

## RESEARCH ARTICLE

# Assesing the Knowledge, Attitudes and Eating Habits of Dietary Fibers in Tîrgu-Mureş Population

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**Background:** The aim of the study was to assess the knowledge, attitudes and eating habits upon consumption of dietary fibers in a group of people from Tîrgu-Mures area. **Material and Method:** We used a transversal descriptive study conducted on a group of 251 subjects from the urban area (76.4%), as well as from the rural area (23.6%), aged between 18 and 62 years, obtained using an online questionnaire consisting of 40 questions related to knowledge and attitude towards dietary fibers and estimated consumption of fiber from whole foods. **Results:** In the study group, we observed that 21.28% consumed whole cereals once per week and 18% did not consume cereals at all; regarding fruit consumption 17.44% consumed 6-8 pieces/week, and 3.4% consumed over 18 pieces/week. Frequency of fast food –meals consuming: 67.68% did not consume fast-food meals, 25.25% ate fast food once/week, and 1.1% consumed fast food between 8-10 times/week. Concerning the statement that fibers can prevent and/or treat colon cancer and obesity, 40% fully accepted the statement, 40% agreed, 14.29% were indifferent and 4.7% were against. From the total group of subjects, approximately 37.6% knew the meaning and classification of dietary fiber, 26.8% knew the recommended amount of fiber to be consumed daily, and 5.9% did not check the fiber content of foods ever. **Conclusions:** The inclusion of cereals and whole foods in diet is recommended in all nutrition guidelines worldwide, because of their association with a high health status, and prevention of chronic diseases. Consumers need to understand the benefits of whole foods, also to recognize and read the information about it on food labels.

**Keywords:** dietary fiber, prevention, whole foods

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## Introduction

The inclusion of cereals, fruits, vegetables and seeds in diet is recommended in all guidance dietary guidelines worldwide, because of their positive association with a high health status, prevent and reduce the risk of vascular disease and chronic diseases (1,2). Consumers should understand the benefits of whole foods and the recognition and reading food labels. Although whole foods are considered among the healthiest food choices available, their consumption falls well below current recommendations, which were based primarily on epidemiological data (3-6).

Currently, in Romania, there are no well-controlled intervention studies to provide detailed evidence to support real health claims and conclusions that can be used for developing effective public health strategies aimed on promoting the consumption of whole foods. In the summary of annual synthesis “Assessment of diet habits and nutritional status of the population” conducted by the National Institute of Public Health in 2010 on a sample of 839 subjects, dietary fiber intake was well below recommendations, both, men recorded an average 11.7 g/day and in women where the average intake was 11.9 g/day (7). The recommended intake for an adult is at least 30 grams per day. And in the summary of the 2011 annual synthesis on a sample of 1071 subjects, dietary fiber intake was well below recommendations, both men recorded an average consumption of 10.7 g/day and in women where

the average intake was 11.3 g/day (8). Despite the mention and recommendation upon consumption of dietary fiber from whole foods in “Guide to Healthy Eating” published by the Ministry of Health of Romania, the lack of a coordinated campaign to promote the consumption of whole foods can contribute to reduced consumption (9).

## Purpose

The purpose of the study was to assess the knowledge, attitudes and eating habits upon consumption of dietary fibers in a group of people from Tîrgu-Mures area.

## Methods

Transversal descriptive study conducted on a group of 251 subjects, aged between 18 and 62 years, achieved by applying an online questionnaire consisting of 40 questions related to knowledge and attitude about dietary fibers and estimated level of fiber consumption from food. Information was collected between August 2014 and October 2014. The subjects were informed about the purpose of this study, and the total number of participants was a sample of the adult population from Targu Mures.

Through the developed questionnaire we followed: demographic data (gender, age, education level, the environment of origin) behavioral and eating habits (number of meals which include salads, fruits, grains per week, the number of meals consumed in the city/home, meals frequency consumed at fast food) subjects knowledge about dietary fiber (definition, types of fiber, the fiber content of foods) means of information and subjects knowledge

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about the relationship between fiber and diseases such as diabetes, cardiovascular disease, obesity, breast cancer, colon cancer and hypercholesterolaemia.

**Statistical analysis**

The information obtained from the questionnaires were centralized in an Excel database and statistical analysis was performed using GraphPad Prisma software (San Diego, California, USA). We used the Mann-Whitney U test to assess differences between nonparametric variables, while the Chi square test ( $\chi^2$ ) was used for categorical variables expressed by numbers(%). All test were interpreted compared to the threshold level of significance  $p < 0.05$  and statistical significance was considered for p-value lower than the value of threshold significance.

**Results**

In the study group from 251 subjects, women were prevalent with a rate of 77%, men represented a rate of 23%. Average age was 32 years (the maximum age was 64 years and minimum 18 years). The largest group surveyed included subjects aged 18 to 24 years old (40%), 40-50 years (20%) and the lowest surveyed group included subjects aged between 50-60 years (10%).

Regarding the residential areas, more than half of the subjects were part of the urban area with a rate of 76.4% and 23.6% belonged to the rural areas. A proportion of 76% of the study group had a higher education, 2.4% had only primary school diploma and 21.6% of the subjects had high school diploma. The proportions observed for gender distribution female/male, 0.77/0.23. These proportions compared with distribution 0.5/0.5,  $p < 0.0001$  resulting that reports from studied sample differ significantly, women being predominantly in a significant proportion.

**Dietary habits**

*Salad consumption:* A rate of 19.1% consume 6-8 times/week, 14.6% of 2-4times/week and 1.1% consumed vegetables more than 16 times/week.

*Whole grainsconsumption:* A share of 20.28% consumed once/week, 18% did not consume cereals, 2.1% consumed more than 18 times/week (figure 1).

*Fruit consumption:* Concerning fruits about 17.4% of the subjects consumed 6-8 times per week, 17.4% of 2-4 times per week, 3.4% consumed fruits over 18 times per week.

*Regarding meals location:* About 36.7% of subjects did not eat out in the city, 38.7% used to eat in town once a week, and 15.3% used to eat in town 2-4 times per week.

*Meals frequency at fast food:* Another objective of the survey was to identify subjects frequency attending fast food restaurants. Most individuals surveyed, 67.68% did not attend at all fast-food restaurants, 25.25% ate fast food once per week and 1% consumed fast food between 8-10 times per week (figure 2).

*Dietary fibers knowledges:* Only vegetable foods have fiber. Regarding this statement, about 34.6% rejected it entirely, 11.8% were indifferent, and 7.9% fully supported the statement (figure 3).

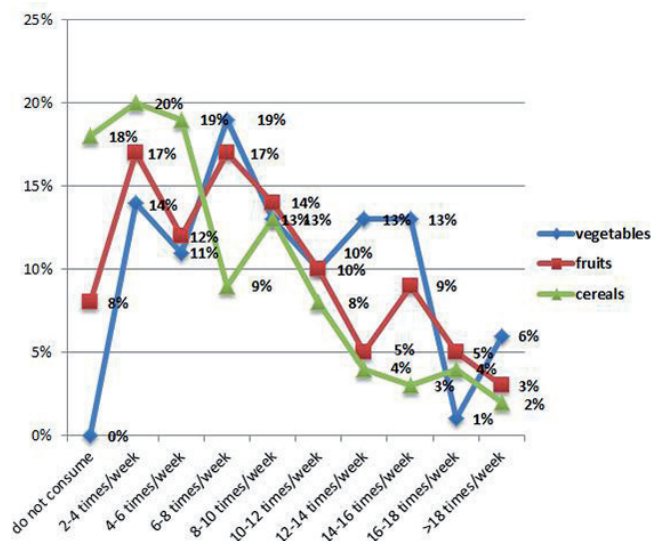


Fig. 1. Salad, fruits and whole grains consumption

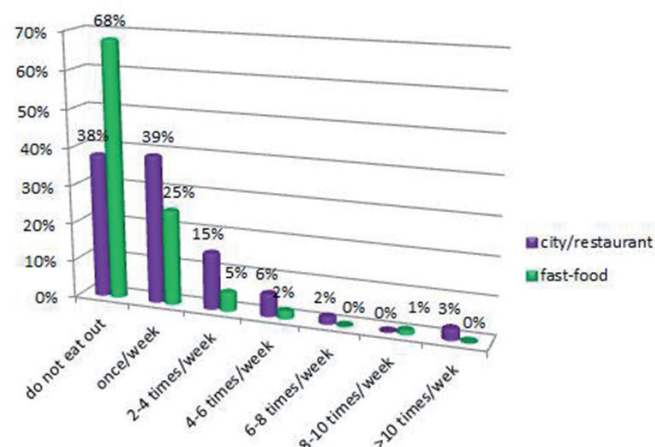


Fig. 2. Meals frequency at fast-food restaurants

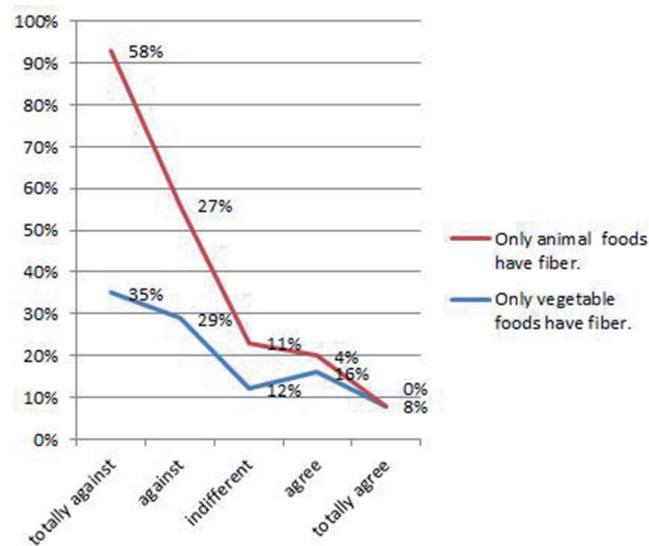


Fig. 3. Dietary fiber knowledges

According to the World Health Organization, the average adult should eat 25g of fiber per day. A share of 5.2% were against this statement, 34.4% were indifferent, and 26.8% fully accepted.

The unpeeled fruits have less fibers than peeled ones. A rate of 48.2% totally rejected this statement, 14.6% were indifferent, and 10.2% fully supported the statement.

Dietary fibers are classified into soluble and insoluble. A proportion of 8.8% were totally against the statement, about 34.4% were indifferent, and 37.6% fully supported the statement.

What means of communication do you consider the most appropriate to encourage the consumption of dietary fiber? A rate of 53.4% considered the Internet an appropriate mean of communication, 20.3% answered magazines and 10.3% considered school books being an appropriate mean of communication.

Where do you usually find information about dietary fibers? A share of 38.4% received information from the Internet, 12.1% from radio stations and 16.4% from TV.

**Relationship between fibers and diseases.**

Eating dietary fibers in appropriate amounts can prevent and/or treat diseases. Concerning the this affirmation, a rate of 38.4% accepted it, 49.6% fully accepted it, 8.4% were indifferent, and 2.4% were against.

Fibers can prevent and/or treat cardio-vascular diseases. A share of 2.6% fully accepted this affirmation, 41% agreed with the affirmation, 22% were indifferent and 9% were against.

Fibers can prevent and/or treat obesity and colon cancer. This statement was fully accepted by 40% of the subjects, about 40% agreed, 14.2% were indifferent and 4.7% were against (figure 4).

Fibers can prevent and/or treat diabetes. This affirmation was accepted by 23% of respondents, 33% were totally agree, 31% were indifferent, and 7% were against.

On the nutritional label of any food I usually check how much fiber it possesses. A proportion of 16.8% totally accepted this affirmation, 25.7% agreed, 34.6% were indifferent, and 5.9% did not check the fiber content of foods (figure 5).

Statistically significant differences  $p < 0.0001$  were identified especially between indicator values representing the rural people and indicator values representing the individuals living in urban areas.

We applied the test Mann-Whitney to check whether there are differences between preferences for vegetables, whole grains, fruits by the gender group criteria. We obtained statistically significant differences ( $p=0.029$ ), and reaching the conclusion that women have different preferences than men concerning consumption of vegetables. Regarding the gender group preferences for fruits and whole grains, we obtained  $p > 0.05$  resulting statistically insignificant differences.

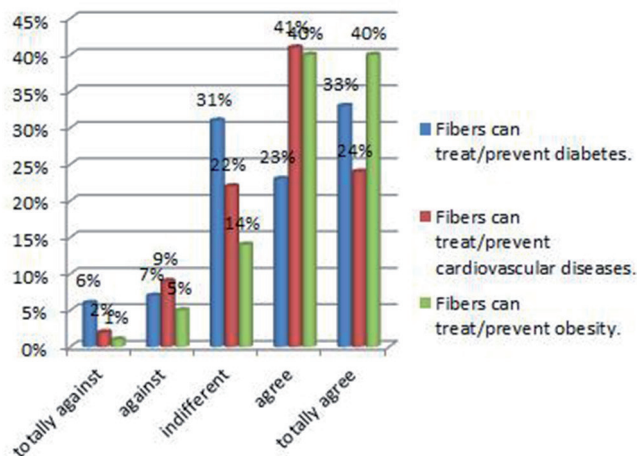


Fig. 4. Fibers can treat or prevent diseases

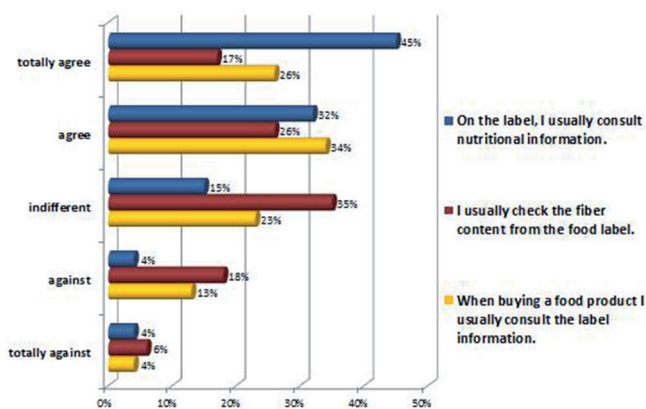


Fig. 5. Food labeling information

**Discussions**

After analyzing the studied data sample, we observed a statistically significant difference regarding the preferences of women compared to men of vegetable consumption. There are no differences between the preferences of fruit and whole grains. A high percentage of the subjects were indifferent when it comes to labeling and information on food labels. There is a rate (8.8%) that do not know the meaning and definition of dietary fiber as well as their role in the human body.

Actual whole grain consumption levels are extremely low and many practical barriers exist to consumer uptake of these foods. Effective communication of whole grain health message is an important strategy to increase awareness of the importance of whole grains in the diet (10-14).

It is gratifying that a majority rate of respondents tend to consume vegetables and fruits at every meal of the day, they are interested in fiber content of foods as well that they read the label of a product before buying it. Daily fiber intake generally has not progressed toward national goals during the past decade, but there are some differences according to health and social factors. Additional clinical practice and public health promoting strategies are needed (15,16).

Among the most common diseases in Romania are: diabetes, different types of cancer, coronarian disease and hypercholesterolaemia. High intake of dietary fiber has been linked to a lower risk of heart disease in a number of large studies that followed people for many years (17-19). In a Harvard study of over 40,000 male health professionals, researchers found that a high total dietary fiber intake was linked to a 40 percent lower risk of coronary heart disease, compared to a low fiber intake (19). Cereal fiber, which is found in grains, seemed particularly beneficial. A related Harvard study of female nurses produced quite similar findings (17-19).

However, eating habits are also as important as high quality food for maintaining the health status.

### Conclusions

The inclusion of cereals and whole foods in diet is recommended by all doctors and specialists, also in all nutrition literature worldwide, because of their association with a high health status, and prevention of chronic diseases. Consumers need to understand the benefits of whole foods, also to recognize and read the information about it on food labels. Despite all specialists advices, the fiber intake is below the recommendations, because of lack of interest and lack of knowledges from population.

The absence of a coordinated campaign to promote the consumption of whole foods and lack of education in schools, medical offices, can contribute to reduced consumption, despite all dietary recommendations of specialists in nutrition and dietetics.

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