Using DIMS for Real-Time Monitoring of Patient Dietary Intake and Plate Waste: A Pilot Study at Herlev Hospital

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Introduction

collecting and analyzing dietary data for monitoring of patient dietary intake

time consuming, inaccuracy and privacy issues, limiting routine monitoring

The dietary intake monitoring system (DIMS)
Aims

- This paper presents the development and the feasibility of using the DIMS 2.0 for the purpose of real-time monitoring of patient dietary intake and plate waste.

- in a study aimed at evaluating a new meal serving system at Herlev hospital.
Development of DIMS (1.0 to 2.0)
What is new about the DIMS 2.0

- Real-time data capture and analysis

Data transmission via wireless

Patient Id
weight image

DIMS Application
Automatizing real-time data analysis

- For monitoring of dietary intake and plate waste
- How?
  - Using DIMS application (on tablet) for real time
    - View cases
    - Meal analysis
    - Waste analysis
    - User interactive analysis
Overview of the application on tablet

![List of meals]

![Match results]
Meal analysis output on the tablet

<table>
<thead>
<tr>
<th>Identification</th>
<th>P-weight</th>
<th>Pre-weight</th>
<th>Post-weight</th>
<th>Time Span</th>
<th>Pre date</th>
<th>Post date</th>
<th>ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>42512FED</td>
<td>200</td>
<td>230</td>
<td>30</td>
<td>00.15.08</td>
<td>2016-04-20</td>
<td>12.23.05</td>
<td>25/38</td>
</tr>
</tbody>
</table>

Pre picture

Post picture
Interactive interface - User input

- Application: co-creational mode
- Interactive interface
  - User can add inputs
  - Improve accuracy portion size estimation

Portion consumed

Before Consumption Photo

After Consumption Photo
Methods

● Prospective study
  - Medical & surgical wards.
  - 9 weekdays in the pre implementation phase

● DIMS 2.0
  - Collect paired before and after photos & weight of plate

● Ethical consideration
  - Patients oral consent.
Results

- Real-time data of 74 plate contents before and after were captured on the mobile tablet
  - portion consumed
  - plate waste
  - 2 minutes time frame for generating a complete patient dietary report.
Measurement of effect of the new meal serving system on food waste reduction in a pilot

<table>
<thead>
<tr>
<th>Meal serving system</th>
<th>Portion served (g)</th>
<th>Portion consumed (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre (n=36)</td>
<td>308 (± 123)</td>
<td>64(± 58)</td>
</tr>
<tr>
<td>Post (n=38)</td>
<td>343(± 106)</td>
<td>71 (± 63)</td>
</tr>
<tr>
<td>P value</td>
<td>0,19</td>
<td>0,58</td>
</tr>
</tbody>
</table>
Conclusion

- DIMS 2.0 application facilitates a real-time monitoring of patient dietary intake and plate waste.
- Allows an investigator to have a quick and efficient overview of a patient with inadequate food intake.
- Photos of before and after meal servings can be used for guiding improved personalized meal serving.
Where are we?

- Automatize real-time monitoring of nutrient intake
  - How:
    - Automatize nutrients intake estimation
    - 3D photo image
    - Photo recognition
    - Link to weight data
    - Nutrient database
    - Software needs (App, real time)
    - Real time nutrient intake estimation
Research Team

- Prof Bent Mikkelsen, (Aalborg University)
- Michal Dobroczynski (syscore ApS)
- Tanga Andersen (MSc. Student, IFS- AAU)

Acknowledgements

- Herlev Hospital Staff
- Patients who participated in the study
- FoodSerVInSIRE, Foodtura
Thanks. Stay updated?

- Register for the Food & Devices Special Interest Group at Linked In
- Receive updates on a regular basis
- Stay tuned for the COST action planning
July 6-7, Preconference: July 5

See you at the 10th ICCAS 2017 Copenhagen
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