

# Current nutritional status of patients with rheumatic diseases in the population of Poland

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## Abstract

**The aim of the study** was to evaluate the current state of nutrition of patients with rheumatic diseases in the Polish population.

**Material and methods:** An anonymous questionnaire study was carried out among the patients of the Institute of Rheumatology in Warsaw in the fourth quarter of 2012. Five hundred questionnaires were distributed, and 397 questionnaires were collected and accepted for further analysis (*response rate* = 79%).

**Results:** Overweight or obesity was present in more than half (53%) of the patients (overweight in 30.5% of respondents, obesity in 22.6%). Among obese subjects, 43% of men and 37% of women in the study think that their diet is correct. Sixty-eight percent of respondents declared that they do not follow any special diet and only 18% declared that they follow a diet with a reduced quantity of mono-saccharides (no sweets). A milk-free diet was followed by 7% of respondents, a meat-free diet by 6%, and a fruit-and-vegetable diet by 5%. Dietary supplements were regularly used by 26.7% of respondents, whereas 33.8% did not use them at all. The average assessment of physical aptitude (Health Assessment Questionnaire – HAQ) in the group of respondents was 0.71. No statistically significant differences were found between higher level of disability (e.g. HAQ  $\geq$  1) and the type of diet followed ( $p = 0.678$ ) or body mass index (BMI) value ( $p = 0.864$ ) in relation to persons with the value of HAQ  $<$  1.

**Conclusions:** More than half of patients suffering from rheumatic diseases are overweight or obese, which corresponds to the body weight profile of the population of Poland. Most patients diagnosed with rheumatic diseases do not follow any special diet. In spite of the frequent use of dietary supplements, the patients do not consult a doctor or a dietician about it. The type of diet and BMI value do not differ according to the level of disability.

**Key words:** rheumatic diseases, diet, dietary supplements, HAQ.

## Introduction

Rheumatic disorders are progressive conditions that reduce the quality of life of the patient. The most common inflammatory rheumatic disorders include rheumatoid arthritis, spondyloarthropathies and osteoarthritis. Connective tissue diseases such as systemic lupus erythematosus, Sjögren's syndrome, scleroderma or dermatomyositis occur less often [1–11].

Rheumatoid arthritis (RA) is an autoimmune, progressive, systemic disease of connective tissue. It is characterized by non-specific inflammation of the joints (symmetrical in most cases), the occurrence of extra-articular changes as well as systemic complications. The disease leads to disability, and premature death [1]. The prevalence of RA in highly developed countries ranges from 0.5 to 1.0% [2]. There are no direct data for Poland. It is estimated that the prevalence of rheuma-

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toid arthritis in Eastern Europe in men is 0.14% (95% CI: 0.08–0.22%) and in women 0.38% (95% CI: 0.24–0.57%). In Central Europe the prevalence of rheumatoid arthritis is 0.15% in men (95% CI: 0.11–0.19%) and 0.41% in women (95% CI: 0.31–0.52%) and for Western Europe 0.24% (95% CI: 0.21–0.28%) and 0.63% (95% CI: 0.55–0.75%) respectively [3].

Spondyloarthropathies (SpA) are an interconnected group of rheumatic disorders, characterized by common clinical symptoms and a similarity of genetic conditions. Spondyloarthropathies include, among others, ankylosing spondylitis (AS) and psoriatic arthritis (PsA) [4]. The disease affects more often men than women (in 2 : 1 proportion). Usually the prevalence is from 0.1% to 1.4% worldwide [5], although even more significant estimations can be met in the world (0.036–0.10%) [6].

Systemic lupus erythematosus (SLE) is a rare, chronic, inflammatory disease of autoimmune origin. Its etiology is multifactorial, and clinical symptoms are varied and depend on simultaneous occupation of many tissues and organs. The symptoms of SLE are most often dermatological, musculoskeletal, renal and cytopenic [7]. In Northern Europe the prevalence is assessed at 40 cases per 100 000 persons, and in the case of African-American persons at 200 per 100 000 persons. In the world population SLE is most commonly found in women: 80–90% of patients suffering from SLE are women [8]. The peak incidence of SLE falls at the relatively young age of 20 to 40 years (average 29 years) [8, 9].

Osteoarthritis (OA) is a group of overlapping disorders that in spite of aetiological differences lead to similar health consequences [10]. It is estimated that at a whole life level the risk of occurrence of osteoarthritis of e.g. the knee is almost 45% [6].

Rheumatic disorders require appropriate and suitable nutrition of patients, the aim of which is to strengthen the therapeutic process. Because of the diversity of rheumatic disorders the persons suffering from inflammatory disorders (such as RA or PsA) should follow a different diet than persons suffering from OA. The diet should reduce inflammatory reaction and the pain [11–14]. Studies have confirmed that rheumatic disorders are less frequent and progress more mildly in Southern Europe, which may suggest that the Mediterranean diet (rich in fish, olive oil and cooked vegetables) influences the diseases' course even though the impact of this influence is limited [11]. It is assumed that the consumption of large quantities of fish, olive oil and cooked vegetables can reduce the risk of the disease. This effect is connected with the high level of omega-3 acids [12]. The positive effect has also been noted for vitamin D and K [14]. The increased intake of table salt (sodium chloride) is also a significant factor that

influences the development of autoimmune diseases, including RA. Excess salt in the diet can lead to stimulation of Th17 cells and cause up to a 10-fold increase in their number, therefore inducing inflammation [13].

The aim of this study was to assess the diet and its influence on the quality of life of patients suffering from rheumatic disorders.

## Material and methods

An anonymous questionnaire survey was carried out among the patients of the Institute of Rheumatology in Warsaw (IR) from September to December 2012. The survey was distributed in the outpatient clinic as well as hospital wards of the institute. The respondents individually filled in the forms and then placed them in the prepared boxes.

The questionnaire was composed of 25 questions, including anthropometric questions. Apart from the demographics it included questions on the use of dietary supplements, the method of nutrition and its evaluation, consulting a doctor or dietician about the diet, the evaluation of health status, the occurrence of symptoms of a rheumatic disorder, comorbidities, quality of life, and fitness determination (Health Assessment Questionnaire – HAQ). The HAQ includes questions on the degree of independence when performing the following activities: dressing and grooming, arising, eating, walking, hygiene, reach, grip, and activities. Data on weight and height measurements were obtained from the declaration of the respondents. The statistical analysis was performed using the following tests: odds ratio (OR),  $\chi^2$ , Kruskal-Wallis analysis. The differences with  $p < 0.05$  were considered as statistically significant.

Five hundred questionnaires were distributed during the study, and 397 questionnaires were collected and accepted for further analysis (*response rate* = 79%). The characteristics of the study group are presented in Table I.

## Results

### Obesity and overweight

The survey results show that more than half (53%) of the institute's patients suffer from overweight or obesity (overweight – 30.5%, obesity – 22.6%). These conditions affect 56% of men and 52% of women. In the group of women obesity was found in 24% of patients and overweight in 28%, and in men 18% and 38%, respectively. Among overweight men 80% considered their nutrition as appropriate. Among women this percentage was lower (63%), but no statistically significant relations between sex groups were determined ( $p = 0.73$ ). Over 38% of respondents who in the study were found

**Table I.** Study group characteristics

	N	%
Gender		
female	307	77
male	90	23
total	397	100
Age		
mean	54.3	
standard deviation	15.7	
median	57	
Time of treatment by rheumatologist		
under 1 year	72	18
2 to 3 years	49	12
4–5	45	11
6–10	56	14
over 10	162	41
Reason for treatment by rheumatologist		
osteoarthritis	107	27
rheumatoid arthritis	165	42
ankylosing spondylitis	57	14
psoriatic arthritis	21	5
lupus	8	2
other	63	16
Comorbidities		
hypertension	140	35
coronary artery disease	46	12
diabetes	22	6
food allergies	15	4
osteoporosis	110	28
none of the above	91	23
Education		
university degree	144	36.3
secondary	141	35.5
post-secondary	34	8.6
basic vocational	51	12.8
lower secondary	3	0.8
elementary	14	3.5
Labour market status		
working	136	34
pensioner	87	22
retired	160	40
pupil/student	19	5
BMI*		
below the standard	10	2.5
standard	174	44.3
overweight	120	30.5
obese	89	22.6

\*standard BMI: 18.5–24.99

**Table II.** Nutritional habits

	N	%
Usually, which of the meals mentioned below do you have during the day?		
breakfast	350	88
second breakfast	140	35
lunch	361	91
afternoon snack	98	25
dinner	296	75
Do you snack between meals?		
yes, regularly	39	10
yes, occasionally	266	67
no	88	22
Usually you eat the largest meal		
in the morning	66	17
during the day	263	66
in the evening	60	15
How many litres of fluids do you drink per day?		
up to 1 litre (up to 4 glasses)	82	20.7
ca. 1.0–1.5 litres (5–6 glasses)	157	39.5
ca. 1.5–2 litres (7–8 glasses)	112	28.2
2 litres or more (over 8 glasses)	44	11.1

to be overweight thought that they were eating well ( $p = 0.642$ ), and 47% of respondents were of a different opinion. There was no significant difference in the results according to gender.

### Nutritional habits

Over 75% of respondents had 3 main meals during the day (breakfast, lunch and dinner). Every fourth person had an afternoon snack, and every third had a “second breakfast”. Four out of five respondents declared that they snacked between meals. In most cases the respondents had the largest meal during the day. Over 39% of respondents drank from 5 to 6 glasses of fluids per day (Table II).

### Diet

The majority (68%) of respondents declared that do not follow any special diet. Only 18% indicated that they follow a diet with reduced quantities of monosaccharides (no sweets), 7% of respondents follow a milk-free diet, 6% a meat-free diet and 5% a fruit-and-vegetable diet. Gender had no statistically significant effect on the results ( $p > 0.05$ ). In the group of patients diagnosed with inflammatory diseases HAQ index had the lowest values for the patients following a vegan and milk-free diet, compared to patients who followed other diets

**Table III.** Range of Health Assessment Questionnaire (HAQ) index in relation to the diet, with allocation to inflammatory and non-inflammatory diseases

Type of diet	HAQ*											
	Total (N = 396 persons)				Inflammatory diseases <sup>^</sup>				Osteoarthritis			
	N (%)	Me-dian	IQR <sup>#</sup>	Value min – max	N	Me-dian	IQR <sup>#</sup>	Value min – max	N	Me-dian	IQR <sup>#</sup>	Value min – max
meat-free (vegetarian)	25 (6%)	0.55	0.2–1.0	0–1.8	11	0.60	0.10–1.25	0–1.80	3	***	***	***
fruit-and-vegetable (vegan)**	19 (5%)	0.5	0.27–0.90	0–1.05	11	0.55	0.30–0.95	0–1.05	2	***	***	***
milk-free	29 (7%)	0.5	0.33–1.05	0–2.0	11	0.50	0.35–1.05	0.15–1.70	2	***	***	***
with reduced monosaccharides (no sweets)	71 (18%)	0.65	0.3–1.1	0–2.2	26	0.60	0.28–1.15	0–2.20	10	0.33	0.16–0.55	0–0.93
do not follow any special	266 (68%)	0.55	0.15–1.06	0–2.8	145	0.80	0.30–1.25	0–2.80	55	0.30	0.05–0.65	0–2.22

\*HAQ  $\geq 1$  – clinical disability, i.e. the occurrence of some degree of limitation in most areas of everyday life. HAQ > 2.25 – high index of disability (Rupiński R, Filipowicz-Sosnowska A. Disease activity and functional disability in rheumatoid arthritis patients. *Reumatologia* 2005; 43: 129-137).

\*\*Vegan diet means not eating not only meat, but also products the production of which is related to the exploitation of animals, such as dairy products (including eggs) and (usually) honey.

\*\*\*Too few to carry out statistical analysis.

#IQR – interquartile range.

<sup>^</sup>RA, PsA, AS, SLE

(meat-free, with reduced monosaccharides) or no diet at all. However, in this group of patients no statistically significant relationship was found between the value of the HAQ index and the type of diet (Kruskal-Wallis analysis  $p = 0.674$ ). In the case of OA patients the groups were too small to statistically analyse the HAQ index and the type of diet (Table III).

### Use of dietary supplements

Only 26.7% of respondents reported regular use of supplements during the last 6 months. Another 36.5% used them occasionally. The remaining 33.8% did not use supplements within the indicated period. The supplements most often used were: calcium – by 56% of respondents; single vitamins (A, B, C, D, E, folic acid) – 54%; supplements with fatty acids – 36%; multivitamins – 23%; supplements with glucosamine sulphate and/or chondroitin – 21%; and collagen – 12%. Among the users of supplements, 28% reported that all the drugs were recommended by a doctor and 36% that only some of them were. However, 37% of respondents used dietary supplementation without a doctor's supervision.

### Role of diet

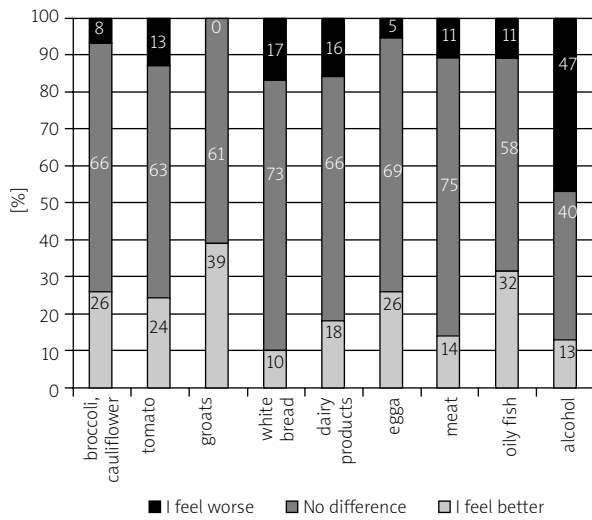
Sixty-four percent of male respondents and 68% of women reported that the diet influences their rheumatic

disorders. However, only 12% of men and 19% of women within the study group have consulted a doctor or a dietitian about the diet. In 27% of respondents rheumatic disease caused the change of diet, whereas 69% of respondents did not change the diet because of a rheumatic disorder. Over 59% of respondents reported that their diet is correct, whereas nearly 25% had the opposite opinion.

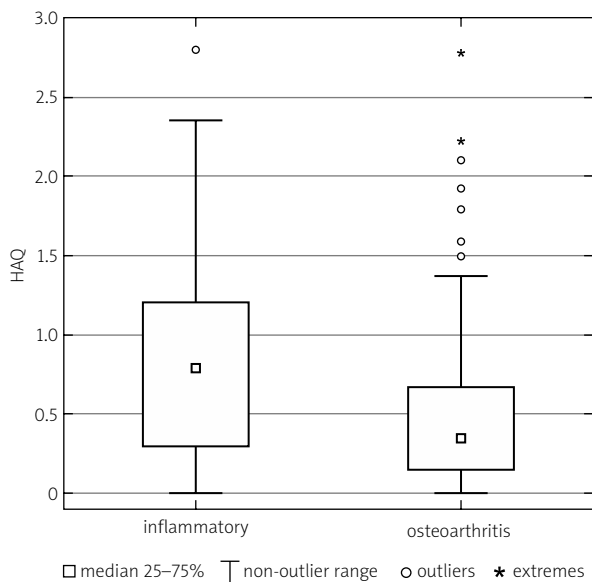
### Influence of consumed products on well-being of the patient

Figure 1 presents the responses of subjects related to the intake of given groups of products and experiencing rheumatic diseases. Although over 60% of respondents stated that diet influences their rheumatic disease, in the case of individual food groups, 10–39% of respondents stated there was such a relationship. Most often the positive influence was assigned to groats (39% of respondents) and oily fish (32%). The respondents declared that they felt worse only after the consumption of alcohol (47%). In the case of other products from 0 to 17% of respondents declared that they felt worse.

The distribution of responses for the variable “groats” is statistically significantly different from the distribution of responses for the remaining variables, except the variables eggs ( $p = 0.0973$ ) and fish ( $p = 0.2977$ ).



**Fig. 1.** Distribution of responses to the questions on the influence of selected products on rheumatic diseases.



**Fig. 2.** Health Assessment Questionnaire depending on the diagnosis.

**Subjective assessment of health status and Health Assessment Questionnaire**

In response to the question “How do you assess your health status?” 47.9% of respondents replied “neither good nor bad”, 25.2% of respondents reported their health status as “bad”, and 22.2% as “good”. Opposite answers, i.e. “very bad” and “very good”, were given by 1% and 3% of respondents respectively.

Symptoms such as pain (53.9%), reduced mobility (30.5%) and swelling of joints (7.8%) hamper everyday life of the patients.

The average assessment of fitness (HAQ, range of evaluation: 0–3) in the study group was 0.71 (standard deviation: 0.62, median: 0.55). In the group of patients with inflammatory diseases the median HAQ index value was 0.79 and in the group of patients with OA it was 0.35. In the group of patients with inflammatory diseases (RA, AS, PsA, SLE) the value of the HAQ index was statistically significantly higher than in the group of patients with osteoarthritis (Mann-Whitney *U*-test:  $p < 0.0001$ ) (Fig. 2).

No statistically significant relationship between higher level of disability (e.g. HAQ  $\geq 1$ ) and the type of diet ( $p = 0.678$ ) as well as the value of BMI ( $p = 0.864$ ) was found in relation to persons with the index value of HAQ  $< 1$ .

**Discussion**

Available reports, both national and international, refer to a specific disease, most often to RA, PsA and SLE. The international literature does not provide the results of studies on the diet and quality of life of rheumatic patients in general. Therefore the results of this study cannot be compared to the results of studies by other authors.

The results of the study on obesity and overweight in the study group are convergent with the data of the Central Statistical Office for the Polish population of adults. In 2009 the prevalence of overweight in Polish women was estimated as 29.4% and obesity as 15.2%. In men this percentage was 44% and 16.6% respectively [15]. The results of this study indicate that obesity is present in 24% of female patients and overweight in 28%. In men the respective figures are 18% and 38%. However, it should be noted that the results were based on declarations of the respondents, so they may vary slightly from the actual value.

According to the results of a study by Borges’ team carried out in a group of 170 women aged from 18 to 60 diagnosed with SLE, as many as 91.8% of patients were classified as well-nourished. Only 6.5% of patients were assessed as moderately malnourished and 1.8% as seriously malnourished. According to BMI, malnutrition was determined in 1.2% of patients; the remaining weight categories were the following: normal (healthy weight) – 35.9% of patients; overweight – 35.3%; and obesity – 27.7% [16]. Patients reported eating only 72.8% of estimated energy needs (food intake was assessed by 24-h recall and a semi-quantitative food frequency questionnaire). The majority (73.5%) of patients eat products that meet 90% of the energy requirement, and 9.6% of patients eat products of energy value that exceeds the requirements (110%). Over 92% of patients use dietary calcium supplements as well as iron supplements (36.7%) and vitamin B<sub>12</sub> (52.3%) [16]. The Klack

team, based on a meta-analysis, concluded that the proper diet in the treatment of SLE is oriented towards reducing the risk of cardiovascular diseases and lowering the indices of the inflammatory process. Systemic lupus erythematosus patients receive recommendations for a diet with moderate quantities of protein, rich in mono- and polyunsaturated fatty acids. In the case of diet supplementation, the supply of vitamin D, calcium and selenium is recommended [17]. It is worth bearing in mind that the correct diet and lifestyle determine the correct supply of calcium and vitamin D<sub>3</sub> [18]. On the other hand, it is recommended to reduce the intake of zinc and sodium supplements, because there is a risk that it may intensify the symptoms of the disease. A zinc-restricted diet causes an increase in the serum levels of corticosteroids, which can contribute to control of SLE. In order to increase the quality of life of SLE patients, the authors also recommend a diet rich in dietary fibre, vitamin D, taurine, and vitamins A, E, B and C [17]. Thumboo and Strand in a systematic review quote the results of studies indicating a significant relation between a diet low in cholesterol and improvement of the quality of life of patients diagnosed with SLE (randomized study, with a control group). The improvement of the quality of life observed in the study group was from 15 to 17% ( $p = 0.05$ ) [19].

The results of a multicentre Swedish study carried out in 2010 in a group of 1333 patients diagnosed with rheumatoid arthritis indicated that most of the patients (40.4%) had normal BMI. In the same study, 39.3% of patients were overweight or obese (15.8%). Only 4.4% of RA patients were underweight. The average value of the HAQ index for all weight categories was 0.6 (except persons with obesity, i.e. BMI > 30 kg/m<sup>2</sup>, where HAQ was on average 0.7) [20]. A similar study was carried out in Poland (in Poznan) in a group of 52 women (average age 56 years) diagnosed with RA. In the study group normal weight was observed in 38% of women, overweight in 29% and obesity in 33%. Increased supply of energy from fats – fatty acids in particular – was observed in the diet as well as an incorrect proportion of omega-6/omega-3 fatty acids. Low intake of folic acid and vitamin D was observed, covering respectively 68% and 29% of recommended values, as well as potassium, calcium and magnesium. On the other hand, excessive intake of phosphorus and sodium was noted. As many as 49.5% of patients in the study group had considerable disease activity [21].

The results of a controlled experimental study carried out in a group of RA patients in Finland by Hanninen indicated the beneficial influence of a vegan diet on the quality of life of RA patients [22]. In the experimental group (that followed a vegan diet) shorter time of morning stiffness of joints was observed ( $p = 0.001$ ) as well

as a lower pain level on the VAS scale (0.38;  $p = 0.003$ ) in relation to the control group. It is assumed that supplements of fish oil can also have a good influence on the alleviation of RA symptoms through slowing down the inflammatory processes [23]. A similar relation can be found in anti-TNF- $\alpha$  (tumor necrosis factor  $\alpha$ ) therapy. The results of a study carried out in a group of 50 RA patients indicated considerable improvement of the HAQ index in the patients who followed this therapy in comparison to the control group. The initial HAQ index was on average 1.83, whereas after 12 weeks of therapy it had decreased to 1.41 ( $p < 0.001$ ) [24]. Sköldstam presented similar results – he performed an experiment in which 26 RA patients followed a Mediterranean diet for 12 weeks (with a control group of 25 patients). In the study group a statistically significant reduction of the HAQ index was observed (average value at the beginning of the study – 0.7, after 12 weeks – 0.6;  $p = 0.012$ ) [25]. It is worth mentioning that Gordon presented different results [26]. In an experimental study carried out in a group of 22 RA patients who followed a low-calorie diet, no difference in the value of the HAQ index was observed before and after the experiment (i.e. after 48 weeks of diet with low fat quantities and rich in fibre, vegetables and fruit;  $p = 0.558$ ). The results of the present study also indicate no difference in HAQ index in relation to the diet in the group of patients suffering from inflammatory diseases (RA, PsA, AS, SLE).

The results of the study carried out by Crilly et al. in a group of 114 RA patients in the UK showed that women (constituting 82% of the study group) more often included fruit and vegetables in everyday diet (women – 69%, men – 14%). Similarly, higher intake of alcohol was observed in the group of women (women – 31%, men – 16%) [27]. In contrast to the above-mentioned results, the results of the present study indicate that a vegetable-fruit diet, a meat-free diet or a milk-free diet is followed by a small percentage of patients. In the Crilly study no statistically significant difference in BMI value was observed in the studied groups: the average value of the index in the group of women was 26.8 and in the group of men it was 27.2 [27]. Similarly, in the present study no difference in BMI range was observed between the group of women and men. It should be however underlined that in contrast to the quoted results of the study carried out in British patients, over 50% of patients were overweight or obese. Crilly et al. found that in the group of women and men moderate disability, defined using the HAQ index, was observed (95% CI: 0.04–0.40;  $p = 0.02$ ). The average value of the HAQ index was higher in the group of women (1.1) than in the group of men (0.8) [27]. The results of the present

study indicate a low disability level among the patients (the average value of HAQ was 0.71).

The results of a study carried out in a group of 126 patients suffering from psoriatic arthritis indicated that the minimum disease activity was often observed in the group of patients who followed a low-calorie diet, compared to the patients who did not follow any diet (OR: 1.85; 95% CI: 1.019–3.345,  $p = 0.043$ ). Over 58% of patients following a low-calorie diet that lasted 6 months lost weight of more than 5% of the total body weight. In the group of patients who lost less than 5%, the HAQ index value was  $1.29 \pm 0.79$ ;  $p = 0.004$ , whereas in the group of patients who lost more than 5% the HAQ index value was  $0.53 \pm 0.67$  [28]. The results of a Brazilian study carried out in a group of 34 men from 18 to 60 years old, diagnosed with psoriatic arthritis, indicated that 48% of patients were overweight and 24% were obese (27% of patients had normal BMI). The index of fat tissue exceeding the regular level ( $> 25\%$ ) was identified in 60% of the studied patients. The average intake of carbohydrates in the study group was  $42.8 \pm 12.53\%$ , proteins –  $20.1 \pm 5.78\%$ , fats –  $35.4 \pm 9.6\%$ . Low supply of fibre, vegetables, fruit, vitamins A, B, C, D, selenium and magnesium was observed. On the other hand, high supply of fats, cholesterol and fatty acids was noted. The research showed that inappropriate diet has a considerable influence on the increased risk of chronic diseases related to obesity as well as the deterioration of the quality of life related to the intensification of the disease symptoms [29].

The results of the present study show that in 27% of patients the diagnosis of rheumatic diseases was followed by a change in diet. This means that even though there is strong awareness of the role of diet in the course of the disease, only a few patients undertake actions to improve their health status through proper diet and body weight control. Understanding the causes of this phenomenon requires further studies.

## Conclusions

1. More than half of patients suffering from rheumatic diseases are overweight or obese, which corresponds to the body weight profile of the population of Poland.
2. Most patients diagnosed with rheumatic diseases do not follow any special diet.
3. In spite of the frequent use of dietary supplements, the patients do not consult a doctor or a dietician about it.
4. The type of diet and BMI value do not differ depending on the level of disability.

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