Promotion of Healthy Nutrition Knowledge Through a Girls’ Health Camp

Adejoke B. Ayoola, PhD, RN¹
Barbara Bosscher Timmermans, PhD, RN¹
Josephine Granner, BSN²
Elise Veurink, BSN, RN¹
Donald Bryant³
Arlene Hoogewerf, PhD⁴

(1)Department of Nursing, Calvin College, Grand Rapids, MI, USA
(2)Calvin College Department of Nursing, Grand Rapids, MI, USA
(3)Bryant’s Healthcare Solutions, Caledonia, MI, USA
(4)Biology, Public Health, Calvin College, Grand Rapids, MI, USA

Purpose: Obesity is one of the significant health problems affecting the population of the United States including adolescents. Consequences of poor nutritional choices and practices include increased risk of type 2 diabetes, poor daily health and well-being, high blood pressure, high cholesterol, heart disease and stroke among many other conditions. These mostly preventable conditions will affect quality of life, and life expectancy if not adequately addressed. To effectively promote the health of the younger generations and the future of the United States, it is essential to introduce the culture of health from a very early age and reinforce these discussions over a lifetime. This study examined whether a one-week health camp with well-focused nutrition sessions can improve nutrition knowledge and attitudes towards fruits and vegetables.

Methods: This study was guided by the Robert Wood Johnson Foundation (RWJF) Culture of Health Action Framework, with a focus of the first Action, which is to make health a shared value, with a driver of creating a mindset and expectations that value health promotion and well-being. The camps included two one-week health promotion day camps designed for young girls ages 9 – 15 years from low socioeconomic and diverse racial backgrounds in an urban medically underserved area. The camps focused on promoting a culture of health, educating girls about their bodies, leadership, and the health professions. Week 1 included 48 girls ages 9 – 12 years, and week 2 included 41 girls ages 12-15 years, with a total of 89 girls who participate in the post-camp surveys. Camp features daily health snacks and a college cafeteria lunch, nutrition and food preparation, among other health-related sessions. This is a simple descriptive study which employs a pre- and post-assessments approach to determine the impact of the HEALTH camp intervention among young girls.

Results: Week 1 focused on healthy beverages and colorful fruits and vegetables, and 12 foods from the questionnaire were featured in recipes. Post-test attitudes were improved for 15 foods, of which 8 were featured foods. For example, the post-test results show that there was a significant increase the percentage of girls who reported that they liked Kale (p=0.02). The post-test correct answer percentages increased for all five knowledge questions (p < 0.05 for three questions) including knowledge of the content of the fruits and types of vitamins in them. During posttest, 83.3% (versus 60.9% pretest; p=0.01) of the girls reported that the type of food they eat can make a difference in their chances of getting heart disease, cancer, or diabetes. Week 2 focused on whole grains and better fast food choices, and 8 foods from the questionnaire were featured in recipes. Post-test attitudes were improved for 18 (including all 8 featured) foods. The post-test correct answer percentages increased for all five knowledge questions.

Conclusion: This study suggests that nutrition knowledge and attitudes can be improved by a one-week health camp. Preventive actions to continue nutritional discussions that will promote healthy nutrition as an expected behavior include providing opportunities for comprehensive nutrition discussions/plans during annual physical exam visit to the clinic. Nurses and all health professionals should have relevant educational materials available for girls that will provide lists of locally available fruits and vegetables, and how to prepare appealing locally available healthy foods at low cost.
Title:
Promotion of Healthy Nutrition Knowledge Through a Girls' Health Camp

Keywords:
Adolescent girls, Health Promotion and Nutritional Education

References:

Abstract Summary:
Two one-week health camps with a well-focused nutrition sessions to promote the culture of health among 89 young girls aged 9-15 years was effective in increasing the nutrition knowledge and attitudes of the girls who attended the camp.

Content Outline:
1. **Introduction/Background**
   1. The importance of focusing on health promotion and nutritional intervention among the younger aged groups
      1. Relationships between nutritional intake and obesity
      2. Obesity and its consequences
      3. Importance of starting healthy nutrition discussion early
         1. Since 1988, there is an increasing trend in the percentage of children 12-19 years who are overweight/obese. In 2014 one in six children (ages 12-19) are obese (CDC, 2016; NCHS, 2016; Trust for America's Health and Robert Wood Johnson Foundation, 2017)
   2. The importance of health promotion nutritional intervention among the younger aged groups
2. **Objective of the study:** To examine the effect of a one-week health camp with well-focused nutrition sessions on nutrition knowledge and attitudes towards fruits and vegetables.
3. **Methods**
   1. Design- This is a simple descriptive study which employs a pre- and post-assessments approach to determine the impact of the HEALTH camp intervention among young girls.
   2. Framework: guided by the Robert Wood Johnson Foundation (RWJF) Culture of Health Action Framework, with a focus of the first Action, which is to make health a shared value, with a driver of creating a mindset and expectations that value health promotion and well-being (RWJF, 2016).
3. Sample- A convenience sample of 100 girls, ages 9-15 years mostly from low socio-economic and diverse racial backgrounds. These girls were recruited to participate in a one week day HEALTH camp from June 19 to 30, 2017.

4. Present the schedule and detailed content for the HEALTH camps

5. Present the content of nutritional sessions of the HEALTH camps

6. Present the data collection process- The pretest survey was completed at the beginning of the camp, on the first day and the post-test survey at the completion of the camp, on the last day. To reduce participants’ burden, the survey questions are few, short and specific to the content.

7. Data Analysis: Used simple uni-variate and bi-variate analyses. Results will be presented in percentages, means, and chi-square test for bi-variate analyses. The test for statistical significance in difference of pretest and post-test percentage of correct answers is made at the 5% level of significance with the standard difference in proportions test for the following.

4. Results: Present Results from the analyses of the camps

For 9-12 years

What you eat can make a difference in your chances of getting heart disease, cancer, or diabetes

<table>
<thead>
<tr>
<th></th>
<th>Pre Period</th>
<th>Post Period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Valid Percent</td>
</tr>
<tr>
<td>True</td>
<td>28</td>
<td>60.9</td>
</tr>
<tr>
<td>False</td>
<td>1</td>
<td>2.2</td>
</tr>
<tr>
<td>Don’t know</td>
<td>17</td>
<td>37.0</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>100.0</td>
</tr>
</tbody>
</table>

There is statistically significant difference between the percentage answering correctly from pretest to post-test. P-value = 0.01.

Which drink contains the least amount of sugar?

<table>
<thead>
<tr>
<th></th>
<th>Pre Period</th>
<th>Post Period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Valid Percent</td>
</tr>
<tr>
<td>100% fruit juice</td>
<td>4</td>
<td>8.7</td>
</tr>
<tr>
<td>chocolate milk</td>
<td>3</td>
<td>6.5</td>
</tr>
<tr>
<td>water</td>
<td>33</td>
<td>71.7</td>
</tr>
<tr>
<td>sports drinks</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>low-fat milk</td>
<td>6</td>
<td>13.0</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>100.0</td>
</tr>
</tbody>
</table>

There is no statistically significant difference between the percentage answering correctly from pretest to post-test. P-value = 0.07.
Fruits and vegetables contain vitamins and ___________.

<table>
<thead>
<tr>
<th></th>
<th>Pre Period</th>
<th></th>
<th>Post Period</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Valid Percent</td>
<td>Frequency</td>
<td>Valid Percent</td>
</tr>
<tr>
<td>protein</td>
<td>25</td>
<td>54.3</td>
<td>13</td>
<td>27.1</td>
</tr>
<tr>
<td>fiber</td>
<td>9</td>
<td>19.6</td>
<td>23</td>
<td>47.9</td>
</tr>
<tr>
<td>cholesterol</td>
<td>3</td>
<td>6.5</td>
<td>7</td>
<td>14.6</td>
</tr>
<tr>
<td>Don’t know</td>
<td>9</td>
<td>19.6</td>
<td>3</td>
<td>6.3</td>
</tr>
<tr>
<td>fat</td>
<td>0</td>
<td>0.0</td>
<td>2</td>
<td>4.2</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>100.0</td>
<td>48</td>
<td>100.0</td>
</tr>
</tbody>
</table>

There is statistically significant difference between the percentage answering correctly from pretest to post-test. P-value = 0.00.

Fruits and vegetables that are high in Vitamin A are ___________ in color.

<table>
<thead>
<tr>
<th></th>
<th>Pre Period</th>
<th></th>
<th>Post Period</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Valid Percent</td>
<td>Frequency</td>
<td>Valid Percent</td>
</tr>
<tr>
<td>red and white</td>
<td>5</td>
<td>10.6</td>
<td>8</td>
<td>16.7</td>
</tr>
<tr>
<td>blue and light brown</td>
<td>0</td>
<td>0.0</td>
<td>2</td>
<td>4.2</td>
</tr>
<tr>
<td>yellow-orange and dark green</td>
<td>9</td>
<td>19.6</td>
<td>21</td>
<td>48.3</td>
</tr>
<tr>
<td>purple and brown</td>
<td>1</td>
<td>2.2</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>Don’t know</td>
<td>31</td>
<td>67.4</td>
<td>16</td>
<td>33.3</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>100.0</td>
<td>48</td>
<td>100.0</td>
</tr>
</tbody>
</table>

There is statistically significant difference between the percentage answering correctly from pretest to post-test. P-value = 0.02.

5. Discussion and Nursing Implications

1. Discuss preventive actions related to the result of the study- Providing opportunities for comprehensive nutrition discussions/plans during annual physical exam visit to the clinic.
2. Providing lists of locally available fruits and how to prepare appealing locally available healthy foods at low cost.
3. Discuss future research recommendations to continue to develop this area of research.
4. 

First Primary Presenting Author
Primary Presenting Author
Adejoke B. Ayoola, PhD, RN
Calvin College
Department of Nursing
Associate Professor
Science Building
Grand Rapids MI
USA


**Publications:** Author and co-author of numerous manuscripts. Numerous presentations at national and international scientific meetings

**Author Summary:** Dr. Ayoola is an associate professor at Calvin College Department of Nursing. She has mentored many undergraduate students in research. In the last three years, she trained over 180 undergraduate nursing students to deliver an educational intervention in Grand Rapids. She is the Principal Investigator on an ongoing randomized control trial to promote women’s reproductive knowledge in low-income medically underserved neighborhoods, funded by Robert Wood Johnson Foundation Nurse Faculty Scholar Program (2012-2015).

Second Author
Barbara Bosscher Timmermans, PhD, RN
Calvin College
Department of Nursing
Associate Professor of Nursing
Grand Rapids MI
USA

**Professional Experience:** Presentations: "Multi-Disciplinary Academically-Based Service-Learning in Community Partnership: Uniting University & Community" Collaborative presentation to be given 2/14/03 at Michigan Campus Compact's 7th Annual Institute on Service-Learning, Mt. Pleasant, MI; "Service-Learning with Nursing Students at the Creston Neighborhood Association" Panel presenter at Lilly Foundation Academically-Based Service-Learning conference held at Calvin College, March, 2001.


**Author Summary:** An Associate Professor at the department of Nursing. She has been involved in quantitative and community-based participatory research which have been presented at local, national and international nursing conferences

Third Author
Josephine Granner, BSN
Calvin College Department of Nursing
Bachelor of Nursing Student
Grand Rapids MI
USA

**Professional Experience:** Josie Granner is an undergraduate nursing student at Calvin College Department of Nursing. She works with Dr Adejoke Ayoola, who is her nursing Professor and supervisor on the study being submitted for the STTI conference.

**Author Summary:** Josie Granner is an undergraduate nursing student at Calvin College Department of
Nursing. She works with Dr Adejoke Ayoola, who is her Professor and supervisor on the study being submitted for the STTI conference.

Fourth Author
Elise Veurink, BSN, RN
Calvin College
Department of Nursing
RN, BNS
Grand Rapids MI
USA

**Professional Experience:** A graduate nurse with her BNSC. Was involved in the design and implementation of the HEALTH camp. Presently works on a maternal and child health unit of a hospital in Grand Rapids

**Author Summary:** A graduate nurse with her BNSC. Was involved in the design and implementation of the HEALTH camp. Presently works on a maternal and child health unit of a hospital in Grand Rapids

Fifth Author
Donald Bryant
Bryant's Healthcare Solutions
CEO
Caledonia MI
USA

**Professional Experience:** Donald Tex Bryant has been an excellent independent contractor for Kent ISD, providing evaluation services specific to our health grants, both state and federal. He has provided consultation and data analysis for the following grants:

**Author Summary:** Donald Tex Bryant has been an excellent independent contractor for Kent ISD, providing evaluation services specific to our health grants, both state and federal. He has provided consultation and data analysis for the following grants:

Sixth Secondary Presenting Author
Corresponding Secondary Presenting Author
Arlene Hoogewerf, PhD
Calvin College
Biology, Public Health
Professor and Academic Dean
Grand Rapids MI
USA

**Professional Experience:** UpJohn Company, Kalamazoo, MI. Post-doctoral researcher in the Cancer and Infectious Diseases Unit, 1991-1994 Glaxo Pharamceutical Company, Geneva, Switzerland, Post-doctoral researcher with the Chemokine Project team, 1994-1997 Midland Certified Reagent Company, Midland, TX. Director of Catalog Products Division, 1997-2000 Professor, Department of Biology, Calvin College, Grand Rapids, MI, 2000-present

**Author Summary:** Dr. Hoogewerf enjoys teaching courses in several programs. She teaches Cell Biology and Genetics and Microbiology in the Biology program, Nutrition in the Health Education Program, and Epidemiology in the Public Health Program. She has a long-time interest in preventative health and the courses she teaches in all of these programs are connected to this interest. She currently is an academic dean and co-director of the Public Health Program.