IMPLEMENTATION OF INFORMATIZATION IN ORGANIZING HOSPITAL MEALS IN THE REPUBLIC OF CROATIA

Natalija Uršulin-Trstenjak1*, Davor Levanić1, Dean Šalamon2, Dinko Puntarić3, Melita Sajko1

1University North, 104 brigade 3, 42000 Varaždin, Croatia
2General Hospital Varaždin, Ivana Meštrovića bb, 42000 Varaždin, Croatia
3Catholic University of Croatia, Ilica 242, 10000 Zagreb, Croatia

*e-mail: natalija.ursulin-trstenjak@unin.hr

Abstract

Ensuring optimal care development of patients’ nutrition and nutritional therapy in healthcare facilities is achieved by implementing the Croatian Ministry of Health’s decision on the “Standard for the Patient Nutrition”. Its features are the basis for the informatization of hospital meals and include 50 different diets defined according to the needs of particular patient groups. New standards provide unambiguous labelling, number and type of diets, diet’s uniform application with certain diseases, consistent nutrition quality, systematic development and control of hospital meals. Each diet has an ordinal number, name, energy value (kJ/kcal), proportion of macronutrients, number of daily meals, its purpose and characteristics. The aim of this paper is to give an overview of the Standard’s implementation through the IT system.

This system connects all hospital departments with the Dietetics and Nutrition Department. The designed software based on user requirements consists of the application software implemented using the program module “Nutrition”. Its menu contains: basic data, applications, menus, worksheets, requisitions, meals calculation, norms, planning, analysis, the core, and user settings. The overview refers specifically to the information oriented connections of the Departments of Gynaecology and Obstetrics and of Dietetics and Nutrition, where according to the Standard with regard to frequency, the diets should be prepared as follows: the diet for women who are pregnant, childbearing and breastfeeding; the diet without limitations; the diet for patients with diabetes; and three diets of the hospital - postoperative, tea and zero. Nutritionists and dietitians in health care and the development of IT system have given a significant contribution to the system’s realization.

Its advantage is reflected in continuous monitoring; instant recognition of deviations from the set parameters; equipment failures establishment; facilitated documentation of parameters; and creation of a database used for trend analysis and implementation of preventive actions, which affects the human resources optimization.

Key words: Hospital meals, Informatization, Standard for the Patient Nutrition.

1. Introduction

Chronologically, the development of the nutritional science begins with picturesque records (5000 BC) and writings on papyrus (1500 BC) at the time of the Egyptians. Hippocratic knowledge regarding the consumption of food as a medicine is present today: “Let food be your medicine, and medicine be your food”. In the 18th century, a scientific approach appears that some types of food can cure a specific disease, e.g. scurvy/citrus fruits (Rene de Reaumour [4]).

Dietetics and diet therapy belong to the nutritional science, whose role is to select a specific type of food for physiological processes, prevention and treatment of diseases [7]. Diet therapy is applied as a general or an individual therapy, or to a group of patients with a particular diagnosis, regardless the outpatient or inpatient treatment. When speaking of hospitalized patients, the tendency is to apply an individualized approach with the cooperation of each department with a nutritionist [5].

The implementation of the Croatian Ministry of Health’s decision on the introduction of the “Standard for the
Patient Nutrition” definitely contributes to the quality of the abovementioned. The Standard includes 50 different diets clearly defined according to the needs of particular patient groups. It provides unambiguous labeling, the number and type of diet, the uniform application of the diet with certain diseases, consistent nutrition quality, systematic development and control of hospital meals [2].

All the features of the Standard present the basis for the informatization of hospital meals [6]. Nutritionists and dietitians in health care and the development of IT system have given a significant contribution to the system's realization. The advantages of installing the target IT system that represents a link of all hospital departments to the Department of Dietetics and Nutrition are reflected in continuous monitoring, an instant recognition of deviations from the set parameters, the establishment of equipment failures, a facilitated documentation of parameters, and a creation of a database that can be used for trend analysis and implementation of preventive actions, which affects the optimization of human resources. In this way, the organization of hospital meals and a close cooperation with nurses, doctors and nutritionists at all times through the IT program and equipment produces the end result - the successful implementation of diet therapy.

2. Materials and Methods

This paper gives an overview of the application and implementation of the “Standard for the Patient Nutrition in Hospitals” through the IT system of a Hospital in the Republic of Croatia between the Department of Gynecology and Obstetrics and the Department of Dietetics and Nutrition.

2.1 Materials

The application of diet therapy in the Hospital is based on the implementation of the Croatian Ministry of Health’s decision on the “Standard for the Patient Nutrition”, which includes 50 different diets listed by number and type, and which are clearly defined according to the needs of particular patient groups. Each diet has its ordinal number, the name, the energy value (kJ/kcal), the proportion of macronutrients, the number of daily meals, its purpose and characteristics [2].

The need for preparing the diets at the aforementioned Department is as follows: the 1st is the diet without limitations; the 6th is the diet for women who are pregnant, childbearing and breastfeeding; the 17th and the 18th are the diets for patients with diabetes with 5/6 meals and with 3/4 meals [2]; and three diets of the Hospital - post-operative, tea and zero [3].

2.2 Methods

The specification of the software equipment was created following the Hospital’s request and it consists of the application software. It has been realized through the program module “Nutrition” based on Oracle technologies and it consists of 11 Menus: basic data, applications, menus (meals), worksheets, requisitions, meals calculation, norms, planning, analysis, the core, and user settings. Each Menu has a number of items of which the first one refers to the data recording, and other ones to data printing. This paper will give an insight (process) the Menu - menus (meals). It consists of items “Norms Recording” and items relating to the “Print Menu” - the menu for the type of meal, the price of meal according to the price of food, the menu referring to the day of the diet and the diets of a day, nutritional values (NV) - NV of the menus, cumulative NV as well as theoretical losses and differences of cumulative NV. Recording of the item menus (meals) includes the entry date of the menu and types of diets, each of which has its own code and name. Diets have their own kinds of meal with corresponding codes and the names of the types of meal. Furthermore, the meals have their own codes and names and are shown in a list [1].

3. Results and Discussion

The results show the organization in the implementation and application of the decision on the “Standard for the Patient Nutrition in Hospitals” through the IT system of a hospital in the Republic of Croatia. The overview refers specifically to the information oriented connections between the Department of Gynecology and Obstetrics and the Department of Dietetics and Nutrition.

The most frequently used diets at the aforementioned Department mentioned in the “Standard for the Patient Nutrition in Hospitals” are enumerated as follows: the diet without limitations can be found under number 1; the diet for women who are pregnant, childbearing and breastfeeding under number 6; the diets for patients with diabetes with 5/6 meals and with 3/4 meals under numbers 17 and 18; and another three diets of the Hospital - post-operative, tea and zero (Tables 1 and 2) [2, 3].

The aforementioned Departments - the Department of Gynecology and Obstetrics and the Department of Dietetics and Nutrition - are always connected. If a specific diet is necessary, the department nurse orders the necessary diet using a computer by choosing one of the 11 Menus, i.e. the Menu - menus (meals). In this Menu, s/he chooses the item “Menu Recording”, where s/he can choose from the catalogue of all the meals offered in the Hospital. There s/he chooses the appropriate diet. In this case the diet in question is the
<table>
<thead>
<tr>
<th>Diet number</th>
<th>Diet name</th>
<th>Energy value kJ/kcal</th>
<th>Meal number</th>
<th>Diet purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Diet without limitations</td>
<td>9200-10040/2200-2400 or 30 kcal/kg TM</td>
<td>3</td>
<td>patients with good nutritional status who do not require any special restrictions</td>
</tr>
<tr>
<td>6.</td>
<td>The diet for women who are pregnant, childbearing and breastfeeding</td>
<td>10460-11720/2500-3000</td>
<td>5</td>
<td>for women pregnant, childbearing and breastfeeding</td>
</tr>
<tr>
<td>17.</td>
<td>Diet for patients with diabetes with 5/6 meals</td>
<td>A) 5440/1300 B) 6280-7120/1500-1700 C) 8790-9630/2100-2300</td>
<td>5/6</td>
<td>for patients with diabetes who are overweight (A), of normal weight (B) and malnourished (C)</td>
</tr>
<tr>
<td>18.</td>
<td>Diet for patients with diabetes with 3/4 meals</td>
<td>A) 5440/1300 B) 6280-7120/1500-1700 C) 8790-9630/2100-2300</td>
<td>3/4</td>
<td>for patients with diabetes who are overweight (A), of normal weight (B) and malnourished (C)</td>
</tr>
</tbody>
</table>


Table 2. The most common diets of the Department - Department for Gynecology and Obstetrics [3]

<table>
<thead>
<tr>
<th>Diet number</th>
<th>Diet name</th>
<th>Energy value kcal</th>
<th>Meal number</th>
<th>Diet purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.</td>
<td>Tea diet</td>
<td>-</td>
<td>-</td>
<td>for the patients in pre- and post-operative phase</td>
</tr>
<tr>
<td>Characteristics:</td>
<td>Consummation of tea only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>67.</td>
<td>Zero diet</td>
<td>-</td>
<td>-</td>
<td>for the patients in pre-operative phase</td>
</tr>
<tr>
<td>Characteristics:</td>
<td>Nutrition without food intake by mouth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>71.</td>
<td>Post-operative diet</td>
<td>733</td>
<td>3</td>
<td>for the patients in post-operative phase</td>
</tr>
<tr>
<td>Characteristics:</td>
<td>Three daily meals: the same (breakfast, lunch and dinner)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Diet for women who are pregnant, childbearing and breastfeeding (under number 6).

The characteristics of the diet are the following:
- High-energy with additional 300 kcal during the second and third trimester of pregnancy, with additional 500 kcal during lactation; it suggests easily digestible food, no strong spices, cooked meat, poultry and fish (oily fish 1 - 2 times a week), and pasteurized dairy products;
- Blue vein cheese, cold salads with perishable ingredients, raw seafood, and big fish are not recommended; the intake of protein and iron and foods rich in folate and vitamin C is important;
- The recommendation is to introduce a snack of greater nutritional density with 2 - 3 servings of milk and dairy products for sufficient calcium intake;
- The water intake for adult women (2 L) during pregnancy is increased by additional 300 mL, and during breast-feeding for additional 700 mL;
- With recommended energy restriction of food intake (as instructed by the doctor), the menu is composed of high-quality ingredients that are a source of protein and listed vitamins and minerals (Table 1).

After the Department of Dietetics receives the ordered diet (automatically, it gets access to other items: the menu for the type of meal, the price of meal according to the price of food, the menu referring to the day of the diet and the diets of a day, nutritional values (NV) of the menu, cumulative NV, as well as theoretical losses and differences of cumulative NV (Figure 1).

Additionally, an overview within the catalog for a particular diet is obtained, i.e. the Diet for women who are pregnant, childbearing and breastfeeding - number 6 (Figure 2).

Catalog - the diet for women who are pregnant, childbearing and breastfeeding - number 6 provides an overview of the following:
1) Date: when the diet is used (Figure 3).
2) Type of the diet: code/number (6)
The name of the diet (the diet for women who are pregnant, childbearing and breastfeeding) (Figure 3)
3) Type of the meal: meal (the number of meals according to the type)
The name of the meal type (breakfast, lunch and dinner) (Figure 4).
4) Meals: code of the meal (210357)
NV meal norms - special beverages. (Figure 5).
5) NV meal type norms and NV of the diet (Figure 6).
4. Conclusions

- A large contribution to ensuring the optimum development of the concern regarding nutrition and nutritional therapy of patients in health care facilities is given by the new “Standard for the Patient Nutrition in Hospitals” which was adopted by the decision of the Croatian Ministry of Health.

- The new standards provide unambiguous labeling, the number and type of diet, the uniform application of diets with certain diseases, consistent nutrition quality, systematic development and control of hospital meals in all the Croatian hospitals.

- A significant contribution to the realization of the aforementioned is given by nutritionists in health care and the targeted application of the IT software equipment. The advantage of such a system is reflected in continuous monitoring, an instant recognition of...
deviations from the set parameters, the establishment of equipment failures, a facilitated documentation of parameters, and a creation of a database that can be used for trend analysis and implementation of preventive actions, which affects the optimization of human resources.

However, what is most important is that all departments of the hospital are connected through a multidisciplinary approach at all times, which enables immediate reactions and preparation of the necessary, appropriate, individual meal for each patient individually, which is then aligned with the treatment course of a disease and a drug therapy.

5. References


