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## THE INCIDENCE OF NEEDLESTICK INJURIES AMONG HEALTH WORKERS IN HUNGARY

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### ABSTRACT

**Aim of the study:** We performed investigative research into the Hungarian situation with regard to needlestick injuries, in 2006, 2008, 2012, among health workers. The objectives of the study were twofold: to reveal the trend in the extent to which health workers are affected, and to draw the attention of economic decision-makers to the importance and currency of the issue.

**Method and sample:** When compiling the self-completion questionnaire used in the survey the authors made use of the questions and findings of a similar study previously carried out in Sweden. The sample was representative, selected taking into consideration the regional and age-group distribution of the individual professions. The population of the first sample was 4789, the second 3824 and the third 4955. The gathered data was processed using an SPSS program, and the results were presented using descriptive statistical techniques.

**Results:** Some 86% of the respondents have pricked or cut themselves in the course of their work. The percentages vary from group to group, with surgical nurses the most susceptible, at 96%, but even in the least hazardous field from this point of view, that of imaging diagnostics, almost 60% of workers have been involved in such incidents. A statistically provable correlation can be found between the incidence of needlestick injuries and the field of work.

**Conclusions:** The survey revealed that the health workers' theoretical knowledge is good. The development of the results between the three phases of the survey demonstrates that the health workers are beginning to show improvement.

**Key words:** Needlestick injuries, Health workers, Clinical safety.

### 1. OVERVIEW OF THE PROBLEM BASED ON THE INTERNATIONAL OUTLOOK

In many countries around the world there is an increasingly severe shortage of nurses. In 2006, the World Health Organisation was the first to

carry out a large-scale study that dealt globally with the current healthcare crisis. According to this, there is much evidence that the shortage of nurses is resulting in longer hospital stays, higher mortality, and a greater incidence of preventable, undesirable outcomes.

Poor working conditions can be regarded as one of the main factors contributing to a reduction in the number of nurses. An unsatisfactory working environment, for example one that is characterised by constant stress, a high static workload, long hours, and working within a duty roster system, a lack of nursing equipment, or poor quality equipment, accompanied by a decline in, or total lack of professional and social prestige, can lead to a deterioration in nurses' physical and mental health, and to premature burnout.

In Europe, every year, around one million health workers are injured by used injection needles (EFN supports European Campaign A, 2006). In the United States work in hospitals and other health care setting about 800 000 needlestick and other percutaneous injuries occur in them every year (Bandolier Extra, 2003). Accidents of this nature can have serious consequences, such as infection by HIV or hepatitis B and C. (CNOHSR, 2003; Slater, K, Whitby, M, 2007) It is for precisely this reason that the relevant committee of the European Parliament intends to introduce legislation aimed at reinforcing the protection of health workers and doctors who are exposed to these risks. In a report submitted on his own initiative, Stephen Hughes, Labour MEP for the North-East of England outlines the means of improving the protection afforded to healthcare workers who are exposed to blood-borne infections due to needlestick injuries. According to the report: "high risk procedures include blood collection, IV cannulation and percutaneously placed syringes. Small amounts of blood can result in potentially life threatening infection. The risk of infection is dependent on various factors, such as the infection status of the patient, the virus load of the patient, the immune status of the staff member, the depth of the wound, the volume of blood transferred, the time between receiving and disinfecting the wound and the availability and use of post-exposure prophylaxis" (EFN supports European Campaign B, 2006).

Until recently, no comprehensive research had been conducted into the number of needlestick injuries that occur, the frequency of such incidents, the measures necessary to deal with them and the possible forms of prevention (Bandolier Extra, 2003). It was in connection with the work of the European Parliament's committee set up to address the problem that a Swedish study was published in 2006, which attempted to ascertain the circumstances surrounding the incidents, and the frequency of their occurrence. "The use of safer instruments can significantly reduce the number of needlestick injuries.

Independently of this measure, regular training and organisational measures can also significantly lessen the number of needlestick injuries. Therefore, as well as the use of appliances with safety features, emphasis should be placed on organisational measures such as established working procedures, the training and instruction of workers, and raising awareness of risky activities", concludes the study. The report describes the currently effective legislation aimed at preventing such accidents, with the author expressing the opinion that "While the existing legislation should, theoretically, address the risk of needlestick injuries, in practical terms this has not been the case." This is followed by a detailed description of the proposed amendments to legislation, for example the use of cannules should be minimised, and: "work practices that pose a risk of needle injury shall be modified to make them safer, and recapping needles shall be eliminated." The report states that "all workers – especially those who perform cannulation – shall be trained in the safe use and disposal of needles and other medical sharps in appropriate sharps containers, as well as in the proper sealing of waste in these containers." According to Stephen Hughes, workers who come into contact with needles and other medical sharps – as is the case under standard procedures in Hungary – should be offered inoculation against Hepatitis B, and all injuries caused by needles or medical sharps must be documented separately (European Parliament, 2007).

Every year the Geneva-based International Council of Nurses, which currently represents 131 professional nursing associations, designates the theme for its international surveys and research projects in the given year. The theme for 2007 is "Positive practice environments: Quality workplaces = quality patient care." This motto has perhaps never been as current and emotive as it now, in the context of the ongoing transformation of Hungary's healthcare and nursing system. What could a positive practice environment mean in the context of the healthcare sector? The use of innovative policy frameworks focused on the recruitment and retention of specialists. The development of strategies for continuing education and upgrading, and accredited vocational training programs. Adequate employee compensation, recognition programs. Sufficient equipment and supplies, as well as a safe working environment (ICN, 2007).

According to a survey conducted in countries with a more developed health culture and care system than Hungary's – the United States of America,

Canada, the United Kingdom and Germany – more than 40 percent of hospital care workers are dissatisfied with their job, with almost a quarter planning to leave the profession within a year. The researchers found a clear link between stress in the workplace and nurses' morale, job (dis)satisfaction and an intention to quit.

The independent survey of more than 700 U.S. nurses, sponsored by the American Nurses Association (ANA) and InVivo Medical Devices, reveals NSIs and blood borne infections remain major concerns for nearly two-thirds (64%) of nurses. The decisions made by the vast majority of nurses (87%) about the type of nursing they do, and that nearly two-thirds of nurses (64%) have been accidentally stuck by a needle while working. Following their most recent needlestick injury, that nearly two-fifth of nurses (39%) nor evaluated or treated at all. While 71% of U.S. nurses state they are familiar with the Needlestick Safety and Prevention Act of 2001, the majority (62%) would benefit from more information about needlestick injury prevention. Nurses say they learn about advancements in prevention and new safety syringe technology from in-service programs at their healthcare facility (67 %), from continuing education courses (40%), and from ANA programs (39%). (ANA, 2008)

According to the RCN's Needlestick injury in 2008 survey, nearly one half of the 4 700 respondents had been stuck by a needle or sharp at some point in their career and 10% had sustained an injury in the past year. (Mooney, H. 2009)

The results of study have influenced the British decision makers to introduce a strategy to decrease a workplace injury in national and European level. ( www.nursingtimes.net, 2009)

The NHS implement new European guidelines on needlestick injuries. (Mooney, H. 2009)

Besides these factors it is also obvious that thousands of nurses, primarily from the developing Asian and African nations, as well as the newest members of the European Union, are migrating to countries with advanced healthcare systems in the hope of a higher salary, better living and working conditions. Therefore – based on a comprehensive study of the crisis that is emerging as a result of the nursing staff shortage – the International Council of Nurses has defined a set of priorities for management of the problem. Together, nursing organisations and representatives of the health sector must determine the nursing levels that are necessary to satisfy patients' needs, to gather data and conduct further surveys (ICN, 2007).

## 2. THE AIM OF THE RESEARCH

Based on international guidelines and the findings of earlier research into the issue, in autumn 2006, 2008 and 2012 we conducted a comprehensive investigative survey into the situation with regard to needlestick injuries in Hungary. The objectives of the study were twofold: to reveal the trend in the extent to which health workers are affected, and to draw the attention of economic decision-makers to the importance and currency of the issue, and the need to follow through with development processes already commenced.

## 3. THE OBJECT OF THE RESEARCH

The object of the research project was to determine the extent to which skilled health workers are exposed to needlestick injuries and cuts, what factors contribute to the occurrence of accidents, and what steps are taken by the workers and their employer to ensure the identification, management and prevention of these problems. The second survey also examined whether the reactions of health workers had changed in the period between 2006, 2008 and 2012.

## 4. METHODOLOGY

When compiling the self-completion questionnaire used in the course of the surveys, the authors drew on the findings of a survey conducted in Sweden in 2005 ([www.vardforbundet.se](http://www.vardforbundet.se)).

The survey was conducted using an anonymous, self-completion questionnaire, in compliance with the appropriate ethical standards. The basis for the questions used in the survey was provided by a questionnaire previously used in a similar survey in Sweden. After being translated into Hungarian, the questionnaire was further refined, in consultation with those departments of Council the Hungarian Health Care Paramedical Professionals that took part in conducting the survey. Before its general deployment, the thus adapted questionnaire was first tested on nursing professionals at the Szent János Hospital in Budapest.

The final questionnaire consisted of 33 closed questions and one open question. Within the regional organisations of Council the assistant vice-president with responsibility for inpatient care undertook an important role in coordinating the research (distribution, collection and forwarding of the questionnaires). For this reason, we briefed them regarding the tasks to be performed, and the need to comply precisely with deadlines, in the form of a group consultation.

We performed the nationwide surveys in autumn (September-October) of 2006 and 2008, (November) 2012 – (January) 2013 with the involvement of the Chamber's Regional Branches. The data gathered in the course of the survey was processed, both in aggregated form and by professional group, using a Software SPSS v15 program. The results were presented using descriptive and inferential statistical methods. Comparisons of the mean values of two groups for their responses to the whole questionnaire were calculated by the use of t-test statistic.

## 5. THE HYPOTHESES OF THE RESEARCH

We worked on the assumption that

- the incidence of needlestick and cut injuries has risen in Hungary over the past two years
- in Hungary the injuries are mainly caused by unforeseeable, unexpected incidents, as well as by incomplete and faulty protective equipment.
- staff are aware of the risk of accidents, but do not report the incidents in the appropriate manner or frequently enough; however, an improving tendency can be observed in this respect.

## 6. THE SURVEY SAMPLE

When defining the sample for the survey, we took as our starting point the aforementioned Swedish survey. In the original study the target group consisted primarily of health workers employed in neonatology and paediatric wards, in clinical laboratories, and in centres for the treatment of infectious disease.

Besides nurses and specialist nurses working on inpatient wards, the population of the Hungarian survey included surgical assistants, anaesthesiology assistants, imaging diagnostics assistants and clinical laboratory assistants, as well as midwives and nurses and ambulance officers working for the rescue services.

The survey was based on a representative, 10% sample. The survey groups were selected from the database of the National Register, by county and in the capital city in accordance with a predetermined set of criteria, taking into consideration the distribution with regard to qualifications and age group. When selecting the sample we took into account the overall number of people in the individual age groups, and the weights of the various professional groups within the overall population.

A total of 5,000 questionnaires were in first research, of which 4789 were returned by deadline at the first survey. This exceptionally high response rate of 95,8% was due to the thorough preparation work and responsible attitude displayed by the staff who participated in conducting the research. In the course of the second survey we once again sent 5000 questionnaires to the departments, of which 3824 completed copies suitable for evaluation were returned by the deadline. This 76.5% return rate can be regarded as high. The population of the third sample was 4955.

## 7. RESULTS

Almost all of the respondents come into contact with sharps and cutting implements, and blood in the course of their work. The return rate was as high as 94.3% even in the case of respondents working in imaging diagnostics, but in many specialist departments 100% of the questionnaires were completed and returned. Some 86% and 83% of respondents had pricked or cut themselves in the course of their work. The ratios differ between professional groups, and the large size of the sample made it possible for us to rate the individual professions by the degree of danger. (Figure 1) Under this rating system, three significant groups can be differentiated: Least at-risk are assistants working in imaging diagnostics and other departments, with 59% of the former and 52% of the latter having experienced such an event. An intermediate category is formed by emergency workers and laboratory assistants, while the group consisting of the remaining professions was the most endangered, comprising surgery assistants with an injury rate of 96% and 95% ( $p < 0.005$ ). (Figure 1)

With respect to all of the individual professions, more than 90% of workers come into contact with pointed and sharp implements, and with blood. In a study of the correlation between the time spent in the profession and contact with such items, there is no significant divergence between the groups ( $p > 0.005$ ); in other words this danger arises immediately in all the professional areas. In terms of frequency, interestingly, such incidents were least common among career starters (53.6% and 64.3%), while this figure was between 78.4% and 89.3% for the remaining age groups. The critical interval in terms of the length of time spent in the profession and occurrence of the accident is the first year, with the next change coming after 10 years. Following this, there is no longer any significant difference. Although the 1-10-year period does, overall, differ from the category of



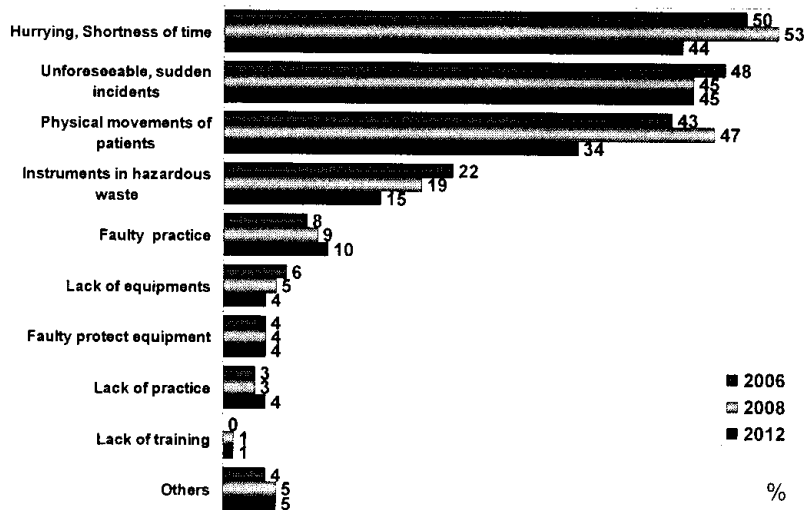


Figure 2: Among the main causes of accidents. (n1=4789, n2= 3824, n3=4996)

Among the main causes of the accidents, hurrying, shortness of time, and the physical movements of patients display a significant upward tendency. There was no significant change in responses to the questions regarding lack of practice, nor with respect to the use of faulty protective equipment. A significant reduction was observed in the incidence of unforeseeable, sudden incidents, as well as in injuries caused by instruments in hazardous waste. (Figure 2)

The survey revealed that the health workers' theoretical knowledge is good, but its practical application and the assumption of personal responsibility still leave a lot to be desired. However, the results of the survey pointed to the beginnings of an improvement when we examined the fulfilment of reporting obligations following an accident. With regard to reporting, in the case of county and city institutions there was a significant tendency towards reporting incidents orally and in writing ( $p < 0.005$ ). Among the various professions, the proportion of nurses who filed written reports increased significantly, as did the incidence of spoken reports in the case of midwives ( $p < 0.005$ ). In terms of the length of time in the profession, among those who had served for 11-20 years and 21-30 years the proportion of workers reporting incidents increased significantly ( $p < 0.005$ ). With regard to reports made by others, within the institution types no significant change to the ratios was observed, and among the professions the proportion of written reports by other grew

significantly. With regard to length of service, the proportion of written reports by other grew among those who had been in the profession for 11-20 years ( $p < 0.005$ ). As regards the workplace audit/examination, significantly more "yes" replies were only given in the "other" category. From the perspective of profession, among those with knowledge a significant number of nurses and workers in the field of imaging diagnostics answered "yes" regarding the workplace audit ( $p < 0.005$ ). In respect of the workplace audit, too, it was the age group with a service history of 11-20 years that replied "yes" in significantly higher numbers. (Figure 3)

We gained some arresting data from the respondents regarding the performance of blood tests after a needlestick injury had occurred. The respondents responded in almost the same extent in the two surveyed periods.

Despite the fact that some 56.4% and 58.2% of respondents reported the accident to their superiors, either verbally or in writing, 81.6% and 81.1% of the healthcare workers who responded had worried, to a greater or lesser extent, following the incident. However, only 26% of the respondents who sustained injuries were offered a blood test in 2006, while this ratio was 31.9% in 2008. Even more shocking were the answers given to questions regarding the measures implemented after the accidents. According to these, only a negligible proportion, 18.1% and 20.5% of those respondents who had suffered

needlestick or cut injuries stated that their employers had investigated the causes of the

accident, and only 36.3% and 37.2% of the respondents indicated an awareness that their

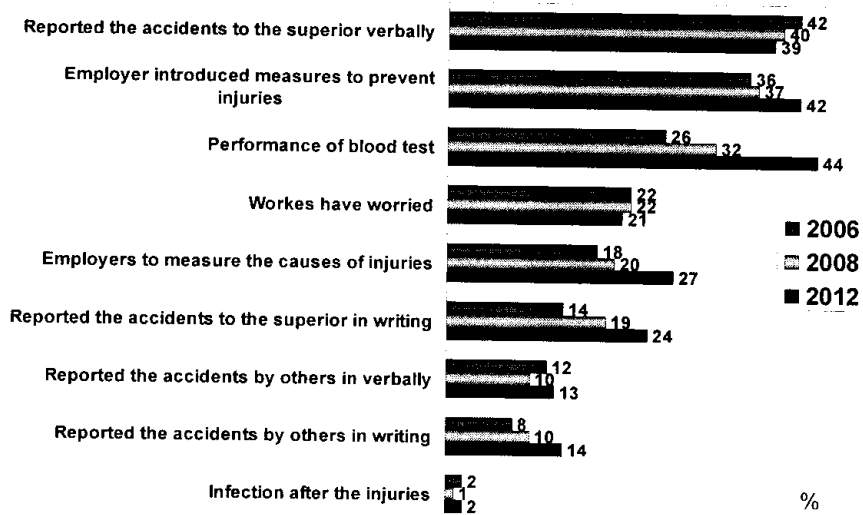


Figure 3: The measures in connection with the needlestick injuries. (n1=4789, n2= 3824, n=4996)

employer had taken any steps to prevent similar accidents. This is important because 81 and 46 persons, or 2% and 1.2% of the health workers in the Hungarian sample had contracted a blood-borne infection as a result of the accident. In this case too, based on the frequency of occurrence, surgical assistants are at the greatest risk.

Some 98.2% and 98.1% of respondents had learned about needlestick and cut injuries, as well as the risk of blood coming into contact with skin or mucus membrane, in the course of their training. A total of 93% of the respondents were worried, to a greater or lesser extent, by the fact that they could occupationally suffer needlestick and cut injuries, and that blood could come into contact with their skin or mucus membrane. Just over seventy percent (71.1% and 73.6%) of the respondents stated that they know of a methodology letter or procedural rule stating what should be done if a needlestick or cut injury is sustained in the course of working, or if blood comes into direct contact with skin or mucus membrane.

### 8. CONCLUSIONS

The findings of the national survey show that no increase in the frequency of needlestick and cut injuries can be proven over the past two years. It was, however, confirmed that the main cause of the accidents continues to be the situations arising from a shortness of time and hurrying on

the part of the workers, which could be closely linked to the staffing issues currently being experienced in the sector. The results of the Hungarian survey match the findings of international research in numerous aspects. Of these, particularly noteworthy is the fact that a survey in the United States also revealed the foremost cause of needlestick injuries to be an increase in the workload, and stress. Significant differences can be observed on terms of the extent in which nurses are involved in needlestick accidents. In both the US and British surveys a far lower proportion of respondents indicated that such an incident had occurred in the course of their career to date. In the US sample 64%, and in the Brit survey less than 50% had been affected. In the Hungarian surveys, in both years, the aggregate figure was unfortunately over 80%. The picture gives even more cause for concern if we examine the professional group of nurses in isolation.

Studying the results of our survey, we also find similarities between the reporting habits of respondents. Almost two fifths of Hungarian and American nurses suffering needlestick accidents, in the same proportion, said they did not regard such incidents as important, and therefore they did not report them, or did not initiate treatment or preventive measures. In a more in-depth investigation of this conduct by nurses, however, the Hungarian results nevertheless present a

more favourable picture, since a great many more legislative measures have been passed in the United States, but despite these the results remain similar to those observed in Hungary.

Possibly due to the activities, professional training courses and publications of the Chamber of Health Care Professionals, the respondents in the survey bear witness to a positive tendency in terms of the number of reports made following accidents, and in the measures taken by employers both for prevention and after accidents. In possession of the survey results, it is worth carrying out a more detailed analysis of the received data. Skilled healthcare workers, even as early as the basic training stages, must be educated regarding the risk factors, as well as the methodological skills related to prevention. Health workers and their managers must be made aware of the consequences of accidents that arise from these factors, and the importance of being honest with regard to the reporting and investigation of incidents that do occur.

However, we consider it important to continue developing the systems for ensuring satisfactory working conditions and providing the material resources related to the individual work processes. We would like to remind all health care professionals of the need to use modern, safe blood-taking systems and safety needles. A wide variety of these instruments is available and ready to be used in Hungary too.

Another key component of the solution proposals is the proper determination of the number of health workers necessary to ensure safe patient care. Sufficient staff numbers results in a lower incidence of errors and accidents (e.g. needlestick, cuts). A high ratio of patients to nurses (i.e. too few skilled health workers) not only has a negative impact on the condition of patients and their recovery, but also leads to dissatisfaction and burnout among the health workers.

Nurses around the world, and in Hungary too, are calling for more attention to be paid to the creation of safe workplaces – in the interests of providing quality care.

We would also like to draw the attention of decision-makers to the need to exercise the utmost care in their human resource planning, and in determining the nurse-to-patient ratio; and we urge them to make every effort to retain skilled health workers and assist in their professional development.

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