

COMPREHENSIVE ASSESSMENT OF HYGIENIC RISK FACTORS IN THE INDOOR ENVIRONMENT OF HOTEL LIVING ROOMS

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Relevance

One of the key criteria determining the quality of service in the modern hotel industry is ensuring a healthy, safe, and hygienically comfortable indoor environment for guests and staff. Since a person spends a certain part of the day in enclosed hotel rooms, indoor air quality, microclimate, lighting, noise, sanitary condition, and biological and chemical pollutants should be regarded as important factors affecting health.

Fine particulate matter — PM_{2.5} and PM₁₀ — is of particular importance in assessing the hygienic safety of the air environment in hotels. Their entry into the respiratory system and prolonged effect on the body are associated with risks to public health. For this reason, limiting the penetration of outdoor dust into hotels, ensuring the efficiency of ventilation and air purification systems, and periodically monitoring air quality are important from a preventive standpoint. In this regard, the comprehensive assessment of hotel living rooms — not only in terms of their general sanitary condition, but also in the interrelated context of microclimate, airborne particulate matter, chemical pollution, ventilation, sanitary condition, and epidemiological risk — is a pressing scientific and practical task.

Aim of the Study

To comprehensively assess the sanitary-hygienic, microclimatic, physical, chemical, and epidemiological factors shaping the quality of the indoor environment in hotel living rooms, and to substantiate preventive measures aimed at reducing potential risks to the health of guests and staff.

Materials and Methods

The main living rooms of hotels and the functionally related elements of their indoor environment were selected as the objects of the study. In assessing the indoor microclimate, attention was paid to indicators such as air temperature, relative humidity, and air movement. In characterizing air quality, the significance of the concentrations of fine particulate matter — PM_{2.5} and PM₁₀ — was taken into account. In addition, the potential sources of chemical air pollution in the rooms, including volatile organic compounds associated with furniture, synthetic finishing materials, paint and varnish coatings, and cleaning and disinfection agents, were assessed from a sanitary-hygienic standpoint.

Research Results and Discussion

The study results revealed that fine particulate matter in indoor air is a factor requiring particular attention. In some of the samples examined, the PM_{2.5} concentration was found to be approximately 80% higher than the reference value adopted for comparison. This indicates the need for joint control of factors such as the penetration of outdoor dust into hotel buildings, ventilation efficiency, the room-cleaning method, and dust accumulation in the indoor environment. Because of their small size, PM_{2.5} particles can reach the deep parts of the respiratory system. Therefore, reducing the amount of dust in hotel rooms should be regarded not merely as a matter of aesthetic cleanliness, but as a sanitary-hygienic task of preventive importance.

Among microclimate parameters, maintaining stable air temperature and relative humidity is important for guests' thermal state and subjective comfort. In particular, in regions with high outdoor air temperatures, the effective operation of air-conditioning systems ensures comfortable indoor conditions. However, sharply lowering room temperature relative to the outdoor environment can also impose an additional load on the body's adaptive processes. For this reason, it is advisable to regularly monitor microclimate indicators and manage them in accordance with seasonal conditions.

Assessment of the sanitary condition of furniture and household furnishings shows that upholstered furniture, mattresses, curtains, carpets, and other

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Date: 30th September, 2026

Website: <https://eglobalcongress.com/index.php/egc>

ISSN (E): 2836-3612

textile products are objects in which dust and allergens may accumulate. Therefore, it is advisable not to limit room sanitation to the daily cleaning of floors and open surfaces alone, but also to include periodic deep cleaning of upholstered furnishings in the sanitary measures plan. From the standpoint of epidemiological safety, it is important to regularly ventilate rooms, carry out cleaning and the necessary disinfection when guests change, keep sanitary facilities in proper condition, and pay particular attention to frequently touched surfaces.

It should also be borne in mind that the category of a hotel or the high level of its service does not by itself guarantee an optimal hygienic state of the indoor environment. When engineering systems, ventilation, air conditioning, cleaning, and sanitary control are properly organized, the negative influence of the outdoor environment can be significantly reduced. Conversely, even in a highly equipped building, indoor air quality may deteriorate if ventilation and sanitary operation requirements are violated. The results obtained show that, rather than analyzing individual indicators in isolation, it is advisable to use a comprehensive approach based on the chain “outdoor environment → building and engineering systems → indoor air quality → sanitary practice → potential risk to human health” in assessing the hotel living environment.

Conclusions

The finding that in some of the examined samples the PM_{2.5} concentration was approximately 80% higher than the reference value adopted for comparison indicates the need to strengthen control over fine particulate dust in indoor air. In this regard, air filtration, improving ventilation efficiency, wet cleaning, and periodic monitoring of PM_{2.5} and PM₁₀ levels are priority preventive measures. Regular control of temperature and relative humidity in hotel rooms, together with planned sanitary-technical maintenance of ventilation and air-conditioning systems, is of great importance in ensuring a stable hygienic state of the indoor environment. Volatile organic compounds associated with furniture, synthetic construction and finishing materials, and household chemical agents should be taken into account as sources of chemical pollution of indoor air. Therefore, in assessing indoor air quality, it is advisable to monitor chemical pollutants alongside dust

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indicators. The absence of a significant correlation between hotel staff's level of knowledge of infectious diseases and environmental quality indicates that ensuring the safety of the indoor environment should not be limited to staff training alone, but should be carried out through engineering-technical, sanitary-hygienic, and organizational measures implemented as a single integrated system. To create a healthy living environment in hotels, it is advisable to comprehensively implement continuous microclimate control, PM2.5 and PM10 monitoring, effective ventilation and air filtration, limitation of VOC sources, regular wet cleaning, sanitary maintenance of air-conditioning systems, and epidemiological prevention measures.