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METHODS FOR EXAMINING AND ASSESSING NATURAL LIGHTING INDICATORS OF ROOMS

Muhammadjonova Muxlisa G‘ofur qizi
Ismoilov Dilmurod Tavakkalovich
Fergana Medical Institute of Public Health Fergana, Uzbekistan

Abstract: The article describes the main methods of hygienic examination and assessment of natural lighting conditions in rooms. It considers the dependence of natural lighting on human activity, the functioning of the visual analyzer, the effectiveness of work and study processes, and the indoor microclimate. It is explained that the assessment of natural lighting in rooms takes into account the light coefficient, the natural illumination coefficient, the dimensions of windows and rooms, the placement of windows, and the influence of external obstructions. The hygienic significance of instrumental examination and calculation methods for natural lighting is also revealed.

Keywords: natural lighting, room, light, natural illumination coefficient, light coefficient, window, hygiene, visual analyzer, sanitary-hygienic assessment.

Introduction

Natural light is one of the important environmental factors for human life and activity. An adequate level of natural lighting supports the normal functioning of the visual analyzer, the comfortable organization of study and work processes, and the provision of hygienic conditions in rooms. Sufficient or insufficient natural light in rooms may depend on the dimensions of the room, the number and area of windows, their placement, and buildings and other obstructions outside the windows.

In the hygienic assessment of natural lighting, not only the presence of light but also its quantitative indicators and its suitability for the intended use of the room are taken into account. Therefore, regular examination of natural lighting in educational, medical, residential, and industrial premises is one of the important sanitary-hygienic measures.

The aim is to cover the methods for examining and hygienically assessing the natural lighting indicators of rooms, and to describe the main indicators of natural light and the practical methods for determining them.

The objectives are:

1. To explain the concept of natural lighting and its hygienic significance.
2. To characterize the main factors affecting the natural lighting of rooms.
3. To describe the methods for determining natural lighting indicators.
4. To show the significance of the light coefficient and the natural illumination coefficient.
5. To describe the principles of sanitary-hygienic assessment of the results obtained.

MATERIALS AND METHODS

The article was prepared using methods of analysis, description, comparison, and generalization of educational and scientific materials on hygiene, medical ecology, and room lighting. The general principles of assessing natural lighting were considered: determining the

dimensions of rooms and windows, calculating the light coefficient, and determining the natural illumination coefficient by the instrumental method.

Natural lighting is the illumination of rooms by natural light coming from the sun and the sky vault. The main source of natural light is solar radiation, and light enters a room through windows, skylights, and other light-transmitting structures. Natural lighting is organized differently depending on the function and layout of the room.

Adequate natural lighting creates favorable conditions for performing visual tasks. Insufficient light may increase the load on the organ of vision, make it harder to distinguish small details, and reduce the comfort of study or work activity. Therefore, the natural lighting of rooms is one of the important areas of hygienic control.

The amount of natural light entering a room depends on a number of factors. These include the area and number of windows, the light-transmitting properties of the window glass, the placement of the windows, the depth of the room, and the color and reflective properties of walls and ceilings. In addition, other structures, trees, and constructions located outside the building may reduce the light reaching the windows.

The geometric dimensions of a room also affect natural lighting. In very deep rooms, the amount of natural light may decrease with distance from the window. Therefore, when assessing lighting, not only the window area but also the depth of the room and the position of the window relative to the work surfaces must be taken into account.

Both calculation and instrumental methods can be used to examine the natural lighting of rooms. One of the calculation methods is determining the light coefficient. The light coefficient expresses the ratio of the total light-transmitting area of the windows to the floor area. This indicator shows, in general terms, how the area allocated for natural light to enter the room relates to the area of the room.

To assess natural lighting more accurately, the natural illumination coefficient (NIC; also known as the daylight factor) is used. It expresses, as a percentage, the ratio of the natural illumination at a given point inside the room to the simultaneous outdoor horizontal illumination. NIC can be determined using a special illuminance meter — a lux meter.

In instrumental examination, the illumination inside the room is measured at designated points and compared with the natural illumination of the outdoor environment. During measurement, the weather conditions, the time of day, the condition of the windows, and other factors affecting the light inside the room must be recorded.

In hygienic assessment, the indicators obtained are compared in accordance with the function of the room and the sanitary-hygienic requirements in force. The requirements for educational rooms, medical institutions, residential premises, and work rooms may differ depending on the type of activity performed. Therefore, the functional purpose of the room must always be taken into account when assessing natural lighting.

In the assessment process, the dimensions of windows and rooms, the light coefficient, NIC, the distribution of light throughout the room, and the presence of external obstructions are considered together. A final conclusion based on only one indicator is not always sufficient. An integrated approach makes it possible to assess the actual lighting conditions of a room more fully.

RESULTS

The analysis established that two main approaches — calculation and instrumental examination methods — can be used to assess the natural lighting of rooms. The light coefficient helps to make a general assessment of lighting potential based on room and window dimensions. NIC, in turn, allows a more accurate assessment by comparing the natural illumination inside the room with the outdoor illumination.

In determining the hygienic condition of natural lighting, the correct placement of windows, the influence of external obstructions, and the depth of the room are of great importance. Likewise, an even distribution of light throughout the room is an important factor in creating favorable conditions for visual activity.

DISCUSSION

Hygienic assessment of the natural lighting of rooms does not consist solely of determining the amount of light. The function of the room, the visual precision required by the work performed in it, and the distribution of illumination must also be taken into account. For example, adequate natural lighting is especially important in rooms where prolonged writing, reading, or work with small details is required.

It is important to organize measurements correctly when examining natural lighting. Because outdoor illumination varies with weather and time, the measurement conditions must be recorded when evaluating the results of instrumental measurements. Curtains, blinds, dirty windowpanes, or external buildings in the room may also affect the amount of natural light.

In general, the hygienic assessment of natural lighting becomes more reliable when calculated indicators and instrumental measurements are analyzed together. This approach helps to develop practical recommendations for creating healthy and comfortable lighting conditions in rooms.

CONCLUSION

The natural lighting of rooms is an important factor in ensuring human visual activity and the hygienic comfort of work and study conditions in the room. Its assessment takes into account the dimensions of windows and rooms, the light coefficient, the natural illumination coefficient, the placement of windows, and the influence of external obstructions. Using calculation and instrumental methods together allows a fuller assessment of the state of natural lighting. Therefore, regular examination of natural light in rooms and comparison of the results with the hygienic requirements in force is one of the important conditions for creating a healthy and comfortable environment.

REFERENCES

1. Gadaev, A., Ismoilov, D., Ruziyev, O., Razakova, R., & Toshboev, F. (2025). Assessing the Impact of Environmental Chemicals on the Development of Neurodegenerative Diseases Across Biological Systems. Journal of Animal Environment, 17(3), 889-900.
2. Tavakkalovich, I. D. (2026). SHAHAR SHOVQINING AHOLI SALOMATLIGIGA TA'SIRI VA UNING HUDUDIY XUSUSIYATLARI [The impact of urban noise on public health and its regional characteristics; in Uzbek]. ACTIVIST SCIENCE, 3(3).

3. Tavakkalovich, I. D. (2026). SUV RESURSLARINING KIMYOVIY VA SANOAT CHIQINDILARI BILAN IFLOSLANISHI SANITARIYA-GIGIYENIK TAHLIL VA NORMATIV TALABLAR [Pollution of water resources with chemical and industrial waste: sanitary-hygienic analysis and regulatory requirements; in Uzbek]. ACTIVIST SCIENCE, 3(3).
4. Ashurova, M. D., Moydinova, Y., Atadjanova, D., Muhammadova, G., & Ismoilov, D. (2023). Pedagogical efficiency of integrated learning in the organization of hygiene classes in medical universities. In BIO Web of Conferences (Vol. 65, p. 10016). EDP Sciences.
5. Umaralievich, A. R., Ugli, I. D. T., Qizi, U. F. U., & Ugli, U. H. N. (2021). Hygienic assessment of working conditions and environmental protection at glass production plants.