Preparation of a Tunisian recipe booklet for phenylketonuric (PKU) patients

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BACKGROUND

Low accessibility of patients with PKU to low protein (LP) products is the dominant difficulty that alter diet adherence of Tunisian PKU patients.

AIM

To develop a Tunisian recipe booklet for PKU patients based on natural foods with low phenylalanine (Phe) content.

METHODS

- LP recipes that were designed by mothers of PKU patients (followed in the referral metabolic department) were collected.
- Nutritional composition was assessed based on composition reference tables.
- Cost was calculated based on the prices in June 2020.
- High Phe content recipes were excluded.
- Satisfaction of patients/mothers was evaluated with Google Forms questionnaire.
Preparation of a Tunisian recipe booklet for phenylketonuric patients. Ben Chehida et al, Tunisia

**RESULTS**

The recipes

- **56 recipes were enrolled:** sweety: 45%; salty: 55%

<table>
<thead>
<tr>
<th>Number of servings</th>
<th>Number of recipes</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>17 (30%)</td>
</tr>
<tr>
<td>2 - 3</td>
<td>19 (34%)</td>
</tr>
<tr>
<td>5-15</td>
<td>16 (29%)</td>
</tr>
</tbody>
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- **Ingredients: N=48**
  - Corn starch used in 86% of recipes
  - 35% other allowed foods
  - 65% foods to be weighed

- **Median intake per serving :**

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<thead>
<tr>
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<th>Average</th>
<th>extremes</th>
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<tbody>
<tr>
<td>Calories (Kcal)</td>
<td>219.7</td>
<td>29.4-788</td>
</tr>
<tr>
<td>Proteins (g)</td>
<td>0.85g</td>
<td>0.03-4.1</td>
</tr>
<tr>
<td>Phe(mg)</td>
<td>29.7mg</td>
<td>0-120</td>
</tr>
<tr>
<td>Carbohydrates (g)</td>
<td>40.65g</td>
<td>5.05-156.7</td>
</tr>
<tr>
<td>Fat (g)</td>
<td>10.5g</td>
<td>0.03-27.8</td>
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</tbody>
</table>
RESULTS

Phe content and cost

- **Phe content per serving** was strongly correlated with protein content (r=0.928; p 0.0001).
- Half of our recipes did not exceed 40 mg of **Phe** (Fig 1) and a cost of 0.6 Euros (Fig 2).

**Fig 1:**
Phe content per serving

- 20-40 mg: 32%
- 41-60 mg: 7%
- 61-99 mg: 2%
- 100-220 mg: 4%
- 0-19 mg: 55%

**Fig 2:** Cost per recipe

- < 0.6 €: 57%
- 0.6 - 3 €: 36%
- > 3 €: 7%
RESULTS:

Evaluation of the booklet by 34 mothers (22 mothers of PKU patients, 12 mothers of other IEM with LP diet) with a Google Forms questionnaire revealed satisfaction among **56% of participants** in average, for all the recipes as a group. The best satisfaction rates were for the recipes of: Pasta, Couscous, Pizza, and Brik.

<table>
<thead>
<tr>
<th>Degree of satisfaction</th>
<th>Low</th>
<th>Intermediate</th>
<th>High</th>
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<tbody>
<tr>
<td></td>
<td>12% (0-42%)</td>
<td>26% (9-56%)</td>
<td>56% (21-83%)</td>
</tr>
</tbody>
</table>

CONCLUSION

- This study resulted in a **validated Tunisian culinary booklet of low protein recipes.**
- It will offer a **variety of menus** that shall improve the **quality of life** of PKU patients.
- It may be **useful** also for patients with other metabolic diseases, renal insufficiency and liver diseases.