

ASSESSMENT OF THE CONSUMPTION OF FIBER FOOD PRODUCTS BY A SELECTED WOMEN'S GROUP

Anna Platta

Gdynia Maritime University, Morska 81-87, 81–225 Gdynia, Poland,
Faculty of Entrepreneurship and Quality Science, Chair of Quality Science and Quality
Management, ORCID 0000-0002-7963-1889,
e-mail: a.platta@wpit.umg.gdynia.pl,

Abstract: The presence of fiber in food, especially fermenting fiber, is the basis of a healthy diet, while probiotics are specialized food ingredients that affect specific bacteria, their final fermentation products, and thus have a beneficial effect on the host's health. The aim of the study was to assess the quantity of consumption of fiber-containing foods by a selected group of women. The study was conducted using the direct survey method among 145 respondents aged over 18 years, residing in the city of Gdynia. By means of the study, it was found that the nutrition behavior of the study group was incorrect, as the frequency of consuming fiber-containing foods was low. Own research and literature studies allow to formulate a statement that healthy people – women living in Poland, do not consume enough dietary fiber in their daily diet. The increase in consumption of products that are sources of dietary fiber by Polish women is very important in terms of improving their well-being and preventing overweight, obesity, diabetes, cardiovascular diseases and gastrointestinal cancer.

Keywords: frequency of eating food, dietary fiber, nutrition behaviors, women.

1. INTRODUCTION

"Dietary fiber is a natural ingredient in cereals, fruits, vegetables and seeds. It is a mixture of various compounds of plant origin resistant to digestive enzymes. It does not matter as a nutrient, however, it has many functions in the body, which makes it necessary in the human diet". Depending on the composition, it has different physical and chemical properties, and thus, a different effect on human body [Grimm et al. 1996].

Fiber is a particularly important and recommended component in the diet of healthy people and of people with metabolic diseases, because its presence reduces the rate of carbohydrate absorption from the gastrointestinal tract into the blood, having a positive effect on the profile of postprandial glucose. Fiber is neither a digested nor absorbed element of the menu. It mainly consists of: cellulose fiber,

hemicellulose fiber, pectin, gums, mucus and lignin. Recently, this list also includes resistant starch (a part of starch that is not digested by digestive enzymes) and functional parts of the dietary fiber (found in food or obtained from other raw materials, e.g. inulin, chitin, polyols, β -glucans of microbiological origin). The components of dietary fiber are divided into water-insoluble and soluble. The second type of fiber has a special impact on reducing fasting blood glucose and regulates its increase after a meal [Włodarek et al. 2014]. An additional advantage of consuming fiber is its anti-obesity and weight-reducing effect, which is particularly important in the prevention of type 2 diabetes. Dietary fiber plays an important role in the function of the colon. It affects the mass of the stool and its composition, while it is important for the development and composition of the bacterial flora. Insulin and fructooligosaccharides are of particular interest because of their probiotic properties [Paczkowska, Białkowska and Kunachowicz 2001; Searle et al. 2009]. These compounds stimulate the growth of bacteria from the Lactobacillus and Bifidobacterium families that live in the large intestine [Douglas and Sanders 2008].

Most dietary fiber is found in plant leaves, tubers and grains, such as dark flour, legumes, bran, breakfast cereals (e.g. oats), rice, cereal, wholemeal bread, vegetables and fruits [Bernas, Czech and Tatoń 2008]. The recommended amount of fiber in an adult's daily diet is 20 to 40 g [Jarosz 2017]. Dietary fiber intake for people with diabetes, obesity or overweight should be about 15 g/1000 kcal diet [2020 Guidelines...]. The presence of fiber in food, especially fermenting fiber, is the basis of a healthy diet, while prebiotics are specialized food ingredients that affect specific bacteria, their final fermentation products, and thus have a beneficial effect on the host's health [Hoyles and Vulevic 2008; Macfarlane, Steed and Macfarlane 2008].

The aim of the study was to assess the quantity of consumption of fiber-containing foods by a selected group of women.

2. MATERIAL AND METHODS

The study was conducted using the direct survey method among 145 women residing in the city of Gdynia. The study was conducted in 2019 using the measurement survey method and applying the direct interview technique. 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 anonymous. Women participating declared that they had higher education (93 persons) and secondary education (52 persons). The study was conducted on a group of 145 women between 19 up to 50 years old.

In order to verify the purpose of the work, a research hypothesis was formulated: the examined group of women shows correct nutrition behavior in the intake of sufficient dietary fiber.

The consumption of dietary fiber products was assessed using a test by Czarnocińska et al. [2013]. This method involved assigning an appropriate number of points to the answers indicated by the authors regarding the frequency of consumption of specific vegetables, fruits and cereal products. The respondents could select only one out of five possible answers, such as: less than once a month – 0 points, 2–3 times a month – 1 point, 1–2 times a week – 2 points, 3–4 times a week – 3 points, 5 and more times a week – 4 points. The respondents were asked about the frequency of consumption of one-day fruit juices, raw and frozen fruits, raw vegetables, boiled potatoes, legumes (beans, peas, lentils), other vegetables (pickled, frozen, boiled, baked), flour products (from graham flour, wholemeal flour, rye flour), bran, groats and dark (rye) bread, brown rice, quinoa and amaranth. The sum of points used to interpret the results was calculated based on the obtained answers. According to the adopted methodology [Czarnocińska et al. 2013], the obtained result could be assigned to one of the following ranges: ≥ 30 – the respondent consumes enough vegetables and fruits; 20–29 – the respondent consumes insufficient amount of vegetables, fruits and whole grain products; < 20 – the respondent consumes a very small amount of fiber. Furthermore, based on the calculated sum of points, it was found that people who obtained less than 20 points consumed unacceptable amounts of dietary fiber, and those who obtained 20 and more points consumed it in acceptable quantities.

Elements of descriptive statistics (percentage of the study group, %) were used to present the results.

3. RESULTS AND DISCUSSION

The diet of a healthy adult should be rich in the dietary fiber contained in raw vegetables, fruits, whole-grain cereal products; among others, in thick groats, brown rice, whole-grain pasta, and dark rye bread. Dry pulses, which have a low glycemic index, are also a very good source of fiber. Furthermore, all types of bran have similar properties, e.g. wheat, oat, buckwheat or rye. The Polish Diabetes Association recommends consuming 25 to 40 g dietary fiber per day [2020 *Guidelines...*].

The results of the study have shown that 41.4% of the respondents have very low fiber consumption, 52.4% – insufficient, and only 6.2% – sufficient (Tab.1). Among the surveyed women, the majority, as much as 52.4% (Tab. 1), consumed an insufficient but acceptable amount of fruit, vegetables and dietary fiber in their diet – 58.6% (Tab. 1). The respondents most often reached for raw fruit and vegetables, silage, wholegrain flour products and dark rye bread. They consumed

quinoa, brown rice, legumes, boiled potatoes, or one-day juices, vegetables or fruit less often. It was also found that only 6.2% of the surveyed women participating in the study (Tab. 1) consumed sufficient amounts of dietary fiber products.

In the case of about 41.4% of the surveyed women, an incorrect quantity (Tab. 1) of fruit, vegetables and cereal preparations were found.

Table 1. The assessment of the amount of consumed products deemed as sources of dietary fiber [Czarnocińska et al. 2013]

Assessment of dietary fiber consumption	Total	
	n = 145	[%]
Sufficient amount of fiber in the diet, i.e. respondents eat very well, eat enough vegetables and fruits in their daily diet; total score > 30 points	9	6.2
Insufficient amount of fiber in the diet, i.e. respondents should consume more vegetables, fruits and cereal products; total score from 20 to 29	76	52.4
A very small amount of consumed fiber, i.e. the respondents' diet, is probably low on important nutrients. Study subjects should eat more vegetables, fruits and other foods high in fiber every day; score < 20 points	60	41.4
Acceptable amount of fiber in the diet; total points \geq 20	85	58.6
Unacceptable amount of fiber in the diet; total score < 20	60	41.4

Source: original studies.

Studies by other authors confirm the results of this and previous studies. Zielke and Reguła [2007], for example, showed that adults (women and men) consumed too little fiber in the whole day diet (about 18 g/day). The study results of Cieloszczyk, Zujko and Witkowska [2011] also confirmed too low dietary fiber intake by the women who took part in the study, and who, indeed, did not even cover the minimum daily requirements. The authors of the cited studies also showed that the respondents rarely consumed legumes or whole grain cereals.

In addition, Szewczyk et al. [2011] found that, of the people taking part in their study, 83% (n = 78) did not consume whole grain pasta at all, 76% neither consumed whole grain rice and the same number of people did not eat bran. These people mainly consumed purified cereal products, such as light bread or white rice. In research conducted by Szczepańska et al. [2010], none of the 443 women consumed enough fiber. The author found insufficient fiber intake among 23% and poor intake among 77% of the study group. Similar studies by the same authors [Szczepańska et al. 2011] say that as much as 85% of all female students (n = 81) had a diet low in fiber, and the remaining 15% consumed insufficient amount of fiber. According to the study conducted by Czarnocińska et al. [2013] related to the study of the impact of attitudes on women's nutritional behavior (n = 1107), 70.5%

of the study participants had very low fiber intake, an insufficient intake was found in 29.1% of the respondents, while it was sufficient in 0.4%.

Overall, the results of the study have shown that 41.4% of the respondents have very low fiber consumption, 52.4% – insufficient, and only 6.2% had sufficient (Tab. 1).

4. CONCLUSIONS

1. The studied group of women consumed too few products containing dietary fiber in their diet.
2. Own research and literature studies allow to formulate a statement that healthy people – women living in Poland, do not consume enough dietary fiber in their daily diet. The increase in consumption of products that are sources of dietary fiber by Polish women is very important in terms of improving their well-being and preventing overweight, obesity, diabetes, cardiovascular diseases and gastrointestinal cancer.

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