Expert opinions about the use of comprehensive nutrition protocol in practice for obesity prevention

Mjenje strokovnjakov o uporabi celostnega prehranskega protokola v praksi pri preprečevanju debelosti

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**ABSTRACT**

**Introduction:** Obesity is associated with a number of chronic diseases. The research aimed to determine the effectiveness of nutrition assessment when using a comprehensive nutrition protocol at primary health service.

**Methods:** A real life situation was analysed for the positive and negative factors in the newly formed comprehensive nutritional protocol. These factors were identified by a group decision-making and a SWOT Analysis (Strengths, Weaknesses, Opportunities and Treats) and subsequently numerically evaluated with the Analytic Hierarchy Process method which included expert opinions.

**Results:** According to experts, the most important factors justifying the introduction of the protocol in practice are "equal treatment for all subjects" and "precisely prepared manual", followed by "individual treatment" and "health status improvements". The two most important negative factors are "dependence on other professionals" and "subjects will not be able to follow the protocol".

**Discussion and conclusion:** Expert opinions favour the introduction of nutrition protocol in clinical practice to ensure equal treatment of all subjects, and enhance obesity prevention with the accompanying detailed instructions. For this reason, further research should address the foundation of dietetic counselling services at the primary level of healthcare, so that physicians could refer obese people to individual nutritional therapy, which may reduce the prevalence of obesity.

**IZVLEČEK**

Uvod: Debelost je povezana s številnimi kroničnimi boleznimi. Analizirana je bila situacija v realnem okolju, to je zdravstvenem timu na primarni ravni, v primeru, če bi natančno opisan celostni prehranski protokol za obravnavo debelosti vpeljali v prakso.

**Metode:** Z opravljenim skupinskim odločanjem v fokusni skupini in orodjem SPIN (Slabosti, Prednosti, Izzivi in Nevarnosti) so bili definirani pozitivni in negativni dejavniki na novo oblikovanega celostnega prehranskega protokola, ki so bili nato z metodo analitičnega hierarhičnega procesa, ki vključuje mnenje ekspertov, numerično ovrednoteni.

**Rezultati:** Ugotovljeno je bilo, da sta po mnenju ekspertov najpomembnejša dejavnika, ki vplivata na prednosti uvedbe prehranskega protokola v prakso, »enakovredna obravnava vseh preiskovancev« in »natančno pripravljena navodila«. Poleg tega sta pozitivna dejavnika še »individualna obravnava« in »izboljšanje zdravstvenega stanja ljudi«. Dva najpomembnejša negativna dejavnika sta »odvisnost od drugih strokovnjakov« in preprečevanje, da »preiskovanci ne bodo zmogli slediti protokolu«.

**Diskusija in zaključek:** Mnenje strokovnjakov je pokazalo potrebo po prehranskem protokolu v klinični praksi, ki bi zagotovil enakovredno obravnavo vseh preiskovancev ter z natančno pripravljenimi navodili, izboljšal uspešnost pri preprečevanju debelosti. Nadaljnje delo bi bilo smiselno usmeriti v vzpostavitev prehranskih posvetovalnic na primarni ravni zdravstvenega sistema, kjer bi lahko zdravniki napotili osebe z debelostjo na individualno prehransko obravnavo, kar bi lahko zmanjšalo prevalenco debelosti.
Introduction

Obesity is associated with many chronic diseases. Due to the rapid increase in the prevalence of overweight and obesity and high costs of treatment, it is necessary to determine how to effectively treat this condition. Long-term positive energy balance leads to obesity, and negative energy balance is one of the most important actions in weight loss (Hamer & Mishra, 2010). Dietitians are experts who can be included in a medical team and the nutrition care process can reduce the prevalence of obesity (AND, 2006; Lau, et al., 2007; NICE, 2014). The role of a dietician is well known and dieticians have already been included in the obesity management treatments (Lacey & Pritchett, 2003; Johns, et al., 2014; Raynor & Champagne, 2016). A dietician uses a nutritional protocol, a formal description of the tasks and procedures to be used during nutritional therapy. The American Academy of Nutrition and Dietetics suggests the following steps in the nutrition care process: nutrition assessment, nutrition diagnosis, nutrition intervention, nutrition monitoring and evaluation (Lacey & Pritchett, 2003). Individual steps are interrelated and have different roles. A carefully prepared protocol is an important tool used by dietetics professionals to provide individual nutrition care in the process of treating obesity and changing behavioural risk factors. Dietitians, working in a multidisciplinary team, are clinically and cost effective in the management of overweight and obesity (BDA, 2016, p. 1). In Slovenia, the situation is still fairly uncertain as there are no established positions for dietitians. The Health Insurance Institute of Slovenia does not cover the costs of nutritional therapy, even though the Resolution on the National Program on Nutrition and Physical Activity for Health 2015 – 2025 considers a dietician an important member of the healthcare team (Ministry of Health, 2015). The study programme in Dietetics was introduced in Slovenia in the year 2007. There are approximately 100 graduate dietitians and 13 masters in dietetics. The profession of dietitian is a regulated profession in the Republic of Slovenia (Ministry of Health, 2016), but it is still rarely a member of a health team. At the primary healthcare

| Sequence of tasks/ | Description of activity/ | Performers/ |
|-------------------|--------------------------|-------------|
| Zapoređenje dejavnosti | Opis dejavnosti | Izvajalci |
| 1 | Precise written instructions for subjects on the day of measurement | Physician or dietician |
| 2 | Resting metabolic rate measurement (RMR), using indirect calorimetry | Dietitian and subject |
| 3 | Height, waist and hip measurements | Dietitian or nurse and subject |
| 4 | Body mass and body composition, using bioelectrical impedance analysis | Dietitian or nurse and subject |
| 5 | Blood pressure measurement | Nurse and subject |
| 6 | Venous blood samples for biochemical analysis | Nurse and subject |
| 7 | Biochemical and hormonal analysis (glucose, triglycerides, total cholesterol, low-density lipoprotein (LDL cholesterol), high-density lipoprotein (HDL cholesterol), C-reactive protein (CRP), adipokines) | Laboratory |
| 8 | Lunch break for fasting subjects | Subject |
| 9 | Food history | Dietitian and subject |
| 10 | Survey questionnaires: dietary habits questionnaire, food list, binge eating questionnaire | Dietitian and subject |
| 11 | Lumbar and flexor endurance test | Dietitian, nurse and subject |
| 12 | Instructions for food record and recording physical activity | Dietitian and subject |
| 13 | Recording food and physical activity | Subject |
| 14 | Data analysis and calculation – part 1 | Dietitian |
| 15 | Food frequency questionnaire (FFQ) | Dietitian and subject |
| 16 | Food record overview | Dietitian and subject |
| 17 | Nutritional counselling - general | Dietitian and subject |
| 18 | Data analysis and calculation – part 2 | Dietitian |
| 19 | Data input in DEXi - model | Dietitian |
| 20 | Determining the date of consultation | Dietitian |
| 21 | Individual plan preparation | Dietitian |
| 22 | Individual dietary counselling | Dietitian and subject |

Legend/Legenda: DEXi - a computer programme for multi-attribute decision making/računalniški program za večparametrsko odločanje.
level there are no dietitians at all. In Slovenia the CINDI workshops conducted programmes for the prevention of cardiovascular disease, which promote healthy eating (Hlastan Ribič & Maučec Zakotnik, 2013). However, these programmes are not designed to treat individuals and dietitians are not included.

A comprehensive protocol for the prevention of obesity "Obesity prevention nutrition protocol", developed by Bizjak (2016), was first used in Slovenia in a group of 48 people (subjects). The author emphasises that all the activities from protocol must be performed in order to carry out a high quality nutritional intervention (Table 1) when used in primary healthcare services. This article aims to assess positive and negative factors of the implementation of dietitians' work in the medical team, using a comprehensive nutritional protocol in treating obesity.

**Aims and objectives**

The aim of the research was to determine the advantages, opportunities, weaknesses and threats of comprehensive nutrition protocol when used in practice, based on expert opinions. The present study explored the complex issues which could be resolved with the expert knowledge and addressed the following research questions: (a) Is the introduction of a dietitian specialist in primary level health teams feasible? (b) What are the advantages and threats of internal and external environment, if the obesity prevention nutrition protocol were introduced in practice?

**Methods**

A qualitative research method was employed in the study. The data were collected using semi-structured interviews in five facilitated group discussions.

**Description of the research instrument**

The data were collected through focus groups, organised for research purposes and monitored by a researcher. The facilitator encouraged the group to discuss complex questions and generate information on participants' views. It was noted that experts can create a real-life situation (van Steenkiste, et al., 2002). Five open-ended questions were framed for discussion and data collection. Strengths, Weaknesses, Opportunities and Treats (SWOT) analysis is a tool for analysing external and internal environments - strengths, weaknesses, opportunities and threats. In order to analyse the usefulness, the internal and external environment must be analysed. The internal environment includes strengths and weaknesses that can influence a person's activity. Opportunities are external circumstances that enable the achievement of the objectives and threats are those factors in the external environment that may hinder the achievement of the desired objectives (Whalley, 2010). The SWOT-matrix in this study is based on the factors identified by our expert group. Since SWOT analysis does not provide numerical results to determine the importance of individual factors that could effect the introduction of dietitian protocol into practice, a new model was developed. The latter combined the SWOT factors with Analytic Hierarchy Process (AHP), with numerically evaluated results. The AHP is a method that can help in assessing quantitative and qualitative criteria in complex decision operations (Saaty, 2007). It is a multicriteria decision-making technique that may express the general decision operation by decomposing a complicated problem into a multilevel hierarchical structure of the objectives, criteria and alternatives. The essence of the AHP-method is a comparison of all the elements in pairs, at the same level in the decision-tree. A series of complex questions, to which we do not have exact answers, are provided to the relevant professionals, assuming that experts can well predict a real situation (van Steenkiste, et al., 2002). A scale 1 to 9 scale was used for a comparison of all the elements in pairs at the same level (SWOT-factors/categories) in the decision-tree (Table 2). On the basis of personal knowledge, experts expressed the difference between the compared parameters (Figure 1).

**Description of a sample**

Competent and experienced professionals in the field of nutrition counselling - dietetics and health were invited to participate in the preparation of the dietetics study program and integration of the profession among health workers at the national level. The experts are university teachers of dietetics, mostly doctoral degree holders. There are fewer than ten dietetics experts in Slovenia who can carry out the processes in the nutritional protocol, four out of which were selected (n = 4) by convenience. Two of them are members of the Slovenian Association of Nutritionists and Dietitians and the European Federation of Association of Dietitians, with extensive experience from the relevant field.

**Description of the research procedure and data analysis**

The study was approved by the National Medical Ethics Committee on January 6th, (56/08/11 bis). Factor identification that composes the SWOT-matrix was followed by pairwise comparison of all the criteria. The experts determined which comparative criterion makes a major contribution to an individual factor, and what is the difference between the compared criteria. We obtained pairwise comparisons estimates, which were further used to calculate the utility functions at individual levels of the decision tree.
If the criterion $i$ is assessed and compared with $j$, using the evaluation $a_{ij}$, the inverse score $1/a_{ij}$ is a measure of the opposite comparison. Pairwise comparison results can be shown by a square and reciprocal matrix. We used the Geometric Mean Method (GMM) (Grošelj, 2013) in the AHP group assessment method, which combines individual assessments into an aggregated pairwise matrix.

The estimated values are entered into the matrix with pairwise comparisons, given as the matrix A (Lipušček, et al., 2003). The matrix of pairwise comparisons $A$ is a square, positive reciprocal matrix in which the diagonal values are equal to 1 and the symmetric values are inverse. If $CR < 0.1$, the data in the pairwise comparisons matrix are harmonized and reliable results may be expected in a multi-attribute decision-making model (Saaty, 2007).

**Results**

The experts highlighted the difference between the compared parameters and formed the assessment criteria in relation to all categories of the SWOT-matrix. By means of SWOT analysis, the strengths, opportunities, weaknesses and threats of the newly formed nutrition protocol were identified (Table 3).
Table 3: SWOT factors of comprehensive nutritional protocol in obesity prevention
Tabela 3: SPIN dejavniki celostnega prehranskega protokola pri preprečevanju debelosti

| Strengths (S)/Prednosti (P) | Weaknesses (W)/Slabosti (S) |
|-----------------------------|------------------------------|
| meticulously prepared manual | dependency on other experts |
| individual treatment        | lack of interest of the management for nutritional therapy implementation |
| equal treatment for all subjects | lack of funding for equipment and analysis |
| shorter response times       | there are no established posts for dietitians in primary healthcare |
| lower costs of treatment     |                              |

| Opportunities (O)/Izzivi (I) | Threats (T)/Nevarnosti (N) |
|-----------------------------|-----------------------------|
| integration and cooperation in various disciplines | subjects will not be able to follow the protocol |
| reducing the cost of treatment | lack of funds for services |
| health status improvements | no funding for nutritional therapy by the Health Insurance Institute of Slovenia |
| implementation of the Resolution on the National Programme on Nutrition and Physical Activity for Health 2015 - 2025 objectives (Ministry of Health, 2015) |                              |

Table 4: Aggregated matrix - geometric mean of all the experts’ assessments
Tabela 4: Skupna matrika - geometrijska sredina ocen vseh deležnikov

| Strengths/Prednosti | Opportunities/Izzivi | Weaknesses/Slabosti | Threats/Nevarnosti |
|---------------------|----------------------|---------------------|--------------------|
| Strengths/Prednosti | 1                    | 1.57                | 3.72               | 2.91               |
| Opportunities/Izzivi | 0.64                | 1                   | 0.64               | 2.71               |
| Weaknesses/Slabosti | 0.27                 | 1.57                | 1                  | 1.19               |
| Threats/Nevarnosti | 0.34                 | 0.37                | 0.84               | 1                  |

Table 5: Importance of categories and factors in nutrition protocol establishment
Tabela 5: Pomembnost kategorij in dejavnikov za uvedbo prehranskega protokola

| SWOT categories/ Kategorija SPIN | Group rating/ Ocena skupine | SWOT factors/ Dejavniki SPIN | Factor priority within the group/ Ocena posameznih dejavnikov | Overall priority/ Skupna ocena |
|---------------------------------|-----------------------------|------------------------------|----------------------------------------------------------------|-------------------------------|
| Strengths/ Prednosti            | 0.441                       | Meticulously prepared manual | 0.254                                                          | 0.112                         |
|                                 |                             | Individual treatment         | 0.245                                                          | 0.108                         |
|                                 |                             | Equal treatment for all subjects | 0.312                                                        | 0.138                         |
|                                 |                             | Shorter response times       | 0.113                                                          | 0.050                         |
|                                 |                             | Lower costs of treatment     | 0.076                                                          | 0.034                         |
| Weaknesses/ Slabosti            | 0.195                       | Dependence on other professionals | 0.361                                                    | 0.070                         |
|                                 |                             | Lack of interest of the management for nutritional therapy implementation | 0.248 | 0.048 |
|                                 |                             | Lack of funding for equipment and analysis | 0.247 | 0.048 |
|                                 |                             | There are no established working places for dietitians in primary healthcare | 0.144 | 0.028 |
| Opportunities/ Izzivi           | 0.239                       | Integration and cooperation among various disciplines | 0.230 | 0.055 |
|                                 |                             | Reducing the cost of treatment | 0.224                                                          | 0.054                         |
|                                 |                             | Health status improvements   | 0.428                                                          | 0.102                         |
|                                 |                             | Implementation of Resolution on the National Programme on Nutrition and Physical Activity for Health 2015 - 2025 objectives (Ministry of Health, 2015) | 0.118 | 0.028 |
| Threats/ Nevarnosti             | 0.125                       | Subjects will not be able to follow the protocol | 0.534 | 0.067 |
|                                 |                             | Lack of funds for services   | 0.195                                                          | 0.024                         |
|                                 |                             | No funding for nutritional therapy by the Health Insurance Institute of Slovenia | 0.271 | 0.034 |
The AHP-group method was performed with aggregation of individual ratings that are equally important. For an overall assessment, GMM was used to calculate the geometric mean of all the experts' assessments and an aggregation pairwise comparisons matrix was prepared (Table 4).

The data in the pairwise comparisons matrix are consistent ($CR = 0.09$). The importance of individual SWOT categories was determined as shown in Table 5.

The analysis based on the expert opinion reveals that the primary factors contributing to the nutritional benefits of the introduction of the protocol in practice are "equality of treatment of all subjects" and "carefully prepared instructions", followed by "individual treatment" and "improving the health status of people".

Discussion

Using a SWOT-AHP model, we analysed our comprehensive nutritional protocol. The basic aim of the model was to establish strategies for the introduction of innovations such as those observed by other authors (Görener, et al., 2012). The introduction of a protocol into practice requires research strategies. Using SWOT - analysis, the positive aspects (strengths and opportunities) and negative aspects (weaknesses and threats) of a designed comprehensive nutritional protocol for the prevention of obesity were analysed. When drawing up the decision tree, we considered all the relevant factors that may affect the application of a comprehensive nutritional protocol for the prevention of obesity in a very complex situation in Slovenia where a dietitian is rarely a member of multidisciplinary healthcare team. In such situation it should be observed that patients are individuals and that the quantity of food they consume cannot be determined unless the value of resting metabolic rate is identified (Nieman, et al., 2003; St-Onge, et al., 2004). Thus, in the present comprehensive nutrition protocol, the measurement of resting metabolic rate is the basis for the preparation of a nutritional plan from which a health professional can design individual menus and manage energy balance. Due to accurately prepared protocol all patients go through the same protocol, providing equal treatment for all. We have prepared a work protocol that could be included in the primary level of the health service, including a dietitian in the multidisciplinary healthcare team. Using SWOT - AHP analysis, numerical values for individual factors were calculated. Further, the values using a group method to define decision utility functions were synthesized. Based on the experts' opinions, pairwise comparisons were evaluated for utility functions calculated at individual levels of the AHP decision tree. In addition, we determined which of the compared criteria makes a major contribution to an individual factor and the difference between the compared criteria. According to the experts, the most important factors that affect the nutritional benefits of the introduction of the protocol into practice are "equal treatment for all subjects" and "precisely prepared manual". Table 5 shows that positive effects dominate. In addition to the "equal treatment for all subjects" and "precisely prepared manual", "individual treatment" and "health status improvements" are also positive factors. The first two negative factors are in the fifth and sixth place: "dependence on other professionals" and "subjects will not be able to follow the protocol".

Limitations of the study

This study was designed for the Slovenian environment and situation that applies to nutritional treatment in Slovenia. This should be taken into consideration when interpreting the results.

Conclusion

The article demonstrates there is a need for nutritional protocols that will ensure equal treatment for all subjects. Nutritional therapy in Slovenia is still in the developing process. Individual treatment usually depends on an expert's assessment decision instead on the evidence-based guidelines. The access to nutritional counselling information is sometimes based solely on the patient engagement. Therefore, precisely prepared manual which establishes equal treatment for all subjects is needed. This will then facilitate the work of individual experts and enable them to devote time to individual diet plan treatment and focus on the goals of improving patients' health. However, introduction of innovations is consequently faced with challenges. Dietitians must work together with other experts from various professional fields. Implementation of nutritional therapy depends on the exchange of information and collaboration of these experts. Changing behavioural factors is a demanding task for patients. Unfortunately, the current situation in Slovenia does not allow dietitians to be part of the medical team at the primary level. So individual nutritional treatment is not a part of a diet therapy for overweight or obese people, although it is well known that proper diet can reduce risk factors of non-communicable chronic diseases. Our proposition is to establish dietetic counselling services at the primary healthcare level allowing physicians to refer obese people to nutritional therapy. Further research could focus on the evaluation of potential financial benefits of dietitians' work on the cost of medical treatment in Slovenia. We assume that in Slovenia, as well as elsewhere, the dietitians' collaboration in a healthcare team can reduce the prevalence of obesity and the cost of treatments of non-communicable chronic diseases.
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