

PIOTR KSIĄŻEK, JOANNA KOZŁOWIEC, MONIKA KOZŁOWIEC

## The nutritional knowledge of pregnant women

### Abstract

**Introduction.** Rational nutrition of women during pregnancy has a great influence on the developing fetus. In the properly developing pregnancy, woman should eat 3-4 quality meals per day. What is more, for the proper development of the fetus, as well as the placenta, uterus and the mammary gland, it is necessary to consume high-value protein products. Moreover, vitamins and mineral compounds are important due to the serious implications that arise if not properly provided.

**Aim.** The aim of the paper is to assess the nutritional practices, the level of knowledge held by pregnant women with respect to proper nourishment practices, and to define the influence of level of formal education achieved upon this issue.

**Material and methods.** The research involved 87 pregnant women who were under the care of the outpatient women's health centre and high-risk pregnancy unit of the Regional Specialist Hospital in Biała Podlaska.

**Results and discussion.** According to most of the female respondents, information concerning proper nutrition of pregnant women is not generally available. Because of this, in completing the questionnaire, more than half of the subjects stated that they often consume white bakery products, white rice and refined pasta – with insufficient consumption of brown bread, rice and wholemeal pasta. Furthermore, while the respondents seem to consume the proper amount of potatoes, barely 8% consume other vegetables with the advised frequency. Moreover, only 31% of the respondents take-in fruits in necessary quantities. However, a majority of them frequently consume milk, yoghurt, cheese, kefir and buttermilk; plus, more than half of the respondents drink at least 1-2 litres of various kinds of liquids per day. Our results also reveal that they very rarely consume fresh fish, poultry and red beef meat, preferring cooked products. Indeed, the respondents stated that they consume meat and fish mainly in a fried form, while 52.9% of the women take-in fast food products. Of note, the surveyed women prefer animal fats. In addition, nearly 70% of the subjects consume too many eggs. Furthermore, more than 40% consume an excessive amount of sugar and sweets. To conclude, the proper amount of meals is consumed by only 52.7% of the respondents, no matter their formal education level.

**Conclusions.** Many abnormalities were found while verifying negatively the hypothesis, according to which, level of formal education achieved has an impact on the increase of consciousness in terms of proper nourishment during the pregnancy.

**Keywords:** knowledge, pregnant women, nourishment.

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### INTRODUCTION

The rational nutrition of women within the pregnancy period has a great influence on the developing fetus. In a properly developing pregnancy, women should eat 3-4 meals per day, at regular intervals [1]. In case of morning sickness and vomiting, the number of meals should be increased to 5-6 of smaller volume per day.

Protein is essential during pregnancy for the right foetal, placental and mammary gland development [2]. Fats not only provide the human body with energy, but also enable the absorption of fat-soluble vitamins (such as A, D, E and K). The importance of carbohydrates comes from their functions in the body system. Indeed, many cells (brain cells,

bone marrow cells) use glucose as a sole source of energy [3]. Vitamins are substances which are necessary for the right bodily functions. The value of their intake increases because the human body cannot synthesize most of these by itself [2]. Vitamins are organic compounds which fulfil a regulatory role and are biocatalysts essential for the maintenance of effective cellular activity. What is more, these condition the right development of particular organs and systems within the child, and these ensure the preservation of the mother's health. Apart from the afore-mentioned fat-soluble vitamins, other most necessary vitamins for pregnant women to take in are the water-soluble vitamins: Vitamin C, Folic acid, as well as other vitamins from the B group (B1, B2, B6, B12). Equally important are the mineral compounds:

<sup>1</sup> Chair and Department of Public Health, Medical University of Lublin, Poland

<sup>2</sup> Regional Specialist Hospital in Biała Podlaska, Poland

<sup>3</sup> Medical University of Lublin, Poland

iron, calcium, iodine, magnesium, phosphorus, potassium and manganese.

An abnormality in the supply of necessary nutrients in pregnancy can be that of either surplus or deficiency. Surpluses result in the overweight of a fetus and complicate pregnancy and labour, hence, potentially inducing serious birth defects. In the case of vitamin and mineral nutrient deficiency, supplementation is needed: Research [4] has shown that a deficiency of Folic acid is the reason for metabolic anemia or primary malformation of neural tube, while iodine deficiency causes goitre or congenital iodine-deficiency syndrome. The natural source of folates for humans are whole grains, liver, egg yolks, green leafy vegetables, carrots, pumpkins, bean, melons and apricots, while sources of iodine are fish and other sea animals, eggs, lemon, garlic, onion, wild cherries and sour cherries [2]. Hence, it is important to include such foods in a pregnant woman's diet.

During pregnancy, the average increase of the body mass is approximately 12.5kg, of which 0.9kg is protein [3]. As for pregnant women's nutriment, 60% of all proteins should consist of high-grade proteins: milk, cheese, meat (including cooked meats and poultry), fish, and eggs. Milk and dairy are also a source of calcium and phosphorus – both of which are essential for the bone-building. However, because of the threat of infection with *Listeria* bacteria, blue cheeses like Brie or Camembert must not be consumed during pregnancy [5]. Of note, the best way of preparing meat dishes is through boiling, roasting and grilling. Finally, fish should be consumed at least twice a week, while egg consumption should be limited to 2 or 3 times per week.

In a pregnant woman's diet, fats should cover 30% of the energy demand. This should include saturated fatty acids to 10% of total fat intake. Of these, an appropriate diet should include to, at least, 4.5%, the essential fatty acids such as Omega-3 and Omega-6, as these play a prominent role in the brain and retina development of the fetus [3]. The source of essential fatty acids are, respectively, fish and vegetable oils. As far as animal fats are concerned, butter is advisable as it is easily digested and contains essential vitamins. Moreover, pregnant women are advised to replace animal fats with vegetable counterparts. Indeed, their abstinence is also said to be a good choice [5]. However, trans-fatty acids (contained mainly in margarine) are dangerous to consume, as they raise the concentration of the 'bad' cholesterol (LDL) and lower the concentration of the 'good' one (HDL) [6].

To the extent of 50-60%, the food energy component of a pregnant woman's diet should be provided by way of carbohydrate consumption based upon grain and cereal products. This is because these are also a prominent source of fibre (the Guideline Daily Amount for pregnant women is 20-40mg per day) [7]. Yet, pregnant women should limit the consumption of white bread, white rice and refined pasta, and favour brown bread, brown rice and wholemeal pasta, as these products contain not only fibre, but also potassium, magnesium, iron, zinc and vitamins E, B1, B2, B6 [5].

What is more, during pregnancy, in every meal, a woman should consume some sort of vegetable. Potato consumption is very beneficial (potatoes contain about 5-30mg of vitamin C per 100g, depending on the storage time [1]). Moreover, fruits should be eaten at least 3-4 times a day (taking

into consideration the fact that citrus fruits are controversial and despite their high vitamin content, they can cause the outbreak of allergies). Indeed, a pregnant woman should limit the consumption of carbohydrates in the form of sugar and sweets, and replace these with fruits and vegetables. Fast food products should be excluded from the diet too. It is also advisable for pregnant women to drink up to 3000ml of fluids per day, excluding alcohol.

## AIM

The aim of the paper is to assess the nourishment practices of pregnant women, to discover the degree of knowledge they hold concerning these, as well as to define the influence of level of formal education on this issue.

## MATERIAL AND METHODS

Our research involved 87 pregnant women who were under the care of the outpatient women's health centre and high-risk pregnancy unit of the Regional Specialist Hospital in Biała Podlaska. The respondents were chosen randomly. They were also differentiated for age, marital status, education, activity in the labour market and the number of pregnancies they had had. Most respondents were from age 30 to 35. The lower cut-off was set at an age of less than twenty and the higher at over 40.

To derive our data, we utilised a diagnostic poll method, employing as a research tool, a questionnaire with a cafeteria-style checklist, as well as current demographic data. We formulated a hypothesis that education has an influence on the growth of consciousness of appropriate nutrition practices during pregnancy. The results of the research was analysed statistically by using chi-squared test to test the hypothesis made. We assumed a statistical significance of  $p < 0.05$ .

## RESULTS AND DISCUSSION

In the opinion of the dominating majority of the respondents (71.2%), information about healthy diet practices during pregnancy is not widely available and not easily obtained. The main sources of information listed as answers are: own experience (49.4%), a doctor (32.2%), a nurse (18.4%), friends and family (17.2%) and books with information folders (13.8%). The media has a marginal contribution to the formation of the respondents' awareness as far as this issue is concerned (9.2%). Even of less importance are dieticians (3.4%). Only 24.1% of the women believe that they eat healthily. Indeed, 14.9% of the respondents have a critical attitude towards their own nutrition practices. Yet, most of the surveyed women (60.9%) cannot say if the way they eat can be described as right.

Over half of the women (65.5%) eat white bread, white rice and refined pasta products at least a few times a week. The rest of them do this no more than once a week. Comparing to the food pyramid for women of child-bearing potential, the obtained results confirm an appropriate consumption of the recommended products as for this subjects' group. However, only 11.5% of the respondents eat brown bread,

brown rice and pasta a few times a week. This points to their insufficient consumption. The least consumption of such items was observed in the group of women with at most, vocational and secondary education.

The respondents, in most cases, eat appropriately to their condition, as far as potatoes are concerned: 56.3% of women consume these at least once a day. Potatoes are eaten by women with vocational education the most frequently: almost 90% of such women make a meal out of these at least once a day. With regard to women with secondary and higher education levels, the numbers are, respectively, 52.4% and 27.8%. Yet, only 8% of the respondents consume vegetables with the frequency advisable for pregnant women. With respect to this figure, the frequency of real consumption is almost identical, irrespective of their education. What is more, only 31% of the respondents eat fruits according to advised frequency. Almost half of the women (46%) eat fruits once a day, but only one in five of them (17.2%) eat these 2-4 times a week. Fruits are eaten once or twice a day by 77.8% of the respondents with vocational education, 81% of those with secondary education and 66.7% of those better educated. Comparing the obtained results to the results of the research conducted among pregnant women from Lower Silesia [8], it should be noted that in that region, 54% of women stated that they ate fruit and vegetable items daily, 37% did so 3 times a week, and 9% did so twice a week. According to other research [9], almost half of the Polish women who are pregnant fulfil the recommendations of rational eating, consuming fruits 3-5 times a day, while approximately 40% of all women consume these items once a day. Many women (65.9%) declare an increased frequency of fruit consumption due to pregnancy.

Most of the respondents (81.8%) drink milk and take in dairy products, yoghurt, cheese, kefir and buttermilk at least once a day. However, a marginal part of those surveyed (2.2% all together) limited the consumption of such items to once a week and a few times a month. The frequency of the consumption of the products is similar among women of different education levels. The results of our own research concerning the consumption of the high-grade protein in this form correspond with the results obtained by other authors [10].

The women surveyed prefer to eat cooked meats: these are consumed by 60% of the women at least once a day. Poultry is eaten by most of the women (56.3%) once a week, while red beef meat is ingested a few times a month (65.5%). Women with higher education eat red beef meat a little more often and poultry less often. Regardless of education, the respondents eat meat mainly in the fried or braised form (respectively: 79.3% and 37.9%). Among those preferring the consumption of boiled or roasted meat dishes, better educated women slightly prevail.

Most of the respondents rarely consume fish (once a week – 66.8%). The most frequent fish consumption (at least once a week – 77.8%) was observed among women with higher education, while, almost one in five respondents (18.5%) who have vocational education, eat fish more rarely than a few times a month. The dominating majority (92%) prefer fish in a fried form which is a characteristic of the Polish cuisine.

Almost 70% of the respondents take in too many eggs: 42.4% eat these once a day, another 26.4% do so even twice a day. The greatest number of eggs is consumed by the women with vocational education (77.7% – at least once a day). Among women with higher education, this derived figure is 44.4%. Of note, 55.6% of the respondents with higher education eat eggs according to the advisable frequency during the pregnancy period, 33% of those with secondary education do the same, and 22.2% of those with vocational education also follow approved guidelines.

The respondents eat animal fat products quite often (these being butter and lard). Over 80% do this at least once a day (which is a practice contrary to the dieticians' recommendations). Furthermore, almost half of the women surveyed (49.4%) ingest vegetable oil products at least once a day, and many women do so 2-4 times a week (34.5%). The most frequent (at least once a day) consumers are women with vocational and secondary education (respectively, 59.3% and 52.4%). Among women with higher education, this figure is 27.8%.

Over 40% of the respondents consume an excessive amount of sugar and sweets. Among women with vocational and secondary education, the percentage of those eating sugar and sweets at least once a day is, respectively, about 50% and 40.5%. An analogous frequency of the consumption of sweet products is declared by 33.4% of those women who are better educated. In addition, fast food products are consumed generally once a week by 52.9% of all respondents. These products are preferred by women with secondary and higher education.

Over half of the women drink up at least 1-2 litres of liquids daily. With regard to women with vocational education, the percentage is 77.8%, while this figure oscillates at around 40% amongst the other groups. The respondents stated that most frequently this item is mineral water (0.35 l), and then, respectively, tea and compote (0.26 l) and juice (0.24 l). Few if any of those surveyed stated that they ingest fizzy drinks and coffee. Moreover, the respondents put forward too, that they seldom touched beer. However, according to other research [11], every third Pole of procreation age (18-40 years old) drinks alcohol during their pregnancy, preferably consuming light liquors such as beer (45%) or wine (42%), but never vodka.

The recommended number of meals per day is taken in by 52.7% of the respondents, while, 1 or 2 meals per day on average are eaten by respondents with vocational education (40.7%). Generally, well-educated women eat right under such circumstances, by consuming 3-4 meals per day. From other research, it may be concluded that during pregnancy, only 61% of the surveyed women eat breakfast every day in terms of the visible irregularity in meal consumption. Our own research reveals that a majority eat copiously 1-2 meals a day, while every third respondent with vocational education does not consume even one such meal. In the group of women with secondary and higher education, the respondents eating 1-2 meals copiously per day were in the highest percentage (76.2 and 66.7%, respectively). Furthermore, a majority of the respondents (80%) snack between regularly set meals (in the mentioned groups of products are sweets and fruits (35.6% and 32.2%, respectively),

sandwiches (25.7%), crisps and sunflower seeds (11.5% indicated), biscuits (8.2%), and vegetables (5.7%).

Our own research results correspond with other available research [11,12] that, in terms of nutrition: a lot of women are not showing health-oriented eating attitudes. On the basis of the research of knowledge and food habits of pregnant women [12], it may be concluded that there are great disagreements between the state of knowledge and genuine nourishment practices. Alternative research confirms our own research results, but subsume the problem differently [13]: eating habits amongst the pregnant women are still improper, especially amongst younger patients, those less wealthy and those less formally educated.

## CONCLUSIONS

Our research material allowed us to point out plenty of abnormalities in the nourishment practices of women within the study. It had revealed the low consumption levels of wholemeal products, as well as red beef meat, poultry and fish. The consumption of vegetables and fruits is also insufficient. What is more, the respondents do not drink the advised amount of liquids. Moreover, an excessive consumption of animal fats and fast food products was seen. This favours obesity. Moreover, the ways of consuming meat and fish raise reservations. Of importance is that the knowledge of the surveyed women regarding proper nourishment practices during pregnancy is mainly based on self-experience. In addition, one gains the impression that the respondents are not looking for a new ways of approaching the issue.

Yet, our work reveals that level of formal education achieved was not the factor critically differentiating statistically the statements concerning self-assessments of nourishment practices during pregnancy. What was seen as of fundamental importance statistically was the number of meals and the quantity of copiously eaten meals. This was skewed towards better educated respondents. Yet, statistically relevant at an accepted level  $p < 0.05$ , level of formal education achieved differentiates the frequency of consumption of such products as wholemeal bread; brown rice and unrefined pasta; potatoes; fruits; fish; eggs; vegetable fats; sugar and sweets; as well as fast foods. What is more, level of formal education achieved differentiates respondents in statistically relevant terms in the range of the amount of liquids drunk every day. In other cases, no statistically relevant influence of level of achieved formal education of the surveyed women regarding nourishment practices was observed.

Verification of the given hypothesis, according to which level of formal education achieved has an influence on the growth of consciousness in terms of proper nourishment in pregnancy progressed with the application of analytically statistical methods. Yet, due to differences in nourishment practices in particular groups of surveyed women (those with vocational, secondary and higher education) being not statistically relevant, the hypothesis was verified negatively.

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### Corresponding author

Joanna Kozłowiec  
tel.: 502 384 992  
E-mail: j.kozlowiec@op.pl