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CANCER-RELATED NUTRITION  
KNOWLEDGE AND ATTITUDES OF HEALTH  
CARE WORKERS IN SERBIA

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ZNANJE I STAVOVI ZDRAVSTVENIH  
RADNIKA U SRBIJI O POVEZANOSTI  
ISHRANE SA KARCINOMIMA

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*Ključne reči*

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*Abstract*

In view of the importance of nutrition in cancer control, the aim of this study was to assess the cancer-related nutrition knowledge and attitudes of health care workers in Serbia. **METHODS:** A cross-sectional study was performed in 2012. in the city of Nis. The data were collected by an anonymous questionnaire, developed based on a review of literature and self completed by 322 health care workers. Data were analyzed using SPSS software package. **RESULTS:** The majority of respondents had insufficient cancer-related nutrition knowledge. Highly statistically significant difference ( $p < 0.0001$ ) were observed between doctor and nurses in relation to nutrition knowledge. Both doctors and nurses had positive attitudes to almost all cancer-related nutrition items. **CONCLUSIONS:** The results suggest that more attention should be given to nutrition in medical curricula. These findings indicated a need for educational and training initiatives of cancer-relation nutrition for all categories of health care workers.

*INTRODUCTION*

Scientific evidence suggests that one third of the cancer deaths can be attributed to nutrition and other lifestyle factors <sup>(1)</sup>. Several studies indicate that nutrition plays a substantial role in the etiology of many types of cancer such as bowel, colon, breast and prostate <sup>(2-7)</sup>. Nutrition is also an important component of management of cancer patients from diagnosis through treatment and recovery <sup>(8,9)</sup>. Therefore, inadequate dietary intake and stress metabolism in cancer, in addition to poor medical nutritional therapy for severe diseases patients, can cause malnutrition.

The patients always consider physicians to be one of the most credible sources of nutrition information <sup>(10,11)</sup>. Due to great interest among patients for the dietary advices and the medical nutrition therapy regarding cancer, knowledge and attitudes of health care workers about nutrition are very important for the management of cancer.

Nutritional education and health promotion initiatives are highly recommended by government in Serbia to prevent and control diet-related chronic diseases <sup>(12)</sup>. However, the lack of knowledge among health care workers may be an important barrier for adequate dietary counseling and nutritional practice <sup>(13,14)</sup>. The aim of this study was to assess the

cancer-related nutrition knowledge and attitude of health care personnel in Serbia.

*MATERIALS AND METHODS*

The present cross-sectional study was conducted among the randomly selected health care professionals working in various medical institutions in Niš, Serbia. The questionnaires were distributed to 150 doctors and 200 nurses and collected with the assistance of health care institution management. A total of 322 health care workers were answered from February to July 2010, that represents more than 5% of the total number ( $n=5797$ ) of health care personnel in Niš with the licenses <sup>(15)</sup>. The health care workers were randomly selected from primary, secondary and tertiary health care sectors, from the departments where cancer patients were common. The health care workers in primary health care included general practice and occupational medicine. Health care workers from secondary and tertiary health care sectors were working in one of the areas: gynecology and obstetrics, respiratory diseases, gastroenterology, hematology, nephrology, urology, otorhinolaryngology, surgery and dermatology.

The self completed questionnaire was developed based on a review of the literature <sup>(16-18)</sup>. It was divided into three

sections. The first section related to demographic background of health care workers as age, sex, previous education, type of specialization and place of work. The second section was designed to test the nutrition knowledge and consisted of 16 multiple-choice questions, each with four possible answers. The third section was intended to examine attitudes about nutrition in the cancer prevention and control.

The results were analyzed using the SPSS software package (version 10.0, SPSS Inc., Chicago, IL, USA). The Mantel-Haenszel  $\chi^2$  analysis was applied to test the statistical significance of differences in knowledge and attitudes between doctors and nurses. The test was considered significant if p-value was equal to, or less than 0.05 .

## RESULTS

Of the 322 health care workers who completed their questionnaires, 87 (27%) were males and 235 (73%) were females. Final response rates of 124 (82.7%) doctors and 198 (99%) nurses were obtained. The ages ranged from 29 to 49 years, with a mean age of  $40.6 \pm 9.3$  years. Among the studied health care workers, 280 (87%) were practicing in the primary health care and 42 (13%) carried out some form of intervention in the hospital.

The proportions of correct answers are provided on the Table 1.

**Table 1.** Cancer-related nutrition knowledge of health personnel

Type of the question	Number of doctors with (%)	Number of nurses with correct answers (%)	$\chi^2$	P	Total number of correct correct answers (%)
Nutrient believed to help protect against thrombosis	112 (90.3)	125(63.1)	28.93	0.01	237(73.6)
Type of cooking as a risk for cancer	105(84.7)	69(34.8)	75.99	0.001	174(54.0)
Type of dietary fiber that decreases the cancer risk	39(31.4)	19(9.6)	8.56	0.01*	58(18.0)
Typical fruit intake of Serbians	53(42.7)	49(24.7)	11.37	0.001	102(31.7)
Major type of fat in olive oil	27(21.8)	18(9.1)	11.48	0.001	45(14.0)
Compared with unprocessed vegetable oils, hydrogenated fats contain	93(75.0)	148(74.4)	0.01	0.01*	241(74.8)
Rich food source of lycopene	122(98.4)	158(79.8)	25.2	0.001	280(86.9)
Nutrient least like to cause toxicity	53(42.7)	49 (24.7)	11.37	0.001	102(31.7)
Most concentrated source of vitamin C	121(97.6)	197(99.5)	2.27	0.01*	318(98.6)
Awareing of the international food guidelines for cancer prevention	53 (42.7)	34 (17.2)	25.2	0.001	87(27.0)
Recommended fat intake	83 (66.9)	42(21.2)	66.91	0.001	125 (38.8)
Type of food believed to have a preventive effect against various types of cancer	71(57.3)	72(36.4)	13.44	0.001	143(44.4)
Number of kcal /g of fat	99(79.8)	38(19.2)	114.37	0.001	137 (42.5)
Not an antioxidant nutrient	52(41.9)	49(24.7)	10.43	0.001	101 (31.4)
Main dietary source of nitrates	94(75.8)	71(35.9)	48.55	0.001	165(51.2)
Nutrient associated with prevention of hormone-responsive cancer in women	79(63.7)	48(24.2)	49.57	0.001	127 (39.4)

\*- statistically non-significant

In general, respondents had inadequate knowledge about the nutrition regarding cancer. For most questions, percentage of correct answers was a less than 50 %. The highest percentage of correct answers was obtained for the questions related to the lycopene and vitamin C sources. Besides, the major of true answers (more than 70%) were found for questions relating to thrombosis protection and hydrogenated fats. The majority of false answers were found relating to fat type in olive oil (14.0%) and type of the fiber that helps in cancer prevention (18.0%). Also, less than a third of respondents were informed on the international dietary guidelines for cancer prevention.

Medical doctors had better nutrition knowledge than nurses. The difference in nutritional knowledge regarding cancer between the group of doctors and nurses was statistically significant for almost all answers ( $p < 0.001$ ). There were no statistical differences among two different groups of health-care workers only for the questions with extreme number of correct answers. It is worth mentioning that a high number of nurses (more than 75%) gave correct answer for only two questions. For example, only about one third of nurses (34.8%) knew the correct answer to the question related to the type of cooking as a risk for cancer.

Health care personnel in the study, however, had positive views about the importance of nutrition in cancer control of their patients. Both doctors and nurses had positive attitudes („strongly agree” and „agree”) to almost all cancer-related nutrition items (Table 2).

**Table 2.** Cancer-related nutrition attitudes of health personnel

Questions	Number of doctors with positive attitude (%)	Number of nurses with positive attitude (%)	$\chi^2$	P
I consider dietary advice to people with cancer very important	94(75.8)	156(78.8)	0.39	P>0.5
I consider identifying malnourish cancer patients useful	109(87.9)	136(68.7)	15.4	P<0.001
Education in the field of nutrition are necessary for cancer control	119(95.9)	179(90.4)	3.42	P>0.05
Patients with cancer can change their habits in diet	98(79.0)	161(81.3)	0.25	P>0.5

### DISCUSSION WITH CONCLUSION

Present study, which is the first study of that type in Serbia, found that medical practitioners’ nutritional knowledge regarding cancer could be consider as insufficient. Selected group of health care workers supposed to be over the average interested in nutrition, since they were working in departments where cancer patients are common.

Unfortunately, they did not demonstrate adequate cancer-related nutrition knowledge. Our findings are in accordance with results from many other studies (19-21), suggested that a high proportion of health care workers in many different countries have insufficient professional knowledge regarding nutrition, that could be the main barrier for good nutritional management, also in cancer patients. Survey carried out in the 1980s of physicians in USA (26) indicated that they seriously underestimated the role of diet in the causation of cancer. Respondents considered diet to be a relatively unimportant factor in cancer causation, whereas they viewed sun exposure, genetics/family history, and radiation exposure as large contributors to the cancer burden. In some rare cases, superior knowledge about healthy lifestyle, as well as dietary habits does not necessarily result into better practices (22).

As we hypothesized, medical doctors scored better than nurses in nutritional knowledge questions.

Insufficient professional education regarding nutrition (23), could be one of the reasons for the obtained results. Namely, in Serbia, within recent years, nutrition has pointed as an important topic among health care workers, but the curriculum of the medical schools does not include enough relevant and adequate topics regarding nutrition. During the last five years, compulsory continual medical education for all healthcare workers started, but nutrition as a topic was less frequent than other clinical contents. For example, finding that only every fourth of the respondents had been informed about guidelines for cancer (24) is particularly devastating.

Insufficient education with regard to nutrition was said by Council of EU Committee of Ministries to be other major barriers for proper nutrition care (25). In this specific case, other barriers for adequate nutrition-related education of cancer patients regarding nutrition could be lack of time, as well as lack of educational materials. Besides, national healthy eating guidelines in Serbia, has not yet been properly implemented. Also the information about nutrition influences to cancer provided by the media and internet is confusing sometimes and contradicting. Optimistic finding is that the most examinees have positive attitudes about healthy eating promotion in cancer patients.

It is obvious from this study that there is a need for (postgraduate) education for health care workers in Serbia on the area of nutrition. Dietitians should be involved in the improving of nutritional knowledge and skills. Based on our results, new measures for raising level of nutritional knowledge toward cancer should be recommended and implemented. All health care workers have to inform about guidelines for cancer control. We hope that our already-started education will contribute in that.

Some limitations should be considered when interpreting the findings of this study. First, the medical professionals working in private and other sectors were excluded from this study. These groups may have different knowledge and attitudes towards nutrition. Second, the effects of gender and place of working on nutrition knowledge and attitudes of both medical professionals was not investigated, mainly due to small sample size. Third, there were no studies in Serbia regarding the nutritional knowledge and attitudes among health care workers and it is impossible to make a comparison. Additionally, we did not examine all aspects of nutrition knowledge. For example, there are many other topics important for medical care of cancer patients (26,27) and it is possible that medical personnel have better knowledge in these other areas.

Despite the limitations, the findings of this study suggest that further attention should be towards the teaching of nutrition for medical staff in Serbia. More emphasis should be given to the application of nutritional principles to the cancer, rather than only metabolism (28,29).

In conclusion, this study revealed an inadequate level of cancer-related nutritional knowledge and high level of positive attitudes on that issue among the health care workers in Serbia. This could be especially important for future post-graduate education of medical practitioners.

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#### Sažetak

Ishrana je izuzetno važna u kontroli karcinoma, te je cilj ovog istraživanja bio da proceni znanje i stavove zdravstvenih radnika u Srbiji u vezi ishrane koji se odnose na karcinome. METODE: Transverzalno istraživanje je sprovedeno u 2012. g. u Nišu. Podaci su prikupljeni pomoću anonimnog upitnika, razvijenog na osnovu pregleda literature i samostalno popunjen od strane 322 zdravstvenih radnika. Podaci su analizirani pomoću programskog paketa SPSS. REZULTATI: Većina ispitanika nije imala dovoljno znanja o ishrani koji se odnose na karcinome, iako se radi o zdravstvenim radnicima. Nadjena je statistički značajna razlika ( $p < 0,0001$ ) među lekarima i medicinskim sestrama u znanju o ishrani. Oba profila zdravstvenih radnika, i lekari i medicinske sestre su imali pozitivne stavove prema gotovo svim ispitanim stavkama. ZAKLJUČAK: Rezultati upućuju na to da više pažnje treba posvetiti ishrani u medicinskim kurikulumima. Ovi rezultati ukazuju na potrebu edukacije i treninga u vezi ishrane i karcinoma za sve kategorije zdravstvenih radnika.

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