.1	236	77.9	1.5	<0.05
Since the BBB Program I eat or drink: (More calcium foods)			206	68.0		
Has the BBB Program helped you become more physically active? (Yes, I am more active)			244	80.5		
Did you attend the BBB Program last year? (Yes)	73	24.8	54	17.8		

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Figure 6 shows the percentage of students who reported meeting the recommendations for dairy consumption and physical activity questions from pre- to post-test. As the Figure demonstrates, the percentage of students who answered each question appropriately increased from pre- to post-test. The questions “Since the BBB Program I eat or drink:” and “Has the BBB Program helped you become more physically active?” were only asked on the post-test.

Figure 6. Behavioral Change of Students from Pre- to Post-test, Maricopa County BBB 2008-2009



Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Mohave County

Table 10. Characteristics of Mohave County Students Participating in the Building Better Bones Program, 2008-2009		
Characteristic	Number of Students	Percent of Total
Test		
Pre-tests	349	50.2
Post-tests	346	49.8
Participating Schools		
	5	
Income		
Schools with more than 50% of students receiving a free or reduced lunch	5	100.0
Grade*		
3 rd grade	7	2.0
4 th grade	10	2.9
5 th grade	332	95.1
Gender*		
Boy	173	49.6
Girl	176	50.4
Total Pre-/Post-tests Received	695	

*Descriptive statistics are based on the highest number of students who took the pre- or post-test.

During the 2008-2009 school year, 695 pre and post tests were completed in Mohave County. This breaks down to 349 pre-tests and 346 post-tests. An estimated 348 students participated in the Building Better Bones lessons, reaching approximately 46 more students than the 2007-2008 school year, which translates into a 15% increase in participation. All participating schools had at least 50% of students receiving a free or reduced lunch through the National School Lunch Program. Most (95.1%) students were in fifth grade, but the curriculum was also provided to some third and fourth graders (2.0% and 2.9% respectively).

Knowledge

As Table 11 shows, all but one knowledge question assessed in the tests showed a statistically significant increase between the pre and post tests. Three questions showed a vast improvement between pre- and post-test. Students were 46.4 times more likely to correctly answer the question “Which activity does not build better bones?”, were 40.0 times more likely to correctly answer the question “What percent Daily Value for calcium do students your age need?”, and were 14.9 times more likely to correctly answer the question “What is osteoporosis?” after completion of the BBB Program. There was no statistically significant change from pre- to post-test for the question “Which fast food item has the most calcium and least fat?”, however over two-thirds of students answered this question correctly on the pre- and post-test.

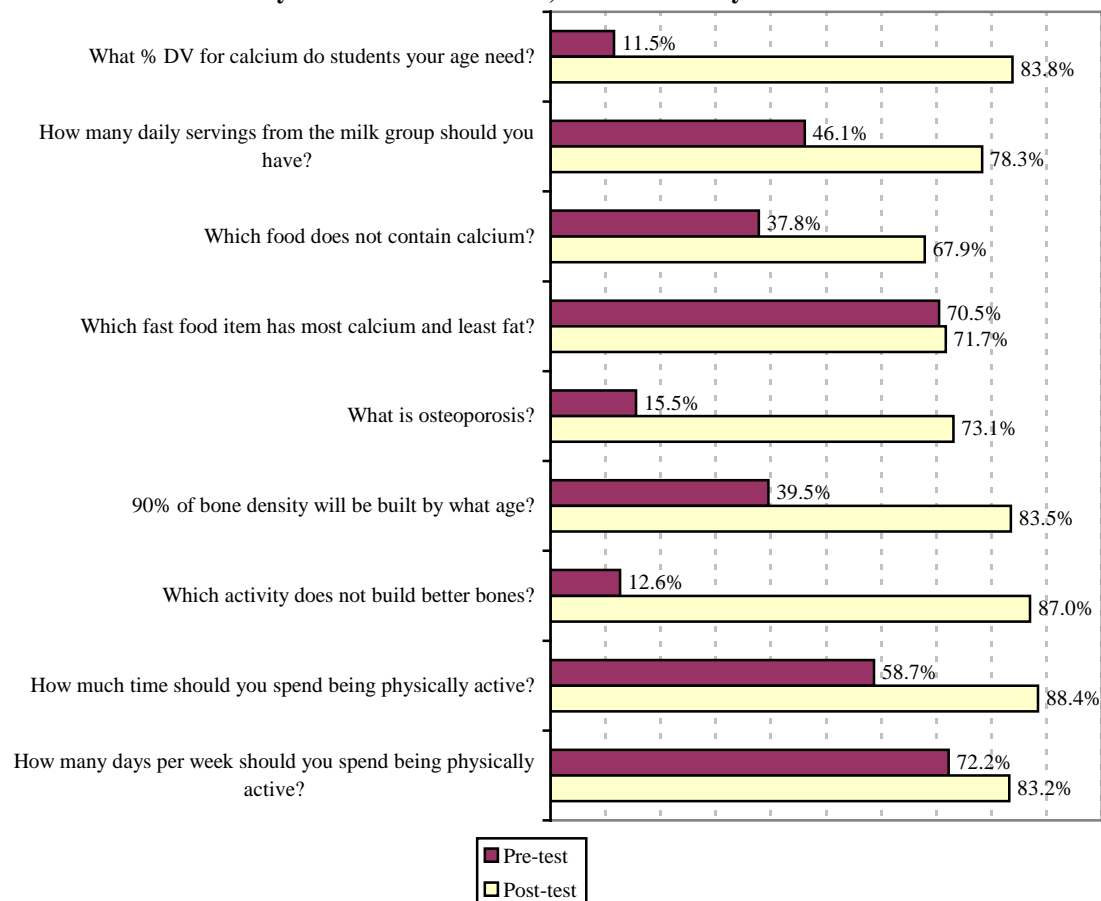
Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Table 11. Mohave County Students' Knowledge Before and After Participating in the Building Better Bones Program, 2008-2009						
Question	Answered Correctly/Affirmatively				Odds Ratio	P-value
	Pre-test n=349 %		Post-test n=346 %			
What % DV for calcium do students your age need? (130%)	40	11.5	290	83.8	40.0	<0.0001
How many daily servings from the milk group should you have? (3 or more)	161	46.1	271	78.3	4.2	<0.0001
Which food does not contain calcium? (Chicken)	132	37.8	235	67.9	3.5	<0.0001
Which fast food item has most calcium and least fat? (Low fat chocolate milk)	246	70.5	248	71.7	1.1	0.73
What is osteoporosis? (Porous bones)	54	15.5	253	73.1	14.9	<0.0001
90% of bone density will be built by what age? (18 years)	138	39.5	289	83.5	7.8	<0.0001
Which activity does not build better bones? (Swimming)	44	12.6	301	87.0	46.4	<0.0001
How much time should you spend being physically active? (60 minutes or more)	205	58.7	306	88.4	5.4	<0.0001
How many days per week should you spend being physically active? (All or most days of the week)	252	72.2	288	83.2	1.9	<0.05

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Figure 7 shows the percentage of students who correctly answered the knowledge questions from pre- to post-test. As the Figure demonstrates, the percentage of students who correctly answered each question increased from pre- to post-test.

Figure 7. Percentage of Students Who Answered Knowledge Questions Correctly From Pre- to Post-test, Mohave County BBB 2008-2009



Behavior

As Table 12 shows, all behavioral questions assessed in the tests showed a statistically significant increase between the pre and post tests.

Dairy Consumption

Two-thirds (32.7%) of students reported on the pre-test that they consumed three or more servings of milk products on the previous day, increasing to half (51.4%) after completing the BBB Program. Furthermore, students were 2.2 times more likely to have consumed the recommended amount of milk products after completion of the BBB Program. Although half of students reported consuming three or more servings of dairy products on the previous day, over two-thirds (69.4%) of students reported that they drank or ate more calcium foods after the BBB Program.

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Physical Activity

The physical activity question has two answers that meet or exceed the minimum recommendations for physical activity: “60 minutes or more” and “2 hours or more”. Just over one-quarter (26.9%) of students reported on the pre-test that they participated in 60 minutes or more of physical activity on the previous day. This increased to just under two-thirds (64.2%) after completing the BBB Program. Furthermore, students were 4.9 times more likely to have reported participating in 60 minutes or more of physical activity on the previous day. When combining the students who answered that they participated in physical activity for “60 minutes or more” with those who answered “2 hours or more” on the previous day, over two-thirds (70.2%) of students reported on the pre-test that they participated in adequate physical activity, increasing to over 80 percent (85.3%) after completion of the BBB Program. Students were 2.5 times more likely to have participated in 60 minutes or more, or two hours or more of physical activity after completion of the BBB Program. Additionally, over three-quarters (79.5%) of students reported that the BBB Program has helped them become more physically active.

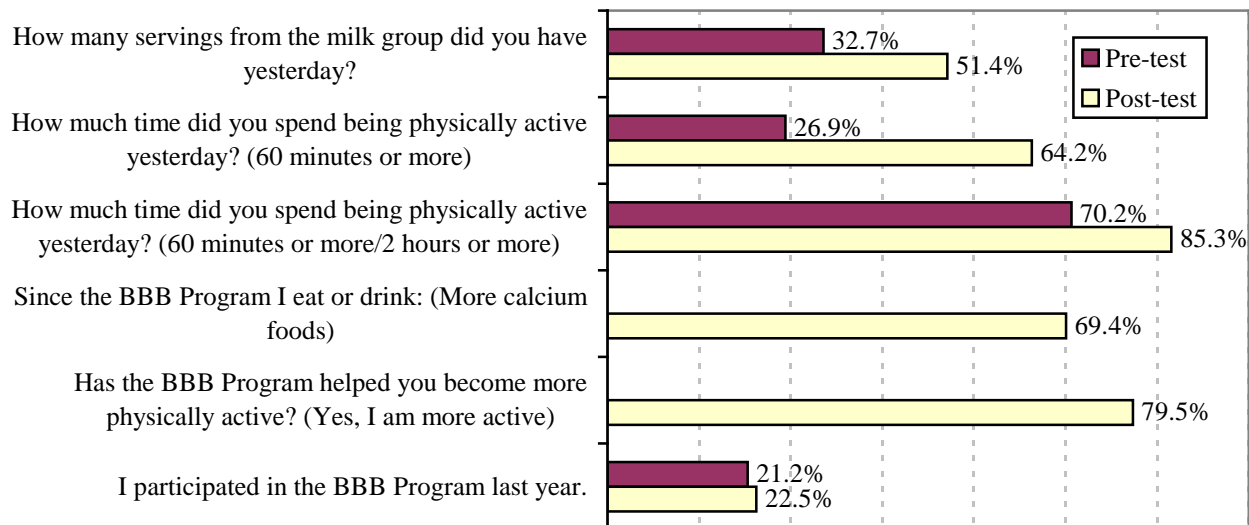
Table 12. Mohave County Students’ Behavior Before and After Participating in the Building Better Bones Program, 2008-2009

Question	Answered Correctly/Affirmatively				Odds Ratio	P-value
	Pre-test n=349		Post-test n=346			
	n	%	n	%		
How many servings from the milk group did you have yesterday? (3 or more)	114	32.7	178	51.4	2.2	<0.0001
How much time did you spend being physically active yesterday? (60 minutes or more)	94	26.9	222	64.2	4.9	<0.0001
How much time did you spend being physically active yesterday? (60 minutes or more / 2 hours or more)	245	70.2	295	85.3	2.5	<0.0001
Since the BBB Program I eat or drink: (More calcium foods)			240	69.4		
Has the BBB Program helped you become more physically active? (Yes, I am more active)			275	79.5		
Did you attend the BBB Program last year? (Yes)	74	21.2	78	22.5		

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Figure 8 shows the percentage of students who reported meeting the recommendations for dairy consumption and physical activity questions from pre- to post-test. As the Figure demonstrates, the percentage of students who answered each question appropriately increased from pre- to post-test. The questions “Since the BBB Program I eat or drink:” and “Has the BBB Program helped you become more physically active?” were only asked on the post-test.

**Figure 8. Behavioral Change of Students from Pre- to Post-test, Mohave County
BBB 2008-2009**



Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Navajo County

Table 13. Characteristics of Navajo County Students Participating in the Building Better Bones Program, 2008-2009		
Characteristic	Number of Students	Percent of Total
Test		
Pre-tests	949	50.9
Post-tests	917	49.1
Participating Schools		
	17	
Income		
Schools with more than 50% of students receiving a free or reduced lunch	17	100.0
Grade*		
4 th grade	10	1.1
5 th graders	935	98.5
Undefined	4	0.4
Gender*		
Boy	486	51.2
Girl	459	48.4
Undefined	4	0.4
Total Pre-/Post-tests Received	1,866	

*Descriptive statistics are based on the highest number of students who took the pre- or post-test.

During the 2008-2009 school year, 1,866 pre and post tests were completed in Navajo County. This breaks down to 949 pre-tests and 917 post-tests. An estimated 933 students participated in the Building Better Bones lessons, reaching approximately 28 less students than the 2007-2008 school year, which translates into a 3% decrease in participation. All of the participating schools had at least 50% of students receiving a free or reduced lunch through the National School Lunch Program. Most (98.5%) students were in fifth grade, but the curriculum was also provided to some fourth graders (1.1%).

Knowledge

As Table 14 shows, all knowledge questions assessed in the tests showed a statistically significant increase between the pre and post tests. Three questions showed a vast improvement between pre- and post-test. Students were 13.1 times more likely to correctly answer the question “What percent Daily Value for calcium do students your age need?”, were 12.3 times more likely to correctly answer the question “Which activity does not build better bones?”, and were 11.3 times more likely to correctly answer the question “What is osteoporosis?” after completion of the BBB Program.

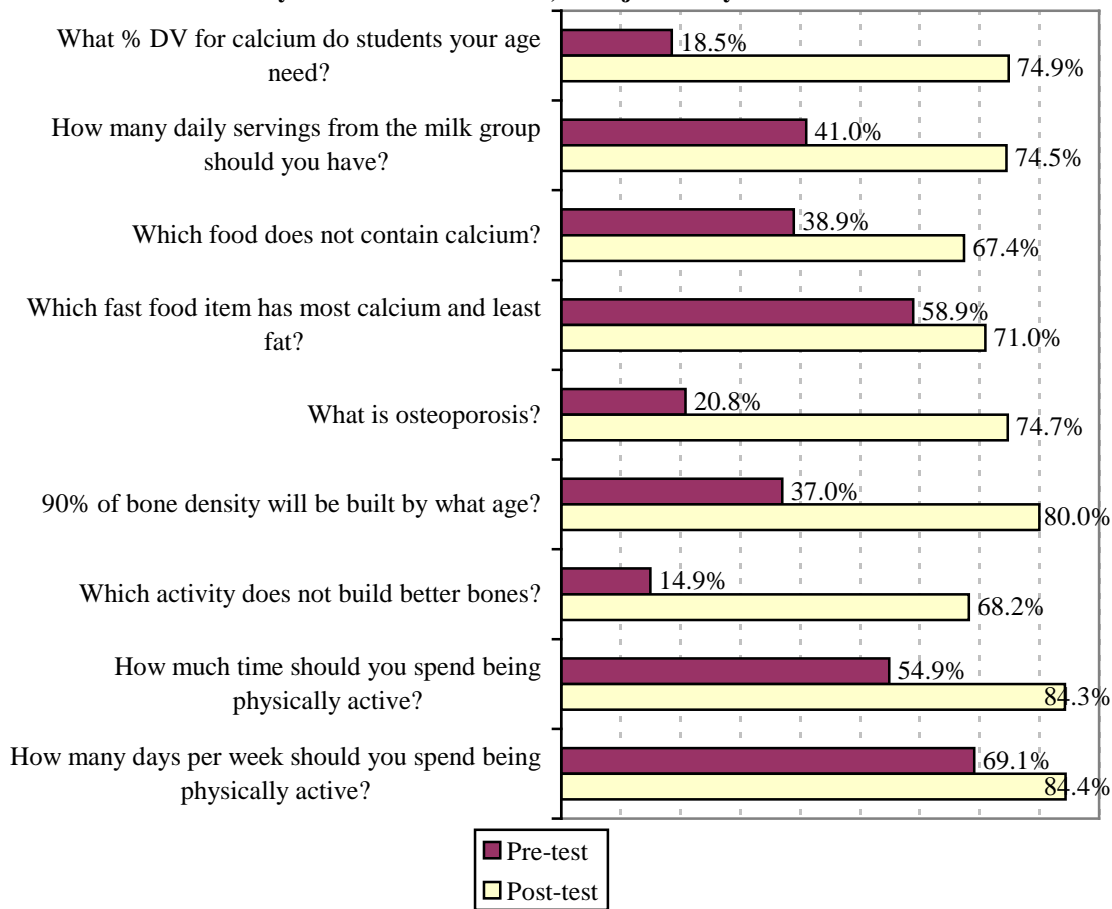
Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Table 14. Navajo County Students' Knowledge Before and After Participating in the Building Better Bones Program, 2008-2009						
Question	Answered Correctly/Affirmatively				Odds Ratio	P-value
	Pre-test n=949 %		Post-test n=917 %			
What % DV for calcium do students your age need? (130%)	176	18.5	687	74.9	13.1	<0.0001
How many daily servings from the milk group should you have? (3 or more)	389	41.0	683	74.5	4.2	<0.0001
Which food does not contain calcium? (Chicken)	369	38.9	618	67.4	3.2	<0.0001
Which fast food item has most calcium and least fat? (Low fat chocolate milk)	559	58.9	651	71.0	1.7	<0.0001
What is osteoporosis? (Porous bones)	197	20.8	685	74.7	11.3	<0.0001
90% of bone density will be built by what age? (18 years)	351	37.0	734	80.0	6.8	<0.0001
Which activity does not build better bones? (Swimming)	141	14.9	625	68.2	12.3	<0.0001
How much time should you spend being physically active? (60 minutes or more)	521	54.9	773	84.3	4.4	<0.0001
How many days per week should you spend being physically active? (All or most days of the week)	656	69.1	774	84.4	2.4	<0.0001

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Figure 9 shows the percentage of students who correctly answered the knowledge questions from pre- to post-test. As the Figure demonstrates, the percentage of students who correctly answered each question increased from pre- to post-test.

Figure 9. Percentage of Students Who Answered Knowledge Questions Correctly From Pre- to Post-test, Navajo County BBB 2008-2009



Behavior

As Table 15 shows, all behavioral questions assessed in the tests showed a statistically significant increase between the pre and post tests.

Dairy Consumption

Just under two-thirds (30.0%) of students reported on the pre-test that they consumed three or more servings of milk products on the previous day, increasing to just under half (41.8%) after completing the BBB Program. Furthermore, students were 1.7 times more likely to have consumed the recommended amount of milk products after completion of the BBB Program. Although just under half of students reported consuming three or more servings of dairy products on the previous day, almost two-thirds (60.9%) of students reported that they drank or ate more calcium foods after the BBB Program.

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Physical Activity

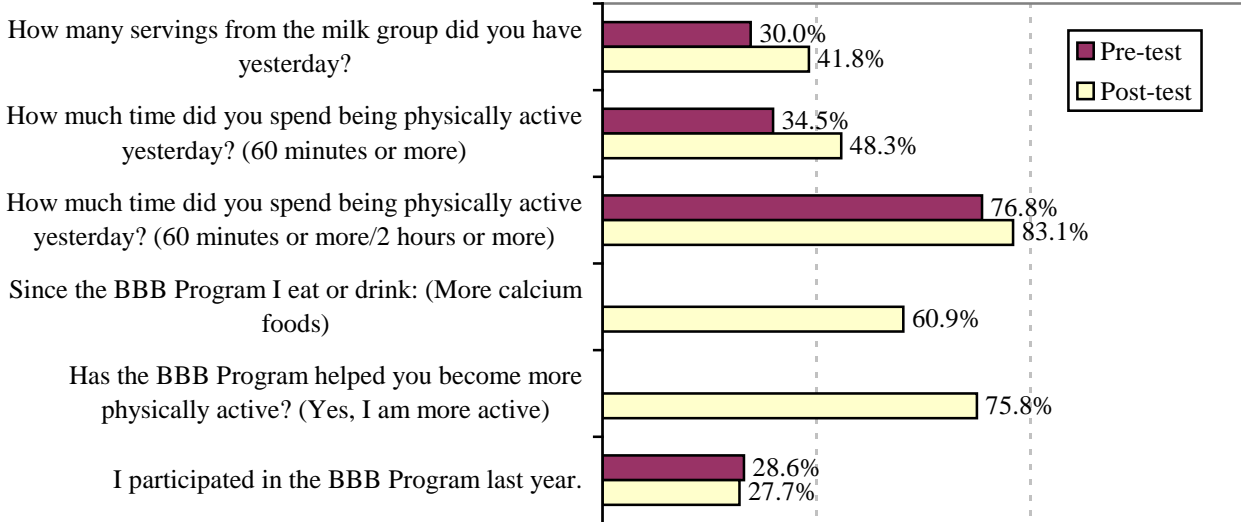
The physical activity question has two answers that meet or exceed the minimum recommendations for physical activity: “60 minutes or more” and “2 hours or more”. One-third (34.5%) of students reported on the pre-test that they participated in 60 minutes or more of physical activity on the previous day. This increased to just under half (48.3%) after completing the BBB Program. Furthermore, students were 1.8 times more likely to have reported participating in 60 minutes or more of physical activity on the previous day. When combining the students who answered that they participated in physical activity for “60 minutes or more” with those who answered “2 hours or more” on the previous day, over three-quarters (76.8%) of students reported on the pre-test that they participated in adequate physical activity, increasing to over 80 percent (83.1%) after completion of the BBB Program. Students were 1.5 times more likely to have participated in 60 minutes or more, or two hours or more of physical activity after completion of the BBB Program. Additionally, three-quarters (75.8%) of students reported that the BBB Program has helped them become more physically active.

Table 15. Navajo County Students' Behavior Before and After Participating in the Building Better Bones Program, 2008-2009						
Question	Answered Correctly/Affirmatively				Odds Ratio	P-value
	Pre-test n=949		Post-test n=917			
	n	%	n	%		
How many servings from the milk group did you have yesterday? (3 or more)	285	30.0	383	41.8	1.7	<0.0001
How much time did you spend being physically active yesterday? (60 minutes or more)	327	34.5	443	48.3	1.8	<0.0001
How much time did you spend being physically active yesterday? (60 minutes or more / 2 hours or more)	729	76.8	762	83.1	1.5	<0.0001
Since the BBB Program I eat or drink: (More calcium foods)			558	60.9		
Has the BBB Program helped you become more physically active? (Yes, I am more active)			695	75.8		
Did you attend the BBB Program last year? (Yes)	271	28.6	254	27.7		

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Figure 10 shows the percentage of students who reported meeting the recommendations for dairy consumption and physical activity questions from pre- to post-test. As the Figure demonstrates, the percentage of students who answered each question appropriately increased from pre- to post-test. The questions “Since the BBB Program I eat or drink:” and “Has the BBB Program helped you become more physically active?” were only asked on the post-test.

**Figure 10. Behavioral Change of Students from Pre- to Post-test, Navajo County
BBB 2008-2009**



Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Yuma County

Table 16. Characteristics of Yuma County Students Participating in the Building Better Bones Program, 2008-2009		
Characteristic	Number of Students	Percent of Total
Test		
Pre-tests	1,984	49.7
Post-tests	2,004	50.3
Participating Schools		
	29	
Income		
Schools with more than 50% of students receiving a free or reduced lunch	28	96.6
Grade*		
4 th grade	44	2.2
5 th graders	1,924	96.0
6 th graders	36	1.8
Gender*		
Boy	1,039	51.8
Girl	961	48.0
Undefined	4	0.2
Total Pre-/Post-tests Received	3,988	

*Descriptive statistics are based on the highest number of students who took the pre- or post-test.

During the 2008-2009 school year, 3,988 pre and post tests were completed in Yuma County. This breaks down to 1,984 pre-tests and 2,004 post-tests. An estimated 1,994 students participated in the Building Better Bones lessons, reaching approximately 56 more students than the 2007-2008 school year, which translates into a 3% increase in participation. The majority (96.6%) of participating schools had at least 50% of students receiving a free or reduced lunch through the National School Lunch Program. Most (96.0%) students were in fifth grade, but the curriculum was also provided to some fourth and sixth graders (2.2% and 1.8% respectively).

Knowledge

As Table 17 shows, all knowledge questions assessed in the tests showed a statistically significant increase between the pre and post tests. Four questions showed a vast improvement between pre- and post-test. Students were 24.2 times more likely to correctly answer the question “What percent Daily Value for calcium do students your age need?”, were 19.6 times more likely to correctly answer the question “Which activity does not build better bones?”, were 18.9 times more likely to correctly answer the question “90% of bone density will be built by what age?”, and were 13.5 times more likely to correctly answer the question “What is osteoporosis” after completion of the BBB Program.

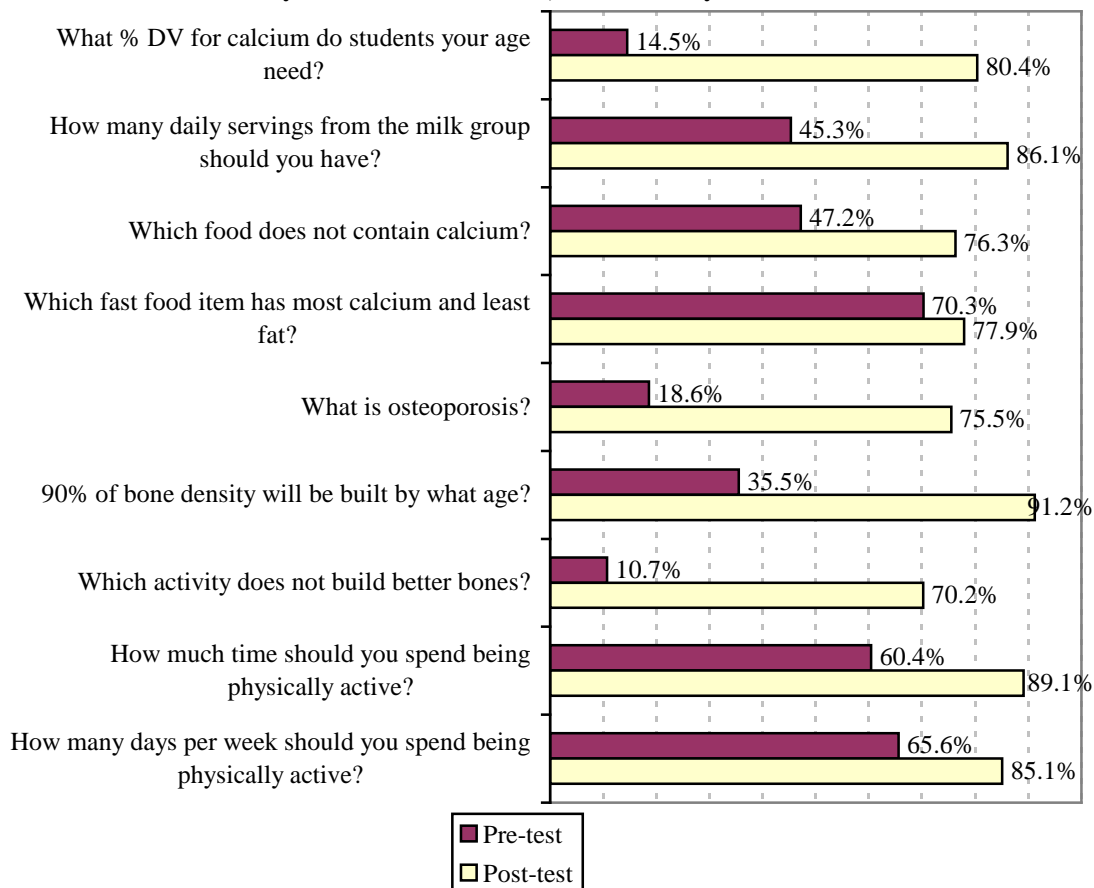
Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Table 17. Yuma County Students' Knowledge Before and After Participating in the Building Better Bones Program, 2008-2009						
Question	Answered Correctly/Affirmatively				Odds Ratio	P-value
	Pre-test n=1,984 %		Post-test n=2,004 %			
What % DV for calcium do students your age need? (130%)	288	14.5	1,612	80.4	24.2	<0.0001
How many daily servings from the milk group should you have? (3 or more)	899	45.3	1,726	86.1	7.5	<0.0001
Which food does not contain calcium? (Chicken)	936	47.2	1,530	76.3	3.6	<0.0001
Which fast food item has most calcium and least fat? (Low fat chocolate milk)	1,395	70.3	1,561	77.9	1.5	<0.0001
What is osteoporosis? (Porous bones)	370	18.6	1,514	75.5	13.5	<0.0001
90% of bone density will be built by what age? (18 years)	704	35.5	1,828	91.2	18.9	<0.0001
Which activity does not build better bones? (Swimming)	213	10.7	1,407	70.2	19.6	<0.0001
How much time should you spend being physically active? (60 minutes or more)	1,199	60.4	1,786	89.1	5.4	<0.0001
How many days per week should you spend being physically active? (All or most days of the week)	1,301	65.6	1,706	85.1	3.0	<0.0001

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Figure 11 shows the percentage of students who correctly answered the knowledge questions from pre- to post-test. As the Figure demonstrates, the percentage of students who correctly answered each question increased from pre- to post-test.

Figure 11. Percentage of Students Who Answered Knowledge Questions Correctly From Pre- to Post-test, Yuma County BBB 2008-2009



Behavior

As Table 18 shows, all behavioral questions assessed in the tests showed a statistically significant increase between the pre and post tests.

Dairy Consumption

Just over one-fifth (21.6%) of students reported on the pre-test that they consumed three or more servings of milk products on the previous day, increasing to just under half (44.7%) after completing the BBB Program. Furthermore, students were 2.9 times more likely to have consumed the recommended amount of milk products after completion of the BBB Program. Although just under half of students reported consuming three or more servings of dairy products on the previous day, two-thirds (65.6%) of students reported that they drank or ate more calcium foods after the BBB Program.

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Physical Activity

The physical activity question has two answers that meet or exceed the minimum recommendations for physical activity: “60 minutes or more” and “2 hours or more”. Just over one-third (37.6%) of students reported on the pre-test that they participated in 60 minutes or more of physical activity on the previous day. This increased to just over half (54.7%) after completing the BBB Program. Furthermore, students were 2.1 times more likely to have reported participating in 60 minutes or more of physical activity on the previous day. When combining the students who answered that they participated in physical activity for “60 minutes or more” with those who answered “2 hours or more” on the previous day, over two-thirds (68.1%) of students reported on the pre-test that they participated in adequate physical activity, increasing to just under 80 percent (78.7%) after completion of the BBB Program. Students were 1.7 times more likely to have participated in 60 minutes or more or two hours or more of physical activity after completion of the BBB Program. Additionally, three-quarters (76.3%) of students reported that the BBB Program has helped them become more physically active.

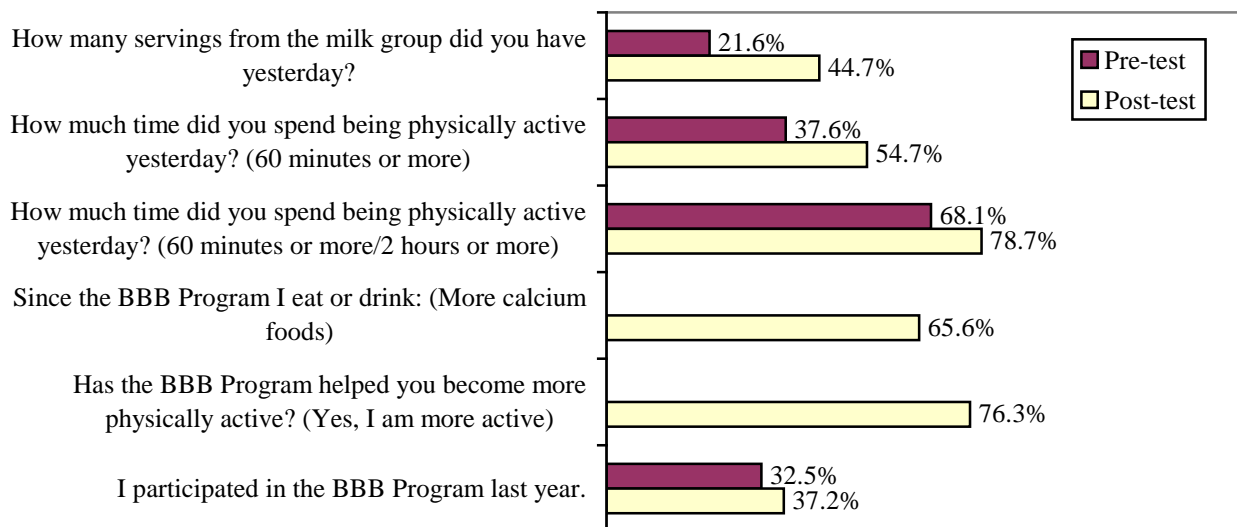
Table 18. Yuma County Students’ Behavior Before and After Participating in the Building Better Bones Program, 2008-2009

Question	Answered Correctly/Affirmatively				Odds Ratio	P-value
	Pre-test n=1,984		Post-test n=2,004			
	n	%	n	%		
How many servings from the milk group did you have yesterday? (3 or more)	428	21.6	896	44.7	2.9	<0.0001
How much time did you spend being physically active yesterday? (60 minutes or more)	728	37.6	1,096	54.7	2.1	<0.0001
How much time did you spend being physically active yesterday? (60 minutes or more / 2 hours or more)	1,351	68.1	1,577	78.7	1.7	<0.0001
Since the BBB Program I eat or drink: (More calcium foods)			1,313	65.6		
Has the BBB Program helped you become more physically active? (Yes, I am more active)			1,529	76.3		
Did you attend the BBB Program last year? (Yes)	644	32.5	745	37.2		

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Figure 12 shows the percentage of students who reported meeting the recommendations for dairy consumption and physical activity questions from pre- to post-test. As the Figure demonstrates, the percentage of students who answered each question appropriately increased from pre- to post-test. The questions “Since the BBB Program I eat or drink:” and “Has the BBB Program helped you become more physically active?” were only asked on the post-test.

**Figure 12. Behavioral Change of Students from Pre- to Post-test, Yuma County
BBB 2008-2009**



Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Washington Elementary School District

Table 19. Characteristics of Washington Elementary School District Students Participating in the Building Better Bones Program, 2008-2009		
Characteristic	Number of Students	Percent of Total
Test		
Pre-tests	833	49.6
Post-tests	848	50.4
Participating Schools		
	10	
Income		
Schools with more than 50% of students receiving a free or reduced lunch	10	100.0
Grade*		
4 th grade	3	0.4
5 th grade	841	99.2
6 th grade	3	0.4
Undefined	1	0.1
Gender*		
Boy	430	50.7
Girl	415	48.9
Undefined	3	0.4
Total Pre-/Post-tests Received	1,681	

*Descriptive statistics are based on the highest number of students who took the pre- or post-test.

During the 2008-2009 school year, 1,681 pre and post tests were completed in Washington Elementary School District. This breaks down to 833 pre-tests and 848 post-tests. An estimated 841 students participated in the Building Better Bones lessons, reaching approximately 15 more students than the 2007-2008 school year, which translates into a 2% increase in participation. All participating schools had at least 50% of students receiving a free or reduced lunch through the National School Lunch Program. Most (99.2%) students were in fifth grade, but the curriculum was also provided to some fourth and sixth graders (0.4%).

Knowledge

As Table 20 shows, all knowledge questions assessed in the tests showed a statistically significant increase between the pre and post tests. Four questions showed a vast improvement between pre- and post-test. Students were 48.7 times more likely to correctly answer the question “Which activity does not build better bones?”, were 29.2 times more likely to correctly answer the question “What percent Daily Value for calcium do students your age need?”, were 25.3 times more likely to correctly answer the question “90% of bone density will be built by what age?” and were 19.2 times more likely to correctly answer the question “What is osteoporosis?” after completion of the BBB Program.

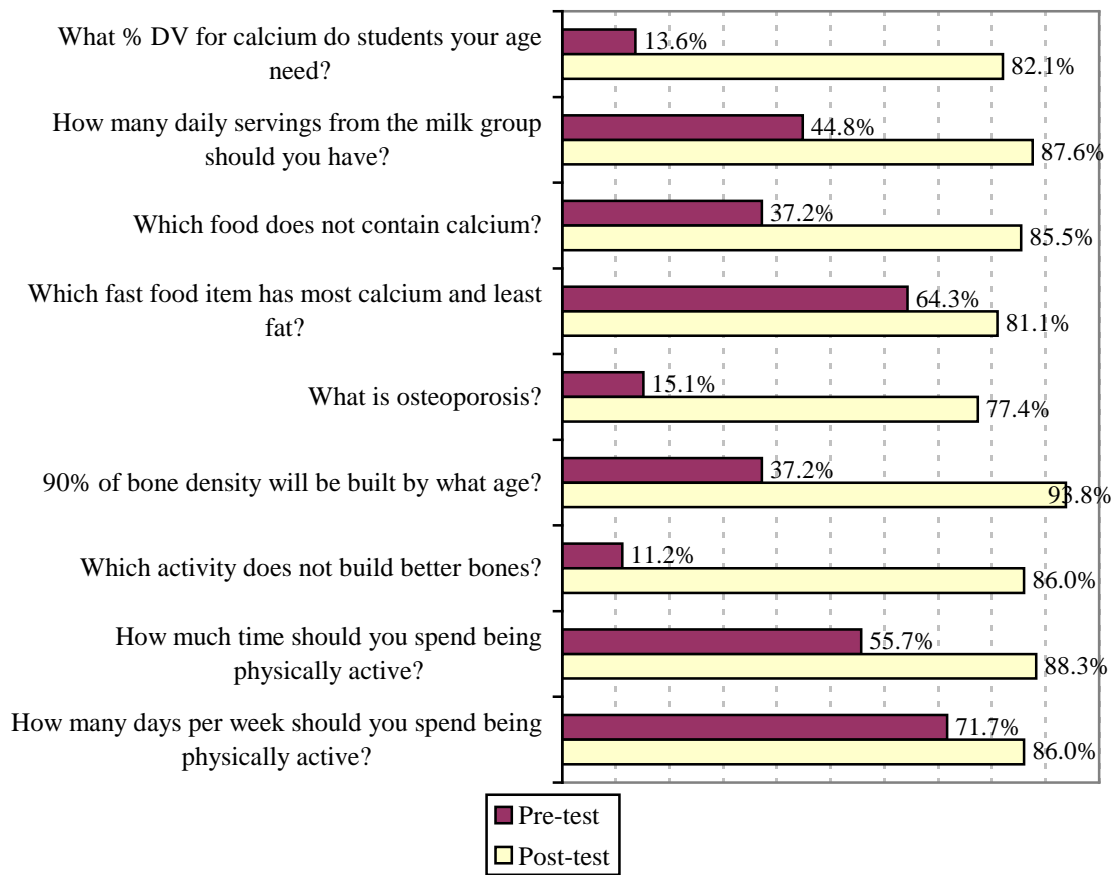
Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Table 20. Washington Elementary School District Students' Knowledge Before and After Participating in the Building Better Bones Program, 2008-2009						
Question	Answered Correctly/Affirmatively				Odds Ratio	P-value
	Pre-test n=833 %		Post-test n=848 %			
What % DV for calcium do students your age need? (130%)	113	13.6	696	82.1	29.2	<0.0001
How many daily servings from the milk group should you have? (3 or more)	373	44.8	743	87.6	8.7	<0.0001
Which food does not contain calcium? (Chicken)	310	37.2	725	85.5	9.9	<0.0001
Which fast food item has most calcium and least fat? (Low fat chocolate milk)	536	64.3	688	81.1	2.4	<0.0001
What is osteoporosis? (Porous bones)	126	15.1	656	77.4	19.2	<0.0001
90% of bone density will be built by what age? (18 years)	310	37.2	795	93.8	25.3	<0.0001
Which activity does not build better bones? (Swimming)	93	11.2	729	86.0	48.7	<0.0001
How much time should you spend being physically active? (60 minutes or more)	464	55.7	749	88.3	6.0	<0.0001
How many days per week should you spend being physically active? (All or most days of the week)	597	71.7	729	86.0	2.4	<0.0001

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Figure 13 shows the percentage of students who correctly answered the knowledge questions correctly from pre- to post-test. As the Figure demonstrates, the percentage of students who correctly answered each question increased from pre- to post-test.

Figure 13. Percentage of Students Who Answered Knowledge Questions Correctly From Pre- to Post-test, Washington Elementary School District BBB 2008-2009



Behavior

As Table 21 shows, all behavioral questions assessed in the tests showed a statistically significant increase between the pre and post tests.

Dairy Consumption

Almost two-thirds (30.7%) of students reported on the pre-test that they consumed three or more servings of milk products on the previous day, increasing to just over half (53.3%) after completing the BBB Program. Furthermore, students were 2.6 times more likely to have consumed the recommended amount of milk products after completion of the BBB Program. Although over half of students reported consuming three or more servings of dairy products on the previous day on post-test, over two-thirds (69.9%) of students reported that they drank or ate more calcium foods after the BBB Program.

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Physical Activity

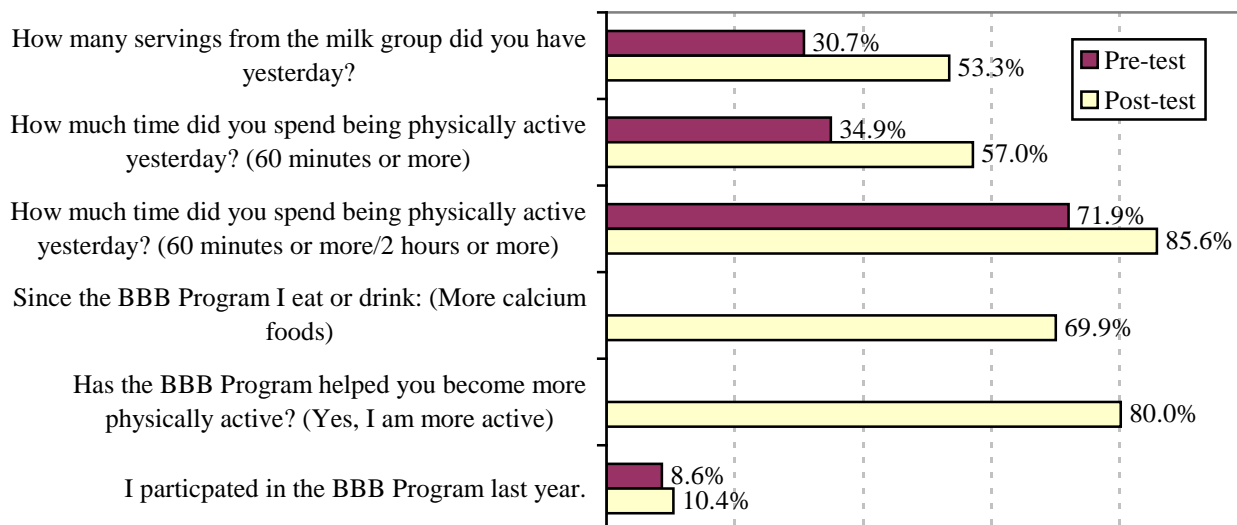
The physical activity question has two answers that meet or exceed the minimum recommendations for physical activity: “60 minutes or more” and “2 hours or more”. Just over one-third (34.9%) of students reported on the pre-test that they participated in 60 minutes or more of physical activity on the previous day. This increased to just over half (57.0%) after completing the BBB Program. Furthermore, students were 2.5 times more likely to have reported participating in 60 minutes or more of physical activity on the previous day. When combining the students who answered that they participated in physical activity for “60 minutes or more” with those who answered “2 hours or more” on the previous day, over two-thirds (71.9%) of students reported on the pre-test that they participated in adequate physical activity, increasing to just over 80 percent (85.6%) after completion of the BBB Program. Students were 2.3 times more likely to have participated in 60 minutes or more or two hours or more of physical activity after completion of the BBB Program. Additionally, the majority (80.0%) of students reported that the BBB Program has helped them become more physically active.

Table 21. Washington Elementary School District Students’ Behavior Before and After Participating in the Building Better Bones Program, 2008-2009						
Question	Answered Correctly/Affirmatively				Odds Ratio	P-value
	Pre-test n= 833 %		Post-test n=848 %			
How many servings from the milk group did you have yesterday? (3 or more)	256	30.7	452	53.3	2.6	<0.0001
How much time did you spend being physically active yesterday? (60 minutes or more)	291	34.9	483	57.0	2.5	<0.0001
How much time did you spend being physically active yesterday? (60 minutes or more / 2 hours or more)	599	71.9	726	85.6	2.3	<0.0001
Since the BBB Program I eat or drink: (More calcium foods)			593	69.9		
Has the BBB Program helped you become more physically active? (Yes, I am more active)			678	80.0		
Did you attend the BBB Program last year? (Yes)	72	8.6	88	10.4		

Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Figure 14 shows the percentage of students who reported meeting the recommendations for dairy consumption and physical activity questions from pre- to post-test. As the Figure demonstrates, the percentage of students who answered each question appropriately increased from pre- to post-test. The questions “Since the BBB Program I eat or drink:” and “Has the BBB Program helped you become more physically active?” were only asked on the post-test.

Figure 14. Behavioral Change of Students from Pre- to Post-test, Washington Elementary School District BBB 2008-2009



Arizona Building Better Bones Program Evaluation
2008-2009 School Year

Conclusion

The overall goal of the Building Better Bones Program is to increase awareness of osteoporosis as a preventable disease by practicing healthy lifestyles including consuming a healthy diet high in calcium and engaging in regular weight bearing physical activity. The Building Better Bones Program includes three interactive classroom lessons with a focus on osteoporosis prevention. The purpose of this report was to summarize the results of the pre and post tests. All students who participated in the BBB Program were asked to complete a pre- and post-test.

During the 2008-2009 school year an estimated 5,021 students participated in the Building Better Bones lessons, with a 2% increase in participation from the 2007-2008 school year. The majority (98.8%) of participating schools had at least half of students receiving a free or reduced lunch through the National School Lunch Program. Most (96.0%) students were in fifth grade, but the curriculum was also provided to first through eighth graders (3.7%)

All knowledge-related questions assessed in the tests showed a statistically significant increase between the pre and post tests. Four questions showed a vast improvement between pre- and post-test. These questions were: “What percent Daily Value for calcium do students your age need?”, “Which activity does not build better bones?”, “What is osteoporosis?”, and “90% of bone density will be built by what age?”.

All behavior-related questions assessed in the tests showed a statistically significant increase between the pre and post tests. Just over one-quarter (26.2%) of students reported on the pre-test that they consumed three or more servings of milk products on the previous day, increasing to just under half (46.9%) after completion of the BBB Program. Students were 2.5 times more likely to have reported that they consumed the recommended amount of milk products after completion of the BBB Program. While just under half (46.1%) of students reported consuming three or more servings of dairy products on the previous day on the post-test, two-thirds (65.9%) of students reported that they drank or ate more calcium foods after the BBB Program. Additionally, students were 2.1 times more likely to have reported participating in 60 or more minutes of physical activity on the previous day. Three-quarters (77.3%) of students reported that the BBB Program has helped them become more physically active.