ABSTRACT

Aim: The aim of this study is to represent the prevalence of non-communicable diseases risks among patients of family medicine practices in the Federation of Bosnia and Herzegovina. Risks prevalence was obtained from an organized massive screening being performed by 100 family medicine teams in four cities of the Federation of B&H during 2013. Material and Methods: Our concept of “preventive treatment of a patient” included detecting and monitoring the following chronic non-communicable diseases risk factors: (a) hypertension; (b) obesity; (c) smoking; (d) physical inactivity; and (e) dyslipidemia; (f) diabetes mellitus. Our sample of examined patients was 46,638. Results: Highest risk prevalence within entire F B&H is observed for dyslipidemia (90.3%) and physical inactivity (64.7%). Lowest prevalence was found for blood sugar and hypertension at 19.2% and 21.6%, respectively. Smoking prevalence of the examined patients was 28.4%. Prevalence of the obesity as health risk (ITM > 30) was 25.5 %. It is of interest that statistically significant differences of individual risk prevalence among cities are evident. Risk distribution among cities ranked from highest to lowest prevalence, shows clearly that Sarajevo is leading in four risks compared to the other cities, while Zenica is ranked lowest for four risk factors. The examined population of the four cities can be ranked from lowest to highest prevalence of the examined risk factors as follows: Sarajevo, Mostar, Tuzla, and Zenica. Key words: non-communicable diseases risks prevalence, regional differences, preventive-promotive program, family medicine, Bosnia and Herzegovina.

1. INTRODUCTION

There is general trend of increased overall mortality rate, rates of malignant and cardiovascular diseases, as well as unhealthy lifestyles in Bosnia and Herzegovina (1). Very often it is explained by the consequences of the latest war, as well as unhealthy lifestyles (2, 3). A study of Marmot (4) on how social standing affects our health and longevity is based on theory that there is a link between socio-economic determinants of health and level of stress. Stress itself could affect life styles or could be harmful to the health status directly through the influence of adrenalin and cortico-steroids. However status syndrome could protect human organism from harmful influence of hormones. Overall social transition in B&H after the war has created lower socio-economic conditions for the great majority of the population in comparison to the pre-war period. Our recent study refers to statistical correlation between social status, related to income and education, to prevalence of risk factors of non-communicable diseases, such as high blood pressure, dyslipidemia, body mass index, lack of physical activity and blood glucose level (5). A phenomenon of social exclusion and high unemployment rate are remarkably spread throughout our society (6). In addition to these processes, there is psychological effect of a continuous political and economic environment instability in the country.

The aim of this study is to represent the prevalence of non-communicable diseases risks among patients of family medicine practices in the Federation of Bosnia and Herzegovina. This study presents the overall risks prevalence, as well as regional differences. In order to carry out this research we had to develop a bonus payment schemes, as well as a set of preventive-promotional services adjusted for family medicine practices as an organized massive screening for entire population being registered with famil-
for January-December 2013 period is presented against the following variables: (a) risk prevalence for total number of the examined patients; (b) risk prevalence by Health Center. The said risk prevalence correlation is presented only on annual basis, without distribution by quarters, because of the relevance of the received results.

The Table 1 shows risk prevalence distribution for the examined patients in F B&H during January-December 2013 period. Highest risk prevalence is observed for dyslipidemia (90.3%) and physical inactivity (64.7%). Lowest prevalence was found for blood sugar and hypertension at 19.2% and 21.6%, respectively. Smoking prevalence of the examined patients was 28.4%. Prevalence of the obesity as health risk (ITM > 30) was 25.5%.

| Risk Factor      | No. of Processed Patients (N) | No. of Patients at Risk (N) | Patients at Risk (% of Processed) |
|------------------|-------------------------------|----------------------------|-----------------------------------|
| Hypertension     | 38006                         | 8211                       | 21.6 %                            |
| Obesity          | 29865                         | 7619                       | 25.5 %                            |
| Smoking          | 32030                         | 9102                       | 28.4 %                            |
| Physical Inactivity | 30908                     | 19995                      | 64.7 %                            |
| Dyslipidemia     | 19298                         | 17421                      | 90.3 %                            |
| Sugar blood      | 11983                         | 2300                       | 19.2 %                            |

Table 1. Risk Prevalence of the Examined Patients in F B&H for January – December 2013 period

The Table 2 shows risk prevalence distribution of the examined patients at Mostar Health Center during 2013. Highest risk prevalence is observed for dyslipidemia (94.5%) and physical inactivity (63.9%). Lowest prevalence was identified for blood sugar and obesity at 22.2% and 23.7%, respectively. Smoking prevalence among the examined patients was 31.4%, and hypertension prevalence was 27.8%.

| Risk Factor      | No. of Processed Patients (N) | No. of Patients at Risk (N) | Patients at Risk (% of Processed) |
|------------------|-------------------------------|----------------------------|-----------------------------------|
| Hypertension     | 2687                          | 802                        | 27.8 %                            |
| Obesity          | 2152                          | 510                        | 23.7 %                            |
| Smoking          | 2261                          | 709                        | 31.4 %                            |
| Physical Inactivity | 2345                      | 1499                      | 63.9 %                            |
| Dyslipidemia     | 1851                          | 1749                      | 94.5 %                            |
| Sugar blood      | 1995                          | 443                        | 22.2 %                            |

Table 2. Risk Prevalence of the Examined Patients at Mostar Health Center during January- December 2013 period

The Table 3 shows risk prevalence distribution of the examined patients at Sarajevo Health Center during 2013. Highest risk prevalence is observed for dyslipidemia (93.0%) and physical inactivity (70.7%). Lowest prevalence was identified for hypertension and obesity at 22.1% and 27.8%, respectively. Smoking prevalence among the examined patients was 28.4%.

| Risk Factor      | No. of Processed Patients (N) | No. of Patients at Risk (N) | Patients at Risk (% of Processed) |
|------------------|-------------------------------|----------------------------|-----------------------------------|
| Hypertension     | 8637                          | 1911                       | 22.1 %                            |
| Obesity          | 6585                          | 1832                       | 27.8 %                            |
| Smoking          | 7191                          | 2315                       | 32.2 %                            |
| Physical Inactivity | 6877                      | 4859                      | 70.7 %                            |
| Dyslipidemia     | 5477                          | 5092                       | 93.0 %                            |
| Sugar blood      | 1339                          | 381                        | 28.5 %                            |

Table 3. Risk Prevalence of the Examined Patients at Sarajevo Health Center during January- December 2013 period

3. RESULTS

Risk prevalence distribution for massive chronic non-communicable diseases of the examined patients in F B&H for January-December 2013 period is presented against the following variables: (a) risk prevalence for total number of the examined patients; (b) risk prevalence by Health Center. The said risk prevalence correlation is presented only on annual basis, without distribution by quarters, because of the relevance of the received results.

The Table 1 shows risk prevalence distribution for the examined patients in F B&H during January-December 2013 period. Highest risk prevalence is observed for dyslipidemia (90.3%) and physical inactivity (64.7%). Lowest prevalence was found for blood sugar and hypertension at 19.2% and 21.6%, respectively. Smoking prevalence of the examined patients was 28.4%. Prevalence of the obesity as health risk (ITM > 30) was 25.5%.
patients was 32.2%, and blood sugar prevalence was 28.5%.

The Table 4 shows risk prevalence distribution of the examined patients at Tuzla Health Center during 2013. Highest risk prevalence is observed for dyslipidemia (96.7%) and physical inactivity (62.7%). Lowest prevalence was identified for blood sugar and hypertension at 14.0% and 18.1%, respectively. Smoking prevalence among the examined patients was 27.5%, and obesity prevalence was 23.4%.

Table 4. Risk Prevalence of the Examined Patients at Tuzla Health Center during January-December 2013 period

| Risk Factor   | No. of Processed Patients (N) | No. of Patients at Risk (N) | Patients at Risk (% of Processed) |
|---------------|-------------------------------|----------------------------|-----------------------------------|
| Hypertension  | 15117                         | 3442                       | 22.8%                             |
| Obesity       | 12089                         | 2827                       | 23.4%                             |
| Smoking       | 12804                         | 3393                       | 26.5%                             |
| Physical Inactivity | 12660       | 7935                       | 62.7%                             |
| Dyslipidemia  | 7989                          | 6730                       | 84.2%                             |
| Sugar blood   | 4343                          | 874                        | 20.1%                             |

Table 5. Risk Prevalence of the Examined Patients at Zenica Health Center during January-December 2013 period

| Risk Factor   | No. of Processed Patients (N) | No. of Patients at Risk (N) | Patients at Risk (% of Processed) |
|---------------|-------------------------------|----------------------------|-----------------------------------|
| Hypertension  | 11365                         | 2056                       | 18.1%                             |
| Obesity       | 9039                          | 2450                       | 27.1%                             |
| Smoking       | 9774                          | 2685                       | 27.5%                             |
| Physical Inactivity | 9026                 | 5702                       | 63.2%                             |
| Dyslipidemia  | 3981                          | 3850                       | 96.7%                             |
| Sugar blood   | 4306                          | 602                        | 14.0%                             |

Table 6. Risk Distribution by Cities from Highest to Lowest Prevalence with Noted Statistically Significant Difference (*), *there is statistically significant difference at confidence level of p<0.05

| Risks          | Risk Distribution by Cities from Highest to Lowest Prevalence with Noted Statistically Significant Difference (*) |
|----------------|-----------------------------------------------------------------------------------------------------------------|
| Hypertension   | Mostar (27.8%) > * Zenica (22.8%) > Sarajevo (22.1%) > * Tuzla (18.1%)                                           |
| Obesity        | Sarajevo (27.8%) > Tuzla (27.1%) > * Mostar (23.7%) > * Zenica (23.4%)                                         |
| Smoking        | Sarajevo (32.2%) > Mostar (31.4%) > Tuzla (27.5%) > * Zenica (26.5%)                                          |
| Physical Inactivity | Sarajevo (70.7%) > * Mostar (63.9%) > Tuzla (63.2%) > * Zenica (62.7%)                                    |
| Dyslipidemia   | Tuzla (96.7%) > * Mostar (94.5%) > Sarajevo (93.0%) > * Zenica (84.2%)                                       |
| Sugar blood    | Sarajevo (28.5%) > * Mostar (22.2%) > Zenica (20.1%) > * Tuzla (14.0%)                                        |

Table 6. Risk Distribution by Cities from Lowest to Lowest Prevalence with Noted Statistically Significant Difference (*), *there is statistically significant difference at confidence level of p<0.05

4. DISCUSSION

Economic development is strongly associated with agricultural mechanization and urbanization. Between the years 2000 and 2030 it is estimated that the percentage of the world’s population living in urban centers will increase from 47% to 60%. Urban living is often associated with lower levels of physical activity than traditional rural living, increasing the risk of overweight and obesity, metabolic syndrome, diabetes, cardiovascular disease and certain cancers. The trends towards increased consumption of energy dense foods, high in saturated fat, sugar and salt, that is associated with urbanization in the vast majority of low- and middle-income countries has been referred to as the „nutrition transition“ (9).

Some groups have much higher rates of diabetes than others. For example, at a country level it is estimated that over 30% of adults in Nauru, 20% in the United Arab Emirates and 10% in Mexico have diabetes, compared to 2.9% in the United Kingdom (9). Some reported data for diabetes prevalence in Bosnia & Herzegovina refer to the values around 7% of the general population (1). Remarkably high percentage of high blood glucose prevalence in our study within the examined family medicine patients of 19.2 could be explained by a phenomena of “bad-risk selection” during our process of patients recruiting for preventive screenings. Actually, a great majority of examined persons often visits family medicine practices due to some chronic conditions. Therefore, it is rational to expect higher risk factor prevalence compared to healthy population living in the settlements and not asking for any medical care. Also there could be a bias due to low number of glucose measurement (11,983 patients) in comparison to blood pressure measurement (38,006 patients) for instance. In addition, lower sample for glucose measurement was most likely determined by some clinical indications for the possibility for higher glucose values or less healthy people completed the test in laboratory and provided a feedback to a physician. Anyway, our finding refers that blood glucose level screening is very cost-effective due to high prevalence of positive results. Also, there is much variation within each WHO region, with over 70% known in North America and only around 20-30% in the few countries representing Africa, there is no strong association between level of development and the proportion of people with known diabetes (9).

Latest data collected by the FB&H population health status surveys (1) are interesting to be discussed in this paper, however it should be kept in mind that survey was conducted on a sample of population in communities/households, not health center patients. Percentage of population to which...
Likewise, incidence of the identified risk factors as well as prevalence or risk severity in line with risk categorization. Effectiveness of prevention services in terms of reduced risk possible, by using software possibilities, to compare effectiveness of year one and year two, and that would give false picture of variables, such as education, income, employment status, etc. Recent results obtained in Mostar (5) refer to high differences in non-communicable diseases risks prevalence between social classes taking into account education status, as well as income level. Higher prevalence of risks within lower social groups was accompanied by higher level of stress. These findings strongly support thesis of Marmot (4) being based on the role of stress, apart from life style, and protective role of population group social standing. Also, our findings on regional differences of risks prevalence could not be elaborated now without evaluation of a number of variables, such as stress level, geographical differences, cultural differences and mentality, climate differences, etc.

Analysis of risk category structure would be possible in our survey for certain period of time only e.g. during the year one of screening. During the year two, such analysis would provide only arithmetical value of behavioral, cultural and mental health status. These findings strongly support thesis of Marmot (4) being based on the role of stress, apart from life style, and protective role of population group social standing. Also, our findings on regional differences of risks prevalence could not be elaborated now without evaluation of a number of variables, such as stress level, geographical differences, cultural differences and mentality, climate differences, etc.

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early detection of certain diseases, could indicate positive trends of variables in the process of monitoring dynamic system of health and diseases.

5. CONCLUSION

Unfortunately, our study could not take into account differences in social status of our patients because software application was not designed to support that kind of analysis. Within patient data the following data should have been included, such as education, income, employment status, etc. Recent results obtained in Mostar (5) refer to high differences in non-communicable diseases risks prevalence between social classes taking into account education status, as well as income level. Higher prevalence of risks within lower social groups was accompanied by higher level of stress. These findings strongly support thesis of Marmot (4) being based on the role of stress, apart from life style, and protective role of population group social standing. Also, our findings on regional differences of risks prevalence could not be elaborated now without evaluation of a number of variables, such as stress level, geographical differences, cultural differences and mentality, climate differences, etc.

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