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Posted Date: 19 January 2024

doi: 10.20944/preprints202401.1504.v1

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Article

Enhancing Elderly Nutrition: A Qualitative Evaluation of Menus in a Social Solidarity Institution in the North of Portugal

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Abstract: The article addresses the importance of nutrition in the health of the elderly population and focuses on the qualitative evaluation of menus provided by a social solidarity institution in Portugal, in order to prevent and/or treat malnutrition or the risk of malnutrition in this vulnerable population. The methodology involves the evaluation of four weekly menus, totalling 28 complete daily menus for the elderly, using the “Avaliação Qualitativa de Ementas para a População Idosa” (AQEDI) tool. The assessment grid is organized into six domains (general items, soup, protein suppliers, carbohydrate supplier side, vegetable side and dessert), each composed of various parameters. The results indicate that all menus were classified as “acceptable”, with percentages ranging from 60.73% to 68.84%, and suggests that while the menus are deemed acceptable, there is room for improvement. Recommendations include increasing the presence of eggs and including seasonal fruits daily, avoiding canned fruit. The study emphasizes the need for coordinated efforts within the institution to enhance menu planning, considering both nutritional guidelines and the sensory aspects of food. Coordination efforts within the institution are crucial for preserving positive aspects and addressing inadequacies in menu planning.

Keywords: elderly; menus; nursing homes; private institutions of social solidarity; qualitative evaluation

1. Introduction

If nutrition plays a crucial role for all age groups, it stands out with even greater importance for the health of the elderly [1]. It is observed that concerns about diet and their impact on health are becoming increasingly evident for care facilities for the elderly such as nursing homes, assisted living facilities, or senior care institutions.

Proper nutrition can lead to a healthy old age, with increased functional capacity and a lower incidence of diseases [2]. Therefore, the monitoring of nutrition by healthcare professionals, through the identification of potential risks or existing dietary errors, and the subsequent guidance for appropriate nutrition tailored to the conditions of each elderly individual, should be ongoing. The responsibility for nutritional intervention extends to all healthcare professionals and should be a shared effort.

Considering the relevance of nutrition for the health of the elderly population, it is important to verify the quality of the menus available in institutions that cater to individuals in this age group. This evaluation allows us to understand the meal preparation methods, food safety, and the availability of cultural and ethnic foods in the menus. It also helps ensure that the food served takes into account the nutritional needs and dietary preferences of an age group with a high prevalence of malnutrition [3–6].

In general, the qualitative evaluation of menus for this age group is important for promoting the well-being and quality of life of the elderly, ensuring that their dietary and nutritional needs are met.

In a previous assessment of the elderly in this social solidarity institution in the municipality of Vila Real [7] researchers found that 18.1% were malnourished, and 45.5% were at risk of malnutrition. Therefore, the objective of this study was to qualitatively evaluate the menus provided by a social solidarity institution in the municipality of Vila Real, north of Portugal, to its users in order to prevent and/or treat malnutrition or the risk of malnutrition in this vulnerable population.

2. Materials and Methods

The study evaluated four weekly menus for the year 2022, totalling 28 complete daily menus for the elderly. All menu evaluations were performed by the same individuals.

For this evaluation, it was used the methods of qualitative menu evaluation and/or proposed criteria for qualitative menu evaluation, AQEDI. This tool has criteria adopted and adapted from existing tools and new criteria based on DASH (Dietary Approaches to Stop Hypertension) diet recommendations [8].

This evaluation involved filling out an assessment grid that takes into account the basic principles of a healthy diet. The assessment grid is organized into six domains (general items, soup, protein suppliers, carbohydrate supplier side, vegetable side and dessert), each composed of various parameters, totalling 43.

The AQEDI grid allows for a detailed analysis after cooking and a comparison between the planned and executed menus [8]. The AQEDI working tool is organized into groups: meat, fish, and eggs; accompaniments; soup; and dessert.

The AQEDI tool also enables identifying necessary modifications before menu execution, providing for prior corrections [8].

The criteria used for the AQEDI are as follows [8]:

- Exclusive offering of water, ad libitum, at lunch and dinner.
- Offering of bread at lunch and dinner, preferably whole grain or mixed grain.
- Absence of repeated dishes within one month.
- Offering of non-vegetable preparations instead of soup, maximum once a week (e.g., chicken soup, fish soup, or meat soup).
- Presence of fatty fish at least twice a week.
- Offering of soup with legumes (either as a base or not) at least three times a week.
- Repetition of soups no more than four times a week, never on the same day or consecutive days.
- Presence of eggs as a single or main protein source, 1-2 times a week.
- Offering of white meats at least three times a week.
- Offering of red meats a maximum of two times a week.
- Offering of legumes on the plate at least two times a week, as a complement or substitution for the carbohydrate source.
- Offering of cooked fruit without added sugar, a maximum of three times a week.
- Presence of processed meat products up to one time a week.
- Repetition of the same legume (on the plate or whole in the soup) more than twice a week.

Specifically this grid is organized into six evaluation domains (general items, soup, protein suppliers, carbohydrate suppliers, vegetable suppliers and dessert) with parameters quantified according to their relative importance for the qualitative balance of the menu, and each domain is assigned a specific weight in percentage.

To quantified each criterion is assigned a relative importance based on what is required, recommended, and desired for a healthy diet, which translates into the following scoring: 3 = required criterion; 2 = recommended criterion; 1 = desired criterion.

Thus, when the menu meets the criterion being evaluated, the corresponding score is assigned. If not, a score of zero is assigned. The score obtained in the menu should be converted into a percentage according to the following formula, which has been used in other evaluation grids [8].

$$\text{Final Score (\%)} = [(S1 \times 0,5) \times 100]/\text{MScore1} + [(S2 \times 0,1) \times 100]/\text{MScore2} + [(S3 \times 0,1) \times 100]/\text{MScore3} + [(S4 \times 0,1) \times 100]/\text{MScore4} + [(S5 \times 0,1) \times 100]/\text{MScore5} + [(S6 \times 0,1) \times 100]/\text{MScore6}$$

S = Sum of the values obtained in each domain.

MScore = Value of the maximum possible scores in each domain (In the first domain, if the answer to item 1.16 is positive, MScore = 60; if it is negative, then MScore = 53; in the second domain, MScore = 8; in the third domain, MScore = 15; in the fourth domain, MScore = 5; in the fifth domain, MScore = 4; and in the sixth domain, MScore = 7).

In order to translate the percentage obtained in the final score of the quantitative evaluation into a qualitative assessment, the criteria used were: <50% Not Acceptable; 50% - <75% Acceptable; 75% - <90% Good; 90% - 100% Very Good.

3. Results

Menus 1, 2, 3, and 4 obtained total percentages of 60.73%, 68.84%, 62.31%, and 63.95%, respectively. Based on these percentage values, all of them were classified as "acceptable" menus.

The Table 1 presents the result of the scores for each item in each domain presented.

Table 1. Results of the final evaluation.

Domain	Item	Menu 1	Menu 2	Menu 3	Menu 4
General Items	1.1 A menu consisting of 5 daily meals.	NC	NC	NC	NC
	1.2 Exclusive offer of water, self-service, during lunch and dinner.	NC	NC	NC	NC
	1.3 Absence of monochromatic meals.	C	C	C	C
	1.4 Offer of products from regional or national production.	NC	NC	NC	NC
	1.5 Absence of dishes with similar consistency components.	C	C	C	C
	1.6 Equitable offering among various cooking methods (except frying).	C	C	C	C
	1.7 Offer of one unit of bread for lunch and dinner.	NC	NC	NC	NC
	1.8 Offer of one unit of whole grain or mixed cereal bread for lunch and dinner.	NC	NC	NC	NC
	1.9 Absence of repeated dishes within a month.	NC	NC	NC	NC
	1.10 Presence of charcuterie products up to 1 time per week.	C	C	C	C
	1.11 Absence of fried and sweets on the same day.	C	C	C	NC
	1.12 Offer of fried foods, at most, 1 time per week.	C	C	C	C
	1.13 Absence of fried foods for dinner.	C	C	C	C
	1.14 Repetition of the same legume (in the dish or whole in the soup) not exceeding twice per week.	NC	C	C	C
	1.15 The dish composed of: protein supplier, carbohydrate supplier, and vegetable accompaniment.	C	C	C	C
	1.16 Existence of technical sheets for meals.	NC	NC	NC	NC
	1.17 Use of raw potatoes in the soup preparation.	C	C	C	C
	1.18 Removal of visible skins and fats from protein suppliers before cooking.	C	C	C	C
	1.19 Offer of cooked fruit, without added sugar, a maximum of 3 times per week.	C	C	NC	C

	1.2NC Daily offer of at least 3 servings of fruit (1 serving \approx 1 medium-sized fruit).	NC	NC	NC	NC
	1.21 Absence of repeated fruit on the same day or on consecutive days.	NC	C	C	C
	1.22 Offer of at least two daily servings of milk or yogurt, preferably semi-skimmed (1 serving \approx 24NCml) in intermediate meals.	C	C	C	C
	1.23 Offer of foods from the cereal and derivatives group in all intermediate meals (1 bread or 6-8 biscuits or a cup of low-sugar cereal).	C	C	C	C
	1.24 Cereal or derivative foods present in intermediate meals (1 bread or 6-8 biscuits or a cup of low-sugar cereal) are preferably whole.	NC	NC	NC	NC
	1.25 Equitable distribution of offerings regarding different bread accompaniments in intermediate meals.	C	C	C	C
	1.26 Inclusion of nuts with a minimum frequency of once a week (quantity equivalent to 1/3 cup of walnuts or almonds or hazelnuts or peanuts or pine nuts or 2 tablespoons of seeds), preferably for dessert or integrated into intermediate meals.	NC	NC	NC	NC
	Total				
	Compliance	14	16	15	15
	Non-compliance	12	10	11	11
	Item score	35	39	38	37
Soup	2.1 Offer of soup for lunch and dinner.	C	C	C	C
	2.2 Offer of dishes without vegetables, in place of soup, a maximum of once a week (broth, fish or meat soup).	C	C	NC	C
	2.3 Offer of soup with legumes (either as a base or not) at least 3 times a week.	NC	C	C	C
	2.4 Repetition of soups up to 3 times per week, at most, and never on the same day or on consecutive days.	NC	NC	NC	C
	Total				
	Compliance	2	3	2	4
	Non-compliance	2	1	2	0
	Item score	4	6	5	8
Protein Suppliers	3.1 Number of fish meals equal to or greater than meat meals.	C	C	C	C
	3.2 Presence of eggs as the sole or main protein source, 1 to 2 times per week.	NC	C	NC	C
	3.3 Offer of white meats, at least 3 times per week.	C	C	C	C
	3.4 Offer of red meats a maximum of 2 times per week.	C	C	C	C
	3.5 Presence of fatty fish at least twice per week.	C	NC	C	C
	Total				
	Compliance	4	4	4	5
	Non-compliance	1	1	1	0
	Item score	12	11	12	14
Carbohydrate Suppliers	4.1 Equitable offering among the main carbohydrate suppliers (rice, potatoes, and pasta).	C	C	C	C
	4.2 Offering carbohydrate suppliers, with a preference for whole grains, in main meals.	NC	NC	NC	NC
	4.3 Offering legumes on the plate at least 2 times per week, as a complement or substitution for the carbohydrate source.	C	C	NC	C
	Total				
	Compliance	2	2	1	2
	Non-compliance	1	1	2	1
	Item score	4	4	2	4

Vegetable Suppliers	5.1 Equitable offering between cooked and raw vegetables.				C	C	C	C			
	5.2 Equitable offering among seasonal vegetables.				NC	NC	NC	NC			
	Compliance				1	1	1	1			
	Non-compliance				1	1	1	1			
Total				Item score				2	2	2	2
Dessert	6.1 Sweet dessert or fruit in syrup, a maximum of 1 time per week.				C	C	NC	C			
	6.2 Offering fresh fruit in all main meals (lunch and dinner).				NC	NC	NC	NC			
	6.3 Offering fruit with a preference for seasonality.				C	C	C	C			
	Compliance				2	2	1	2			
	Non-compliance				1	1	2	1			
Total				Item score				4	4	1	4
Final evaluation	Quantitative (%)				60,73	68,84	62,31	63,95			
	Qualitative				Acceptable	Acceptable	Acceptable	Acceptable			

Legend: C - Compliance; NC - Non-compliance.

4. Discussion

Due to the scarcity of studies focused on menus for the elderly, the discussion of this results is not very extensive. It is also worth noting that the different published studies use different evaluation tools, which sometimes hindered the comparison with results of this study.

From the completion of the evaluation grid, it was observed that in the "General items" domain, the technical sheets for each menu are not provided, which is a way to inform about the nutritional information of the meal, as recommended by Lima [9] in a guidance on menus and school canteens.

Technical specifications for menus are important because they provide detailed information about the ingredients, preparation methods, and nutritional information of the dishes. These documents assist in the consistent and efficient planning and preparation of meals, as well as provide valuable information to users with dietary restrictions and/or nutritional/food concerns. Food specification sheets are also important for financial management, as they help determine the cost of dishes and control expenses related to selected ingredients.

Regarding the "general items," it is worth noting that each of the evaluated menus only includes 4 daily meals instead of the recommended [8].

Concerning the qualitative evaluation of the soup, all menus were classified with an acceptable score mainly due to the variety of vegetable products. This result is consistent with a study conducted by Guerra and Rocha [10] in 45 preschool children. As observed in all evaluated menus, there was only one weekly meal of "canja" (chicken soup). The compliance with the recommendation of using legumes as a base in the soup 2 to 3 times a week at a minimum also contributed to the positive result in the "soup" item, consistent with the study conducted by Cardoso [11] in an evaluation of 3-day meals of 45 elderly individuals, where soup typically consisted of vegetables and/or legumes. This is contrary to the study conducted by Lopes and Rocha [12] in an evaluation of school menus in the municipality of Pombal, in Portugal, where the result was negative due to the scarce use of legumes in the soup. The daily presence of soup cooked with vegetable products, which are excellent sources of vitamins, minerals, and fiber, in the menu is one of the recommendations for a healthy diet [13].

Regarding the "protein sources," it is noteworthy that there is an equitable offering between fish and meat dishes. However, the provision of dishes using eggs as the main protein source is below the recommendations in all evaluated menus, with eggs being used only in two menus and once a week. The dietary recommendations from the Institute of Medicine, as disclosed by McGuire [14], suggest the inclusion of an egg dish in the menu plan with a minimum frequency of once a week. A similar result was found in a study conducted by Reis, Figueiredo, and Ávila [15], which highlighted the lack of weekly egg availability. Eggs are a rich source of high biological value proteins and

predominantly monounsaturated and polyunsaturated fats. They are also excellent providers of minerals (phosphorus, iron, and zinc) and vitamins A, B complex, and D [16]. According to national recommendations, the emphasis should be on offering "white meats" instead of "red meats" [13]. All evaluated menus complied with the recommendation regarding both "red meats" (maximum of two times a week) and "white meats" (minimum of three times a week). Lima and Rocha [17], on the other hand, found opposite results, with non-compliance regarding "red meats" and compliance regarding "white meats."

About the recommendation to include fatty fish in the menus at least twice a week, only one of the menus does not meet this parameter. However, the fatty fish used exclusively include salmon, sardines, and tuna. As for lean fish such as monkfish, hake, and cod, they are frequently used, which is beneficial for the elderly due to their ease of digestion [18]. The diet can contribute to successful aging through the consumption of omega-3 fatty acids present in fish and can directly influence the innate immunity process [19].

All dishes in the evaluated menus in this study included a carbohydrate-containing side dish. However, contrary to the study by Lima and Rocha [17], there was an equitable distribution between rice, pasta, and potatoes. Vegetables, due to their nutritional characteristics, are a fundamental component of daily food intake, and their inclusion in meals should be ensured in all meals [13]. It was found that this recommendation was not met in 3 out of the 4 evaluated menus. Similarly, low availability of vegetables was observed in the works of Guerra and Rocha [10] and Lima and Rocha [17]. The recommendation to offer legumes on the plate at least twice a week was always respected, not as a substitution for the carbohydrate source but as a complement, contrary to what is mentioned in the studies conducted by various authors [10,17,20].

It was found that seasonal fruit was offered as dessert in all menus, 10 out of 14 times per week, which is consistent with the study on the quality of menus in various institutions conducted by Lima and Rocha [17], where it was also observed that fruit is the predominant dessert in institutional cafeterias.

A healthy elderly person can consume three servings of fruit per day, ensuring a good intake of antioxidants that prevent cellular degeneration and premature aging, as well as important fibers, vitamins, and minerals for the proper functioning of the body [21].

Fruits contain compounds such as lycopene, polyphenols, and resveratrol, which help prevent prostate cancer, hypertension, and cardiovascular diseases [22].

Regarding the offering of sweets, canned fruit or fruit preparations, in the present study the recommendations were not met in all evaluated menus. These results are consistent with those found by Candeias and Rego [20], who estimated an excessive offer of sweet desserts, and by Reis, Figueiredo, and Ávila [15], which observed that the "desserts" domain showed that not always only one sweet or canned fruit was provided per week, which may contribute to excessive sugar consumption. The study by Lima and Rocha [17] shows that the recommendations for offering sweets and canned fruit were met in 75% to 100% of the evaluated menus, and the research by Cardoso [11] reveals that the intake of sweets is facilitated, both at lunch and dinner, once a week on different days.

The provision of water and regular bread should be included in all meals in the menu, as they are already used, in order to enrich it. With these suggestions for actions that already exist in reality but are not included in the menus, the qualitative evaluation, for example, of menu 2 would change from being classified as "acceptable" (68.84%) to "good" (77.32%).

The menus are prepared by personnel without specific training in the field of nutrition, such as social service technicians, sociocultural animators, nurses, and supervisors of services. Although there is occasional supervision for the inclusion of allergens in the menus by a food engineer, there is no involvement in their preparation or in the actual cooking process. The guidelines of the "Programa Nacional para a Promoção da Alimentação Saudável" of the Portuguese "Direção Geral de Saúde", specifically those by Ferreira et al. [8], are sometimes mentioned in the support material for menu planning, but they are not always correctly implemented in practice. An evaluation of private social solidarity institutions in Matosinhos, Portugal, parish revealed that the majority of menus were

prepared without the participation of qualified professionals, and half of them were not supported by any materials [23].

Having established criteria for various parameters of meal quality, it is necessary to ensure that they are met and monitored. This can be achieved by the involvement of specialized healthcare professionals in menu planning, as well as the availability of technical sheets for all meals served.

As a proposed improvement in menu quality, the authors suggest that everything offered to the users be included in the menu, which currently does not include all five daily meals (breakfast, lunch, afternoon snack, dinner, and supper). We would recommend the daily inclusion of raw and cooked vegetables, always prioritizing seasonal vegetables. Regarding protein sources, it is recommended the presence of eggs as either the only or the main protein source, at least once a week. A reduction in the offering of sweets, canned fruit, and fruit preparations would also be advised. Seasonal fruit should be consistently included in the menus. Furthermore the use of whole foods as additions or substitutions for more processed options would be a significant improvement in menu quality.

Appropriate nutritional monitoring should be implemented, with regular assessment of the elderly individuals' nutritional status and adjustments to their diet and, consequently, the institution's menu, as needed.

This evaluation should also consider the sensory and experiential aspects of food, such as taste, texture, appearance, and flavor.

It would be beneficial to identify any issues with the food served, such as lack of flavor, unpleasant appearance, or difficulty in chewing or swallowing. Incorporating feedback from the elderly individuals themselves can help ensure that the food served meets their preferences and needs.

5. Conclusions

The four evaluated menus obtained the following assessment percentages: 60.73%, 68.84%, 62.31%, and 63.95%, respectively. Based on these percentages, all of them were classified as "acceptable" menus.

The results obtained were deemed acceptable in all domains, according to the proposal for menu evaluation by Ferreira et al. [8]. To improve the menus, it is suggested to increase the presence of eggs as the only or main protein source at least once a week and to include seasonal fruit daily, while avoiding canned fruit.

This study allowed for the identification of the quality of the menus provided by the institution. It emphasizes the need to coordinate efforts within the institution to preserve the aspects that were deemed appropriate and improve those that are inadequate in terms of menu planning.

Author Contributions: Conceptualization, S.C.F.F. and M.C.T.S.; methodology S.C.F.F., S.C.B. and M.C.T.S.; formal analysis, S.C.F.F., S.C.B. and M.C.T.S.; investigation, S.C.B.; writing—original draft preparation, S.C.F.F., S.C.B. and M.C.T.S.; writing—review and editing, S.C.F.F. and M.C.T.S.; visualization and supervision S.C.F.F. and M.C.T.S.; project administration, S.C.F.F. All authors have read and agreed to the published version of the manuscript.

Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the e UTAD Ethics Committee (CE-UTAD) (Ref. Doc 34-CE-UTAD-2022, approval date: 12/05/2022).

Informed Consent Statement: Written informed consent was obtained from all subjects involved in the study.

Conflicts of Interest: The authors declare no conflicts of interest.

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