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EVALUATION OF THE NUTRITION BEHAVIOUR OF PEOPLE ABOVE AGE 65

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Abstract: The population of elderly people is rising, both in developed and developing countries. Due to the physiological changes occurring with age, food consumption patterns alter, and the variety of foodstuffs consumed diminishes. The purpose of the study was to evaluate the consumption of various foodstuffs necessary for the daily diet by the elderly. The study was conducted using the direct survey method among 102 respondents aged over 65 years, residing in the city of Sopot. It was found that the nutrition behaviour of the study group was incorrect. The frequency of consuming wholemeal bread, grits, legumes, vegetables and fruits was low. The drinking of milk and the consumption of dairy or fish occurred rarely. Additionally, they preferred animal fats, not recommended in their diet. They mainly consumed three meals a day, and drank insufficient amounts of fluids. Overweight and obesity were predominant.

Keywords: nutrition behaviour, food intake frequency, elderly people.

1. INTRODUCTION

The population of elderly people is rising, both in developed countries, including Poland, and developing countries. This creates a challenge and an opportunity for the food industry [Jędrusek-Golińska et al. 2018]. Food manufacturers notice the needs and the related consumer potential of the elderly, but so far there are few systematic actions on the market aimed at gaining and retaining elderly consumers [Awdziej 2014]. Due to the physiological changes occurring with age, food consumption patterns alter as well, and the variety of food consumed diminishes. This directly affects both the quality of life for the elderly, and their susceptibility to disease [Christensen et al. 2009]. For this reason, it is important that the elderly follow the nutrition recommendations prepared by the Food and Nutrition Institute [IŻŻ 2018] suitable for their age group, which involves the consumption of the correct proportions of varied groups of the foodstuffs necessary in the daily diet.

According to the FNI nutrition principles, the elderly should: 1. Eat meals regularly (5–6, every 2–3 hours). Drink fluids, at least 2 litres daily; 2. Eat fruits

and vegetables as often as possible, at least half of their daily food intake. Of these, 1–2 portions can be replaced by juices (200-400 ml); 3. Eat cereal products, especially wholemeal; 4. Consume dairy every day (primarily fermented products - yoghurts, kefirs) – at least 3 large glasses. These can be partially replaced with cheese; 5. Eat fish, eggs, lean meats, legumes, and plant oils. Limit the consumption of red meat, processed meat products and animal fats; 6. Limit the consumption of sugar and sweets (these should be replaced with fruits and nuts), and avoid drinking sweetened beverages; 7. Do not add salt to products, and purchase products with low salt content. Use herbs, as they contain valuable ingredients and improve flavour; 8. Do not consume alcohol; 9. Remember to supplement their daily diet with vitamin D (2000 IU/day); 10. Maintain physical and mental activity every day. Get involved in satisfying social activities.

The proper nutrition principles published by the FNI, related to the Healthy Eating and Physical Activity pyramid for elderly people [IŻŻ 2018] are a response to the WHO recommendations and include the idea of "Less sugar, salt and fat, more dietary fibre". The pyramid's authors note that people with diagnosed diseases (e.g. stroke, myocardial infraction, osteoporosis, type 2 diabetes) require personalised nutrition recommendations. Observing nutrition recommendations by the elderly will enable them to maintain good health and give them the opportunity for to grow older more actively and healthily. There is a range of pro-health products available on the Polish market, of which the elderly can take advantage. However, for optimal use of these products, the nutrition behaviours of the elderly need to be identified.

The purpose of the study was to evaluate the consumption of various foodstuffs necessary for the daily diet by the elderly.

2. MATERIAL AND METHODS

The study was conducted on a group of 102 people aged at least 65 years. The criteria for selecting respondents for the study were the spatial and social environments, i.e. the "Uzdrowisko Sopot" Independent Public Healthcare Centre in Sopot, located at the "Leśnik" Sanatorium Health Resort, which the respondents attended for dedicated group activities. Non-probability sampling was used, in which the researcher, based on an understanding of the population, selected the individuals to be included in the sample [Szreder 2004]. The study was conducted in 2017 using the measurement survey method, applying the direct interview technique. An original survey questionnaire was used, consisting of closed questions. Question comprehension was verified in a pilot study on a 30-person group. The respondents were asked about their sex, age, body weight, height, chronic disease incidence, and their nutrition behaviour. Answers to questions concerning nutrition behaviour were adjusted to fit the FNI-recommended (2018)

frequency of foodstuff consumption by the elderly. Based on the values of body weight and height provided by the study group, the body mass index (BMI) values were calculated to estimate the occurrence of overweight and obesity. The study group performed a subjective assessment of their income by selecting one of four possible answers, i.e. 'my financial status is very good – we can afford to satisfy all our needs and we are able to save money as well', 'good – we can afford to satisfy our basic needs and we are able to save money as well', 'average – we can afford to satisfy our basic needs, but we are unable to save any money', or 'poor – we cannot afford to satisfy our basic needs'. Furthermore, a subjective evaluation of the study group's knowledge concerning proper nutrition principles in advanced age was performed. The respondents' task was to select one of the possible answers, i.e. 'my knowledge of nutrition principles in advanced age is very good / good / poor / insufficient'. The criterion of sex was taken into account when discussing and interpreting the study results. Elements of descriptive statistics (percentage of the study group, %) were used to present the results.

The study group included 63 women (61.8%) and 39 men (38.2%). They were characterised by varied levels of education. The most numerous group were those with middle education – 40.2% of the group. 35.3% of the group had higher education, 8.8% had vocational, 3.9% had basic, and 11.8% did not indicate their education levels. Most declared that they prepare meals for themselves and/or their family independently (75.5%). The others declared that they do not prepare meals independently (12.7%), or that they require assistance in culinary tasks (11.8%). 21.6% of the group considered their financial status to be good (we can afford to satisfy our basic needs and we are able to save money as well), 72.5% to be average (we can afford to satisfy our basic needs, but we are unable to save any money), and 5.9% to be poor (we cannot afford to satisfy our basic needs). The majority of the women (64.1%) and men (55.6%) considered their knowledge of proper nutrition principles to be average. A good knowledge of nutrition principles at an advanced age was declared by 34.3% of the women and 36.7% of the men, while insufficient was declared by 1.6% of the women and 7.7% of the men.

3. RESULTS AND DISCUSSION

A healthy lifestyle is 50% reflected by the quality of life, and a rational diet markedly affects the quality of life and health of all population groups [Słowińska and Wądołowska 2008]. Nutrition plays an important role in body ageing and fosters well-being in old age [Jurczak, Barylski and Irzmański 2011].

According to literature data [Drzycimska-Tatka, Drab-Rybczyńska and Kasprzak 2011; Jurczak, Barylski and Irzmański 2011] and original research, the BMI values calculated for older people above the age of 65 indicted overweight in 50% of cases, 1st degree obesity in 11.8%, 2nd degree obesity in 2.9% and 3rd

degree obesity in 1% of the respondents. Excessive body weight was found both among women (60.3%) and men (74.4%). Furthermore, the respondents reported diseases that may stem from improper nutrition behaviour, such as: cardiovascular system disease (56.9% of the study group), type 2 diabetes (6.9% of the study group), gout (2% of the study group), digestive tract diseases (22.5% of the study group) and locomotor system diseases (66.7% of the study group). 21.6% of the study group considered their financial status to be good (we can afford to satisfy our basic needs and we are able to save money as well), and 72.5% to be average (we can afford to satisfy our basic needs, but we are unable to save any money). Although the subjective evaluation of income by the study group was satisfactory, it did not translate to proper nutrition behaviour in the group. Fluid intake was too low (Tab. 1) and did not cover the daily needs [Jarosz 2012]. Most respondents consumed less than five glasses a day (78.4% of the study group) (Tab. 1).

This study and literature data [Gębska-Kurczewska 2002] confirm that people of advanced age eat significantly fewer meals than the recommended number (in original research – 56.9%). Furthermore, elderly people most commonly ate 3 meals a day (68.3% of the women, 59% of the men) (Tab. 1). Products containing complex carbohydrates and dietary fibre were consumed only once a day by as many as 76.4% of the study group. It was observed that products providing a source of full-value animal protein were eaten more frequently by men than women (Tab. 1). This study and Gacek [2008] both demonstrated a higher consumption of milk and cheese by women than by men at an advanced age. Women typically included milk and dairy in two (55.6% of the studied women) or three (7.9% of the studied women) meals a day (Tab. 1). The study group consumed an insufficient amount of fruits and vegetables. Most of the women and men ate them during two meals a day (58% of the study group) (Tab. 1). This study indicates a too low consumption of fish by elderly people. The consumption of fish was deemed insufficient in 88.2% of the respondents (Tab. 1). Only 17.8% of the studied men and 7.9% of the studied women consumed no less than two fish servings a week (Tab. 1).

The study group were unable to specify the consumption frequency of individual fat types. Among liquid fats, they preferred rapeseed oil. Olive oil for culinary purposes was used only by 16.7% of the study group, and less than once a week. Soybean oil was the least frequently consumed by this study group of people over the age of 65 (Tab. 2). Gacek compared the consumption of olive oil by Polish and German elderly people and demonstrated that those residing in Poland consumed it less frequently than people of similar age residing in Germany. Różańska et al. [2013] demonstrated that the Polish elderly residing in small localities consumed excessive quantities of saturated fats. This original study demonstrated a higher preference for cow butter than for plant margarines among the study group. A higher preference for butter by men was observed,

12.8% consuming it once a day and 17.9% two to three times a day. Furthermore, men consumed plant butter and lard more frequently than women (Tab. 2).

Table 1. Selected nutrition behaviours of elderly people above the age of 65 [%]

| Nutrition behaviour | Respondent sex | | Total n = 102 |
|---|-----------------|---------------|------------------|
| | women n = 63 | men n = 39 | |
| Amount of fluids drank daily | | | |
| less than 3 glasses | 12.7 | 15.4 | 13.7 |
| 3 to 5 glasses | 68.3 | 59 | 64.7 |
| more than 5 glasses | 19 | 25.6 | 21.6 |
| Number of meals eaten daily | | | |
| less than 3 meals | 6.3 | 2.6 | 4.9 |
| 3 meals | 49.2 | 59 | 52 |
| 4 to 6 meals | 44.4 | 38.5 | 43.1 |
| Frequency of bread, grits and legume consumption | | | |
| every day at least 2 of the above products | 22.2 | 38.5 | 22.5 |
| every day at least 1 of the above products | 44.4 | 59 | 48 |
| less frequently | 31.7 | 2.6 | 28.4 |
| no information | 1.6 | - | 1 |
| Frequency of meals containing major quantities of animal fat | | | |
| every day in all meals | 12.7 | 23.1 | 16.7 |
| every day in 2 meals | 58.7 | 46.2 | 53.9 |
| less frequently | 23.1 | 27 | 25.5 |
| no information | 7.7 | 1.6 | 3.9 |
| Frequency of milk and cheese consumption | | | |
| every day in 3 meals | 7.9 | - | 4.9 |
| every day in 2 meals | 55.6 | 41 | 50 |
| less frequently | 36.5 | 56.4 | 44.1 |
| no information | - | 2.6 | 1 |
| Frequency of cheese consumption | | | |
| at least twice a week | 7.9 | 12.8 | 9.8 |
| at least once a week | 50.8 | 46.2 | 50 |
| less frequently | 39.7 | 38.7 | 38.2 |
| no information | 0.06 | 0.04 | 2 |
| Frequency of fruit and vegetable consumption | | | |
| every day in 3 meals | 14.3 | 12.8 | 13.7 |
| every day in 2 meals | 66.7 | 48.7 | 59.8 |
| less frequently | 15.9 | 35.9 | 23.5 |
| no information | 3.2 | 2.6 | 2.9 |

Source: original studies.

The results suggested the conclusion that elderly people above the age of 65 do not eat properly. The results showed that elderly people consumed the products recommended for their daily diet at incorrect frequencies and in incorrect proportions, or avoided them entirely. A marked majority consumed only small quantities of fruits and vegetables (Tab. 1), thereby increasing the risk of vitamin, mineral and dietary fibre deficiencies in their daily diet. Furthermore, a low consumption of cereal products (bread, grits) and legume-type vegetables was observed (Tab. 1), even though these products are a source of complex

carbohydrates, dietary fibre, plant protein, minerals and vitamins. A deficiency of the above leads to pathologies in the functioning of all organs, while a deficiency of B-vitamins manifests in adverse changes in the nervous system [Słowińska and Wądołowska 2008]. The diet of the study group was milk- and dairy-poor (Tab. 1). Insufficient milk product consumption lead to protein and calcium deficiencies. A protein deficiency fosters undesired reactions in the organs and metabolic processes [Wądołowska 2010], as protein is responsible for the building and rebuilding of all system tissues, hormones and enzymes [Puchalska-Krotki and Marcinkowska-Suchowierska 2011]. Calcium, in turn, is responsible for the correct functioning of the skeletal system, maintaining the acid-base homeostasis, and participates in many metabolic processes [Grodzicki, Kocemba and Skalska 2007]. An unsatisfactory, low frequency of fish consumption by the elderly (Tab. 1) promotes a risk of cardiovascular system disease, as it may lead to limits in the supply of polyunsaturated omega-3 fatty acids in the diet, if their supply is not supplemented from other sources, e.g. from plant oil consumption. An intake of omega-3 fatty acids in the daily diet is highly important at every stage of life, as they exhibit preventive effects against cardiovascular system disease, inhibit ageing, prevent the development of atherosclerosis lesions and skin lesions, and regulate the functioning of the immune system. Iodine, which is found in fish etc. is essential for the proper functioning of the hormonal system [Puchalska-Krotki and Marcinkowska-Suchowierska 2011]. The frequency of animal fat consumption, higher than plant fat consumption, was observed in the study group's diets (Tab. 2), which is a concern as it a factor increasing the risk of developing cardiovascular system disease and atherosclerosis lesions in most systems of the organism. A low frequency of plant fat consumption means a low supply of the polyunsaturated fatty acids which prevent, for example, the deposition of plaque in blood vessels, and reduce triglyceride and total cholesterol levels in the blood serum [Puchalska-Krotki and Marcinkowska-Suchowierska 2011]. The failure to include the above products in the diet leads to nutritional deficiencies and to malnutrition. Furthermore, as many as 56.9% of the study group declared that they eat 3 or fewer meals a day (55.5% women, 61.6% men) and drink insufficient amounts of fluids (3–5 glasses were consumed by only 64.7% of the study group, 68.3% of women and 59% of men). It was found that only 21.6% of the elderly, including 19% of the women and 25.6% of the men, drank more than 5 glasses of liquids a day (Tab. 1). The recommended amount is 2 litres for women and 2.5 litres for men. Unfortunately, as a result of physiological changes in their organisms, the elderly do not feel thirst and forget to hydrate themselves. This carries the risk of organism dehydration, dysfunction of processes occurring in the system, mental disorders, and may even lead to death. Water is an essential element of the diet, as it participates in biochemical processes, regulates body temperature and acts as a transport medium [Jarosz 2012].

Table 2. Consumption frequency of fat of plant and animal origin by elderly people above the age of 65 [%]

| Fat type | Frequency of fat consumption | | | | | |
|---------------------------------------|------------------------------|------------|-------------|-----------------|-------|----------------|
| | 2-3 times a day | once a day | once a week | less frequently | never | no information |
| Olive oil | | | | | | |
| women, n = 63 | 1.6 | 17.5 | 6.3 | 19 | 7.9 | 47.6 |
| men, n = 39 | 5.1 | 15.4 | 5.1 | 20.5 | 17.9 | 35.9 |
| total, n = 102 | 2.9 | 16.7 | 5.9 | 19.6 | 11.8 | 43.1 |
| Rapeseed oil | | | | | | |
| women, n = 63 | 6.3 | 39.7 | 14.3 | 7.9 | 3.2 | 28.6 |
| men, n = 39 | - | 33.3 | 17.9 | 2.6 | 12.8 | 33.3 |
| total, n = 102 | 3.9 | 37.3 | 15.7 | 5.9 | 6.9 | 30.4 |
| Sunflower oil | | | | | | |
| women, n = 63 | 3.2 | 11.1 | 9.5 | 11.1 | 12.7 | 52.4 |
| men, n = 39 | - | 10.3 | 10.3 | 23.1 | 12.8 | 43.6 |
| total, n = 102 | 2 | 10.8 | 9.8 | 15.7 | 12.7 | 49 |
| Soybean oil | | | | | | |
| women, n = 63 | - | 1.6 | - | 9.5 | 22.2 | 66.7 |
| men, n = 39 | 2.6 | - | - | 5.1 | 38.5 | 53.8 |
| total, n = 102 | 1 | 1 | - | 7.8 | 28.4 | 61.8 |
| Butter | | | | | | |
| women, n = 63 | 25.4 | 47.6 | 1.6 | 4.8 | 4.8 | 15.9 |
| men, n = 39 | 35.9 | 23.1 | 2.6 | 10.3 | 10.3 | 17.9 |
| total, n = 102 | 29.4 | 38.2 | 2 | 6.9 | 6.9 | 16.7 |
| Plant butter (soft margarines) | | | | | | |
| women, n = 63 | 15.9 | 9.5 | 6.3 | 15.9 | 12.7 | 39.7 |
| men, n = 39 | 17.9 | 12.8 | 7.7 | 17.9 | 15.4 | 28.2 |
| total, n = 102 | 16.7 | 10.8 | 6.9 | 16.7 | 13.7 | 35.3 |
| Lard | | | | | | |
| women, n = 63 | 1.6 | - | 6.3 | 17.5 | 25.4 | 49.2 |
| men, n = 39 | 2.6 | 5.1 | 10.3 | 15.4 | 30.8 | 35.9 |
| total, n = 102 | 2 | 2 | 7.8 | 16.7 | 27.5 | 44.1 |

Source: original studies.

Among the study group, all above the age of 65, overweight and obesity were predominant. Improper nutrition, rich in fats of animal origin and simple carbohydrates, yet poor in fruits and vegetables, fosters the development of excessive body weight and cardiovascular system disease, insulin resistance, type 2 diabetes, atherosclerosis, and locomotor system disease [Drzycimska-Tatka, Drab-Rybczyńska and Kasprzak 2011]. Functional food may aid in ensuring good nutrition among elderly consumers [Jędrusek-Golińska, Górecka and Szymandera-

Buszka 2016]. According to different studies, elderly people do not consume functional food frequently enough. In Poland, there is a tendency to reduce interest in functional food as a method of maintaining and improving one's health with age [Wądołowska et al. 2009]. Therefore, it appears essential to conclude that food manufacturers should undertake educational actions intended to promote a pro-health nutrition model among elderly people. These actions should be based on the quality characteristics of the product itself, the necessity for rational nutrition and the impact of bioactive ingredients on health at every stage of life.

4. CONCLUSIONS

1. The nutrition behaviour of the members of the study group, all above the age of 65 years, was poor.
2. They consumed inadequate amounts of milk and dairy, fish, cereal products, legumes, fruits and vegetables, ate too few meals, drank insufficient fluids, and failed to follow the foodstuff and fluid consumption recommendations of the NFI (2018) for people at an advanced age.
3. Among the study group, all above the age of 65, overweight and obesity were predominant.

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