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Epidemiological Analysis Incidence of Workers in Flour Production

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Abstract

The article analyzes the results of medical examinations and morbidity with temporary disability among flour mill workers. The assessment of the level of prevalence of the disease among production workers was carried out according to the data of the reporting form and cards for personal records, taking into account the analysis of the incidence with VUT. The incidence of year-round individuals was studied (from 2019 to 2023) over a three-year period. The authors showed that diseases, the respiratory system, allergic diseases and the musculoskeletal system predominate in the nosological structure of morbidity.

Keywords: *Grain Processing, Respiratory System, Heavy Metals, Temporary Disability, Experience.*

1. Introduction

In order to further ensure the country's food security, saturate the market with high-quality, safe and affordable food products, strengthen the purchasing power of the population, liberalize foreign economic activity and develop a healthy competitive environment, as well as eradicate existing systemic problems in this area throughout life, the country is taking consistent measures to streamlining and simplifying export-import operations, removing barriers and restrictions in the implementation of imports of food products in demand, strengthening guarantees for protecting the rights of subjects of foreign economic activity[1,3]. A necessary condition for the implementation of the strategic national priority of improving the quality of life of the population through guaranteed high standards of life support. The condition for the growth of the socio-economic condition of the country is dictated by the need to expand the flour-grinding industry, which is the primary task of the national economy, serves as the main supplier of bread, food for the population, animal feed, and fertilizer for plants. The development of all other branches of agriculture depends on the level of development of the grain economy [2,5].

All over the world, the grain processing industry occupies a leading position for the possibility of innovation, taking into account the nature of its ancient history, traditional flour production technologies, climatic features, a growing population and an increase in the labor force in rural areas. Since each stage of the formation of these sectors of the national economy is harmoniously connected with modernization, optimization, and increasing the reliability in providing the population with bakery products, this process is irreversible and each innovative achievement leads to the emergence of new assortments of the bakery industry [5,6,9] .

In our country, the implementation of the main tasks of the programs of the UN Food and Agriculture Organization (FAO), aimed at supporting the development of grain products and its sustainable development, contributes not only to the prosperity of this industry, but also to agriculture as a whole [11,12,13,15].

In recent years, Uzbekistan has been implementing a set of measures to develop grain products, expand the range and range of manufactured finished products, which are becoming in demand and competitive . (No.UP-530316.01.2018)[17].

According to the statistics of the World Labor Organization (WTO), there are about 4.5 million people whose professional activities are related to the production of grain in the world, 16,250 people work in this production in Uzbekistan (of which more than 70% are middle-aged men) [8.9].

Protecting the health of workers in this industry, and reducing the possible occupational risk in the workplace, are not only a solution to social and economic problems, but also to the category of strategic issues. The study of the working conditions of flour mill workers showed that workers employed at all stages of the technological cycle for processing grain products into flour are affected by a complex of unfavorable factors of the production environment that exceed the norm, which subsequently leads to a decrease in labor productivity [3,5,10].

An analysis of the literature data of domestic and foreign scientists shows that industrial enterprises are objects of technogenic factors, various accidents, processes, high risks and industrial hazards that may pose a threat to the environment. (Slavinskaya N.V., Iskandarov A.B., 2019). Studies conducted in Russia show that the flour-grinding industry includes 342 specialized flour mills and 1,700 small enterprises with a total production capacity of up to 30 million tons of processed grain per year; in fact, 18-20 million tons of grain are processed into flour per year. [20,21].

The study of the influence of dust content in the air of the working area showed that among the workers of the flour milling industry they suffer from respiratory diseases 1.5 times higher than other diseases and increases with age and work experience [Edimichev D. A. 2009]. In Kazakhstan, the working conditions of workers at the flour mill in Almaty were studied in the scientific work of Tungyshbayeva U. O. 2019. In a survey of the health of workers in the flour-grinding industry, scientific papers from Kyrgyzstan and Ukraine were published. An International Labor Organization (ILO) report indicates that more than 2.4 million workers die each year from work-related illness and accidents. Work-related respiratory diseases associated with airborne particles such as flour dust are responsible for an estimated 386,000 deaths and 6.6 million disease-adjusted life years. [16,17,18,19].

In the Republic of Uzbekistan, great attention is paid to the development of the country's economy, the introduction of new modern technologies, the technical re-equipment of various sectors of the economy, which is reflected in the documents of the Law "On labor protection" (2016). In order to increase the productivity of flour milling, a Decree of the Cabinet of Ministers of the Republic of Uzbekistan “On approval of the technical regulation on grain safety” was adopted 12/07/2018 , \ The presented scientific work is aimed at solving a number of tasks specified in the Law "On the sanitary and epidemiological welfare of the population" (2016), as well as in a number of fundamental regulations issued by the President of the Republic of Uzbekistan on February 7, 2017 "On the strategy Actions for the further development of the Republic of Uzbekistan "(UP-4947), dated January 12, 2018. Resolution No. PP-10 dated November 16, 2021 "On measures for further development in the production and sale of grain in the Republic" In the industry under consideration, the country has carried out huge structural changes aimed at further deepening economic reforms, creating new and modernizing existing industries, creating favorable conditions for attracting foreign investment, increasing volumes and expanding the range of products. Although exposure to flour dust, combined with the dramatic expansion of flour milling, is a priority health issue, the extent of the problem has been little studied in Uzbekistan.

The above data dictates the relevance of studying the working conditions and health protection of workers in the modern flour-grinding industry in the new Uzbekistan.

Goal of the work:

Analysis of the incidence of workers employed at flour-grinding facilities to characterize the health status of workers and assess the working conditions of modern production. Development of evidence-based preventive therapeutic measures.

2. Materials And Methods

The study was carried out in JSC Bukhoro don mahsulotlari , Bukhara. For studying the health of employees of this enterprise, the incidence for 201 9-2021 - 2023 was analyzed in stages. The method of covering continuous observation with the passage of a periodic medical examination was applied on the basis of the Order of the Ministry of Health of the Republic of Uzbekistan No. 200 dated July 10, 2012 “On the procedure for conducting a medical examination of employees” paragraphs No. 3.22 and 4.8. Based on these orders, employees of this production should be subject to a periodic medical examination once every 2 years. The analysis used data from the outpatient medical record form No. 025-1 / y

To assess the level of morbidity with temporary disability (TDT), the scale “Estimates of morbidity rates with TTD according to E.L. Notkin »

to a medical examination at Bukhorodonmahsulotlari JSC for 2021, of which 260 were men and 18 were women, 252 (90.6%) were studied, a card of employees who underwent a medical examination

conducted on the basis of agreement No. 57.0 3.05.2021 “Bukhoro Shahar tibbiot birlashmasi tasarrufidagi kup tarmokli markaziy polyclinic "

When performing statistical analysis using the Microsoft standard analysis package Excel and Statistica 10.0, student's test was used to compare averages.

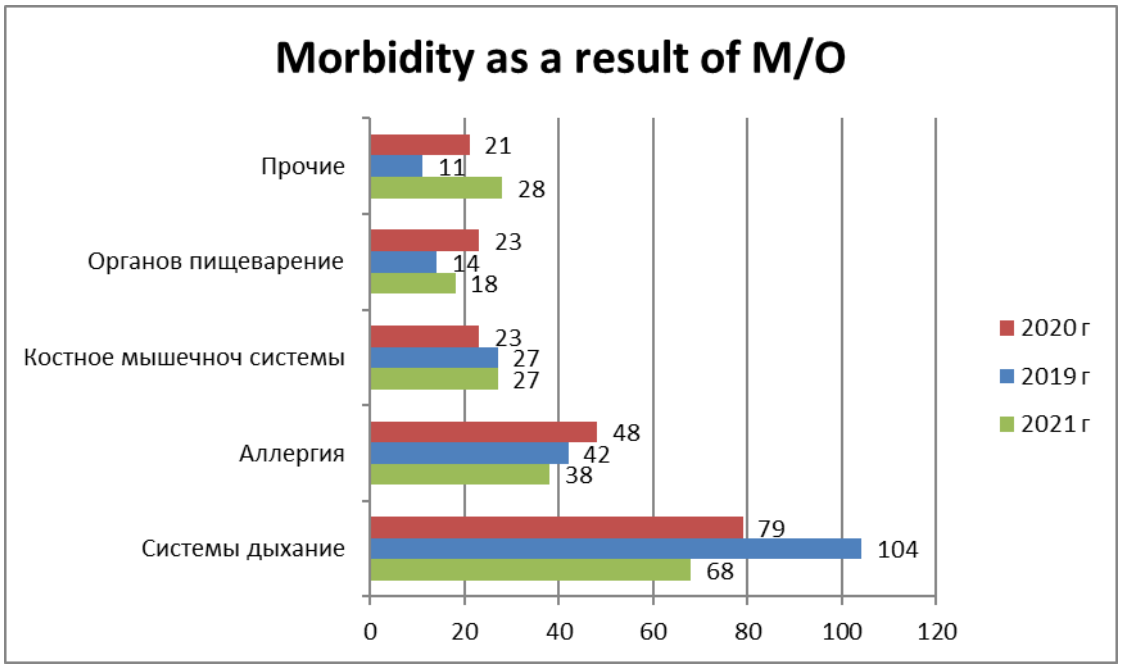
3. Results and Discussion

Results: data from a medical examination of the main professions of the flour mill showed that the level of general morbidity on average detected in 2017 was 198 cases per 100 examined 80.2 2019 was 191 per 100 examined 76.4 of the flour milling industry, which is presented in the table.

Morbidity as a result of medical examination of workers

JSC " Bukharodonmahsuloti ", (per 100 employees)

Disease	Number of Cases 2019	For 100r Cases	Number of Cases 2021	For 100r Cases	Number of Cases 2023	For 10 Cases 0r
breathing systems	104	52.5	79	41.3	68	37.9
allergy	42	21.2	48	25.2	38	21.2
Bone muscular systems	27	13.6	23	12.0	27	15.0
organs digestion	14	7.7	23	12.0	18	10.0
others	eleven	5.5	21	11.0	28	15.6
Total	198	80.2	191	76.4	179	72.7



The presented data show that, compared with previous years, for the last year 2020, the overall incidence among workers decreased by 1.5 times. If the overall incidence was registered in 2017

198 (80.2) cases of diseases, then in 2019 it was 191 (76.4) and in 2021 179 (72) cases of diseases were registered, there is a downward trend in the incidence. At In the study of morbidity, we saw a relationship between the development of the disease and risk factors, such as flour dust, which is the main adverse factor affecting the body of workers in the work area, as evidenced by high rates of upper respiratory tract diseases. In the next place are diseases of the bone - muscular system (osteochondrosis, sciatica, sciatica), in third place - eyes, nose and skin, as evidenced by allergic symptoms such as (sneezing, irritation, pruritus). In fourth place - diseases of the digestive system. 258 flour mill workers of different ages and with different work experience were involved in the medical examination in 2021.

The examination was carried out by 246 (95.3%) workers, of which 207 were men, 38 were women. According to the results of the medical examination, it was found that the level of general morbidity, which amounted to 179 cases of patients, of which 122 were workers, the main group, which includes workers directly exposed to exposure to harmful factors at the workplace, i.e. workers working in the preparatory workshop, grinding, sorting, packing department and loaders and control groups of 57

workers not exposed to harmful factors, these are laboratory assistants, administration workers and security guards. Estimates of general diseases showed the following differences: in the main group, the intensive indicator of general morbidity was (100 examined) 48.0, which is 122 cases, and in the control group 57 cases were registered, the intensive index (100 examined) was 22.6. As it turned out, in the first group the incidence is 2 times higher than in the control group. Comparative indicators for nosology's of the disease were also studied; it was found that in the main group, diseases of the respiratory system are 64 (52.4) cases, allergies - 14 cases (11.4) and the musculoskeletal system - 20 cases (16.3) . In the control group, these figures looked like this: diseases of the respiratory system - 4 (7.0) cases, allergies - 24 (42) cases and the musculoskeletal system - 7 (12.3) cases. Thus, significant differences are visible, which depend on the working conditions at the workplace. Between the main and control group of workers, the prevalence of the disease looked like this:

Morbidity of workers of JSC " Bukharodonmahsuloti ", according to nosology

(per 100 employees) for 2021

disease	Basic gr (abs)	for 100 obsle forged	Control gr (abs)	per 100 examined
Diseases of the system breathing	64	52.4	13	7.0
Diseases of the musculoskeletal system	20	16.3	10	12.2
Diseases of the hearing organs	13	10.6	5	8.5
allergy	14	11.4	10	42.1
others	eleven	9.7	19	29.8
total	122	48.0	57	22.6

Analysis in the context of the nosological structure of the disease in the first place is the disease of the respiratory system, in the second place are allergic diseases, in the third place are musculoskeletal diseases, all of them were registered in all the studied years.

Study or prevalence of diseases among flour mill workers, having general information about pathologists and registered . But these data were not enough for a complete picture to characterize the prevalence of diseases , so a large number of workers could not easily explain to doctors about their health changes (they do not have complaints) in the body. This dictated the need to study temporary disability (TS) in order to achieve more realistic estimates of the prevalence and diseases among milling workers .

Morbidity of workers AO " Bukharodonmakhsuloti ", by nosological structures (per 100 employees) (VUT)

Disease	**2019 num . cases**	**2020 num . cases**	**2021 number cases**	**2019 number Sl. per 100 workers**	**2020 number Sl. per 100 workers**	**2021 date Sl. per 100 workers**
respiratory system disease	43	15	27	51.0	39.4	43.5
musculoskeletal disease	19	5	14	22.6	13.1	22.5
with allergic diseases	eleven	9	eleven	13.0	23.0	17.7
digestive system disease	5	4	6	5.9	10.5	9.8
others	6	5	4	7.1	13.1	6.3
Total184	84	38	62	45.6	20.6	33.6

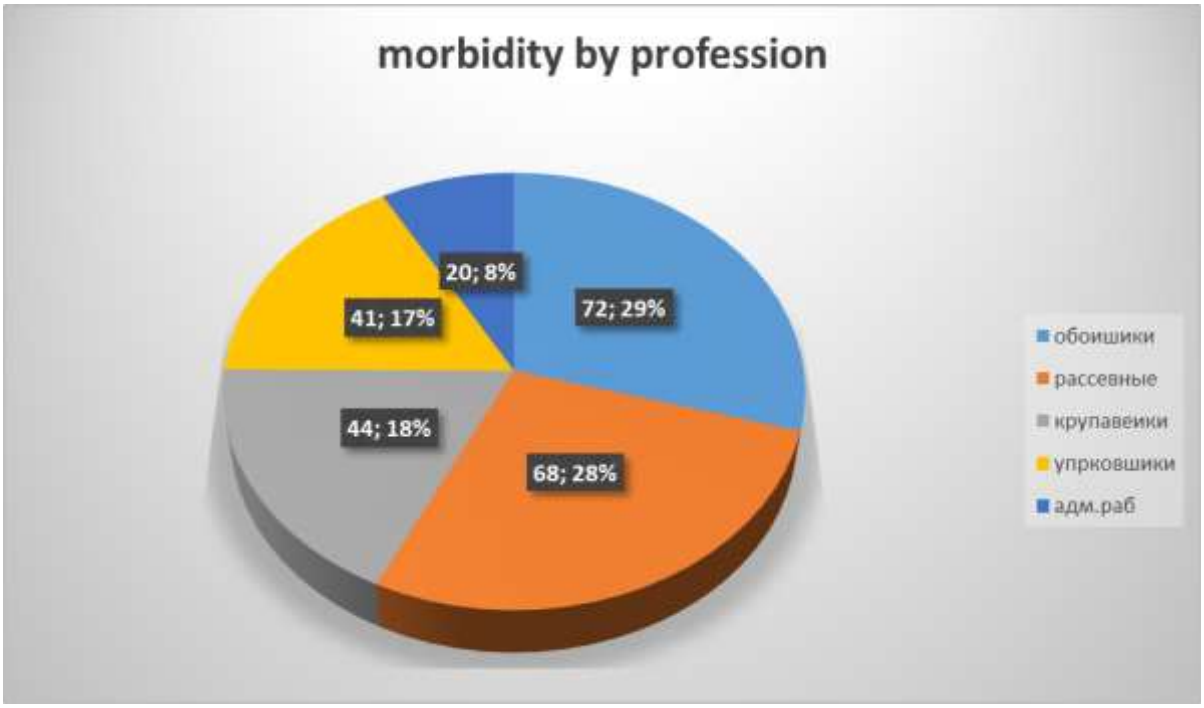
An analysis of the disease from temporary disability for 3 years showed that the temporary disability of flour mill workers due to the disease per 100 workers averaged 45.3 cases and 966 days in 2019 with an average duration of one case of 11.5 days.2020 amounted to 20.6 cases and 538 days with an average duration of one case of 14.3 days.2021 33.6 cases and 749 days with an average duration of one case of 12.1 day. (table)

Having considered the comparative data for 3 years on the nosological structure, we see the similarity of the disease of the respiratory system as the highest rate of cases (51.0. 39.4.43.5.) and is in the first place. For 2019, 2021, the second place (22.5) was musculoskeletal systems, allergic diseases 13, (11), the rest were diseases of the digestive system 5.9 (5) and other diseases 6.3 (6). In 2020, there was decrease in the total number of temporary loss According to the VUT data, the working capacity of workers is also high, with an average duration of one case of 14.5, which is associated with a pandemic.

Morbidity of workers AO " Bukharodonmahsuloti ", by profession

(per 100 employees from. (VUT)

profession	2019	For 100 cases	2020	For 100 cases	2021	For 100 cases
mill	26	30.9	14	36.8	17	27.4
sieving	31	36.9	7	18.4	22	35.4
Krupoveyki	9	!0.7	9	23.6	8	12.9
movers	12	14.2	5	13.1	eleven	17.7
admin , security	7	8.3	3	7.8	5	8.0
Total	84(250)	33.6	38(184)	20.6	62(250)	24.8



The highest level of temporary disability, in all directions and diseases, was among the workers of the main group in the cleaning and grinding departments: -966 ± 1.81, against - 538.95 ± 0.98 - in the control group and 663.50 ± 2.05 (p<0.001). This is mainly due to diseases of the respiratory system, the musculoskeletal system and allergies.

Morbidity of workers AO " Bukharodonmahsuloti ", by length of service (per 100 employees).

Experience work	2019 num . cases	2020 num . cases	2021 number cases	2019 number Sl. per 100 workers	2020 number Sl. per 100 workers	2021 date Sl. per 100 workers
1-5	10	4	4	11.9	10.5	6.4
5-10	14	7	7	16.6	18.4	11.2
10-15	16	8	18	19.0	21.0	29.0 _
15-20	13	6	12	15.4	15.4	19.2
20 or more	31	13	21	36.9	34.2	33.3
Total	84	38	62	33.6	20.6	24.8

For all the listed diseases, the level of statistical indicators in days is significantly higher for workers in the main group (except for injuries and poisonings) working in departments under the influence of harmful factors.

Morbidity in the structure is typical for each group of experience: when working up to 10 years, respiratory diseases are in the first place, the musculoskeletal system is in the second place, and allergies

are in the third place; with an increase in the length of service up to 15 years, diseases of the musculoskeletal system and allergies are in the first place, the respiratory organs are in the second place, and the digestive system is in the third place; with an experience of 11 years or more, respiratory disease is again in the first place, muscle and connective tissue is in the second place, the musculoskeletal system is in the third place, diseases of the digestive system are in fourth place. Analysis of variance showed that diseases such as diseases of the musculoskeletal system and respiratory organs depend on professional experience ($p<0.05$), and diseases of the circulatory and digestive organs are purely age-related ($p<0.05$)

Correlation for 2021-0.8

Correlation for 2020-0.7

Correlation for 2019-0.7

Correlation indicators show that with the growth of work experience, the level of the disease increases almost equally for the studied years, so the Pearson correlation coefficient is 0.7-0.8 positively average trend activity. The incidence rate of VUT for 2019 is 84 cases (45.3) and 966 days for 2020 was 38 (20.6) cases and 538 days for 2021 62 (33.6) cases and 749 days, this year estimated the overall incidence rate below average. According to the nosological structures of the disease, the respiratory system in the rank had a level above the average, averaging 60-63% of the total morbidity.

4. Conclusion

Thus, the results of the analysis of studies show that workers in the flour milling industry were exposed to a complex of unfavorable occupational factors of different nature and intensity of risk (flour dust, microclimate, insufficient illumination of the working area, industrial noise, the severity of the labor process), the results of which made it possible to assess the conditions labor as harmful of the 1st-3rd degree (classes 3.1-3.3), forming a priori occupational risk categories from high (unbearable) and low (moderate) requiring the use of urgent measures to detect it.

There is evidence in the literature that flour dust in its composition contains antigens of microorganisms, which can be an etiological factor in the formation of immunopathological and allergic diseases - allergic bronchitis, professional allergic bronchial asthma (Baker's asthma)

According to the results of the PMO, the health of workers in the flour milling industry can be regarded as unsatisfactory. The presence of a statistically significant correlation between the prevalence of non-infectious occupational diseases of various organs and systems with polyetiological pathology and work experience in hazardous working conditions indicates their professional conditionality.

The production conditionality of health disorders is confirmed by the establishment of causal relationships with the work of medium and high degrees of respiratory diseases, diseases of the musculoskeletal system.

The health of flour mill workers should include the introduction of innovative technologies and modern resource-saving equipment, preventive measures of a sanitary-technical and medical-preventive order.

The introduction of the developed complex of health-improving measures is the basis for creating conditions and working regime at modern flour mills that ensure an increase in working capacity, efficiency and productivity, and disease prevention. The results of the research formed the basis of methodological recommendations on sanitary supervision and improvement of working conditions at flour mills.

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