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Morbidity with temporary disability of healthcare worker: analysis, economic loss and reasons

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ABSTRACT

The article studies the morbidity with temporary disability (MWTD) and the assessment of the expected economic loss; identifies the causes of high morbidity and disadaptation in industrial integration of healthcare workers. The study took into consideration the following aspects: age, duration of employment, category and number of morbidity cases, profession and departments in which employees work. The duration (severity of morbidity) and the number of cases of MWTD were established to depend on age and there is a significant increase among workers after 50 years, that may indicate the morbidity as chronic. The results of the distribution analysis of morbidity in individual classes (doctor, nurse, etc.) showed that there is no interrelation between them, but significant are departments and professions. The greatest economic losses are observed in the departments with higher average age and the difference between general and medical duration of employment. The reasons for the high morbidity of WTD at the initial professional stage (0-5 years) include 1) working for a long period as a non-medical specialist; 2) no relationship between occupational choice and personality traits; 3) low professionally important personal qualities. Preventive maintenance to reduce economic losses in the hospital should be aimed at: reducing the average age of workers (attracting young professionals) in departments with high rates; reducing of a significant difference (working as non-medical specialist) between general and medical duration of employment (refresher courses and mentoring); shirting into medium or high rates of professionally important personal qualities of medical specialists (conducting personally-focused trainings).

Keywords: morbidity, healthcare system, economic loss, healthcare workers

INTRODUCTION

Currently, the number of specialists working in the industry is relevant, but their health status can be even more important for the health care system.

The quality of medical care and results depend directly on the human resources of health services. The costs spent on training, maintenance and development of skilled workers are incomparable with the social and economic effect that society receives in terms of maintaining human health. The initial cost, spent on human resources, gains a higher value due to the accumulation of theoretical and practical professional knowledge over time (1-8).

The overall morbidity of the healthcare workers tends to increase. During the surveys, a wide range of laboratory and instrumental methods were used. The study shows that the morbidity rates data obtained from official report forms are several times lower compared to the survey data (9-11).

The reason for the discrepancy is that most healthcare workers prefer to self-medicate or receive medical treatment from their colleagues without registering the case of the disease in medical records. Therefore, such cases are not included in the general statistics (12,13).

High rates of morbidity and often chronic diseases are determined by working stress, part-time/night/shift work, reduced living standards, widespread self-medicating, formal and often poor-quality medical examinations (14).

The morbidity of temporary disability is an important indicator of the health assessment of healthcare workers.

This type of morbidity causes great economic loss, which consists of the costs of providing medical care, disability benefits and reducing the volume and quality of intangible services. Reviewing and assessing of morbidity rates, their trends, prevalence and factors affecting the loss of ability to work identifying, all these factors help to reduce morbidity, improve workers' health, and increase labor productivity (12,15-17).

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Knowing the causes of METD allows to develop sound recommendations for primary prevention and thus have higher efficiency and require less economic loss than secondary prevention (9,18).

The development of preventive maintenances aimed at health preserving of healthcare workers is a pressing issue and is determined by the professional specificity, low medical reporting, factors of production characteristics, social status, living standards and working conditions. Quantitative and qualitative assessments of occupational safety and health risk are priority factors in the development of preventive maintenances (19,20).

Problem Setting

The relevance of this study lies in the fact that at the present stage of development of our society, it is important to know not only the morbidity terms of healthcare workers, but its causes in order to plan and perform the preventive maintenances properly and economically sound.

It should be noted that there is not enough scientific research and publications on the study of morbidity, economic loss and economically sound and put in practice preventive maintenances aimed at reducing all of these factors among healthcare workers.

It is important to know the reasons that lead to high MWTD rates for the development of economically sound recommendations. Meanwhile, the duration and number of cases of morbidity will be affected by the duration of employment in the profession, since it is subject to the "dose-respond" relationship used in toxicology. Important is to assess the role of gender, age, duration of employment in the profession etc. in order to identify the causes of morbidity.

The solution to any problem is realized and understood faster if transfer to an economically sound loss. At the same time, the amount of money that must be spent on the treatment and rehabilitation of patients will depend on age, since it is related to the formation of the pathological systems directly, and leads to chronic diseases.

The aim of the research is to study 1) the impact of the medical profession, age duration of employment in the profession on morbidity with temporary disability of healthcare workers, 2) assessment of an expected economic loss and 3) the influence of the main causes that can significantly affect the morbidity.

METHODOLOGY AND RESEARCH METHODS

Description of the Subject

The level and structure of morbidity of healthcare workers was examined on the basis of the report form No. 16-TB (temporary disability) of a medical institution using a continuous sampling method (the number of cases and days of temporary disability, the average duration of a case).

The study took into consideration: hospital, age groups from 20 years and older with an interval of 5 years, the diseases classification according to ICD-10 (International Classification of Diseases), the number and duration of temporary disability, medical and general duration of employment groups from a year or more with an interval of 5 years, different teams of profession (doctors, nurses, etc.). The sample consisted of 285 cases and was carried out in Irkutsk.

Methods

The study of the morbidity and the assessment of expected economic loss caused by MWTD was carried out according to the generally accepted methodology based on the temporary disability reports (Form No. 16-TD) of the medical institution.

Theoretical and practical researches of domestic scientists were used to assess the morbidity and economic loss from temporary disability of healthcare workers (10,21-23;).

Morbidity with temporary disability rates and the economic loss assessment were obtained using "STATISTICA" software tools. Wiesbaden's questionnaire (WIPPF) and the Cluster Analysis using the Chebyshev Distance was used to determine professionally important personal qualities. Kendall rank correlation coefficient was used to confirm the results of cluster analysis.

RESULTS

The average duration of a disability case shows the severity of the disease and the quality of the ability to work examination. The number of days of disability per 100 employees characterizes mainly the severity of the disease, and also has a certain economic value.

Table 1: *The age effect on the severity of MWTD*

Age	MWTD days Average	MWTD days Number	MWTD days standard deviation	MWTD days Min	MWTD days Max
20-25	4.00	3	1.000000	3.0	5.0
25-30	5.04	27	2.652741	1.0	15.0
30-35	5.90	20	3.338768	3.0	15.0
35-40	5.38	26	2.714066	1.0	15.0
40-45	6.38	26	4.050451	1.0	15.0
45-50	5.61	26	3.125085	1.0	15.0
50-55	5.69	36	2.806314	2.0	15.0
55-60	6.66	47	3.465837	1.0	15.0
60 and older	7.04	73	4.161458	2.0	18.0
Total	6.16	284	3.496869	1.0	18.0

The duration (severity of morbidity) and the number of cases of MWTD were established to depend on age and there is a significant increase among workers after 50 years. Thus, in the age group of 50-55 years old, the average number of days of MWTD is 5.69 and the duration is 36 days, 6.66 and 47 - 55-60 years, 7.04 and 73 - 60 years and older, respectively. There is a significant increase with age that may indicate the morbidity as chronic. For comparison, for the age group of 25-30 and 30-35 years the average number of days is 5.04 and duration 27 days; (**Table 1**).

Analyzing the interrelation of individual classes of morbidity with the duration and number of MWTD among healthcare workers, we observe that the duration is depends of one categories of diseases, and the number of others. Thus, the following classes of diseases influence the duration of MWTD the greatest: neoplasms, diseases of skin and subcutaneous tissue, circulatory system, musculoskeletal system and connective tissue, nervous system disorders. Diseases of the respiratory system, musculoskeletal system, circulatory system and digestive organs cause the greatest number of cases.

Studying the morbidity structure allows determining the leading classes of diseases that influence the duration and frequency of the MWTD, which contributes to planning and performing the preventive maintenances properly and economically sound.

The most common circulatory diseases among healthcare workers are chronic coronary artery disease (18.7%), hypertensive heart disease (hypertensive disease with primary damage to the heart) (12.5%), essential (primary) hypertension (12.5%), and atherosclerosis of lower limb arteries (12.5%).

The respiratory diseases are characterized by the prevalence of acute upper respiratory infections of multiple localization (38.7%), acute upper respiratory infections of unspecified localization (11.3%), acute laryngitis and tracheitis (9.6%), acute bronchitis (7.2%).

The musculoskeletal system and connective tissue diseases are characterized by lumbago with sciatica (20.0%), lesions of the intervertebral discs of the lumbar spine (20.0%), cervicalgia (13.3%) and dorsagia (10.0%).

Inflammatory diseases of the jaws (28.5%), gastritis and duodenitis (21.4%), other diseases of the pancreas (14.3%) and chronic pancreatitis (10.7%) characterize as the morbidoty of the digestive system.

Men have more long-lasting MWTD than women and they are dominated by such classes of diseases as the circulatory diseases, skin and subcutaneous tissue diseases, urogenital diseases, injuries, poisoning and accidents, and women by neoplasms. In the study, only women suffered from infectious and parasitic diseases, nervous system disorders, eye diseases and attachments. The general morbidity of healthcare workers is mainly influenced by 2 classes, these are respiratory diseases, musculoskeletal system and connective tissue diseases (64%), circulatory, digestive, urinary diseases which together make up 26%, have a mess impact.

Studies have not revealed any relationships or interdependences of morbidity and profession. Doctors and nurses are equally dominated by diseases of the respiratory organs, musculoskeletal system and connective tissue, and this does not depend on who they work with.

The number and the maximum duration of MWTD depend on age. Thus, with age there increases development of chronic diseases which affects the total duration of diseases.

Analysis of the average duration of morbidity in days and the number of cases led to need of assessment of a total duration in days (duration x number of cases), which showed that the two above mentioned classes of diseases also prevail.

Besides, there were differences depended on the number of morbidity rates and the department of the Medsanchast where patients work. The longest duration (in days) of MWTD was observed in female counselling center (269), children's

Table 2: *Duration of employment impact on the expected economic losses in departments of Medsanchast*

Department	General duration of employment	Medical duration of employment	The number of cases per 100 employees	The duration of cases per 100 employees	The expected economic losses per 100 employees/ thud rubles
Female counselling center	28.48	15.07	60.71	960.5	2294
Admission department	24.44	16.82	31.25	1068.7	2229
Children's clinic	24.03	14.25	80.64	767.7	1676
Therapeutic department	32.11	22.44	69.23	684.7	1568
Neurology department	17.17	13.08	83.33	566.7	1339
Gastroenterological department	27.86	15.28	42.86	428.6	1231
Emergency department	25.63	16.36	40.91	386.2	907
Hospital administration department	25.72	5.39	26.67	376.5	875
X-ray department	29.56	26.62	37.5	331.1	794
Physiotherapy department	30.21	26.68	29.63	248.0	578
Clinic	21.39	14.05	20.48	137.2	297
Total	24.13	15.71	799.78	7849.2	18362

clinic (238), hospital administration department (226), therapeutic department (178), maternity hospital (172) and emergency department (171).

The average cost of one working day, the number of cases and the duration of morbidity were took in the consideration while assessing the economic losses from MWTD. Generally, the economic losses from the MWYD amounted to 5.131 million rubles a year for a medical institution, and the duration in days was 2,207.

The greatest expected economic losses were received in those departments where the highest overall rates of incidence are: female counselling center (642 thousand rubles), children's clinic (520 thousand rubles), hospital administration department (525 thousand rubles), therapeutic department (408 thousand rubles.), maternity hospital (405 thousand rubles.) and the emergency department (357 thousand rubles).

The number of employees in the departments is different and this fact led to recalculating the results. Thus, the number of cases per 100 employees would be 799.78, and the duration was 7849.2. The expected economic loss per 100 employees would be 18362 thousand rubles. Previous results were significantly lower (5131 million rubles), because it was difficult to distribute the sick employees by department due to the lack of data and a significant percentage of healthcare workers who are self-medicating and do not fall into statistics. Thus, the indicators of the expected economic loss can significantly increase and the social insurance fund will cover them by paying for sick leave. At the same time, in the Medsanchast, the absence of healthcare worker (because of illness) should be replaced by other specialists, which leads to overworking, physical exertion and as a result, a decrease in the quality of services provided to the population.

The greatest expected economic losses per 100 employees were: female counselling center (2,294 thousand rubles), admission department (2,229 thousand rubles), children's clinic (1,676 thousand rubles), therapeutic department (1,568 thousand rubles), hospital administration department (875 thousand rubles.), etc. (**Table 2**).

The results showed that economic losses are interrelated with age and duration of employment in the profession. Studies have revealed that by departments the average age is 46.4 years, general duration of employment is 24.1 years, and medical duration of employment is 15.7 years. In general, the difference between general and medical is 8.4 years.

Besides, we have identified the most unfavorable by morbidity and economic loss department of Medsanchast. Thus, in the female counselling center, the average age of healthcare workers was 50.2 years, the difference between the general and medical duration of employment was 13.4 years, emergency department (45.7; 7.6, respectively), children's clinic (48.6; 10), therapeutic department (53.3; 10), and hospital administration department (51; 20.3).

The Cluster Analysis using the Chebyshev Distance showed that to the combined homogeneous group (by quantitative similarity) can be included the following indicators: general and medical duration of employment and number of years, as the specialty and the number of days of disability are closely related to them. The department does not play a significant role.

Kendall rank correlation coefficient was used to confirm the results of cluster analysis. Thus, the number of days of disability reliably depends on age and duration of employment, the more they are, the more prolonged are diseases.

DISCUSSION

More than 50% of healthcare workers have no agreement of general and medical duration of employment, moreover, among younger worker such indicators are in about 70% of cases. Discrepancies are 7 years for doctors, 8 years for nurses, 23 years for hospital aides.

There are separate groups of employees, who were noted with significant discrepancies from other groups associated with the greatest differences in general and medical duration of employment. In terms of significance, these differences are noted in groups of up to 5 years, 15-20, 25-30 years. We associate these with frequent cases of discharge caused by disadaptation, professional crises, occupational burnout, lack of motivation, and high morbidity rates. Therefore, these groups of duration of employment workers require more attention and applying of preventive maintenances aimed at improving working conditions, increasing professional motivation, etc. At the same time, the group of young specialists of 0-5 years should deserve the most attention.

In our opinion, the following factors may be attributed to the causes of high morbidity and impaired production adaptation at the start of work activity among young specialists.

After graduation, young professionals are often not satisfied with the proposed salary in public medical institutions, and they are to go to private hospitals either to change profession. The prolonged absence in the medical profession leads to the decrease of previously developed personal qualities associated with the profession, and later when returning to the profession it is difficult for a specialist to build communicative contacts, properly use psychological defenses, self-regulation, etc. Along with psychological problems, the professional problems arise, since it is human nature to forget that leads to a decline in qualifications due to the loss of theoretical knowledge and practical experience. Absence in the profession within five years precisely leads to such problems.

The reduction of the general theoretical and practical skills of medical staff is due to the process of depreciation and obsoletion of them. The precondition for the preservation and improvement of professional qualifications is constant self-education aimed at improving and mastering theoretical and practical skills.

Additionally, specialists who have no relationship between occupational choice and personality traits are the most professional disadaptated. The percentage of non-coincidence can be more than 50%, which indicates on the quality of career guidance in the school (24). The psychological structure of the personality, quality health indicators, physiological characteristics, etc. are the most important for personality traits assessment.

For the young professionals who are trying to realize themselves in the profession, important are sufficiently developed professional qualities for production adaptation. These qualities are individual psychological characteristics of a specialist's personality, which combine various structural and functional components of the psyche that affect the effectiveness and success of a professional activity.

To study the professional qualities of a specialist (operating staff, nurses, doctors and administration) we estimated their frequency in specialty (low, medium and high rates) and the frequency within the profssion using the Wiesbaden questionnaire, which is designed to diagnose the characteristics of a person's character. The questionnaire has 27 questions, and helps to determine such qualities as: accuracy, cleanliness, punctuality, politeness, honesty, etc. With the help of the Cluster Analysis using the Chebyshev Distance we have formed the qualitative optimal and insignificant characteristics of the professional qualities separately for doctors, nurses, attendants, and administration.

The results of our research showed that compliance with optimal indicators (in %) is: doctors - 44.4, nursing staff - 43.0, staff - 33.3 and administration - 57.

Low rates of optimally significant qualities of medical workers, difficulty in diagnosing and processing the results of the research have pushed us to develop a computer program to assess the professional and psychological fitness of medical workers. The program can be used when applying for work in medical institutions and assess these qualities when applicants enter medical universities and colleges. The computer program "Assessment of the professional and psychological fitness of medical workers" was registered with the Federal Service for Intellectual Property. As a result of testing, we get a general characteristic, the severity of professional qualities, and on the basis of the data obtained, correspondence or non- correspondence with the optimal set of professional qualities, and then the task of hiring a specialist is solved. The presence of individual low professional qualities allows for recruitment to conduct remedial work aimed at the development of these qualities and for these purposes apply personally-oriented professional training. These trainings allow developing the motivation-need sphere among specialists (professional growth trainings, motivation, professional self-determination); to form certain types of professional activities (communication training, intellectual skills, creativity, etc.); to develop socially and professionally important qualities, abilities (trainings of cooperativity, professional cooperation, communication, professional creativity), etc.

When conducting remedial trainings, we solve a number of tasks aimed at correcting the professional psychological profile of a person, reducing professional stagnation and destructive personality changes, increasing professional and psychological competence, developing professional skills, qualities, abilities, etc.

In modern conditions, the priority in the system of preventive maintenances is to reduce the incidence with temporary disability.

At the same time, it is important to know not only the incidence rates and its causes, but to be able to develop and release a set of economically sound preventive maintenances on the basis of these data.

It is clearly difficult to objectively estimate the morbidity rate with temporary disability and economic losses, because healthcare workers often self-medicate or use the help of their colleagues. Nevertheless, the expected economic losses of a particular hospital and social insurance fund make us seriously think about solving this problem.

CONCLUSION

The results of the studding the morbidity with temporary disability, the calculation of economic losses in the hospital allow us to draw the following conclusions, which must be taken into account when developing effective, economically sound preventive maintenances.

The duration (severity of the morbidity) and the number of cases of MWTD depends on age, the older the medical workers, the more significant their increase (the morbidity becomes chronic).

When analyzing the relationship of individual classes of morbidity with duration and number of MWTD, the results indicate that classes of diseases may have a subacute, acute, chronic course, and therefore, the duration and frequency of cases of diseases will be different and it often depends on age.

As a result of the study, no correlation was found between morbidity and specialty. Regardless of whom the specialists work a doctor or a nurse, they are dominated by equal classes of diseases.

The greatest economic losses are observed in those departments with higher average age and a more significant difference between general and medical duration of employment. The calculation of total economic loss showed that both material and production are significant. Additionally, it became clear to us that this problem requires more detailed and in-depth study.

The overall duration of the incidence of various classes of diseases shows that the most important and significant are only two classes of diseases: respiratory and musculoskeletal systems diseases.

The Cluster Analysis using the Chebyshev Distance showed that in terms of quantitative similarity, the homogeneous group can include such indicators: age, general and medical duration of employment, specialty and number of days of disability.

The reasons for the high morbidity of WTD at the initial professional stage (0-5 years) include 1) working for a long period as a non-medical specialist; 2) no relationship between occupational choice and personality traits; 3) low professionally important personal qualities.

The greatest expected economic losses are observed in the departments of the hospital with higher average age and the difference between general and medical duration of employment.

Preventive maintenance to reduce economic losses in the hospital should be aimed at: reducing the average age of workers (attracting young professionals) in departments with high rates; reducing of a significant difference (working as non-medical specialist) between general and medical duration of employment (refresher courses and mentoring); shirting into medium or high rates of professionally important personal qualities of medical specialists (conducting personally-focused trainings).

The results of the research, obtained by studying the MWTD and the assessment of the expected economic loss; identifies the causes of high morbidity and disadaptation in industrial integration of healthcare workers do not have a clear professional reference, they can be taken as a basis and used in the development of economically sound preventive maintenances in other professions.

REFERENCES

1. Preobrazhenskaya VS, Zarubina AV. The main trends of staffing in the regional health care system. Problems of social hygiene, health and medical history, 2002;2:11-3.
2. Golubeva AP, Bobrova IP. Expert assessment of the quality of the diagnostic and treatment process. Health care, 2004;7:38-42.

3. Groysman VA. Quality management of medical care. Standards and quality, 2004;4:100-3.
4. Manerova OA. On the main directions of personnel policy in health care. Health management problems, 2004;6(19):29-33.
5. Schepin OP, Medic VA, Starodubov VI. The study of public health at the present stage of development of society. Problems of social hygiene, health and medical history, 2005;5:3-6.
6. Erugin MV. Stimulation of medical professionals to improve the quality of medical care. Health economics, 2008;6:18-20.
7. Schepin VO, Poyarkova ES. Structural and functional transformations of the state health care system of Russia. Health economics, 2008;8:14.
8. Pedik IA, Voit LN. Medical and social characteristics of the medical staff of medical institutions of the Amur Region (literature review). Bulletin of public health and health care of the Far East of Russia, 2011;1:1-16.
9. Glotova IG, Dzugaev VK. The incidence of nursing staff according to opinion polls. Head Doctor, 2003;6:54-7.
10. Lisitsyn YuP. On the concept of health strategy. Problems of social hygiene, health and medical history, 2003;2:7-12.
11. Grigorieva AN, Savvina NV, Grigoriev GI. Health of medical workers of Yakutsk. Bulletin of NEFU, 2011;8(4):51-5.
12. Starodubov VI, Kalininskaya AA, Eygin LE. Analysis of the incidence of temporary disability dentists. Problems of social hygiene, health and medical history, 2001;4:14-8.
13. Grigorieva AN, Savvina NV, Gryaznukhina NN, Grigoriev GI. Personnel structure and incidence rates with temporary disability of medical workers in Yakutsk. Bulletin of Public Health and Health Care of the Far East of Russia, 2010;1:1-5.
14. Dyachenko VG, Kostakova TA, Pchelina IV. Medical staff of the Far East. The turn of the crisis. Khabarovsk. Publishing house: GBOU VPO DVGMU. 2012.
15. Ovcharov EA. Sanological approach to the study of morbidity with temporary disability oil workers in Western Siberia. Problems of social hygiene and the history of medicine, 1996;6:16-9.
16. Amanbekova AU, Zhumabekova GS, Abdikova BG, Kulmagambetova AR. The influence of production factors on the reproductive health of workers and workers of industrial enterprises. Occupational health and medical ecology, 2009;3(24):22-30.
17. Belozerova SM. Features of the formation of morbidity in the conditions of industrial labor and new technologies. Occupational medicine and industrial ecology, 2011;3:13-9.
18. Medic VA, Lisitsin VI, Tokmachev MS. Public health and health care: a guide to practical exercises. Moscow. Publishing house: GEOTAR-Media. 2012.
19. Ovcharov VK. The study of social factors in the formation of public health. Social Sciences and Health. Moscow. Publishing house: Science. 1987.
20. Yuriev LN. Burnout syndrome in mental health workers: a model of formation and scale of the problem. Social and clinical psychiatry, 2004;4:91-6.
21. Kolyado VB, Baranov OP, Plugin SV, Tribunsky SI, Kolyado EV. Examination of temporary disability. Barnaul. Publishing house: AGMU. 2006.
22. Saveliev VN, Ezhova NN, Gasnikov VK. A guide to practical exercises in public health and healthcare. Izhevsk. Publishing house: GOU VPO "Izhevsk State Medical Academy". 2008.
23. Luchkevich VS. Basics of public health and healthcare. St. Petersburg. Publishing house: SPb. 2011.
24. Golmenko AD. Psychological criteria for assessing professional suitability. Irkutsk. Publishing house: SIPEU. 2008.

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