DEcision support system (dss) for adult weight management

Aadilah.B.*, Khairuddin, I. and Hazizi,A.S.
Institute of Biological Sciences, Faculty of Science, University of Malaya, 50603 Kuala Lumpur, Malaysia
*Corresponding author: aadilah@siswa.um.edu.my

INTRODUCTION

The research is to develop a decision support tool that can calculate energy input and expenditure requirements versus actual daily caloric needs among adults in Malaysia. The focus will be on adults aged between 18 to 59 years old, which is the age range considered as a stable growth level. Typically, on a daily basis, a man needs 2500 kcal while a woman needs 2000 kcal.

Objectives of the research:
1. Digitization of the expert viewpoint
2. A tool that assist user to keep track of food consumption and energy expenditure
3. A comprehensive Malaysian food database

METHODOLOGY

To achieve all this functionality in one system, this DSS is developed through four major steps:
1) Knowledge acquisition, where the expert in nutrition will be interviewed to identify the concept and meaning (expert requirements) within a decision-making situation, and suggest the solution for any constraints. The concept referred to here will be based on the energy balance principle.
2) Knowledge organization, where the data from the Nutrient Composition of Malaysian Foods book, Metas table and expert viewpoint are digitized and organized. A Database of Malaysian Foods will be developed using File Maker Pro 10, an advanced database software tool with and in-built source code editor.
3) Knowledge modelling will go through the System Development Life Cycle (SDLC).
4) Evaluation of the system’s performance will allow a few of the target users to get a hands-on feel of the DSS, after which they shall be implored to give feedback by way of an evaluation form. This feedback will go a long way towards helping the improvement of the DSS, to the end that a precise determination of energy intake (through food consumed), along with energy expenditure (through physical activity), can be achieved.

Table 1: Comparison current Weight Management System and proposed system

<table>
<thead>
<tr>
<th>No.</th>
<th>Current System</th>
<th>Proposed System</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Local system: the Malaysian Food Database in the NutriWEB Malaysian webpage (belongs to Malaysia Nutrition Society) only reflect the nutrient composition for food key-in by user but does not calculate the nutrient intakes.</td>
<td>It will provide nutrient composition food list that can be searched easily or key-in by user, together with different unit measurement per portion. It also calculates the nutrient intakes for individual and compared with RNI and Malaysia DG.</td>
</tr>
<tr>
<td>2</td>
<td>Most of the system in Malaysia provide BMI, Nutrient intakes and physical activities calculator are built-in together. It also has either one. Physical activities in calories burner specific intensity for particular physical are not listed with different strength measurement.</td>
<td>Development of energy balance system as a component of body weight management in which consist of two main components of nutrient intakes and physical activity calculations.</td>
</tr>
<tr>
<td>3</td>
<td>Does not provide energy balance calculator system caused students and nutritionist have to component of body weight management which is based on Malaysia Dietary Guidelines and RNI to support energy balance calculations.</td>
<td>It will be work as decision support tool.</td>
</tr>
<tr>
<td>4</td>
<td>Local software such as Nutrical which was based almost entirely on the Malaysian Food Composition Database and nutrient intake calculation only calculates individual calorie requirements including calories contained in said foods and will help to balance the menus. Updated food list can be easily added and downloaded.</td>
<td>This system will calculate on nutrients and caloric intake as well as energy expenditure program and PFCOP[1] calculations.</td>
</tr>
<tr>
<td>5</td>
<td>International system: different food database and physical activity measurements are used in their system based on local community with different target group of peoples; thus may not suitable to be used in Malaysia.</td>
<td>Will be based on Malaysia Foods with Malaysian adults as the target group.</td>
</tr>
</tbody>
</table>

Table 2: BMR predictive equations for adult Malaysians

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Formula</th>
<th>Error</th>
<th>SE Mean</th>
<th>%Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male 18-30</td>
<td>84</td>
<td>0.0350(W) + 2.48</td>
<td>0.64</td>
<td>0.0363</td>
</tr>
<tr>
<td>30-60</td>
<td>223</td>
<td>0.0432(W) + 3.11</td>
<td>0.50</td>
<td>0.0189</td>
</tr>
<tr>
<td>Formula 18-30</td>
<td>131</td>
<td>0.0353(W) + 1.99</td>
<td>0.51</td>
<td>0.0263</td>
</tr>
<tr>
<td>30-60</td>
<td>218</td>
<td>0.0539(W) + 2.14</td>
<td>0.51</td>
<td>0.0200</td>
</tr>
</tbody>
</table>

Due to the increasing of weight problem among adults and a need for comprehensive information on the actual dietary intake, the weight management DSS been proposed here to leads to better solved data analysis and decision making to experts(nutritionist and dietitian) that encompass of recommended dietary allowance and physical activity recommendations. Hence, no doubt that each and every Malaysian should maintain an optimum and healthy body weight range throughout life.

CONCLUSION

Major expected outcomes of the DSS as stated below:
1. A tool to calculate the energy balance with the recommendation for best health practice.
3. Optimize the nutrition management task.
4. An improvement to the current Malaysian Food Database.

OUTCOME RESEARCH

ACKNOWLEDGEMENTS

REFERENCES
3. Ismail et al. (1996).