

## Some Hygiene Challenges for a Sustainable Living Environment

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### Abstract

A sociological study was conducted to assess the level of knowledge, skills and abilities in matters of hygiene of sleep and sleeping place based on the results of a survey of 667 adults living in various regions of Uzbekistan.

It was found that more than 10% of the surveyed population, regardless of the region of residence, had one common bedroom for all family members or combined a bedroom with other living rooms. About 40% of the surveyed population did not observe the hygiene of the bed.

The study of hygienic aspects of the organization, maintenance and provision of one of the issues of household hygiene - safe hygiene of the bedroom in households located in different regions of the republic indicates the need to develop targeted measures to improve hygiene literacy and change the attitude of the population to the creation of favorable household hygiene in their own household. To this end, a software product has been developed that will draw the attention of the population to existing problems in their own households, change their attitude to the importance of household hygiene in maintaining the health and well-being of the family.

**Keywords:** *personal hygiene, sleep hygiene, bed hygiene, hygiene literacy of the population, behavioral change in the population, software product, self-assessment, indicators of safe water supply, sanitation and hygiene, household hygiene.*

## Introduction

In modern conditions, universal coverage and access to comprehensive quality and safe sanitary and hygienic conditions focused on the needs and interests of the population are realized through improved water supply, sanitation and hygiene. However, efforts to accelerate the achievement of universal coverage and high quality care are undermined by the lack of basic infrastructure and hygiene in both urban and rural areas. Whereas, improving the issues of ensuring access and coverage of the population to safe and high-quality conditions of water supply, sanitation and hygiene are indispensable conditions for maintaining health and ensuring the well-being of the population, as well as the social and economic development of the country [13, 14].

The problem of access to high-quality and safe conditions of water supply, sanitation and hygiene is very relevant in modern conditions of modernizing the system to support the quarter and family, local governments, non-governmental organizations, healthcare, education and science and requires management decisions at various levels. An indispensable condition for the validity of these decisions is reliable information: on the level of provision with sanitary and hygienic conditions for households located both in rural and urban areas based on the formation of a database that allows monitoring, analysis, assessment and forecasting of the human environment, as well as determination of cause-and-effect relationships between the level of provision of the population with safe conditions for water supply, sanitation, hygiene and family well-being in order to take adequate measures to improve the quality of life of the population of the republic; on the main trends in the field of high-quality and safe water supply, sanitation and hygiene, taking into account the current

sanitary rules, norms and hygiene standards in the field of design, installation, maintenance of residential buildings in the climatic conditions of Uzbekistan, as well as the best international practices [14, 16, 18].

One of the most important tools for making science-based decisions in the field of improving living conditions and raising the standard of living of the population in each district and city, especially in remote regions of the republic, ensuring sanitary and epidemiological well-being, in which there is no harmful effect of environmental factors on humans and favorable conditions for his life are provided, is the conduct of social and hygienic monitoring [17, 15]. In this regard, a reasonable assessment of the factors is necessary to identify the degree of trouble and further build an effective intervention or prevention program with the involvement of the population itself in an objective self-assessment of the level of household hygiene in their own household in order to change attitudes and behavior towards the importance of household hygiene in maintaining the health and well-being of the family.

According to many studies, the importance of healthy sleep in protecting the body from infectious diseases has been proven. During sleep, the body releases proteins called cytokines that fight inflammation and infection. Lack of sleep or poor-quality sleep reduces this immune response and increases the risk of disease. Lack of sleep can slow down the immune response and allow the disease to progress further [5, 6, 12]. Sleep hygiene and bed hygiene are of great importance in ensuring a quality, healthy night's sleep. Sleep hygiene, including the bedroom environment, as well as the daily routine, are the main components of sleep hygiene. Maintaining a stable sleep schedule, a comfortable bedroom environment,

no clutter, a relaxing routine before bed, and healthy habits throughout the day all contribute to perfect sleep hygiene. Sleep hygiene involves both environment and habits, and it can pave the way for better quality sleep and better overall health [11].

In a 2022 study among adults in the city of Tabuk, Saudi Arabia, there was a significant association between the incidence of sleep problems and poor sleep hygiene ( $p < 0.001$ ). The percentage of respondents who had problems with sleep was significantly higher among those who had poor sleep hygiene (76,5%). There were rates of excessive or severe daytime sleepiness among those with poor hygiene (22,5% vs. 11,7% and 5,2% vs. 1,2%,  $p = 0,001$ ). Participants with depression were significantly higher in the group with poor hygiene practices (75,8%) compared to those with good hygiene practices (59,6%) ( $p = 0,001$ ). This allows us to conclude that there is a significant relationship between the level of sleep hygiene and the development of daytime sleepiness and depression among the adult population [4].

Creating a favorable living environment is the main goal of developing sustainable housing, which is to create a balance in the relationship between housing design and meeting the daily needs of the population based on the cultural and social characteristics and climatic and geographical conditions of the region of residence [1,8]. Many authors highlight an important role in making architectural and planning decisions of residential spaces to take into account the efficiency and functionality, as well as the ergonomics of the designed housing [2,7]. At the same time, when modeling residential cells, the expediency of the distribution of bedrooms is taken into account, taking into account the needs of each family member [7,8,9]. Due to the fact that, according

to the results of our research, regardless of the region of residence, households, including three generations, consisted of an average of 5-6 people (medium families) and 7 or more people (large families), it is advisable to design for such households bedrooms are two less than the number of people [1,3].

The main goal of the sociological study was to assess the level of knowledge, skills and abilities in matters of a healthy lifestyle - observing hygiene of sleep and sleeping place based on the subjective opinion of representatives of three generations of the family living in different regions of Uzbekistan. The purpose of developing a software product was to attract the attention of the population to existing problems in their own households, to change their attitude to the importance of household hygiene in maintaining the health and well-being of the family.

### **Materials and research methods.**

The object of the study was the urban population living in the city of Margilan of the Fergana region and the city of Syrdarya of the Syrdarya region, as well as the rural population living in the desert (Republic of Karakalpakstan, Shumanai region and Navoi region, Konimekh region) and mountainous (Namangan region, Kasansay region and Tashkent region, Parkent district) areas of the republic.

To study the subjective opinion of the population, a survey-interview of the population was carried out using specially designed questionnaires, followed by the use of computational, statistical and analytical research methods. The questionnaire consisted of several blocks: "Passport section", "Water supply", "Sanitation", "Hand hygiene", "Body hygiene", "Sleep and bed hygiene", "Kitchen

hygiene"; "Knowledge, skills and abilities in household hygiene", "Socio-economic factors of household hygiene". In total, more than 667 households were surveyed, interviews were conducted among families in which representatives of three generations lived together, including grandparents - grandparents (first generation), parents (second generation) and children (third generation). The results of the study made it possible, with the participation of specialists from the Research Institute "Family and women" under the Ministry for the Support of Mahalla and Family, as part of the implementation of the project "The role of household hygiene in creating a sustainable social environment in the family" (Phase II) funded by the Public Foundation for the Support of Women and Family in In Uzbekistan, the software product "Maishiy gigiyena yulduzlari" (No. DGU15113 dated February 22, 2022) was developed, which takes into account the directive and regulatory documents of the Republic of Uzbekistan, as well as international recommendations in the field of safe sanitation and hygiene at household levels.

### Results of the study and their discussion.

In this paper, we present the results of a study on the study of hygiene issues related to the conditions for organizing a bedroom and a sleeping place in the surveyed households (Table 1). So, to the question "Do you have separate sleeping quarters?" 60% of respondents noted the presence of a separate bedroom for parents and a common bedroom for children, and in urban and mountainous areas this indicator practically did not differ and amounted to 64,5 and 69,4% - respectively, while in the desert area there were 1,4 and 1,5 times less than 47,2%. Whereas, the presence of a separate bedroom for parents and a separate nursery (separately for girls and boys) of respondents living in a desert area (36,4%) was indicated 1,4 and 1,9 times more compared to those who lived in urban and mountainous areas (26,3% and 21,5%, respectively). However, more than 10% of the surveyed population, regardless of the region of residence, had one common bedroom for all family members or combined a bedroom with other living rooms, often a hall, which is an unfavorable factor.

**Table 1. Hygiene characteristics of the bedroom in households, depending on the region**

Index	Location of households		
	Urban region(n=217)	Mountain region(n=219)	Desert region(n=231)
Having a separate bedroom ,%			
Available, but one shared bedroom	5,5	4,1	6,5
Available, where the bedroom is separate for parents and a common children's room	64,5	69,4	47,2
Available, a separate bedroom for parents and a separate children's room (separately for girls and boys)	26,3	21,5	36,4
Missing we combine the bedroom with other living room	3,7	5,0	10,0
Availability of a separate set of bed linen for each member, %			
Each family member has a separate set of bed linen	54,4	51,6	67,1
Have separate bedding sets for parents and children	43,3	45,2	26,0
In a set of bed linen intended for common use by all family members	2,3	3,2	6,9
Number of seed bedding sets, %			

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Index	Location of households		
	Urban region(n=217)	Mountain region(n=219)	Desert region(n=231)
One set for each family member	41,5	37,4	48,9
Two set for each family member	53,5	51,1	32,0
Only for children / only for parents /only one set for guests	0,5	3,7	6,9
Doesn't use bedding		1,8	3,9
Used mainly for bed sheets (duvet covers, pillowcases)	4,6	5,9	8,2
Frequency of bed linen change?			
1 time per week	85,3	69,4	33,8
1 time per month	12,4	28,8	52,4
As it gets dirty	0,0	1,4	8,7
Don't know it's hard to answer	2,3	0,5	5,2

When asked about the availability of a separate set of bed linen, the following data were obtained: each family member had an individual set of bed linen - about 60% of the surveyed contingent, and in desert areas 1,2 and 1,3 times more compared to urban and mountainous areas (67,1% versus 54,4% and 51,6% respectively); had separate sets of bedding for parents and children - almost 40% of respondents, and in urban (43,3%) and mountainous areas (45,2%) almost 2 times more compared to the population living in the desert area (26,0%).

According to hygienic requirements, it is necessary to have at least two sets of bed linen for each family member [10]. The identification of the number of replaceable sets of bed linen among respondents from different regions showed that on average 45,5% of respondents had 2 sets of replaceable bed linen and used complete sets (sheet, pillowcase, duvet cover and sheet), which meets hygiene requirements, and 42,6% of respondents had only 1 set of removable bed linen and also used it in full; while the rest used 1 set of bed linen and only for children, parents and / or guests (3,7%), used bed linen in a partial set and mostly only sheets (6,2%) and almost 2% - Didn't use bed sheets at all.

Equally important for a healthy sleep is the timely ventilation of the bedroom before going to bed. The study of this issue made it possible to establish that, on average, among all the respondents, about 50% regularly ventilated the bedroom, 35% - sometimes, about 10% - rarely and more than 5% - never ventilated.

Thus, more than 10% of the surveyed population, regardless of the region of residence, had one common bedroom for all family members or combined a bedroom with other living rooms, often a hall, which does not meet hygienic requirements.

About 40% of the surveyed population, and especially those living in mountainous and desert areas, did not comply with the principles of hygiene in the maintenance of bed linen.

Development of a tool for self-assessment of the level of provision with household hygiene. The results of the sociological survey made it possible to determine the need to develop modern tools for assessing the level of provision with household hygiene with the involvement of the owners of households themselves. Along with the hygiene of sleep and bed, the basics of household hygiene include such issues as:

the level of provision with conditions for safe and high-quality water supply and sanitation,

the level of organization of hand and body hygiene in the household;

the level of provision with safe hygiene conditions for the kitchen and food;

economic issues of household hygiene.

The self-assessment tool is presented as a software product, "Household Hygiene Stars" (No. DGU15113 dated 02.22.2022), designed for use on computers and mobile phones, which has the following characteristics:

- Mobility is determined by the ability to install on various models of computers, smartphones and operating systems, without restrictions on its operation in a computer network;

- Reliability is determined by the uninterrupted and stable operation of programs, the accuracy of performing the prescribed processing functions;

- Efficiency is determined by the minimum possible consumption of computing resources and the maximum possible speed.

- Modifiability is determined by the ease of making changes, taking into account the suggestions and recommendations of users.

- Takes into account the human factor - providing a friendly interface for the end user, the presence of a context-sensitive hint as part of the software, in addition, in an accessible form, the identification of key aspects for the development and use of the embedded data and their functionality, the derivation of the analysis of the results and the possibility of downloading and saving practical recommendations on 5 issues (water supply, sanitation, body and hand hygiene, kitchen

hygiene, sleep hygiene and economic aspects of household hygiene) in pdf or jpg format;

- Communication - is based on the maximum possible integration with other programs, providing data exchange in common presentation formats (export / import of databases, implementation or linking of processing objects, etc.).

- Self-assessment - the user subjectively assesses the level of provision with sanitary and hygienic conditions of his own household.

- Automatic system for analyzing and processing the entered data - the results of self-assessment are automatically registered in a single database in the context of regions, districts, cities, quarters;

- Utilization of resources - due to the presence of the control panel, a single database is automatically formed, which allows you to map (rank) the territory of the republic in terms of the level of provision with sanitary and hygienic conditions based on the results of user self-assessment.

- Learnability - based on the answers that users indicate compliance with hygiene requirements, a star is assigned. Based on the entered and processed data, in case of not receiving a star for each of the criteria, the program allows the user to receive online information on a set of practical recommendations for improving identified problems in the household in the form of bright and colorful posters, including high-quality and safe conditions for water supply and sanitation and accommodation, on observing the rules of personal hygiene, as well as recommendations on managing the family budget, taking into account the improvement of household hygiene.

The software product was developed on the basis of the Telegram-bot platform (for operation on the @honadonstar smartphone) and on the basis of the Internet browser (for operation on the website <https://vm625022.had.su/hygiene/site/ru>). The software product is built on the basis of a survey, which consists of 5 sections: 1. water supply and sanitation; 2. hand and body hygiene; 3. kitchen and food hygiene; 4. sleep hygiene; 5. family budget for household hygiene. Each section includes 5 simple questions and as a result of self-assessment, the owner of the house can receive all "Five Stars of Household Hygiene". With a lack of stars, the program issues recommendations for improving household hygiene on that topic, in the form of posters. In addition, for clarity, the user's dialog menu, as well as each question, is accompanied by bright drawings developed using a design program for working with vector graphics. This survey does not involve the collection of personal data and follows the principles of anonymity. The survey takes 5-10 minutes.

When developing a software product, factors such as convenience and mass character were taken into account in order to cover the population of the republic and solve a wide range of tasks - from propaganda to teaching the population the basics of safe sanitation and hygiene.

### Conclusion

The study of hygienic aspects of the organization, maintenance and provision of one of the issues of household hygiene - safe hygiene of the bedroom in households located in different regions of the republic indicates the need to develop targeted measures to improve hygiene literacy and change the attitude of the population to the creation of favorable

household hygiene in their own country. homeownership. To this end, a software product has been developed that will draw the attention of the population to existing problems in their own households, change their attitude to the importance of household hygiene in maintaining the health and well-being of the family.

### References

1. Blagova M.V. Architectural formation of a commercial dwelling on a social and functional basis (on the example of the city of Rostov-on-Don): Abstract of the thesis. Sciences. - Nizhny Novgorod, 2015. - 52 p.
2. Saidiy S.A. How to build an earthquake-resistant house //Practical guide. – Ministry of Emergency Situations of the Republic of Uzbekistan, State Committee of the Republic of Uzbekistan for Architecture and Construction, UNDP. - Tashkent, 2012. - 44 p.
3. Yakupova G.A. Young rural family in modern conditions: Abstract of the thesis. - Ufa, 2018. - 52 p.
4. Alanazi EM, Alanazi AMM, Albuhairey AH, Alanazi AAA. Sleep Hygiene Practices and Its Impact on Mental Health and Functional Performance Among Adults in Tabuk City: A Cross-Sectional Study. *Cureus*. 2023 Mar 16; 15(3):e36221. doi: 10.7759/cureus.36221. PMID: 37069886; PMCID: PMC10105495.
5. Besedovsky L, Lange T, Haack M. The sleep-immune crosstalk in health and disease. *Physiol Rev*.2019; 99(3):1325-1380. doi:1152/physrev.00010.2018
6. Del Gallo F, Opp MR, Imeri L. The reciprocal link between sleep and immune

- responses. *Arch. Ital. Biol.* 2014; 152(2-3):93-102. doi:12871/000298292014234;
7. Hyun-ah Kwon and Soomi Kim. Characteristics of Residential Space in Response to Changed Lifestyles: Focusing on the Characteristics of Residents and the Relationship between Individual and Family // Sustainability. 2019; 11(2006):22 p.
  8. Kumwenda, S. Challenges to Hygiene Improvement in Developing Countries. 2019. 10.5772/intechopen.80355.
  9. Maldives Population and Housing Census. Statistical Release VI: Housing and Household Characteristics // National Bureau of Statistics. 2016:25 p.m.
  10. SanPiN RUz No. 0323-15 "Hygienic standards for the annual minimum need for sanitary items, hygiene for the population";
  11. Irish, L. A., Kline, C. E., Gunn, H. E., Buysse, D. J., & Hall, M. H. (2015). The role of sleep hygiene in promoting public health: A review of empirical evidence. *Sleep Medicine Reviews*, 22, 23–36. <https://pubmed.ncbi.nlm.nih.gov/25454674/>;
  12. Sleep disorders. Anxiety and Depression Association of America (ADAA). Accessed March 17, 2020. <https://adaa.org/understanding-anxiety/related-illnesses/sleep-disorders>;
  13. WHO The European health report 2018: More than just numbers: evidence for everyone. - 2019. - 182 p.
  14. WHO Guidelines for Sanitation and Public Health. - 2019. - 220 p.
  15. WHO/FAO/OIE. Technical brief on water, sanitation, hygiene (WASH) and wastewater management to prevent infections and reduce the spread of antimicrobial resistance (AMR). 2020;32 p.
  16. WHO/UNICEF. Water supply, sanitation, hygiene and waste management in connection with the spread of the SARS-CoV-2 virus, which is the causative agent of COVID-19 // Interim recommendations. - 2020. - 15 p.
  17. WHO/FAO. Guide to World Food Safety Day 2021. Safe food for a healthy future. - 2021. - 8 p.
  18. International Bank for Reconstruction and Development/World Bank. The glass is half full. Diagnosis of the relationship between the level of well-being and the conditions of water supply, sanitation and hygiene in the Republic of Tajikistan // Version of the document for discussion during the conference. - 2017. - 231 p.