PUBLIC HEALTH AS SOCIAL SIGNIFICANT PROBLEM OF MODERNITY AND OBJECT OF MANAGEMENT

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Introduction: In the context of the restructuring of the country's territorial structure on the basis of decentralization of power, the restructuring requires the management of social institutions, one of the tasks of which is to ensure public health in general, and at the territorial level in particular.

The aim: To form an effective mechanism of functioning of public health at the territorial community level through the cooperation of social institutions (health care system, education, social protection).

Materials and methods: methods of system analysis and synthesis, bibliographic, data collection and analysis, generalization methods.

Review: In the context of ensuring the effective functioning of the public health care system, the issue of the willingness of local authorities, the community and the social institutions to address this problem is crucial.

The formation of modern public health theory and practice is based on the implementation of the following principles: collective responsibility for health; the role of the state in the protection of citizens' health; coverage of all population groups; taking care of major socio-economic factors that affect health.

We have analyzed the state of public health practice at the territorial level, namely: the interaction of professionals from different sectors of the social institutions (health care system, education, social protection) and heads of the united territorial communities (UTC). It is revealed that one of the obstacles to establishing close relationships in work is the cross-sectoral and interdepartmental barriers, through which the activities of the subjects are disconnected and sometimes insufficiently known to specialists working in related agencies, which is a significant obstacle to the implementation of parity professional communication and cooperation. This is mainly manifested in the absence of a single information base on the needs of people living in the territory of the UTC, and it does not allow the management of social institutions and the UTG management in a timely manner, to make preventive decisions that directly affect the quality of public health care of both adults and children.

The first attempt to form an effective mechanism for the functioning of the system of social institutions has already been proposed in 2011 in our previous publications. The study of modern management practices has shown that some issues of functioning of social institutions need further elaboration.

Conclusions: We propose: *first*, to introduce a self-management element in the field of health care at the level of the UTC residents; *secondly*, to improve the mechanism of training specialists in different branches of the social institutions and managers; *thirdly*, to create an information portal with information on the specific needs of the local population at the UTC level. This will make it possible to provide a list of services that will be provided by social institutions within the UTC, including for children currently in the category of people with special educational needs, as they require compulsory medical support during their stay in educational institutions.

KEY WORDS: public health, communities, specialist training, self-management

INFLUENCE OF THE TYPE OF EDENTULOUS MANDIBLE ATROPHY ON THE DISTRIBUTION OF STRESS-STRAIN STATES AFTER DENTAL PROSTHETICS

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Introduction: In prosthetic treatment of edentulous patients, the functional efficiency of removable dentures is largely related to the anatomical-topographic features of the prosthetic bed. The character of edentulous mandible atrophy is import ant for choosing prosthetic tactics, in particular for determining the method of fixing a removable denture – by functional suction in "classic" designs of complete removable dentures or by supporting on dental implants. However, the distribution of stress-strain states under overdentures, taking into account the character of atrophy of mandible alveolar ridge, has not been learnt yet.

The aim of this research was to compare stress-strain states in biomechanical systems "complete denture – mandible" and "overdenture – intraosseous implants – mandible" under conditions of different types of edentulous mandible atrophy.

Materials and methods: The distribution of stresses in cortical bone and displacements of the dentures on the prosthetic bed was examined, using ANSIS 12.1 finite element analysis. The virtual models of edentulous mandible with different types of atrophy by Keller were learned. It was simulated a chewing load of 100 N in the area of molars and premolars on both sides.

Results: In biomechanical systems "complete denture – mandible" the maximum stresses in the bone tissue of the prosthetic bed were observed for the third type of edentulous mandible atrophy, the smallest ones – for the second type (9.0 MPa vs 7.0 MPa). In simulation models "denture – intraosseous implants – mandible" there was a significant

increase in stresses in the alveolar bone. The biggest stresses were in the marginal bone for the first and third types by Keller (93.0 MPa and 68.5 MPa).

In turn, the movements of bases of complete dentures were insignificant (for the first type – 0.07 mm; for the second type – 0.02 mm; for the third type – 0.05 mm; for the fourth type – 0.07 mm). The use of intraosseous implants and overdentures increased in movements by several times (for the first type – 3.4 mm; for the second type – 2.0 mm; for the third type – 4.9mm; for the fourth type – 2.0 mm). For complete dentures displacement fields were uniform, for overdentures supported on implants they were not. Under expressed alveolar process in the first and third types of edentulous mandible atrophy, it was an increase in the displacements of the distal sections of the dentures on both sides. It is well-known, that such a distribution of stress-strain states causes atrophy of prosthetic bed tissues.

Conclusions: The distribution of stress-strain states are different for different types of mandible atrophy both for complete dentures and for overdentures supported on implants. Use dental implants helps to increase functional efficiency, at the same time increases the chewing load on the alveolar part, thus causing a significant increase in stress-strain states. As a result of dental implantation, the maximum stresses are in the marginal bone where implants are fixed. Saved alveolar process in the first and third types of edentulous mandible causes significant denture displacement that accelerates the atrophy of the tissues of the prosthetic bed. The results are important for understanding clinical situation and choosing of prosthetic tactics in edentulous patients.

KEY WORDS: edentulous mandible, dental prosthetics, finite element analysis

MATHEMATICAL MODELING OF EPIDEMIC PROCESS OF HEPATITIS C IN UKRAINE

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Introduction and aim: The prevalence of young people in hepatitis C (HC) structure, significant level of latent HCV-infections and absence of specific prophylaxis may complicate the epidemic situation of HC in Ukraine in the coming years. Here we use a mathematical model to reveal the most significant factors of HC transmission in Ukraine.

Materials and methods: This study is based on the correlation and regression analysis involves identifying the relationship between dependent variables y (annual number of acute and chronic HC as well as HCV-contaminations events in 25 regions of Ukraine) and independent variables x (that influence variables y). Number of HCV-contamination events was calculated by multiplying the absolute risk of infection of a number of populations. In total, 16 x-factors were included in the analysis: number of persons who received etiotropic treatment; number of persons with disorders due to drug use, including opioids; number of patients with sexually transmitted infections; number of visits to dentists and persons who received dentures; number of surgical operations, blood transfusions, endoscopic examinations, laboratory blood tests, hemodialysis and so on. Multiple correlation coefficients (R), coefficients of determination (R^2) and regression coefficients (b_0, b_1, b_2) were determined. The significance of the R^2 was determined using F-statistics and significance F. The significance of regression coefficients was estimated by the range of 95% confidence intervals (CI), t-criterion, p-value, and standard errors (m).

Results: As a result of analysis of the correlation between dependent (y) and independent (x) variables and sequential modification of the regression models by eliminating insignificant factors and inclusion of significant ones, two indicators are revealed that best describe the HC epidemic process (EP) in Ukraine and the following equations are obtained:

1. For description EP of acute HC

$y = 0.000021\, x - 11.353$,

where y is an annual number of people with acute HC; x - annual number of visits to dentists.

Model is characterized by the R = 0.892, R^2 = 0.796, F-statistic: 89.9 on 1 and 23 degrees of freedom, significance F: 0.0000000021; regression coefficients: b_1 = 0.000021 (m = ± 3.982; t = 2.85, $t_{critical}$ = 1.71; p = 0.009; 95% CI: - 19.59; -3.116); b_0 = -11, 353 (m = ± 2.3 × 10^{-6}; t = 9.48, $t_{critical}$ = 1.71; p = 0.0000000021; 95% CI: 0.000017; 0.000026). Modeling of chronic HC EP did not reveal any statistically significant coefficients that may be explained by the incomplete registration of chronic hepatitis cases.

2. For characteristic the number of HCV-infections events (transmission realization)

$y = 0.0058\, x_1 + 4.563\, x_2 - 36552.721$,

where y is a number of HCV-infections events; x_1 - number of laboratory blood tests; x_2 - number of sexually transmitted diseases.

In this model R = 0.92; R^2=0.842, F-statistic: 58.62 on 2 and 22 degrees of freedom, significance F: 0.00000000153; regression coefficients: b_1 = 0.0058 (m = ± 0.00082; t = 7.1, $t_{critical}$ = 1.71; p = 0.0000004; 95% CI: 0.0041; 0 ,0075); b_2 = 4.563 (m = ± 1.526; t = 2.99, $t_{critical}$ = 1.71; p = 0.0067; 95% CI: 1.4; 7.73); b_0 = -36552.721 (m = ± 10649.1; t = 3.43, $t_{critical}$ = 1.71; p = 0.0024; 95% CI: -58637.63; -14467.81).

Conclusions: At least 84% of HCV-infection events in Ukraine are due to sexual contacts and laboratory sampling of blood. Acute HC accounts for approximately 0.033% of the total number of infected people. Almost 80 % of acute HC are associated with dental procedures.

KEY WORDS: Hepatitis C, epidemic process, dental procedures, laboratory sampling of blood, sexual contacts