Phenylketonuria (PKU) is an inborn error of metabolism characterized by the deficiency of liver enzyme phenylalanine hydroxylase. PKU patients cannot convert phenylalanine (Phe) into tyrosine (Tyr). Phe accumulates in the brain causing toxicity, tyrosine becomes conditionally essential and must be supplemented with medical formula. -- Treatment = lifetime low-Phe diet -- -- Hard to translate Rx to a menu -- -- Food fatigue is common ---- Loss of Therapeutic Benefit

WHAT IS CULINARY NUTRITION AND WHY DOES IT MATTER FOR PKU

- The integration of nutrition principles including nutrient knowledge & their medicinal properties, with culinary skills
- 200 mg of Phe lunch vs.

BACKGROUND

- Knowledge of treatment and of low-Phe foods do not influence diet compliance for PKU
- Standardized information-based approach of counseling is still costumery and leads to non-compliance in PKU
- Cooking techniques and access to attractive simple low-Phe recipes may create long-term diet behavior change and improve diet adherence in PKU
- Hands-on cooking classes improve culinary nutrition knowledge, skills & self-efficacy in all health conditions managed through diet
- Dietetics students at SJSU receive a heavily theoretical education with few culinary classes

OBJECTIVE AND HYPOTHESIS

- To examine the impact of a hands-on cooking module on San José State University (SJSU) dietetic students' knowledge of low-phenylalanine (Phe) foods and their ability to make appropriate culinary recommendations to adapt recipes for low-Phe diets.
- Our study hypothesizes that hands-on culinary classes will increase dietetic student’s knowledge of low-Phe foods and ability to make culinary recommendations for low-Phe recipes.

METHODS

- Quasi-experimental pilot study with hands-on culinary nutrition cooking lab and pre-, post- and follow-up testing
- Questionnaires scored Phe & PKU knowledge, cooking frequency and confidence, and recipe adaptation
- Descriptive Statistics was used to compare means and analyze trends in the data

INTRODUCTION / HANDS-ON CULINARY LAB

WHAT DID WE FIND?

<table>
<thead>
<tr>
<th>Table 1: Comparison of Pre, Post, and Follow-Up Knowledge Index</th>
<th>Pre-Intervention</th>
<th>Knowledge Index Post-Intervention</th>
<th>Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group (n=5)</td>
<td>16.0 (8.5)</td>
<td>20.0 (6.8)</td>
<td>22.8 (6.4)</td>
</tr>
<tr>
<td>Intervention Group (n=5)</td>
<td>14.0 (6.2)</td>
<td>27.2 (2.8)</td>
<td>23.3 (2.6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2: Comparison of Pre, Post, and Follow-Up Application Ability</th>
<th>Pre-Intervention</th>
<th>Post-Intervention</th>
<th>Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group (n=5)</td>
<td>2.8</td>
<td>2.0</td>
<td>2.2</td>
</tr>
<tr>
<td>Intervention Group (n=5)</td>
<td>1.8</td>
<td>2.2</td>
<td>2.0</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 3: Comparison of Pre, Post, and Follow-Up Teaching Confidence</th>
<th>Pre-Intervention</th>
<th>Post-Intervention</th>
<th>Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group (n=5)</td>
<td>1.8</td>
<td>1.6</td>
<td>1.2</td>
</tr>
<tr>
<td>Intervention Group (n=5)</td>
<td>1.4</td>
<td>1.8</td>
<td>1.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 4: Comparison of Pre, Post, and Follow-Up Ability to Adapt Recipe</th>
<th>Pre-Intervention</th>
<th>Recipe Adaptation Index Post-Intervention</th>
<th>Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group (n=5)</td>
<td>5.00 (2.7)</td>
<td>4.00 (1.7)</td>
<td>2.00 (1.3)</td>
</tr>
<tr>
<td>Intervention Group (n=5)</td>
<td>4.80 (2.4)</td>
<td>6.60 (1.1)</td>
<td>2.60 (1.5)</td>
</tr>
</tbody>
</table>

DISCUSSION

- Intervention group nearly doubled their knowledge of low-Phe foods.
- Confidence index + intervention group shows increased confidence scoring 1 point higher on the post questionnaire compared to pre-test, while control group was less confident in the post-test.
- The intervention group also felt more confident in applying the new knowledge learned in the cooking lab in their future profession and in teaching the material to others after the intervention according to the results of the post questionnaires. Six-week follow-up results showed a decline of knowledge. This decline may have been because this treatment was only a one-time lesson.
- The results of the Recipe Adaptation Index represent the measure of the participants’ ability to make culinary recommendations for a low-Phe diet (Table 4). The control group participants scored on average 1 point lower in the post test when compared to the pre-test and even lower after six weeks. The intervention group went up by almost 2 points in the post test which shows a trend of increased ability to make culinary recommendations for a low-Phe diet.
- Three similar recipe tests were given at the pre, post, and follow-up and the drop in the mean score during the follow-up may be attributed in part to timing as it was completed at the end of the semester when participants may have been preoccupied with final exams and other end of semester obligations.

LIMITATIONS

- This was a pilot study with a small sample size that excluded true randomization due to the purposive sampling technique used. The treatment consisted in a one-hour cooking lab administered one time only. The questionnaire and recipe adaptation tests used were created for this study, therefore not validated.

CONCLUSION & AREAS FOR FUTURE WORK

- Positive trends indicate improved knowledge of low-Phe foods and ability to make culinary recommendations for the low-Phe diet.
- Culinary nutrition may be a beneficial addition to nutrition coursework.
- Conduct with a larger dietetic student population and semester-long cooking class programs

REFERENCES

For questions or requests, please contact Daniela Crabill at crabill.dani@gmail.com.


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