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CHARACTERISTICS OF NURSING CARE IN PEDIATRIC WARDS AND INFECTION CONTROL

ABSTRACT

Of a dissertation for the award of doctoral degree
Scientific Speciality: 'Nursing Care Management'

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The dissertation contains 137 standard pages and is illustrated with 91 figures. Appendixes - 2. The reference list includes 175 literature sources, 59 in Cyrillic and 116 in Latin.

The dissertation was discussed and directed for defense by the Departmental Council of the Department of Health Care at the Branch - Sliven, Medical University "Prof. dr. Paraskev Stoyanov" - Varna on 14. 07. 2022.

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The dissertation defense will take place on 27. 10. 2022 From ..... in Aula Hall, Branch - Sliven at an open meeting of the Scientific Jury.

Contents

INTRODUCTION

Children health is a priority for health systems worldwide. The provision of quality health care for paediatric patients, the reduction of mortality, the prevention of infectious morbidity and infection control is of great importance and engages the attention and efforts of all countries, and it is embedded not only in health care facilities and in different organisations, but also as an overall government policy. In hospital care, nursing care for children is mainly provided in children's wards and clinics.

Nosocomial infections are a problem that affects healthcare at all levels and threatens the health of both patients and healthcare providers. Their development is a major cause for disability and mortality in hospitalized patients and especially in children due to age-related physiological features**.** Medical-related infections also lead to extended hospital stays, which in turn are associated with additional financial costs.

The prevention and control of nosocomial infections are included in medical standards and regulations, which contain recommendations for dealing effectively with this problem.

Pediatric wards and clinics are said to be at risk of development of nosocomial infections. All individuals - medical and non-medical professionals working in paediatric facilities - are obliged to comply with the established standards and mandatory precautions and to ensure that infections related to the care of children do not develop.

The prevention and control of healthcare-associated infections in paediatric wards and clinics is a process that requires a high level of responsibility, periodic training and provision of up-to-date information to healthcare professionals, as well as continuous

updating of prevention and control programmes according to the specific characteristics of pediatric patients.

Aim, tasks and working hypotheses of the dissertation

Aim

To investigate the specificities of health care in pediatric wards, the coherent organisation of infection control, and the attitude and knowledge of the staff regarding nosocomial infection control.

Tasks

1. To clarify the characteristics of the child as a patient and the specifics of their care.
2. To investigate staff's attitude towards the problem of nosocomial infections and the extent to which the implementation of control measures is adhered to in the process of working in paediatric wards.
3. To derive the criteria for effectiveness in the control of nosocomial infections /rules, algorithms and controls on disinfection rules/.
4. To conceptualize a model related to the organization of nosocomial infection control activities in hospital facilities for the treatment and care of children.
5. To suggest optimization in the activity and structure of the implementation of measures regarding the control of nosocomial infections.

Working hypotheses

1. It is assumed that in pediatric wards there are performance gaps which are a precursor to the occurrence of nosocomial infections.
2. It is assumed that the allocation of staff responsibilities is not at the required level and this could be the cause of gaps

in the prevention and control of nosocomial infections in paediatric wards.

3. Training of ward staff is a prerequisite for quality health care delivery to paediatric patients and control of NI prevention activities.
4. Finding an accessible way to inform companions about the risks of transmission of HAIs would ensure greater responsibility and cooperation on their part in protecting hospitalized children from developing such infections.

Organisation of the survey

1. Subject of the study

1.1 The organization of prevention and control of nosocomial infections in the delivery of health care in pediatric wards.

2. Object of the study

2.1 The objects of the study are:

- Nurses providing health care in the paediatric structures of Dr. Ivan Seliminski Hospital - Sliven and St. Marina University Hospital - Varna.
- Students from the specialty "Nurse", studying at the Sliven Affiliate of MU Prof. Dr. Paraskev Stoyanov MU - Varna.
- Paramedics working in the children's ward of Dr. Ivan Seliminski Hospital - Sliven and St. Marina Univetrsity Hospital - Varna.

3. Study Scope

The study started in December 2021 and ended in May 2022. The statistical sample comprises a total of 118 respondents divided into the following groups:

Group I - 46 nurses providing health care in the pediatric structures of Dr. Ivan Seliminski Hospital, Sliven and St. Marina University Hospital, Varna.

Group II - 60 students from the specialty "Nurse", studying in the Sliven Affiliate at Prof. Dr. Paraskev Stoyanov Medical University - Varna.

Group III - 12 nurses working in the children's ward of Dr. Ivan Seliminski Hospital - Sliven.

4. **Place and time of the study:**
   - the survey was conducted through two types of anonymous questionnaires in the cities of Sliven and Varna.
   - the survey of health care professionals nurses and students was conducted in the pediatric wards where they work/conduct clinical practice.
   - the study was carried out independently between 01.12.2021 and 31.05.2022, and all interviewees were familiar with the purpose and nature of the research.

5. **Data collection methods**
   - survey
   - programmed interview with health care professionals and nursing students.

6. **Data analysis methods /statistical methods/.**
   - descriptive statistics
   - correlation analysis
7. **Survey instrumentation**

Questionnaire №1

The questionnaire was designed for nurses, nursing students and medical orderlies, and aimed to investigate the level of competence regarding the prevention and control of nosocomial infections in paediatric wards.

- The first group of questions (2 - 8) aims to test the level of familiarity nurses, students and orderlies have with the problem of nosocomial infections.
- The second group of questions (9 - 15) aims to test the level of awareness of nurses, students and orderlies about the precautions for prevention and control of nosocomial infections.
- The third group of questions (16-22) aims to examine the extent to which precautions for the prevention and control of nosocomial infections are implemented in practice in the pediatric inpatient setting.
- The last questions of the questionnaire (23 and 24) seek to verify the need for further information on the problem of nosocomial infections in pediatric wards.

Questionnaire No. 2

Programmed interview containing 10 questions aimed at health care professionals working in a children's ward and nursing students undertaking clinical practice in a children's ward.
The interview aims to clarify the responsibilities of health care professionals and nursing students regarding specific features related to the prevention and control of nosocomial infections specifically for pediatric wards.

Results and discussion

The total number of participants in the survey is 118. The distrbution by occupation is shown in Figure 1.

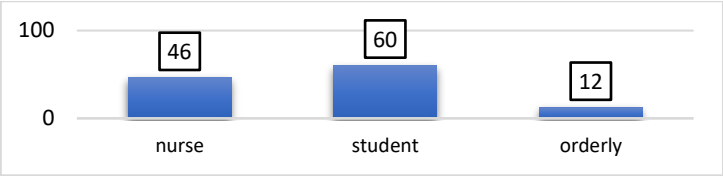

Fig. 1 Fig.1 Distribution of respondents by absolute number (n=118)

Figure 2 shows the relative share of the different groups participating in the study. The relative share of the first group of respondents, namely nurses is 39%, students as the second group of respondents have a relative share of 50.8%, and the third group of respondents, in the face of orderlies, occupies 10.2% relative share of the sample.

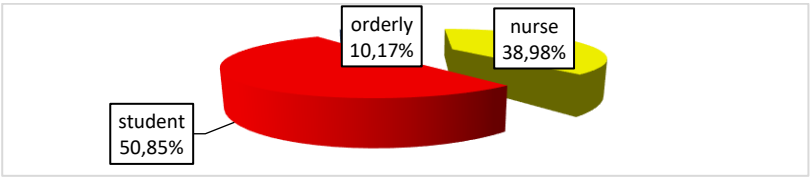

Fig. 2. Distribution of sample groups by relative proportion (n=118)

The first group of questions is aimed to subjectively test the degree of knowledge nurses, students and orderlies have with the problem of nosocomial infections.

When asked whether they were aware of whose responsibility it is to prevent and control nosocomial infections, the majority of healthcare professionals (68.2%) felt that they were fully aware. It is worth noting that there are also those who believe that they have no knowledge of this responsibility (18.2%). A very small proportion of respondents indicated some knowledge (9.1%) and considerable knowledge (4.5%) (Figure 3).

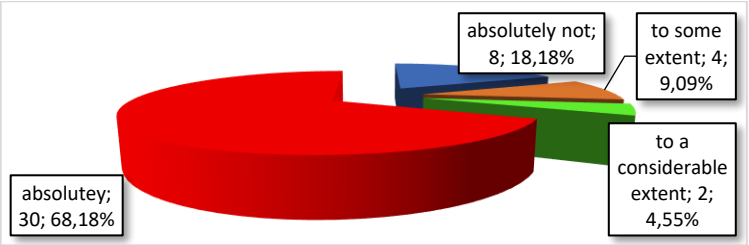

Fig. 3. Are you aware of whose responsibility it is to prevent and control HAIs? /nurses/

The data for students is quite similar. 53.3% of them considered themselves to be fully familiar with the issue, while 26.7% stated a lack of such information (Fig. 4).

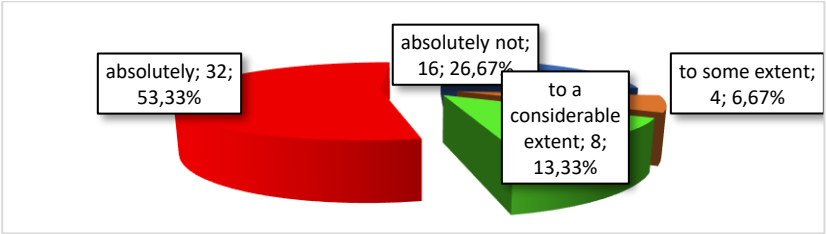

Fig. 4. Are you aware of whose responsibility it is to prevent and control HAIs? /students/

The data provided by the sanitation group is much more variable. 33.3% of them demonstrated that they were fully aware of whose responsibility it is to prevent and control NI. The same relative proportion of respondents gave the answer "to some extent". Equal results were obtained for those who thought they had considerable knowledge pertaining to this issue and those who claimed to have no information on the issue (17.7% each) (Figure 5).

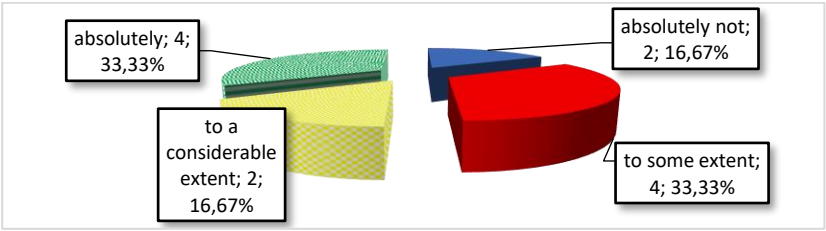

Fig. 5. Are you aware of whose responsibility it is to prevent and control HAIs? /orderlies/

Less than half of the nurses surveyed (40.9%) claimed to be fully aware of the medical standard on prevention and control of HAIs. The remainder felt that they were somewhat (18.2%) considerably (22.7%) familiar, and 18.2% indicated that they carried out their professional activities without being fully aware of the standards imposed in practice (Figure 6). In turn, this self-assessment by the respondents shows basic knowledge, some routine work and insufficient awareness of the rules and regulations in place.

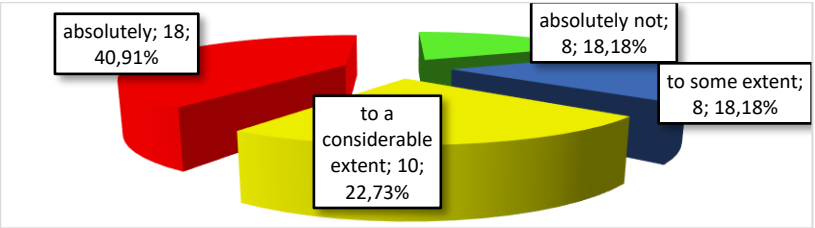

Fig. 6. Are you familiar with the medical standard for prevention and control of HAIs? /nurses/

The data obtained by students in quite different. 63.3% assumed that they were fully familiar with the content of the standard, while another 26.7% considered themselves to be somewhat familiar (Fig. 7).

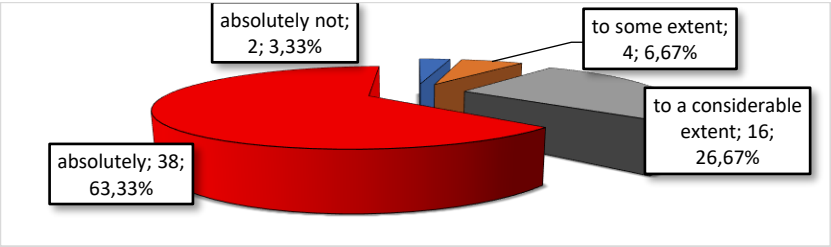

Fig. 7. Are you familiar with the medical standard for prevention and control of HAIs? /students/

Insufficient knowledge of the medical standard is evident from the data obtained from the third group of respondents, namely

the orderlies. 50% of them state that they do not know the standard and only 16.7% claim to be fully aware of it (Figure 8)

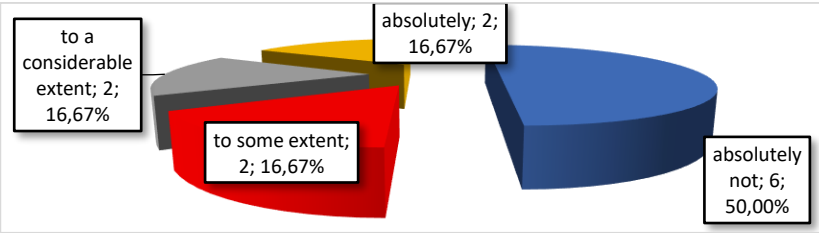

Fig. 8. Are you familiar with the medical standard for prevention and control of HAIs? /orderlies/

When asked who carries out the activities for prevention of HAIs, 45.5% of the nurses stated that they were fully knowledgeable, with 31.8% having considerable knowledge. A significant proportion of them (18.2%) claim that they have no information on the implementation of these activities (Figure 9).

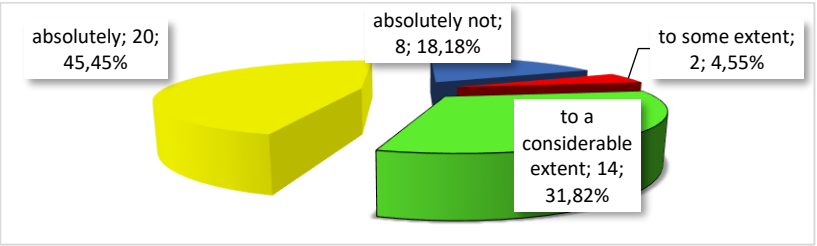

Fig. 9. Are you aware of who carries out the prevention activities for HAIs? /nurses/

In the data obtained from the second group of respondents there is some fluctuation. There was an equal proportion of students who thought they were fully aware and considerably aware of who carries out NI prevention activitiesand those who claimed to have no knowledge of the issue, at 30% each (Figure 10).

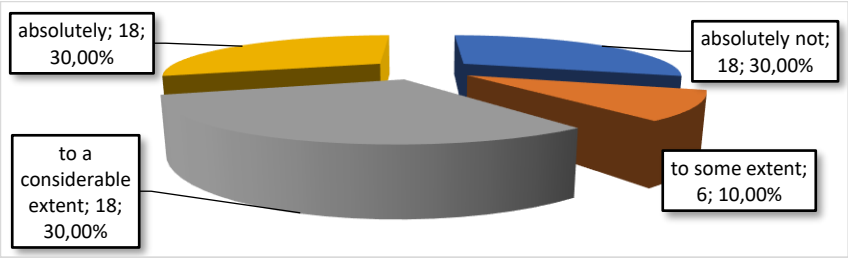

Fig. 10. Are you aware of who carries out the prevention activities for HAIs?/students/

A relative proportion of 66.7% of the third group of respondents claimed to have some knowledge about the implementation of NI prevention activities. It is noteworthy that there are no respondents who consider that they are not at all informed about the issue (Fig.11).

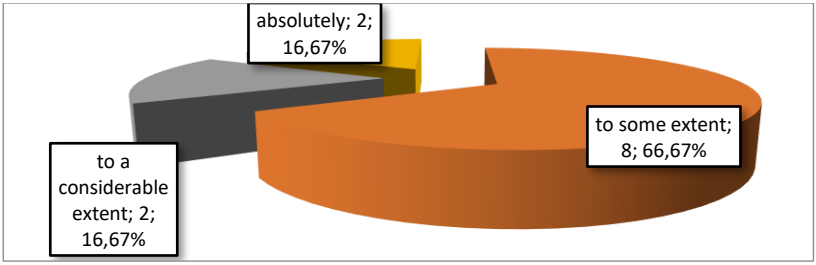

Fig. 11. Are you aware of who carries out the prevention activities for HAIs?/orderlies/

Only 31.8% of the surveyed health care professionals claimed to be fully aware of the categories of hospital care facilities and wards that are at specific risk of developing NI. The data contained in Fig. 12 is in almost equal proportion, indicating a certain inconclusiveness regarding nurses' awareness of at-risk hospital units, which in turn

would suggest some underestimation of the risks of NI.

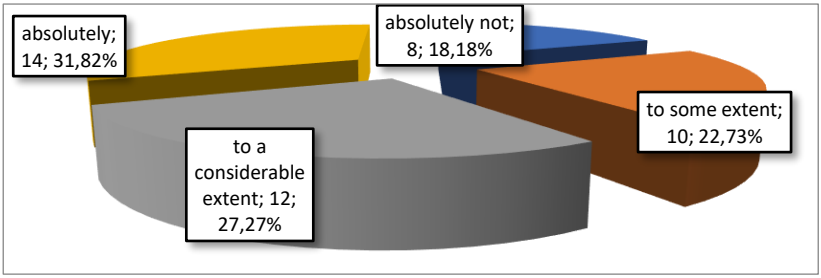

Fig. 12. Are you familiar with the categories of inpatient care facilities and wards according to the specific risk of developing HAI? /nurses/

The students' answer to this question is much more convincing. Half indicated that they were completely familiar, and 30% claimed to be considerably familiar with hospital facilities and wards at risk of developing HAI (Figure 13).

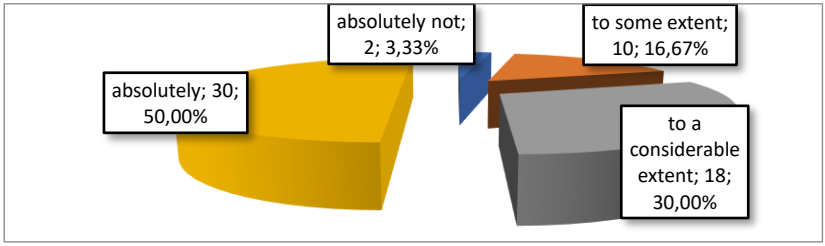

Fig.13. Are you familiar with the categories of inpatient care facilities and wards according to the specific risk of developing HAI?/students/

Out of the surveyed paramedics, 50% were of the opinion that they were not aware of the hospitals and wards at risk of NI. For the rest of the respondents, there was some inconclusiveness in their knowledge of the issue (Figure 14).

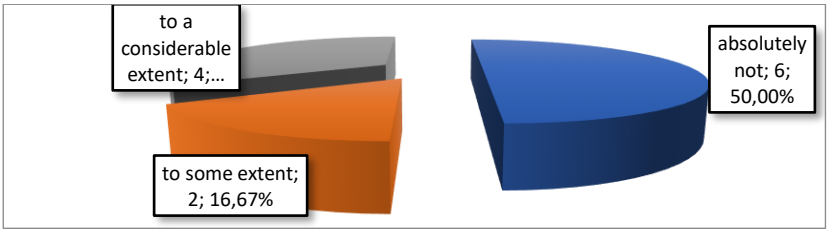

Fig.14. Are you familiar with the categories of inpatient care facilities and wards according to the specific risk of developing HAI?/orderlies/

From the content of Figure 15, it is clear that only 22.7% of the health care professionals surveyed indicated full knowledge of the annual prevention and control program for HAIs at the facility where they work. The same relative proportion of nurses surveyed stated that they were not familiar with this document. The largest number of respondents demonstrated only some knowledge (36.4%). These facts are somewhat disturbing as these professionals are directly involved in the prevention and control of HAIs in the facility where they carry out their professional activities.

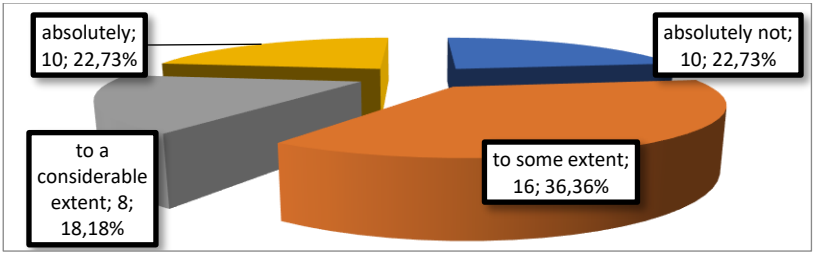

Fig. 15. Are you familiar in detail with the annual programme for prevention and control of HAIs in the health facility where you work/conduct clinical practice/? /nurses/.

At the same time, more than half of the students surveyed (53.3%), stated that they were fully familiar with the annual program of the health care facility where they conduct their clinical practice. It is likely that this information was provided by the clinical practice educators in the respective hospital structures (Figure 16).

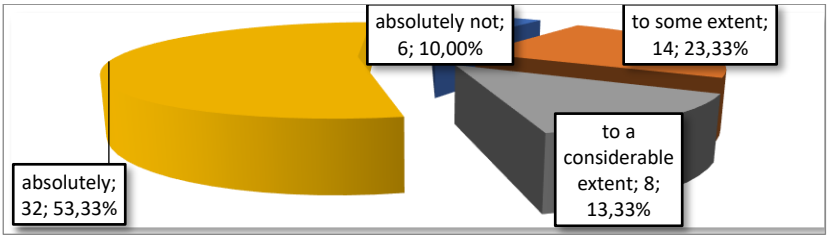

Fig. 16. Are you familiar in detail with the annual programme for prevention and control of HAIs in the health facility where you work/conduct clinical practice/?/students/

With the third group of respondents, who are actually part of the individuals directly involved in the prevention and control of HAIs in medical institutions, it is noteworthy that 50% believe that they are only somewhat informed about the content of the annual HAI prevention and control programme. 16.7% of this group of respondents indicated "completely" and 33.3% claimed to be considerably familiar (Figure 17).

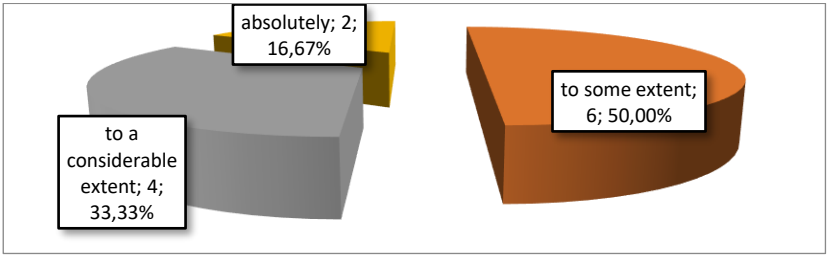

Fig. 17. Are you familiar in detail with the annual programme for prevention and control of HAIs in the health facility where you work/conduct clinical practice/?/orderlies/

The data contained in Figure 18 shows that 45.5% of the nurses surveyed were of the opinion that they had knowledge of the risk factors for the occurrence of HAI and 27.3% of the respondents indicated that they had a considerable knowledge of these factors. Taking into account the answers of the other respondents, it seems that there is knowledge on the subject, but it is not sufficient.

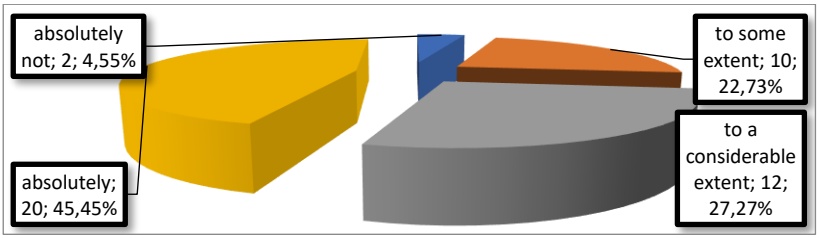

Fig. 18. Are you familiar with the factors which determine the risk of developing HAIs? /nurses/

The answers of the second group of respondents are much more explicit. Compared to health care professionals, a much higher relative proportion of students (68.9%) stated that they were fully aware of the risk factors for NI (Figure 19).

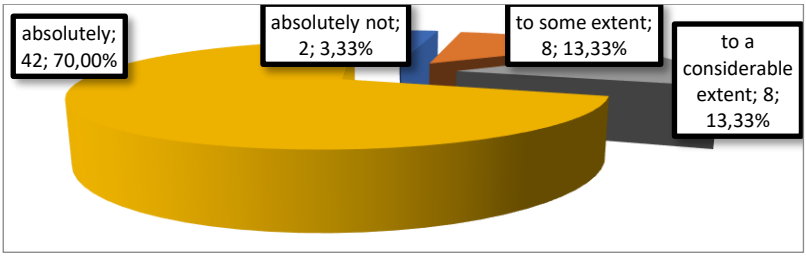

Fig. 19. Are you familiar with the factors which determine the risk of developing HAIs?/students/

With the medical orderlies' answers, it is striking that the response with the highest relative proportion was "to some extent" at 50%. 33.3% gave the answer "to a considerable extent" and only 16.7% said they were fully aware of the issue (Figure 20).

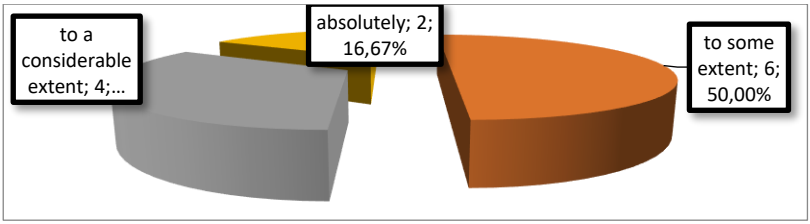

Fig. 20. Are you familiar with the factors which determine the risk of developing HAIs?/orderlies/

A large proportion of nurses stated that they do not receive enough information about problems related to HAIs (36.4%), and 18.2% indicated a response of "somewhat", showing that they are aware that they are providing health care based on basic knowledge without periodic updating and upgrading of information (Figure 21).

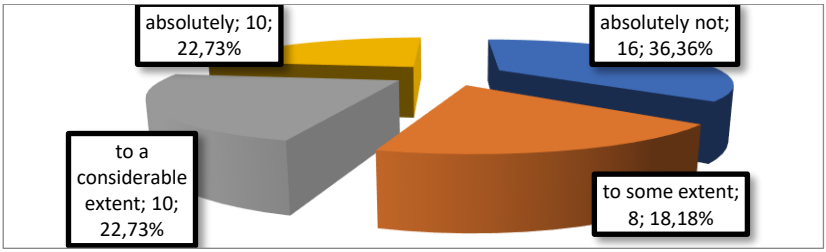

Fig. 21. Do you think that you are getting enough information about HAI? /nurses/.

The responses of the surveyed students are of interest. There was minimal difference in the relative proportion of those who thought they received enough information about IBD (30%) and those who thought they were not sufficiently informed (36.6%) (Figure 22).

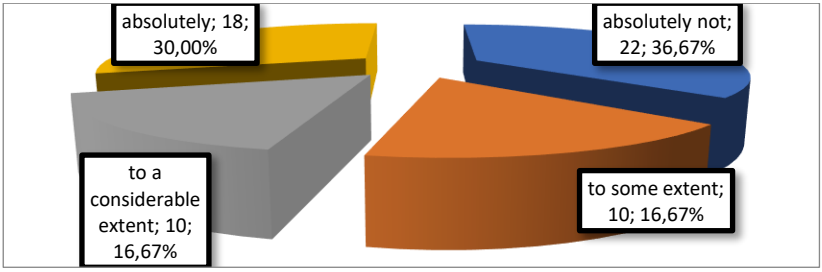

Fig.22. Do you think that you are getting enough information about HAI?/students/

The data contained in Figure 23 is quite indicative. 50% of the interviewed sanitarians felt that they did not receive enough information on the problem and 33.3% of respondents indicated that the information they received was not comprehensive. None of them feel fully informed about HAI.

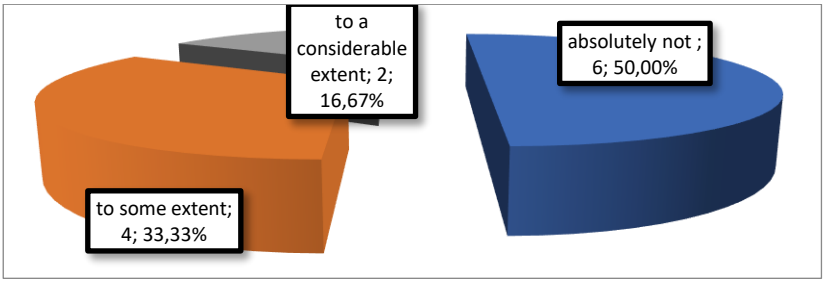

Fig. 23. Do you think that you are getting enough information about HAI?/orderlies/

The aim of the second group of questions of the survey was to check the level of awareness of nurses, students and orderlies regarding the mandatory precautions for the prevention and control of nosocomial infections.

When asked if they knew the mandatory minimum requirements for the prevention of HAIs, 40% of nurses gave a strongly positive response, the same percentage claimed to have a considerable amount of knowledge, and 18.2% stated that they had some knowledge of the subject. These results are not entirely convincing given the mandatory form of the standard precautions (Figure 24).

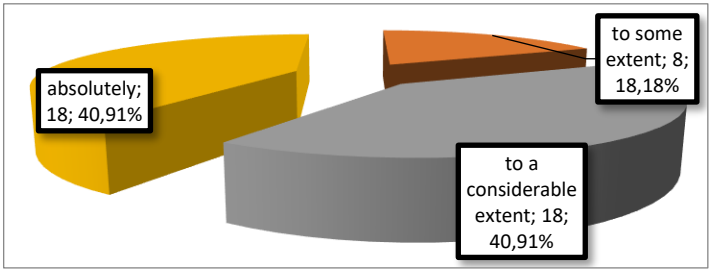

Fig. 24. Are you familiar with the mandatory minimum requirements for the prevention of HAIs /standard precautions/? /nurses/

The data in Figure 25 shows that 46.7% of the students felt that they were fully aware of the standard precautions for prevention of NIs.

There are 10% fewer who claim to be considerably informed for the issue. There was also a small proportion of respondents, 6.6%, who indicated a lack of knowledge of the mandatory minimum requirements for NI prevention (Figure 25).

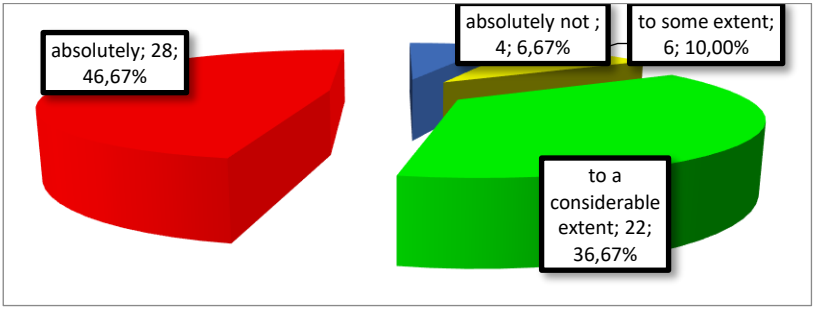

Fig. 25. Are you familiar with the mandatory minimum requirements for the prevention of HAIs /standard precautions/?/students/

The third group's awareness of standard precautions is illustrated in Figure 26. Half of the sanitarians
stated that they had full knowledge of standard precautions for the prevention of HAIs, 16.7% assume
that they had considerable knowledge of these precautions. 33.3% give the answer "to some extent". As with nurses, there are none who demonstrate a lack of knowledge about these measures.

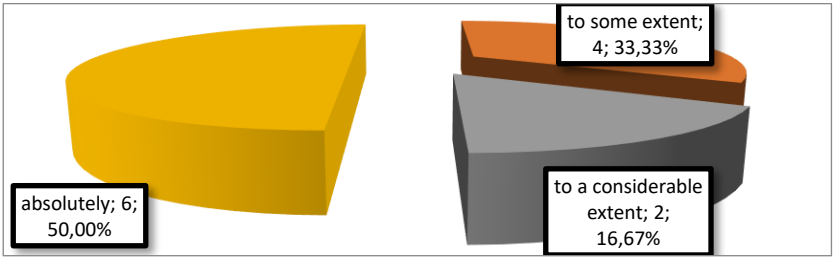

Fig. 26. Are you familiar with the mandatory minimum requirements for the prevention of HAIs /standard precautions/?/orderlies/

Less than half (45.5%) of health care professionals say they know what the standard precautions include and under what expected contact they are applied . 31.8% consider that they are familiar to a considerable extent with the implementation of these measures. 22.7% indicated that they were somewhat informed about the issue (Figure 27).

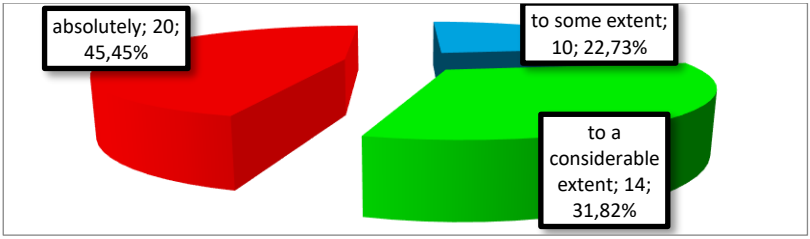

Fig.27. Are you familiar with what the standart precautions involve and under what expected contact they are applied? /nurses/

When asked the same question, 60% of the second group of respondents stated that they had full knowledge of what the standard precautions involve and when they are applied in practice. The data shows that 26.7% of students claim to be significantly familiar with this issue. The relative proportion of those who felt they had no knowledge (6.6%) and those who said they were somewhat informed (6.7%) of the issue was almost equal (Figure 28).

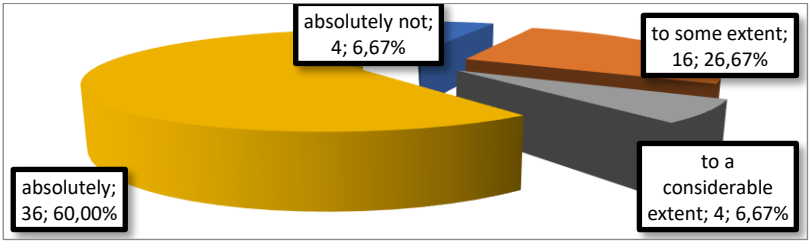

Fig.28. Are you familiar with what the standart precautions involve and under what expected contact they are applied? /students/

In the group of the interviewed orderlies, 50% of the respondents demonstrated awareness of the application of standard

precautions to a significant degree. Absolutely equal is the relative share of respondents who indicated the other possible answers to the question - 16.7% each (Figure 29).

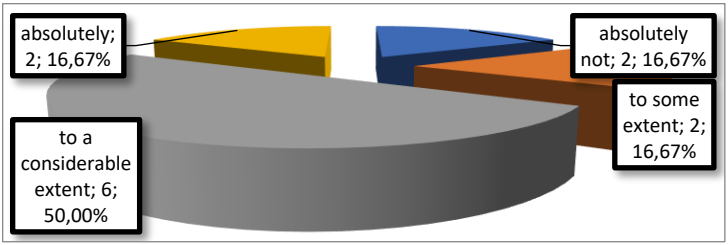

Fig.29. Are you familiar with what the standart precautions involve and under what expected contact they are applied? /orderlies/

The data contained in Figure 33 shows that 68.2% of the nurses surveyed considered hand hygiene as a standard precaution in the fight against HAIs. According to another 22.7% of this group of respondents, hand hygiene protects only to some extent (Figure 30).

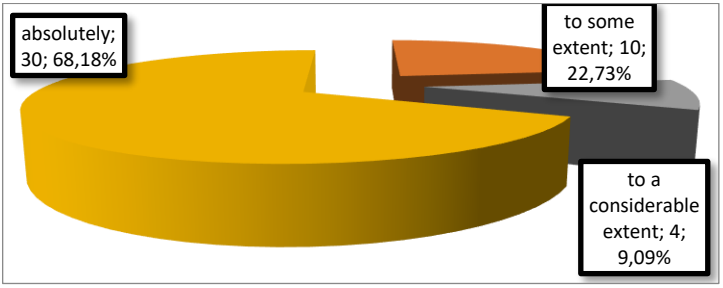

Fig. 30. Is hand hygiene a standard precaution in your opinion? /nurses/

80% of the students stated that they strongly agree that hand hygiene is a standard precaution. A very small proportion of respondents gave the answer "to some extent" (13.3%) or "to a considerable extent" (3.3%). 3.3% did not consider this measure to be standard in HAI prevention (Figure 31).

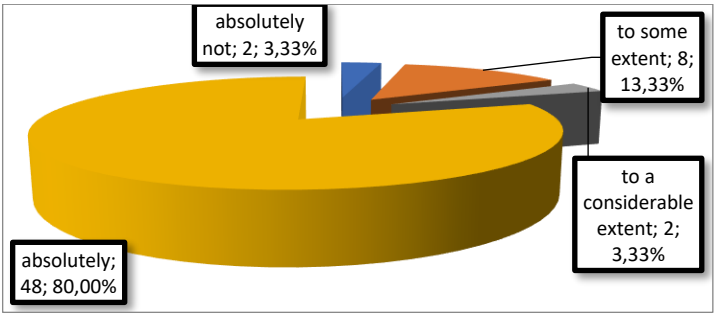

Fig. 31. Is hand hygiene a standard precaution in your opinion?/students/

Half of the surveyed sanitarians felt that hand hygiene was the standard in preventing HAIs. 16.7% of the respondents gave the answer "to a great extent" and 33.3% of them were of the opinion that hand hygiene protects to some extent (Figure 32).

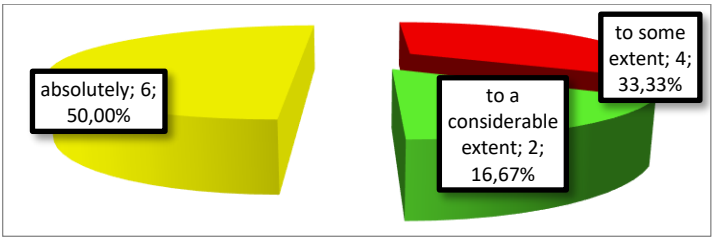

Fig. 32. Is hand hygiene a standard precaution in your opinion?/orderlies/

The majority of health care professionals surveyed (81.8%) believed that hand disinfection is a standard precaution in the prevention of HAIs. Very few of them show some hesitation on the issue (Figure 33).

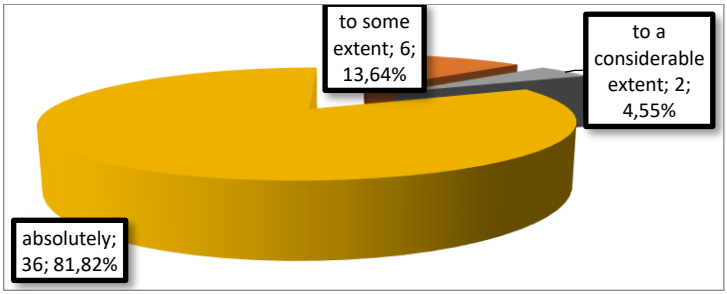

Fig. 33. Is hand disinfection a standard precaution in your opinion? /nurses/

71.9% of the students gave a positive answer to this question. It is noteworthy that in this group of respondents there are those who are more evasive in their answers. An equal relative proportion (10.5% each) thought that hand disinfection was a standard precaution from some to a significant degree. According to 7% of the respondents, this precaution does not belong to the standard activities to protect against HAIs (Figure 34).

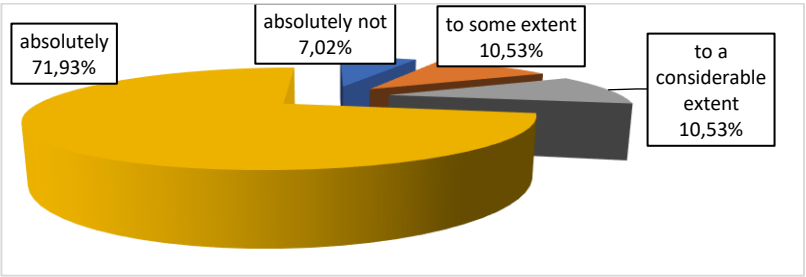

Fig. 34. Is hand disinfection a standard precaution in your opinion? /students/

In the case of orderlies, as well as nurses, the majority of respondents (83.3%) were of the opinion that hand disinfection is a standard precautionary measure in terms of prevention of HAIs (Figure 35).

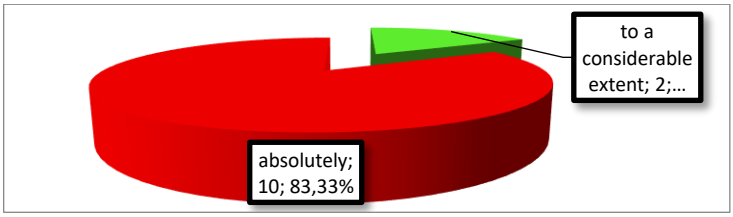

Fig. 35. Is hand disinfection a standard precaution in your opinion? /orderlies/

When asked whether they were familiar with the elements of hand hygiene, the highest proportion (72.7%) of respondents from the nurses' group answered "completely". 18.2% of the respondents were considerably knowledgeable and 9.1% were somewhat knowledgeable. In full accordance with the nature of the profession, there are none who are ignorant of the matter (Fig. 36).

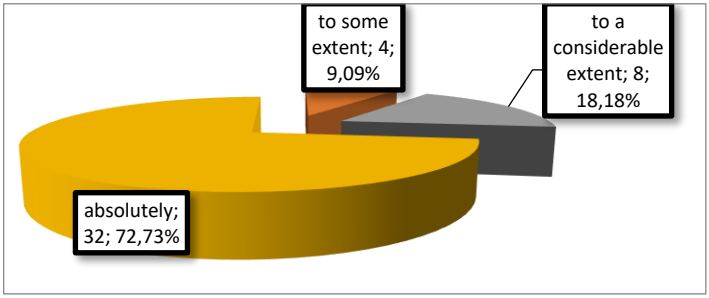

Fig. 36. Are you familiar with what elements hand hygiene includes? /nurses/

When asked the same question, 83.3% of the students stated that they were fully aware of the elements of hand hygiene. In this group of respondents it is noticeable that there is a certain proportion (3.3%) who have no knowledge of the issue (Figure 37).

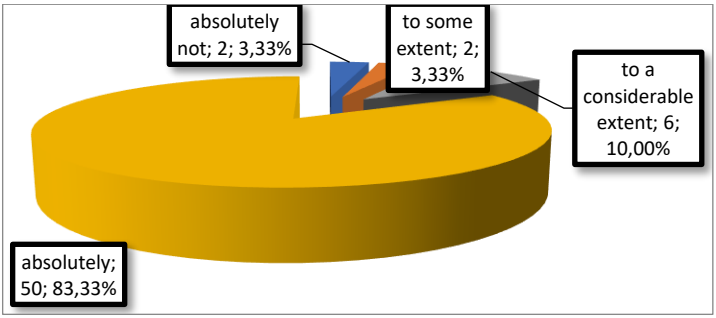

Fig. 37. Are you familiar with what elements hand hygiene includes? /students/

For sanitarians, the relative proportion of those who stated that they had complete knowledge of the elements of hand hygiene was also prevalent (66.7%). An equal proportion of them indicated that they were familiar to a considerable or some extent - 16.7% each. Similar to nurses, there are no nurses who lack knowledge of the matter (Figure 38).

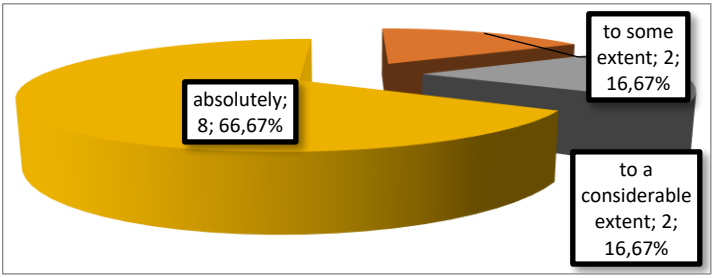

Fig. 38. Are you familiar with what elements hand hygiene includes? /orderlies/

The content of Figure 39 shows that 72.7% of health care professionals stated that they were fully aware of when hand hygiene disinfection was recommended. An equal proportion of respondents were somewhat to substantially familiar (13.6% each). There is a lack of those who have no knowledge of the issue (Figure 39).

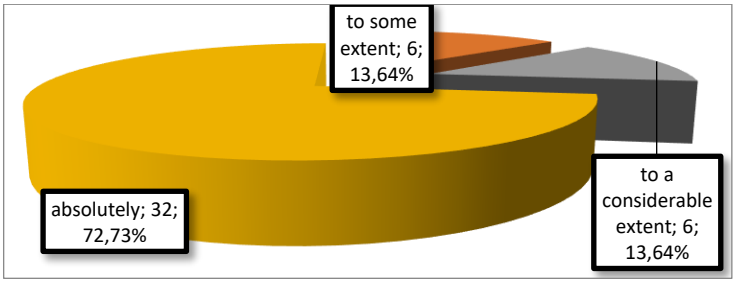

Fig. 39. Are you aware in which cases hygienic hand disinfection is recommended? /nurses/

The majority of students (83.3%) also claimed to have complete knowledge regarding the application of hand hygiene disinfection in practice. In this group of respondents, although in a small proportion (3.3%), a lack of knowledge of the issue is also evident (Figure 40).

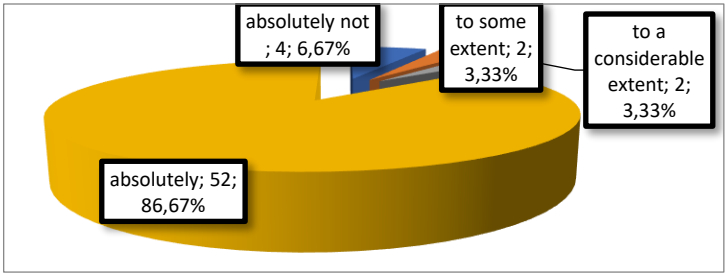

Fig. 40. Are you aware in which cases hygienic hand disinfection is recommended? /students/

In the third group of respondents, 66.7% of respondents demonstrated complete knowledge of the issue, and 33.3% claimed to be largely familiar with the cases in which hygienic hand disinfection is recommended (Figure 41).

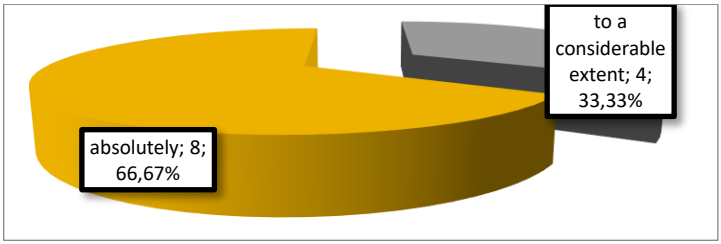

Fig. 41. Are you aware in which cases hygienic hand disinfection is recommended? /orderlies/

The aim of the third group of questions in this survey is to examine the extent to which the precautions imposed for the prevention and control of HAIs in the paediatric inpatient setting are implemented in practice.

When asked if they felt threatened by an NI in their workplace, 40.9% of nurses responded "somewhat". Not a small proportion of respondents (31.8%), were fully aware of some risk for themselves, 18.2% reported a significant risk for themselves, and 9.1% did not think there was a risk for them (Figure 42)**.**

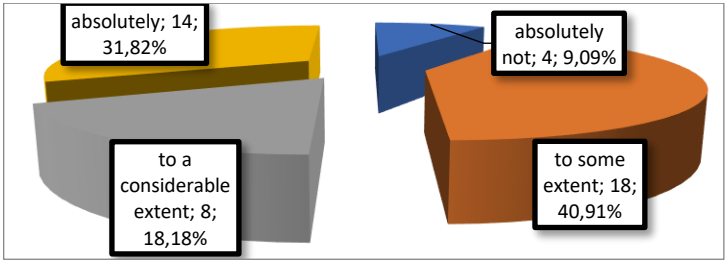

Fig. 42. Do you think there is a risk for you from an NI in a children's ward? /nurses/

Compared to the health care professionals, there was a slightly higher relative proportion (36.7%) of students who were completely convinced that there was a risk of HAI in the children's ward and a risk for them, 20% of the respondents felt that the risk for them was to a considerable extent, 33.3% felt at risk only to some extent and 10% said that there was no risk for them in the ward (Figure 43).

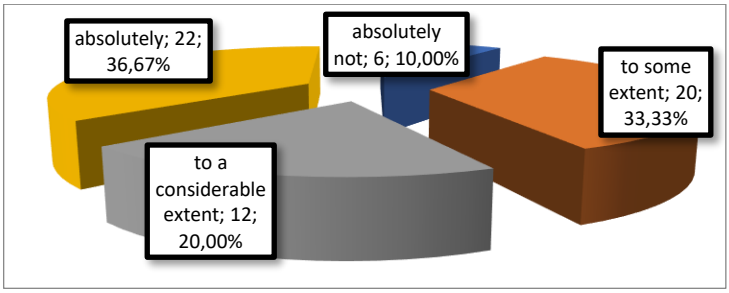

Fig. 43. Do you think there is a risk foryou from an NI in a children's ward? /students/

The content of Figure 44 shows that half of the orderlies felt that there was a risk to them from an HAI in the ward. The remainder of this group of respondents felt that they were at some (33.3%) to significant (16.7%) risk (Figure 44). It is noteworthy that none of the respondents indicated a lack of risk of HAIs for themselves, which in turn raises some doubt about the application of established rules and norms on the prevention of HAIs and, accordingly, risk minimization.

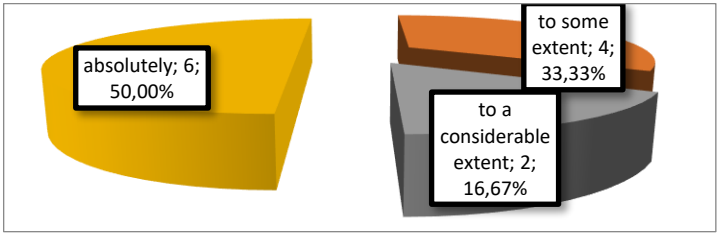

Fig. 44. Do you think there is a risk foryou from an NI in a children's ward? /orderlies/

As of the existing risk for patients in the children's ward, nurses had the highest relative proportion (45.5%) of those who thought that there was some risk of HAI for hospitalized children. There was little difference between those who stated that patients were at significant risk (27.3%) and those who were completely convinced (22.7%) that there was a risk to them, and 4.5% of respondents believed that there was no risk to paediatric patients (Figure 45).

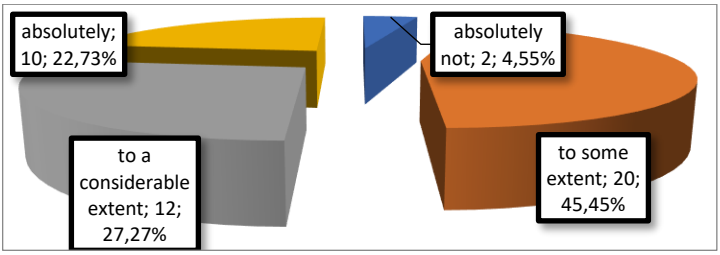

Fig. 45. Do you think there is a risk of a HAI for patients in a pediatric ward? /nurses/

Half of the students conducting clinical practice in the ДО stated that pediatric patients are completely at risk for inpatient HAIs. 30% of respondents believe that there is some risk to children and only 10% believe there is no risk (Figure 46)

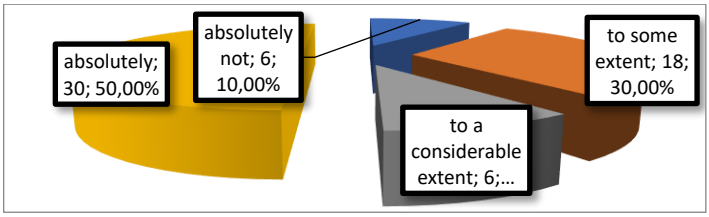

Fig. 46. Do you think there is a risk of a HAI for patients in a pediatric ward? /students/

Half of the interviewed orderlies felt that patients in a paediatric ward were at some risk of an HAI. 33.3% of respondents were completely certain that such a risk existed for hospitalized children, and 16.7% reported that it was possible to a significant extent. It is noteworthy that absolutely all respondents do not completely exclude such possibility (Fig.47).

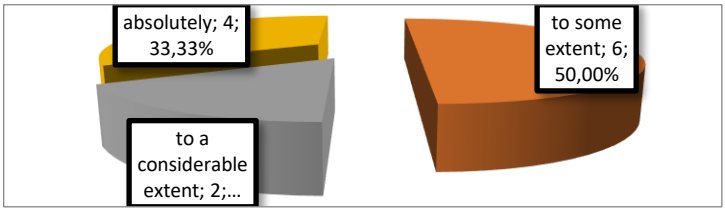

Fig. 47. Do you think there is a risk of a HAI for patients in a pediatric ward? /orderlies/

When asked if they always use personal protective equipment when working with a patient, over half of the nurses surveyed (59.1%) gave a strongly positive response. However, there are also those who to to some extent omit the use of such means. 18.2% of health care professionals indicated a response of "to a great extent" and 22.7% use personal protective equipment to some extent (Figure 48).

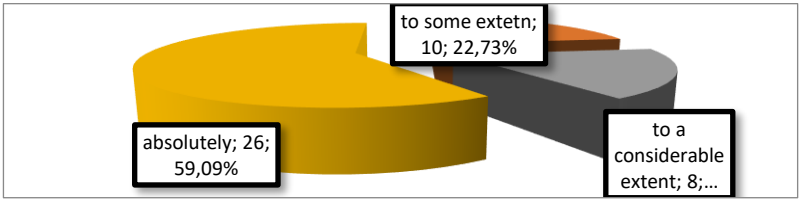

Fig. 48. Do you always use personal protective equipment when working with a patient? /nurses/

As many as 76.6% of the students interviewed stated that they use personal protective equipment when in contact with patients. With this group, it is striking that although small (10%), there is a certain proportion who do not use such tools, which indicates a certain lack of awareness of the risk for patients and for the students themselves (Fig. 49).

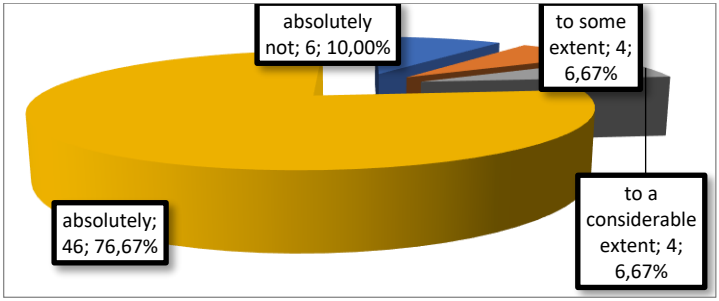

Fig. 49. Do you always use personal protective equipment when working with a patient? /students/

The relative share of respondents using personal protective equipment (66.7%) was predominant in the third group. 33.3% of the responding sanitarians indicated a response of "to a considerable extent" and there were no paramedics who did not use protection when working with a patient(Figure 50).

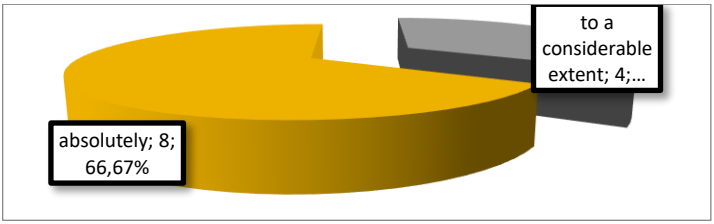

Fig. 50. Do you always use personal protective equipment when working with a patient? /orderlies/

The relative proportion of respondents stating that they feel fully responsible and those who to a large extent take responsibility for the issue are equal (31.8% each). 22.7% of respondents indicated that they take some responsibility for the activities mentioned. It is noteworthy here that 13.6% of health care professionals working in a paediatric ward felt that they had no responsibility regarding the prevention and control of hospital-acquired HAIs (Figure 51).

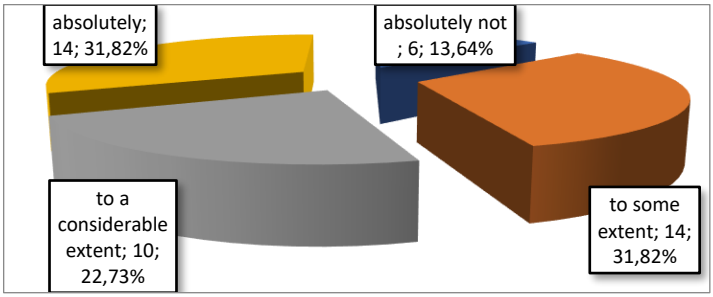

Fig. 51. Do you consider yourself responsible for the prevention and control of HAIs in a children's ward? /nurses/

The majority of the students surveyed (63.3%) stated that they felt responsible for the prevention and control of NI in the pediatric ward. 13.3% of respondents felt that they were responsible to a

considerable extent and 16.7% to some extent. 6.7% is the relative proportion of those who do not take responsibility for the prevention and control of HAIs in pediatric hospital settings (Figure 52).

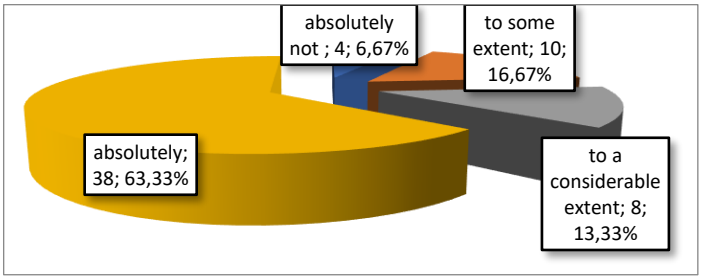

Fig. 52. Do you consider yourself responsible for the prevention and control of HAIs in a children's ward? /students/

The data from Figure 53 shows that the highest relative proportion of orderlies (66.7%) felt somewhat responsible regarding the prevention and control of HAIs in the ward. 16.7% of respondents take responsibility for the problem completely or to a significant extent. It is only in this group of respondents that there are no respondents who do not feel responsible for these activities.

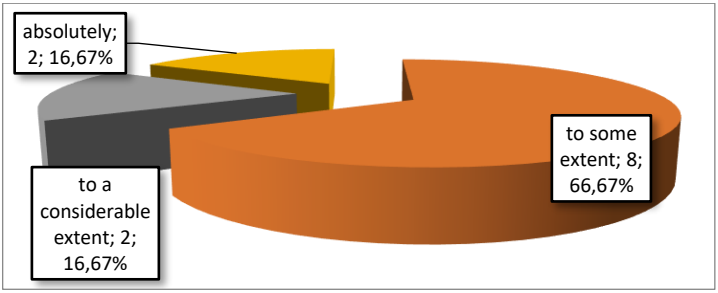

Fig. 53. Do you consider yourself responsible for the prevention and control of HAIs in a children's ward? /orderlies/

The results illustrated in Fig. 54 showed that 40.9% of the health care professionals surveyed were aware of who supervised their professional activities on the ward. 22.7% of nurses demonstrated a significant degree of knowledge, but it is striking that the same proportion of respondents were providing care in the inpatient setting

without being aware of who was supervising their work. 13.6% of interviewees said they were only somewhat familiar with who supervised them in their professional activities related to pediatric patients.

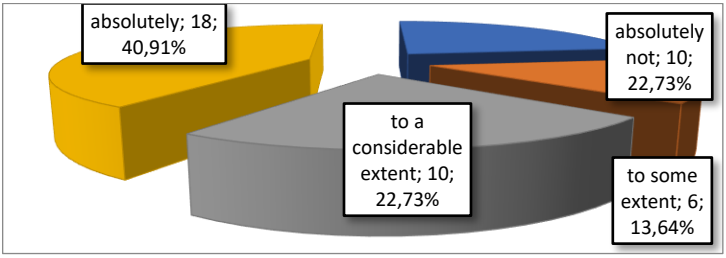

Fig. 54. Are you aware of who supervises your activities while working in the ward? /nurses/

There was insufficient persuasiveness in the students' responses. 36.7% of them stated that they know who controls their activities in the ward. However, an overwhelming relative proportion (41%) of respondents said they were not at all aware of who supervised them during clinical practice. 20% of respondents said they were somewhat familiar with this issue (Figure 55).

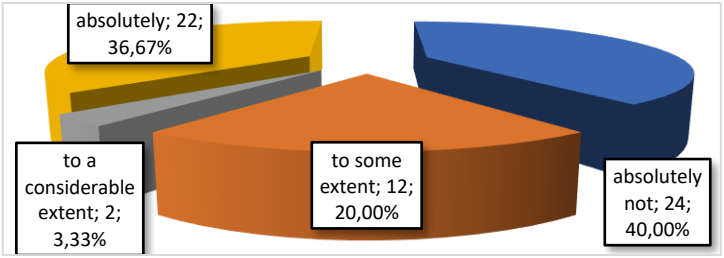

Fig. 55. Are you aware of who supervises your activities while working in the ward? /students/

Half of the interviewed orderlies were fully aware of who supervises their activities on the ward where they work, and 16.7% were aware to a considerable amount. 33.3% of respondents stated that their knowledge in this regard was only to some extent . It is

noteworthy that there are none who are unfamiliar with the controlling authorities (Figure 56).

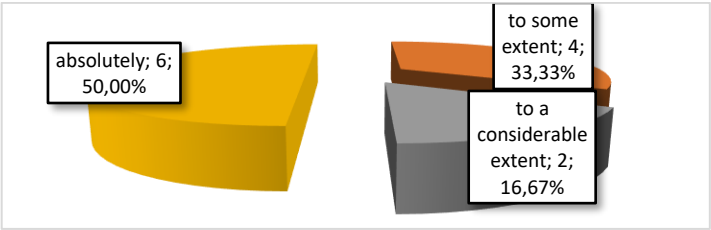

Fig. 56. Are you aware of who supervises your activities while working in the ward? /orderlies/

Half of the respondents from the nurses' group stated that they never violated the rules of asepsis and antisepsis when performing manipulations. 22.7% of respondents said that this had happened to some extent. With 9.1% it is to a significant extent and 18.2% strongly admit to having broken these rules (Figure 57).

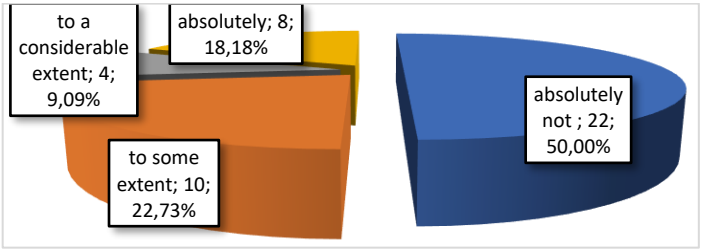

Fig. 57. Have you had a case where you violated the rules of asepsis and antisepsis when performing manipulations? /nurses/

For the same question, 70% of the students responded that they had never violated the rules, 3.3% indicated a response of "to some extent", 6.7% had violated the rules of asepsis and antisepsis to a significant extent, and 20% of the respondents clearly reported that they had violated these norms (Figure 58).

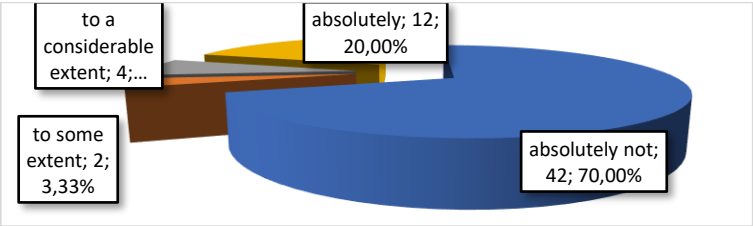

Fig. 58. Have you had a case where you violated the rules of asepsis and antisepsis when performing manipulations? /students/

16.7% of the orderlies, who participated in the survey, stated that they violated the rules of asepsis and antisepsis, in 33.3% of the respondents this occurred to a considerable extent, and 50% of the respondents indicated the answer "to some extent" (Fig. 59).

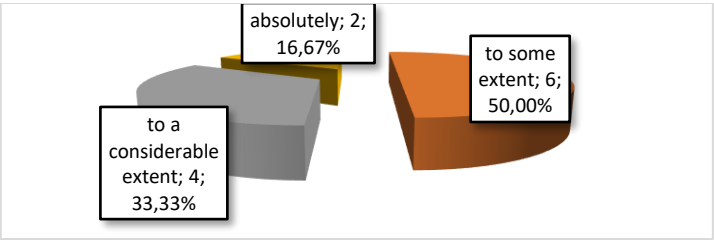

Fig. 59. Have you had a case where you violated the rules of asepsis and antisepsis when performing manipulations? /orderlies/

The purpose of the last two questions of the survey was to examine the need for additional information on the problem of nosocomial infections in the paediatric ward.

When asked if they needed further information on the prevention and control of HAIs on the ward, health care professionals stated to varying degrees that they did. 36.4% are completely convinced that they need such information, 27.3% give the answer "to a great extent" and 18.2% give the answer "to some extent". A small proportion of nurses (18.2%) felt that they did not need further information on the issue (Figure 60).

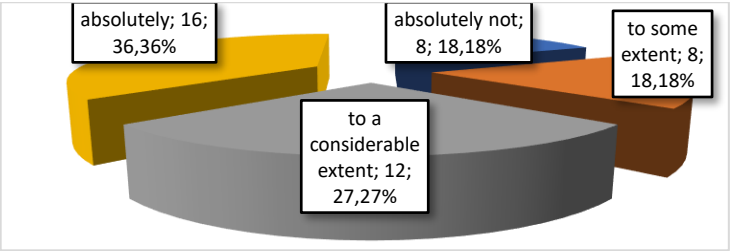

Fig. 60. Do you need further information on the prevention and control of HAIs in a children's ward? /nurses/

The data obtained from the group of the surveyed students was quite different. 46.7% of them stated that they did not need any further information regarding prevention and control of HAIs in the pediatric ward. An equal proportion of respondents (23.3% each) felt that they needed such information for considerable to some extent and only 6.7% wanted to be further informed on the issue (Figure 61).

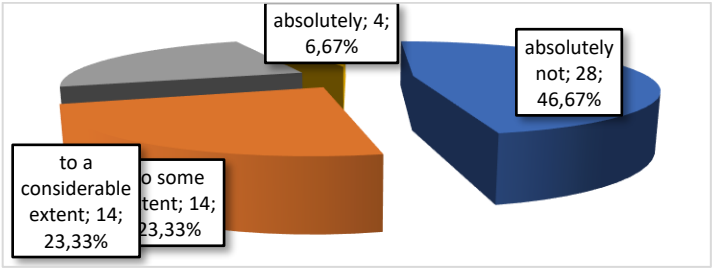

Fig. 61. Do you need further information on the prevention and control of HAIs in a children's ward? /students/

Half of the respondents in the third group stated that they needed further information on issues related to the prevention and control of HAIs in their workplace. An equal proportion of respondents (16.7% each) indicated the other three answers to the question (Figure 62).

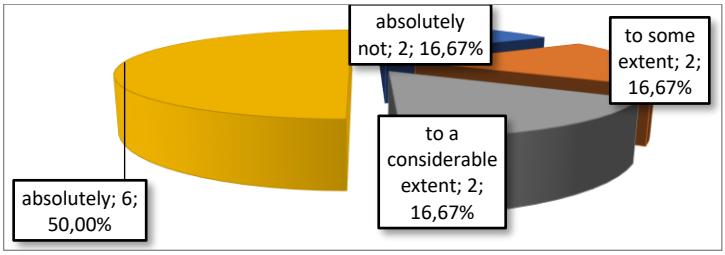

Fig. 62. Do you need further information on the prevention and control of HAIs in a children's ward? /orderlies/

Regarding the need to provide information about the risks of developing NI to the attendants in the ward, 95.5% of the inteviewed nurses believed that attendants should be made aware of the problem, and 4.5% of the respondents stated this need is to a great extent (Figure 63).

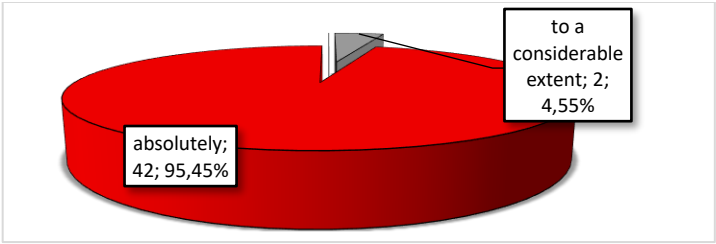

Fig. 63. Do you think it is necessary for ward attendants to be informed about the risks of developing HAI? /nurses/

The majority of students surveyed (66.7%) also stated that such information was necessary for ward attendants, 10% was the relative proportion of those who felt that such information should be provided to ward attendants to a considerable extent, 16.7% stated that this was only necessary to some extent, and 6.6% of students reported no need for ward attendants to be informed of these risks (Figure 64).

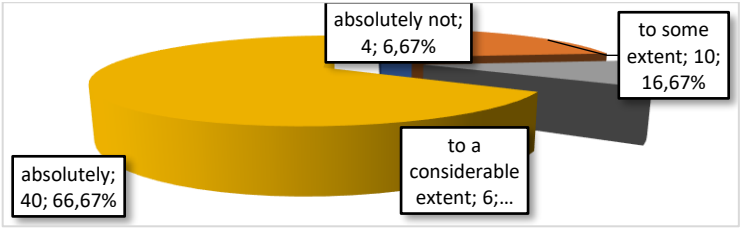

Fig. 64. Do you think it is necessary for ward attendants to be informed about the risks of developing HAI? /students/

The respondents from the sanitation group demonstrated an absolute majority. 100% felt that ward attendants should receive information about the possible risks of developing an NI (Figure 65).

Fig. 65. Do you think it is necessary for ward attendants to be informed about the risks of developing HAI? /orderlies/

For the needs of the research, a programmed interview,targeting health care professionals and nursing students, was prepared.

The first interview question is related to the respondents' knowledge about NI. The largest number (18) of the interviewed nurses indicated that these infections were associated with the hospitalization of patients, which in practice is a rather general concept and indicates insufficient depth of knowledge. 14 of them thought that these were infections acquired from patients in connection with medical care, 10 of the nurses thought that these were infections acquired from medical and non-medical staff, as well as from trainees in the facility, in connection with patient care. These

answers are definitely more detailed and describe the essence of NI. Only 8 of the respondents indicated that NI was related to the care of patients by attendants (Figure 66).

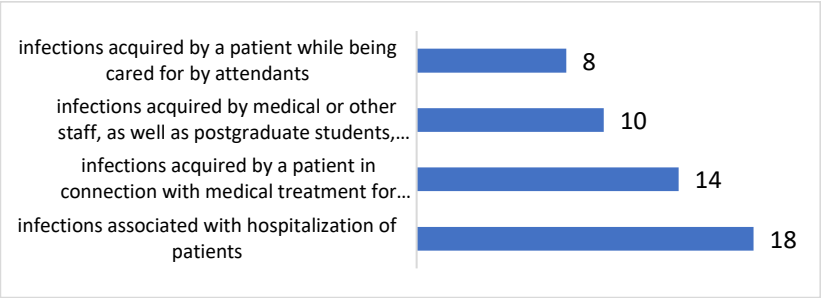

Fig. 66. What do you know about nosocomial infections? /nurses/

In general, respondents from the student group demonstrated a good level of knowledge about NI and this is evident from the data presented in Figure 67. Responses detailing the nature of the problem dominated, with 40 of the responses stating that NIs were infections acquired by medical or other staff, as well as by trainees in patient care settings, and 36 of the responses stating that these were infections acquired by a patient in connection with medical care for another illness. It is noteworthy that a certain number of interviewees explained the HAIs with the presence of attendants (24), and a small number of them (4) believed that these infections were only related to the hospitalization of the patients.

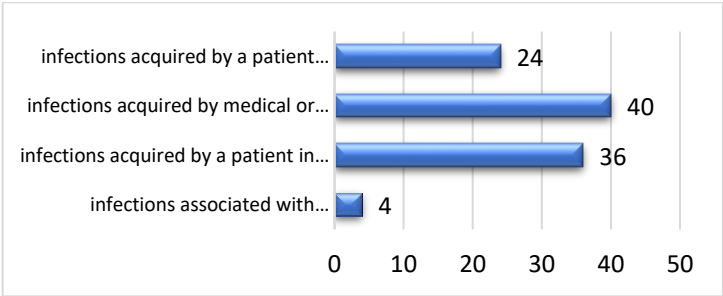

Fig. 67. What do you know about nosocomial infections? /students/

Nurses' responses were the most numerous as factors of transmission of HAIs, citing contaminated hands of attendants (30) first, followed by contaminated surfaces (28) and toys (24). Less importance is given to contaminated hands of staff (14) and possible contaminated instrumentation (12). The fewest respondents admitted infection due to contaminated medicine vials (4) (Figure 68).

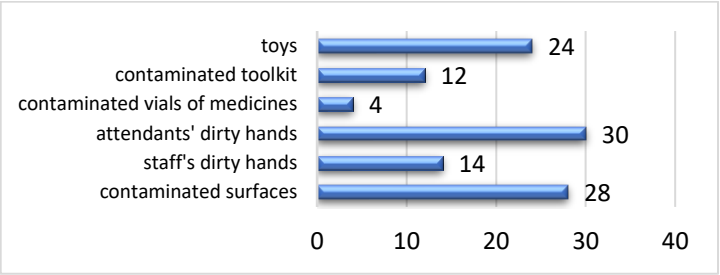

Fig. 68. What do you think are the sources /factors/ of nosocomial infections in the paediatric inpatient unit? /nurses/

Majority of the students surveyed (46) were also of the opinion that soiled hands of attendants were a factor in the development of HAIs in the hospital. They are followed by those who believe that contaminated surfaces (40) as well as contaminated staff hands (38) are the cause of infection. Some of them attributed importance to contaminated instrumentation (36), toys handled by hospitalized children (34), and contaminated medicine vials (32) (Fig. 69).

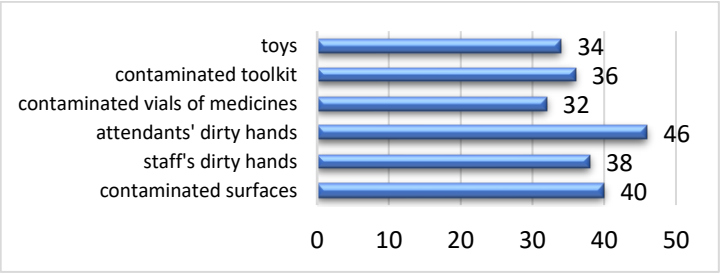

Fig. 69. What do you think are the sources /factors/ of nosocomial infections in the paediatric inpatient unit? /students/

In general, regarding the main routes of transmission of HAI in the paediatric ward, health care professionals did not ignore any of the possible answers given, indicating knowledge of the topic.

The most frequent responses were related to non-compliance with the hygiene and epidemiological regime in the ward by the attendants (38), as well as the exchange of toys between hospitalized children (28). 24 of the surveyed nurses were of the opinion that transmission of infection was possible in the ward when using contaminated instruments and patient care items. An equal number of respondents admitted the possibility of transmission of infection due to non-observance of aseptic and antiseptic rules when performing manipulations (16), as well as through contaminated kitchen utensils (16). A number of interviewees mentioned direct contact with companions (14) and personal items of patients (14) as a possible route of transmission, and only two of the medical nurses assumed that this was possible when a peripheral venous source was inserted (Fig. 70).

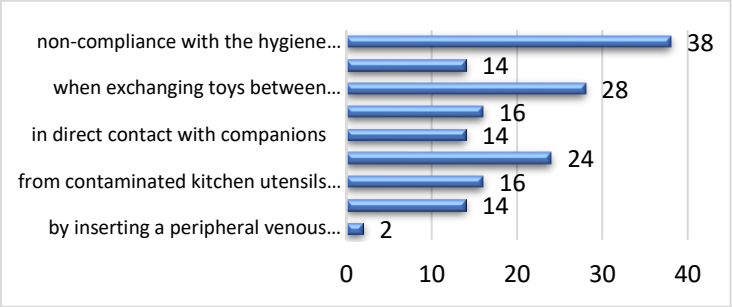

Fig. 70. In your opinion, what are the main routes of transmission of HAIs in paediatric wards? /nurses/

When asked the same question, the highest number of students thought it was direct contact, through contaminated hands (42). Quite a few of the interviewees mentioned the possible transmission of infection through the use of contaminated instruments (38), personal

objects of the patient (38), and exchange of toys between children (38). Some of the students attributed importance to non-compliance with aseptic and antiseptic rules when performing manipulations (30) and direct contact with the patients' attendants (30). The least respondents were of the opinion that transmission of infection was possible through contaminated kitchen utensils (26), insertion of PVC (26), and neglect of the hygiene and epidemiological regime in the ward by attendants (26) (Fig. 71).

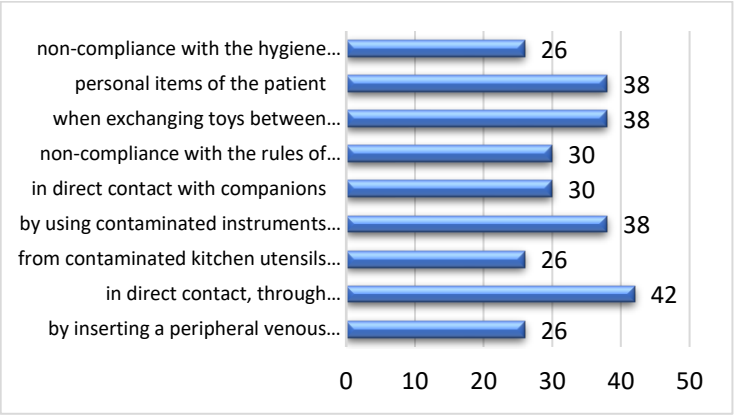

Fig. 71. In your opinion, what are the main routes of transmission of HAIs in paediatric wards? /students/

The content of Figure 72 shows that 24 of the interviewed health care professionals stated that they were fully aware of the annual disinfection and sterilization program in the pediatric ward. Another 20 of them were somewhat informed, and two nurses indicated that they were not familiar with the program (Figure 72).

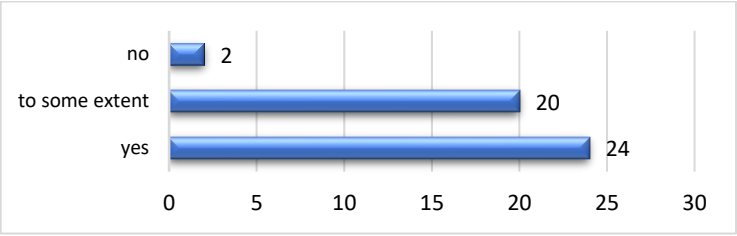

Fig. 72. Are you familiar with the annual disinfection and sterilization program in the pediatric ward? /nurses/

With the students there was an overwhelming majority of respondents (34) who had some knowledge of the annual disinfection and sterilization program in the pediatric ward. Six of them were fully knowledgeable, while 16 of the prospective nurses surveyed stated a lack of knowledge (Figure 73).

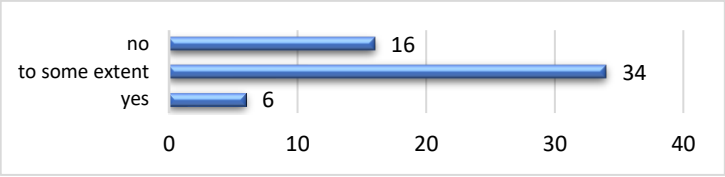

Fig. 73. Are you familiar with the annual disinfection and sterilization program in the pediatric ward? /students/

When asked where they obtain information on the prevention and control of HAIs from, an equal number of nurses interviewed cited on-boarding instruction (16) and Internet sources (16). Colleges were a source of information for 14 of them, and periodic training was a way of awareness for 12 of the respondents. Only 8 of the nurses obtained information about the problem from specialised literature (Figure 74).

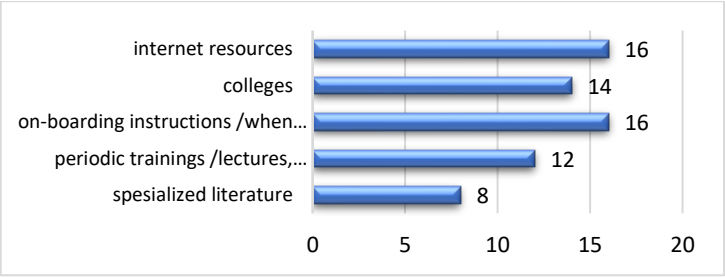

Fig. 74. Where do you get your information on prevention and control of HAIs? /nurses/

The majority of students (40), not surprisingly, stated that they receive information regarding prevention and control of HAIs during

lectures. A large number of them (32) referred to instruction during clinical practice as a source of information, a number of respondents (10) were informed by literature specialised on the topic and 6 of them used internet sources. It is noteworthy that several of the students interviewed (14) indicated a response of "colleges" (Figure 75).

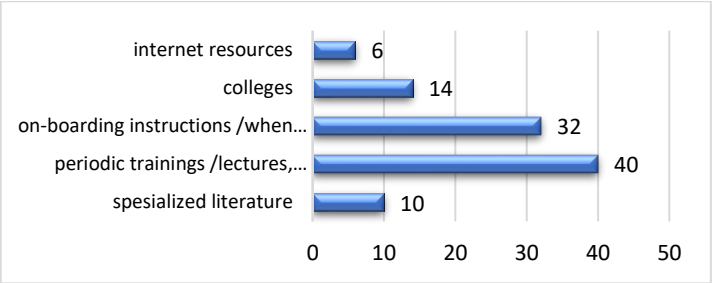

Fig. 75. Where do you get your information on prevention and control of HAIs? /students/

Fewer than half of the interviewed nurses (20) stated that they always inform ward attendants of the risks of an HAI. Some of them claim to provide such information almost always (10), 14 nurses warn attendants about a possible risk of NI only when they have time, and 2 of them say that they do not inform attendants about this problem (Figure 76).

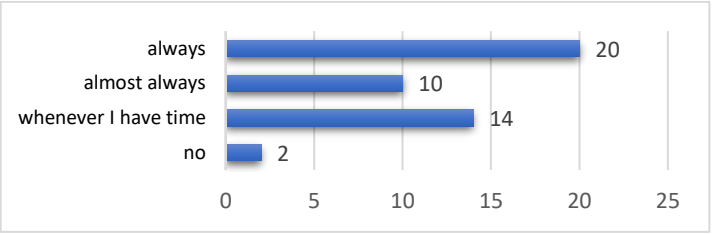

Fig. 76. During work /clinical practice/ do you inform attendants about the risks of HAIs? /nurses/

The majority of respondents from the student group (36) stated that they inform the attendants of hospitalized children about the risks of NI when they have time, 10 of them share this risk with them almost always, some respondents stated that they never provide

such information (6) and the smallest number of students stated that they always inform the attendants in the ward about the possible risk of NI (4) (Figure 77).

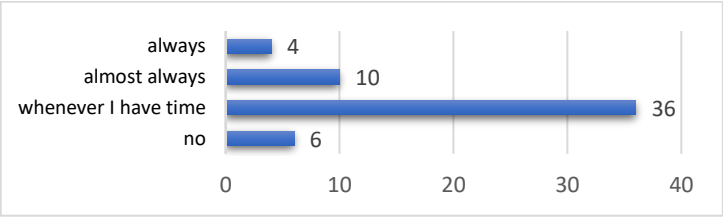

Fig. 77. During work /clinical practice/ do you inform attendants about the risks of HAIs? /students/

Analyzing the data from Fig. 78 it is clear that the majority of health care professionals surveyed were only somewhat (16) willing to take responsibility regarding the performance of non-medical staff on the ward. Commitment to this activity was significant in 14 of the nurses interviewed. There is an equal number of respondents who always feel responsible for the quality of work of non-medical staff and those who do not take responsibility regarding these activities (8 each)**.**

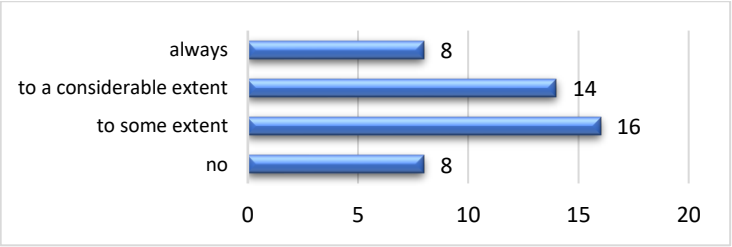

Fig. 78. Do you feel accountable for the performance of non-medical staff in the ward where you work / do clinical practice? /nurses/

On the other hand, with students, those who did not feel responsible about the actions of non-medical staff on the ward during clinical practice (36) were dominant. An equal number indicated that

they take some (6) or a great deal of responsibility (6) and only 8 respondents feel fully responsible for the problem (Figure 79).

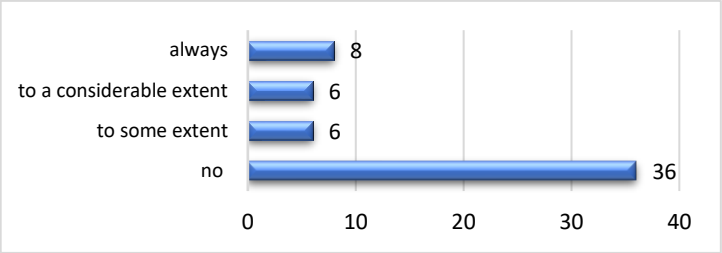

Fig. 79. Do you feel accountable for the performance of non-medical staff in the ward where you work / do clinical practice? /students/

It is evident from the data in Figure 80 that less than half (18) of the nurses surveyed significantly supervise the work of non-medical staff on the ward. 14 of them are committed to this responsibility. A small number of respondents (8) said they always supervise the activities of non-medical staff at work, and even fewer said they do not find it necessary to review these activities (6).

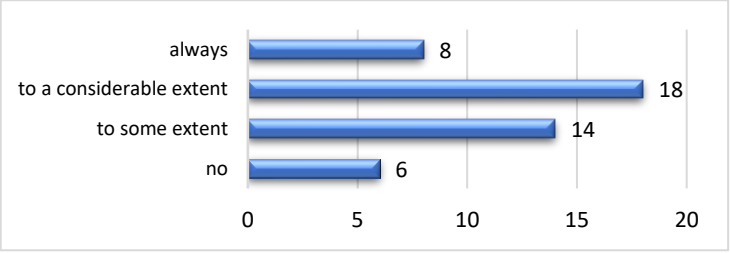

Fig. 80. Do you control the activities of non-medical staff in the department where you work /carry out clinical practice/? /nurses/

The data in Figure 81 shows that the majority of students surveyed claimed to supervise the work of non-medical staff on the ward to some extent during clinical practice (28). Others undertake

This action to a considerable extent (10). 14 of the respondents do not supervise these activities, and a minority stated that they always supervise the work of non-medical staff (4).

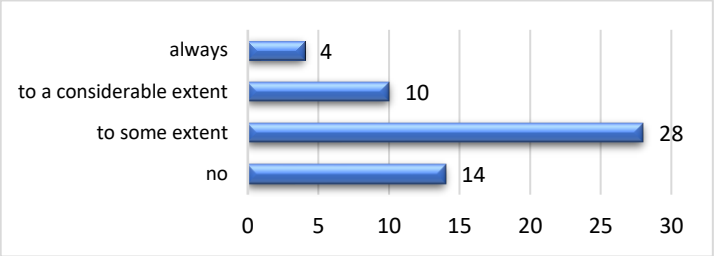

Fig. 81. Do you control the activities of non-medical staff in the department where you work /carry out clinical practice/? /students/

When asked whether additional events and measures are needed to reduce the risks of developing a HAI in a paediatric ward, the majority of health care professionals surveyed gave an affirmative answer (24). 12 are of the opinion that this is needed to a considerable extent (12) and 6 express such need to some extent. According to 4 of the nurses, no further measures are needed in this regard (Figure 82).

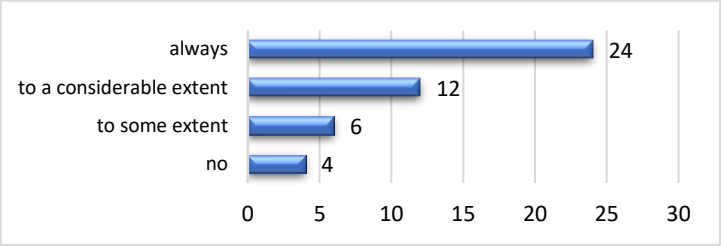

Fig. 82. Do you think that additional events and measures are needed regarding the reduction of the risks for the development of HAIs in the children's ward? /nurses/

In contrast to nurses, 8 of the students gave an affirmative answer to the same question. The majority of respondents in this group (24) said that no additional activities were needed to reduce the

development of HAI in the paediatric ward. A large majority of them are of the opinion that there is only some need for such measures (18), while 6 of the respondents think that additional measures are needed to a significant extent (Figure 83).

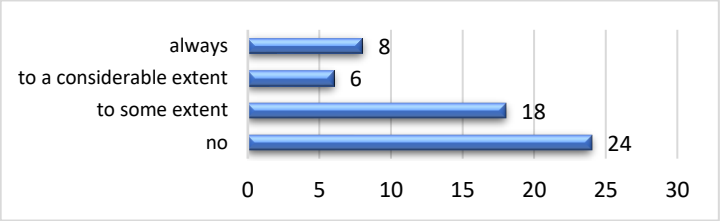

Fig. 83. Do you think that additional events and measures are needed regarding the reduction of the risks for the development of HAIs in the children's ward? /students/

Discussion

The first questionnaire survey was aimed at obtaining a clear view on the limits of nurses', students' and orderlies' knowledge of the general rules concerning the responsibility and implementation of NI prevention and control activities, the statutory medical standard, and the factors determining the risk of such infections.

The answers to the questions concerning the respondents' knowledge of the medical standard on prevention and control of STIs (question #3) and the factors determining the risk of STIs (question #7), are of interest. There, it is noticeable that the students demonstrate much higher awareness compared to the health care professionals. Concerning the awareness of medical standard on prevention and control of HAI, the relative share of awareness in favour of students - 63.3%, compared to nurses - 40.9% is remarkable. For question #7, 68.9% of the students indicated full awareness of the factors determining the risk of developing HAI, respectively the relative proportion of nurses was 45.5%.

These differences are not surprising as students receive adequate information during their theoretical training, which is relevant and accompanies clinical practice in hospital care settings,

and nurses actually have a basic knowledge of the issues, which in practice is probably not updated and is displaced by the routine in their profession.

The Medical Standard on the Prevention and Control of HAIs states that prevention activities are the responsibility of all medical professionals, non-medical staff, students and others. Surprisingly inconclusive answers were given by all respondents, precisely regarding the implementation of these activities (question 4). This shows a real lack of awareness on the part of the respondents, which could be an obstacle in the allocation of duties and the establishment of control in the wards where they carry out their professional activities and training. In this case, there is some contradiction with the respondents' answers to question 2, which is related to knowledge about the responsibility of prevention and control of HAIs, and to which all respondents showed a higher degree of awareness compared to question 4. The difference in nurses' responses is particularly noticeable - 68.2% of them believe that they are fully informed about whose responsibility it is to prevent and control HAIs, while less than half of them (45.5%) claim to be fully aware of who carries out the activities to prevent these infections. The impression given is that there is insufficient systematization in the information available to respondents, which in turn is a prerequisite for certain gaps in practice, regarding the prevention and control of HAIs and related activities.

Taking into consideration the responses related to the respondents' level of familiarity with NI, it is not surprising that when asked whether they felt that the information they received about HAIs was sufficient, 36.4% of health care professionals, 36.6% of students and as many as 50% of paramedics realized that they were not sufficiently informed about the problem.

When asked whether they were aware of the mandatory precautions for groups at risk of HAIs, 54.5% of nurses, 60% of

students and 50% of orderlies stated that they had complete information on the subject.

Taking into account the compulsory form of these measures, the results obtained are not particularly satisfactory and indicate some kind of knowledge that is probably not consolidated over time.

Lack of awareness is evident in the respondents' answers to questions related to their knowledge on standard precautions and when they are applied in practice (questions 10 and 11).

These measures are set out in legislation as mandatory requirements, which include the use of equipment to protect patients, staff and others, and safe methods of work. 40.9% of the nurses, 46.7% of the students and 50% of the orderlies claimed to be aware of the mandatory minimum requirements for prevention of HAIs (standard precautions). In all three groups, the relative proportion does not exceed 50%, indicating that some knowledge exists, but it is not conclusive and this gives ground for developing a certain risk at work. 6.6% of the students surveyed claimed to have no knowledge of the issue, which indicates likely gaps in theory and therefore also carries some risk in practice.

Talking about what standard precautions include and in what expected contact they are applied, 45.5% of health care professionals, 60% of students and 16.7% of paramedics state that they are completely familiar. It is noteworthy that the relative proportion of students get a majority, which in practice is explainable by the up-to-date information they receive in theory alongside clinical practice. The contradiction between the responses of the sanitarians is quite interesting. This contradiction stems from the high relative proportion of those who claim to be familiar with standard precautions (50%) and the much lower relative proportion of those who know what these precautions involve and when they are used (16.7%). The same proportion of them (16.7%) claim that they are not at all familiar with this issue. This shows that for this group of respondents, knowledge

and information probably exist, but they are not complete and systematized, making them partly poorly understood by this study group.

It has been scientifically proven that a major factor in the transmission of HAIs is the hands of staff. The research conducted in this regard is clear that hand hygiene and disinfection is an effective method to reduce and prevent the occurrence of HAIs, and this method is standardized in the legal provisions.

When asked if hand hygiene was a standard precaution 68.2% of the nurses, 80% of the students and 50% of the orderlies surveyed indicated "completely".

The results obtained to the question whether hand disinfection is a standard precaution are much more definite. 81.8% of health care professionals, 83.3% of sanitarians and 71.9% of students were of the opinion that hand disinfection belongs to standard precautions.

In general, all respondents showed good knowledge of hand hygiene and disinfection, yet considering that these measures are a proven and established standard in the prevention of HAIs, the results of the survey are not very satisfactory.

When asked what elements hand hygiene includes, all three groups of respondents demonstrated a very good level of awareness. 72.7% of the nurses, 83.3% of the students doing clinical practice in the pediatric ward and 66.7% of the orderlies working in these wards were fully aware. It is not surprising that there are no nurses and orderlies who do not know what hand hygiene involves, and this is understandable, given that they perform this action repeatedly at work.

The fact that only with students there is a certain proportion of them who lack knowledge on the issue (3.3%), is of interest. The probable reason for this is gaps in theoretical field as well as lack of experience.

Similar data was obtained from all respondents to the question concerning when hand hygiene disinfection is recommended. 72.7%

of the health care professionals, 86.7% of the students and 66.7% of the paramedics reported complete knowledge of the subject. Here again, a small proportion of the group of students with no knowledge of the issue stands out (6.6%).

Considering that research in this area points to hand hygiene as the most important measure in the prevention of HAIs, the presence of even a small proportion of respondents with no knowledge of the issue could be considered as a certain risk for the occurrence of HAIs in paediatric wards.

The prevention and control of HAIs are particularly important in the paediatric inpatient setting, given that this category of wards are legally designated as high risk for these infections.

For the questions related to the risk to staff and patients of developing HAI (Q16 and 17), the majority of all three groups of respondents reported to one degree or another that such a risk existed for both parties. It is noteworthy that both in the group of health care professionals and in the group of students there is a small percentage of those who do not consider risk for patients and themselves. The probable cause for nurses could be a certain inertia in the work, and neglecting the fact or insufficient information that the pediatric patient contingent is listed as at risk of HAI, and all medical and non-medical staff, as well as trainees represent groups at risk, regarding NI. On the other hand, it could be argued that those who claim that there is no risk are precisely those who are fully aware of the established norms for the prevention of NI and, by following them in practice, are aware that the risk of contracting such infections is minimised. In comparison, respondents in the third group to both questions were of the opinion that both staff and hospitalised patients were at some risk, which to some extent raises the question of whether this group of respondents were practically following the established rules and using personal protective equipment to avoid the existing risk of an HAI.

In terms of knowledge about the risk categories of hospitals and wards, there is insufficient awareness of the issue, which is a prerequisite for underestimating the risks for the patients themselves and the nurses caring for them.

When asked if they always use personal protective equipment when working with a patient, 59.1% of nurses, 76.7% of students and 66.7% of orderlies gave a positive answer. The slightly lower relative proportion of nurses using protection compared to students and orderlies could be interpreted with the emergency situations arising in medical practice and requiring immediate intervention by health care professionals. It is noteworthy that 10% of students claim not to use personal protective equipment, which suggests a lack not so much of knowledge as of acquired habits in practice.

One of the conditions for quality disinfection is the presence of disinfectant dispensers in the risk areas of the wards. 50% of the nurses, 63.3% of the students and only 33.3% of the orderlies, who were surveyed, were of the opinion that the ward was fully equipped in this regard. In the context of this question, the ones of interest are those according to which there is no possibility of disinfection in areas at risk. This answer was given by 13.6% of nurses, 6.7% of students and 33.3% of orderlies. It is noteworthy that the sanitarians who claim that disinfectant dispensers are available in the hazardous areas have the lowest relative share compared to the other two groups of respondents, and the same proportion of them expressing the opinion that there are no such devices in the hazardous areas represent a majority compared to the other respondents. This fact should be of some concern as the professional duties of the orderlies are directly related to the prevention of HAIs and it is their activities that are actually carried out in almost all areas of the wards, which in turn implies a good risk assessment and the equipment provided specifically related to the possibility of disinfection.

Regarding whether they consider themselves responsible about the prevention and control of HAIs in the children's ward, 31.8% of nurses, 63.3% of students and 16.7% of orderlies consider themselves responsible.

The relative proportion of health care professionals and orderlies who hold this belief is less than 50%, which is highly unsatisfactory. Another worrying fact is the presence of nurses (13.6%) and students (6.7%) who are not at all perceived as responsible regarding the occurrence of NI in the ward where they work.

This is probably dictated by insufficient information on the problem, as well as a possible unclear division of staff responsibilities, which in turn is a real prerequisite for gaps in the prevention and control of HAIs in the ward itself.

On the question refering to who supervises the activities carried out while working in the ward, 40.9% of the nurses, 36.7% of the students and 50% of the orderlies, who were surveyed, stated full awareness. This data is not entirely conclusive, and taking into account the relative proportion of those who claim not to know who supervises their work, namely 22.7% of nurses and 41% of students, again there is a need for information and a lack of precise and clear division of responsibilities within the ward itself.

When asked if there had been a case where they had broken these rules during manipulation, 50% of the nurses and 70% of the students surveyed stated that this had never happened. It is noteworthy here that no such response is indicated by the sanitarians. The probable reason for this on their part is their association of the manipulations solely with the specific medical activities performed on the patients themselves.

The complete violation of the rules of asepsis and antisepsis was evidenced by the responses of 18.2% of nurses, 20% of students and 16.7% of orderlies. Overall, the relative proportion of respondents

indicating this response is not large, but is nevertheless concerning and represents a potential risk to paediatric patients.

When asked if they needed additional information on prevention and control of HAIs specifically in the pediatric ward, 36.4% of nurses, 6.7% of students and 50% of orderlies expressed a complete need. As those working on these wards, health care professionals and orderlies reported to varying degrees that their knowledge of the issue needed to be updated. It is noteworthy that students willing to obtain additional information represent the smallest relative share of the three groups and, respectively, the largest share (46.7%) of those who do not need such additional knowledge. They probably consider that the theoretical training which is laid down in the training programme is fully comprehensive and well mastered by them.

Regarding whether they felt that attendants needed to be informed about NI issues, respondents from all groups demonstrated a complete majority. 95.5% of nurses and 100% of orderlies stated that such information was imperative, and 66.7% of students were of the same opinion on the matter.

In terms of professional experience, there is absolute conviction and awareness on the part of those working in the wards, that the attendants of children represent a peculiar risk factor for the development of a HAI. In turn, the fact that the nurses and orderlies unanimously agree on the need to provide these persons with information on the problem in order to prevent such consequences, is completely understandable.

The second survey was designed to clarify the responsibilities of health care professionals and nursing students regarding specific features related to the prevention and control of nosocomial infections, specifically for pediatric wards.

In the analyses of the literature sources, what stands out is the opinion that despite the progress and continuous development of

medicine, nosocomial infections accompany healthcare at all levels (Brannigan E. et al, 2009) (Gladilova A, 2020). The knowledge of all medical professionals, non-medical staff and trainees in healthcare settings is essential for the prevention and control of these infections (Kelsey MC, 2000) (Wong CA, Cummings GG, 2007).

In-depth knowledge of HAI was demonstrated by the student group respondents in their answers to the first interview question, and in comparison, the nurse interviewees were less circumstantial in their knowledge of the topic. The majority of students are aware that these are infections affecting both medical and non-medical staff and trainees in health care facilities (40) and, in addition, patients treated in health care facilities (36). On their behalf, 10 and 14 health care professionals gave the same answers, respectively. The highest number of nurses (18) believed that NIs were related to hospitalization of patients. Here again, the fact that students receive up-to-date information on the issue during their theoretical training is confirmed, and the need for nurses to update information on the issue is evident.

On the second interview question, all respondents showed knowledge of the factors leading to the development of HAIs in paediatric wards and generally did not ignore any of the options mentioned. It is striking that most of the nurses (30) and students (46) surveyed were of the opinion that dirty hands of attendants were the cause of NI in the ward.

Regarding the routes of transmission of HAI in paediatric wards, respondents from both groups gave importance to all the possibilities mentioned in the interview, which gives reason to believe that they are well aware of the problem. The largest number of nurses (38) again cited as a reason the attendants in the hospital and their failure to comply with hygiene and epidemiological standards, probably from a practical perspective. In comparison, the number of students who are of the same opinion is 26. Non-compliance with ward rules by attendants is a problem that could be due to a lack of

information about the importance of these norms, or to insufficient control by those responsible for maintaining order in the paediatric hospital structure.

Among students, the highest number (42) is of those who considered direct contact, through contaminated hands, as the main route of transmission. Undoubtedly, this is a fact that is referred to as leading in the scientific literature.

28 of the nurses surveyed cited the exchange of toys between children as a possibility of transmitting infection, making this the second most important option for them. A significant number of students (38) were also of the opinion that while playing with mutual toys, transmission of HAIs is possible. In practice, this is largely possible and specific to children's wards.

Enough studies in this regard have shown that toys are one of the routes of transmission of infection in the pediatric inpatient setting. In such establishments it is practical for playthings to be of materials that can be disinfected without causing damage. In order to minimise the possibility of transmission, decontamination activities should be monitored, attendants should be informed of the risk and ward staff should accept that they are responsible for this problem.

The next most cited route of transmission of HAIs by nurses is the use of contaminated instrumentation. This answer was given by 24 of them. Similar is the opinion of the students surveyed - 38 of them indicated this answer to the question. These results show good awareness on the part of the respondents, both in terms of practice and theoretical knowledge.

Only 2 of the nurses interviewed admitted transmission of infection through the insertion of a PVC. In comparison, 26 of the students surveyed were of the opinion that transmission of HAI was possible through this manipulation.

When asked about their knowledge of the annual disinfection and sterilization program on the ward, 24 of the nurses interviewed

responded positively, suggesting adherence to responsibilities pertaining to their professional duties, as well as supervision of the work of non-nursing staff and inpatient trainees. In comparison, only 6 of the students surveyed claimed to be familiar with this program. This suggests that the information provided to them during clinical practice in the ward in relation to this problem is too scarce.

20 nurses and 34 nursing students of the interview participants indicated that they had only some knowledge of the issue, which is indicative for disregard of the rules set out in this document

A cursory knowledge or lack of familiarity with such documents leaves the impression that the information, which nurses and students receive, is insufficient or partially ignored, which is a prerequisite for gaps in the work process.

An indicative fact from the study is that the source of information on the prevention and control of HAIs for 16 of the health care professionals interviewed was the on-boarding briefing. Another 16 of them indicated that they get their information from internet sources. This data is very worrying as the on-boarding instruction is done only once and it becomes obsolete for nurses with bigger experience in the filed. On the other hand, internet sources are not always verified and this puts in doubt the accuracy of the information received on the issue.

Colleges were a source of information for 14 of the nurses surveyed, 12 of them stated that they were informed by periodic training on the topic, and 8 of the respondents used specialized literature.

In comparison, the largest number of students surveyed (40) unsurprisingly received information on the prevention and control of NI during lectures and tutorials, followed by those who cited pre-clinical ward practice instruction as a source of information (32). Specialized literature was referred to by 10 of the respondents in this group, and 6 of them used internet sources.

The response of 14 of the surveyed students who stated that they get information on prevention and control of HAIs from colleges, remains unclear.

The majority of respondents demonstrated interest in the quality implementation of HAI prevention activities in paediatric wards. 30 of the interviewed nurses and 42 of the interviewed students, stated that they always observe aseptic and antiseptic compliance and quality implementation of the annual disinfection and sterilization program of the ward. There are no health care professionals who do not comply with these norms, but 4 of the surveyed students admitted that they do not observe their compliance and quality performance, which on the one hand is explainable by the lack of experience and practical skills and habits, but on the other hand poses some risk of admission of HAI.

The presence of attendants is one of the specific factors for the transmission of HAI in pediatric wards. All respondents were of the opinion that, for one reason or another, perople who accompany paediatric patients during hospitalisation are a possible source of infection. The survey results show that 20 of the nurses surveyed always provide such information, and 10 of them make attendants aware of these risks almost always. 14 of the respondents claim that they discuss this issue only when they have time and 2 of them state that they do not provide information on the issue. Surprisingly, the majority of the students interviewed (36) indicated that they only inform the chaperones of the children when they have time. Same like the nurses, 10 of them discussed the possible risks of NI almost always. 6 of respondents admitted that they do not inform a companion, and a very small number of them (4) say they always do.

The lack of time indicated by respondents suggests that information materials on the risks and routes of transmission of HAIs, that are visual and accessible to all ward attendants during the hospital stay, could be developed on paediatric wards.

The clear allocation of staff responsibilities is a prerequisite for quality control of activities, as well as for quality health care for hospitalized patients, specifically pediatric patients. When asked if they felt responsible about the performance of non-medical staff on the ward, most of the nurses surveyed (16) indicated that they took some responsibility. 14 of them to a significant extent feel responsible about these activities and only 8 of the respondents fully accept this responsibility. It is noteworthy that among this group of respondents there are also those who do not feel responsible (8) about the duties of non-medical staff. In the nurses' job description, it is indicated that they supervise the activities of the orderlies, as well as carrying out ongoing control of compliance with hygiene requirements, many of which are also included in the professional duties of non-medical staff. When analysing the survey data, the impression is that there is a lack of clarity about the division of responsibilities within the ward.

The majority of the interviewed health care professionals (24) strongly agreed that further events and measures were needed regarding the reduction of the risks of developing an HAI on the ward. 12 of them express such a need to a considerable extent, and 6 of them to some extent. Only 4 of the nurses felt that there was no need for additional NI containment activities on the ward. Respondents from the student group had different opinions compared to nurses. 24 of the respondents felt that additional events and measures regarding HAIs on the ward were not necessary and for 18 of them the need was only to some extent. A small proportion of students (8) fully recognised the need for further action to reduce the risks of HAIs, and 6 respondents agreed to a considerable extent.

When comparing the results of the two groups of respondents, the answers are not surprising. Nurses, from their position working on the wards, have a clearer judgement of the activities involved in limiting the risks of infection and therefore a more realistic view of the weaknesses in the organisation of work, while students, on the

other hand, spend much less time in the paediatric wards, which technically gives us reason to believe that the understanding of the overall organisation of events and measures to limit the risks of infection is not complete.

Conclusions

1.There was a significant difference between the respondents regarding their knowledge of the medical standard on prevention and control of HAIs, in favour of the interviewed students.

6. There was a lack of systematic knowledge of the responsibilities and activities for prevention of HAIs.
7. All respondents were found to be aware that they were not sufficiently informed about the problems of HAI.
8. The respondents' knowledge of standard precautions was reported to be inconclusive.
9. The majority of respondents reported a possible risk to patients and staff on paediatric wards.
10. Insufficient awareness of responsibility on the part of nurses and orderlies regarding the prevention and control of HAIs was found.
11. The results of the analysis showed a consensus of health care professionals and orderlies working in the ДО about informing attendants about the risks of HAIs in the ward.
12. Analysis of the data shows that respondents identified the presence of attendants on the ward as a risk factor and source of HAI.
13. The results of the present study indicate insufficient updating of nurses' knowledge about the problems of HAI in pediatric hospital settings.

14. There is a need for accessible information methods designed for companions of hospitalized children on the risks of HAIs in the ward.
15. There was insufficient supervision by health care professionals of the activities of non-medical staff.
16. There is need for additional interventions and measures for prevention of HAIs in paediatric wards by nurses.

Contributions of the thesis

1. Conceptualizing a model for research and optimization of nosocomial infection control in a pediatric ward.
2. Revealing the level of awareness and training of medical and non-medical staff in a paediatric ward regarding nosocomial infections.
3. Establishing a model for ongoing review and updating of knowledge of specialists working in the pediatric ward regarding nosocomial infections to guide the training process.

Publications related to the thesis

1. Sultanova D, "Investigation of the ways of transmission of hospital-acquired infections in children", Research Potential of Young Scientists: a Look into the Future, Proceedings of the XVII Regional Scientific and Practical Conference of Master's Students, Postgraduate Students and Young Scientists Tula. L. N. Tolstoy 2021, 224-229
2. Sultanova D, Study of nurses' knowledge for prevention of the transmission of nosocomial infections in children's wards", Conference proceedings: 3rd international conference: Nursing care - a contribution to the quality of life, June 7-8, 2021, 249-256

3. Sultanova D, Study of the knowledge of the students of the specialty "Nurse" about the nosocomial infections in the departments of pediatrics, XXXII International Scientific on-line conference of the Union of Scientists - Stara Zagora, 02-03 June 2022, under print in on-line journal. "Science & Research: Volume 6, 2022