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Original Research

Association between non-communicable disease multimorbidity and health care utilization in a middle-income country: population-based study

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ABSTRACT

Objective: The objective was to analyze possible inequalities by gender in the utilization of health services (general practitioner [GP] and hospital), among people with non-communicable diseases (NCDs) in the Republic of Serbia, with special reference to multimorbidity. In addition, we examined the prevalence patterns of NCDs by sociodemographic characteristics of the population.

Study design: This study is a population-based, cross-sectional survey.

Methods: A secondary analysis from the 2013 Serbian National Health Survey included 13,765 adults aged ≥20 years. Multivariable logistic and linear regression analyses were performed to assess the association between NCDs and health care utilization.

Results: Multimorbidity was present in 30.2% of the total sample. An increased number of NCDs was associated with a higher utilization of both primary (odds ratio [OR] for having any GP visit is 3.17 in males and 3.14 in females; unstandardized coefficient [B] for number of GP visits is 0.33 for both gender) and secondary health care services (OR for having any hospitalization is 2.45 in males and 1.97 in females; B for number of overnight stays in hospital is 1.62 in males and 0.97 in females) in Serbia.

Conclusions: Our study provided strong evidence that an increased number of NCDs was significantly associated with a higher utilization of health care services in Serbia. There is a need for wise, decisive, and integrated care interventions for effective management of NCDs and their risk factors. Further research is necessary with special emphasis on the role of the health system in satisfying needs of such patients.

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Introduction

Non-communicable diseases (NCDs), also known as chronic diseases, are nowadays one of the most dominant public health and health care scourges that are socially and economically devastating our society. According to the World Health Organization, NCDs are the leading killer in the world with 38 million deaths each year. Approximately three-quarters of NCD deaths occur in low- and middle-income countries.[1,2]

The rising prevalence of NCD multimorbidity, commonly defined as the co-occurrence of two or more chronic conditions in an individual,[3,4] is the major issue facing health care systems worldwide.[5,6] International evidence has showed that patients with multimorbidity are older,[7,8] belong to lower socio-economic groups,[9,10] have a poorer quality of life,[11,12] and use health care services more often.[9,10,13,14]

There is a problem in the treatment of multimorbidity because general practitioners (GPs) apply clinical guidelines mostly focused on a single chronic condition and consequently it may even have adverse effects on the health of people with multimorbidity.[15]

The Republic of Serbia, as an upper-middle-income Southeastern European country, which has been undergoing huge sociodemographic and health care system transformations in recent decades, did not remain resistant to the growing burden of NCDs. They are estimated to account for 95% of total deaths (cardiovascular diseases 54%, cancers 23%, chronic respiratory diseases 4%, diabetes 3% and so forth) and the probability of dying between 30 and 70 years of age from the four main NCDs is 25%.[16] A matter of great concern is the fact that the prevalence of chronic diseases in Serbia has risen substantially in the last decade and a half and will continue to rise in coming years.[17,18] A recent study conducted in Serbia[19] discovered that multimorbidity is present in nearly one-third of adult respondents, especially in the elderly.

The health care in Serbia is based on a system of mandatory social health insurance, financed by salary contributions paid by employers and employees to the Republic Health Insurance Fund, which also guarantees health insurance coverage to unemployed, internally displaced people, refugees, and marginalized population groups. Medical services such as specialist treatment, hospitalization, prescriptions, services during pregnancy and childbirth, and rehabilitation are covered by state fund. Owing to the absence of private health insurance, private funding is completely based on out-of-pocket payments.

The health infrastructure consists of institutions organized in three health care levels by both the public and private sectors; primary (health care centers), secondary (general and specialized hospitals), and tertiary (teaching hospitals).

There is a paucity of literature on NCD multimorbidity, and to the best of our knowledge, no research on the relationship between multimorbidity and health care utilization exists in Serbia. Therefore, the aim of this study was to analyze possible inequalities by gender in the utilization of health services (GP and hospital), among people with NCDs in the Republic of Serbia, with special reference to multimorbidity. In addition, we examined the prevalence patterns of NCDs by sociodemographic characteristics of the population.

Methods

Study population and sample

This study represents a secondary data analysis of the 2013 National Health Survey (NHS) for the population of Serbia carried out by the Ministry of Health of Serbia and the Institute of Public Health of Serbia 'Dr Milan Jovanovic Batut'. The study population included 13,765 adults aged ≥20 years (94.1% of all interviewed participants). People living in collective households and/or institutions, and residents of Kosovo and Metohija (under the United Nations Mission) were excluded from the survey.

NHS 2013 was performed in line with the EUROSTAT recommendations for performance of the European Health Interview Survey (EHIS wave 2 methodological manual).[20] A stratified, two-staged representative random sample of the Serbian population was used for this study. The sample was selected firstly within four geographical regions of Serbia (Vojvodina, Belgrade, Sumadija and Western Serbia, and Southern and Eastern Serbia) and secondly among urban and rural settlements. The sample size encompassed all registered households in the 2011 Serbia population Census. In total, 670 Census enumeration areas were defined as primary sampling units, on the basis of probability proportional to size sampling procedures. Households, as the units of the second stage of sampling, were selected using simple random sampling without replacement. Ten households were selected from each selected enumeration area, plus three backup households. Out of 10,089 households contacted, a total of 6500 agreed to participate in NHS 2013, with a response rate of 64.4%. Of the 16,474 registered households members aged >15 years, 14,623 were interviewed, which yielded a response rate of 88.8%. For the purpose of this study, our analysis was limited to the population aged 20 years and above (n = 13,765).

Information on sociodemographic characteristics, self-reported presence of chronic diseases/conditions, and utilization of health services of respondents was obtained by face-to-face interview carried out at home, using a standardized questionnaire for the population above 15 years of age. Interviews were performed by trained teams consisting of two trained interviewers and a healthcare worker. All respondents were informed about the purpose of the study and gave written consent to participate.

Variables

The following demographic variables were selected from the database: age (20–29, 30–39, 40–49, 50–59, 60–69, >70 years), sex, type of settlement (urban and rural), and marital status (married or living with a partner and without a partner). Education was used as a socio-economic variable and categorized as low (no education, incomplete primary school and primary school), middle (three or four years of secondary school), and high (college or university education).

Self-reported data on the presence of chronic diseases/conditions were obtained with a questionnaire that asked the following question: 'Have you had any of the following diseases or conditions in the previous 12 months?' Participants

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