Building Better Bones for a Better You: Osteoporosis Prevention for Adolescent Girls

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Introduction & Background

- Osteoporosis is a serious bone disease affecting 5.3 million Americans aged 50 years and older (Health People, 2012).
- It is more common in women (NOF, *n.d.*b).
- It causes loss of bone mass and bone fragility, which leads to bone fracture (NIH, 2012b).
- Bone fractures are associated with severe pain, loss of stature, limited mobility, and death (NOF, *n.d.*a).
- Adequate intake of calcium and Vitamin D is essential to maintain bone health (HHS, 2004).
- Performance of weight-bearing exercise helps build bone strength and bone density (NIH, 2012a).

Problem Statement

By the age of 18, females achieve peak bone mass, which is a contributor to bone strength (NIH, 2012a). Thus, osteoporosis prevention should occur during childhood and adolescence to build bone mass and promote bone health. However, there are gaps in knowledge about osteoporosis and methods of its prevention, especially among adolescent girls. Providing osteoporosis prevention education to adolescent girls is essential to reduce the risk of developing osteoporosis.

Purpose & Goal

- The purpose of this thesis project was to design and present an educational session about osteoporosis prevention directed towards adolescent girls.
- The goal of this thesis project was to bring awareness of osteoporosis and to stimulate motivation for a health promotion change.

Theoretical Framework

The osteoporosis prevention educational session incorporated Albert Bandura's social cognitive learning theory to optimize learning, comprehension, and motivation. Social cognitive learning involves the following four components (Cherry, 2015):

Attention → Retention → Reproduction → Motivation

Methodology

- Sample: 8 female adolescents involved in a girls club (*n*=8)
- Data Collection Instruments:
  - Demographic questionnaire with questions pertaining to previous osteoporosis knowledge, milk intake, and exercise regimen.
  - Pretest and posttest utilizing the same questions as depicted in Table A, Table B, and Figure 1.
- The 40-minute educational session included an overview of osteoporosis, risk factors, health complications, interactive learning activities and methods of prevention, particularly adequate consumption of calcium and vitamin D and participation in weight-bearing exercise.
  - Interactive learning activities included meal planning, reading nutrition labels, practicing weight-bearing exercise, and making a calcium-rich snack.

Demographic Questionnaire & Pretest → Conduct Educational Session → Posttest → Analyze Data
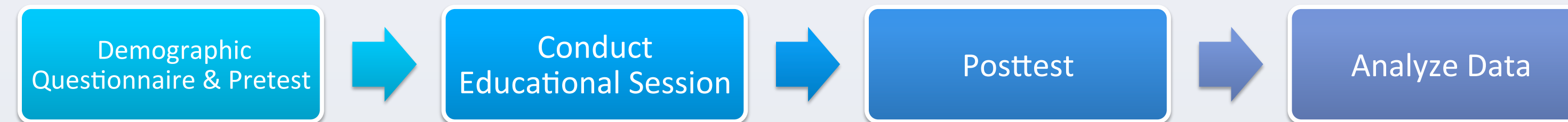
Findings

Table A, Table B, and Figure 1 display the pretest and posttest results.

Table A
Knowledge-Based Questions – Pretest and Posttest Results

Question	Correct Answers (%)		Change (%)	Significance
	Pretest (n = 8)	Posttest (n = 8)		
1. Osteoporosis is a _____?	100	100	0	-----
2. When is the best time to start preventing osteoporosis?	87.5	100	+ 12.5	0.35*
3. How much calcium should you have in one day?	0	100	+ 100	0.15*
4. How much vitamin D should you have in one day?	0	100	+ 100	0.50*
5. Which food is a good source of calcium?	50	100	+ 50	0.04*
6. Which kind of exercise is the best for preventing osteoporosis?	37.5	100	+ 62.5	0.08*
7. In one week, how often should you be doing exercises that prevent osteoporosis?	75	100	+ 25	0.19*

*Note. n = 8. *p < 0.05*

Table B
Personal Perception of Importance Question – Pretest and Posttest Results

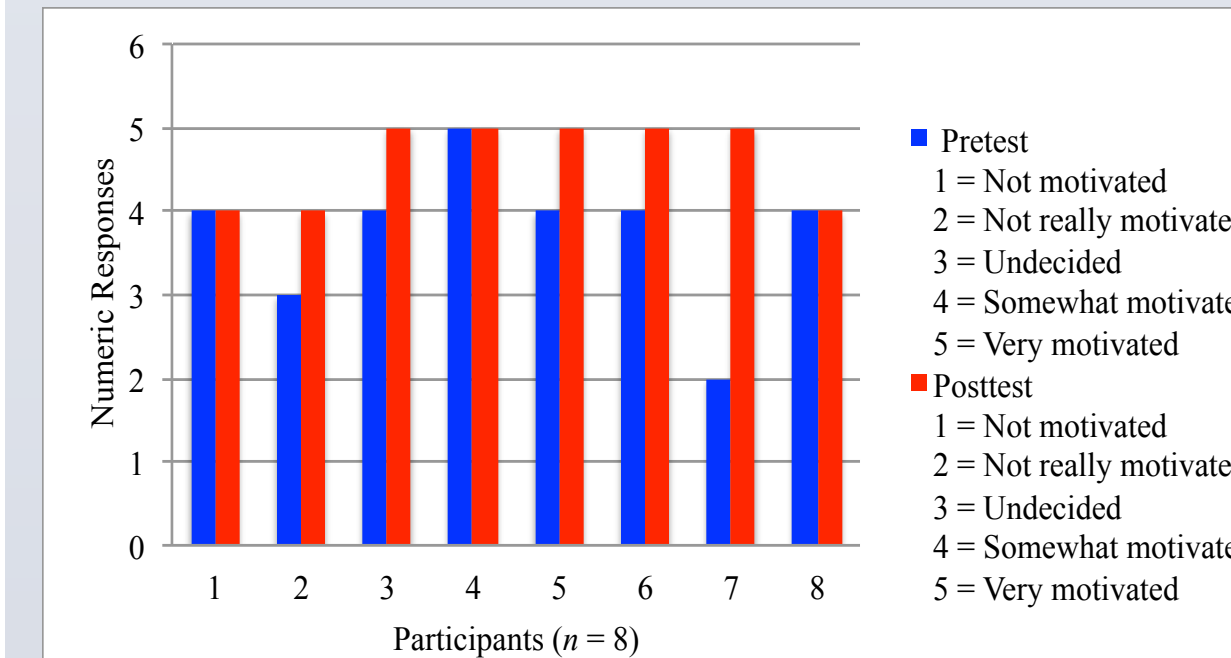| Question	"Very Important" Responses (%)		Change (%)	Significance
	Pretest (n = 8)	Posttest (n = 8)		
8. On a scale of 1 – 5, taking measures now, to build strong bones, is how important to you?	62.5	100	+ 37.5	0.10*

*Note. n = 8. *p < 0.05*

Figure 1. Pretest and posttest results for question 9, "On a scale of 1 – 5, how motivated are you at this moment, to prevent osteoporosis?"

Pretest
1 = Not motivated
2 = Not really motivated
3 = Undecided
4 = Somewhat motivated
5 = Very motivated

Posttest
1 = Not motivated
2 = Not really motivated
3 = Undecided
4 = Somewhat motivated
5 = Very motivated

Conclusions

- The goal of this thesis project was achieved.
- Among participants, knowledge about essential osteoporosis facts, calcium intake, vitamin D intake, and weight-bearing exercise was newly acquired or reinforced.
- Positive changes to personal perceptions of osteoporosis prevention and motivation to begin osteoporosis prevention occurred.

Recommendations & Implications

- Educators, community health nurses, and school nurses should utilize this educational session as a guide to deliver effective osteoporosis prevention education to adolescent girls.
- This educational session should be incorporated into the health and nutrition curriculum of middle schools and high schools.
- Future nursing research must be done to determine best teaching practices among adolescent girls.
- Other methods of delivering education (i.e. interactive website, smart phone application) to adolescent girls must be studied.
- Future longitudinal studies must be conducted to determine if motivation to prevent osteoporosis is sustained at various intervals after the educational session.

Limitations

- Small sample size
- The educational session was held after school.

References

Cherry, K. (2015). *Social learning theory*. Retrieved from http://psychology.about.com/od/developmentalpsychology/a/sociallearning.htm

Healthy People. (2012). *Arthritis, osteoporosis, and chronic back conditions*. Retrieved from http://www.healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=3

National Institutes of Health [NIH]. (2012a). *Kids and their bones: A guide for parents* (NIH Publication No. 12-5186). Bethesda, MD.

National Institutes of Health [NIH]. (2012b). *Osteoporosis overview*. Retrieved from http://www.niams.nih.gov/Health_Info/Bone/Osteoporosis/overview.pdf

National Osteoporosis Foundation [NOF]. (n.d.a). *What is osteoporosis?*. Retrieved from http://www.nof.org/articles/7

National Osteoporosis Foundation [NOF]. (n.d.b). *What women need to know*. Retrieved from http://www.nof.org/articles/235

U.S. Department of Health and Human Services [HHS]. (2012). *The surgeon general's report on bone health and osteoporosis: What it means to you* (NIH Publication No. 12-7827). Bethesda, MD