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PREVALENCE OF OCCUPATIONAL EXPOSURES AND PROTECTIVE MEASURES IN COMPANION ANIMAL VETERINARY PRACTICE

Master's thesis

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MSc

Tallinn 2018

TALLINNA TEHNIKAÜLIKOOL
Infotehnoloogia teaduskond

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KOKKUPUUDE TÖÖKESKKONNA RISKITEGURITEGA JA KAITSEMEETMETE RAKENDAMINE LEMMIKLOOMAARSTIDE PRAKSISES

Magistritöö

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Tallinn 2018

Author’s declaration of originality

I hereby certify that I am the sole author of this thesis. All the used materials, references to the literature and the work of others have been referred to. This thesis has not been presented for examination anywhere else.

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14.05.2018

Abstract

The aims to be acheived with this master thesis were to investigate how occupational health and safety is being managed and what is being done to protect physical and mental health of employees within a certain working environment; to assess if there are any noncompliances with applicable legal requirements. Working environment chosen for aforemetioned purpose was companion animal veterinary practice - a medical specialty concerned with preventive medicine, zoonosis, parasitology and epidemiology.

In order to conduct this study, several research methods were used. Firstly, relevant academic literature was studies to determine the most dangerous occupational hazards and existing safety practices within the profession. As a second step, the data was collected from Estonian veterinary practices: through self-administered online questionnaire of veterinarians and assistants spread in the specialized online community Vetist Sõbrad; through exponential non-discriminative snowball sampling technique (N=162); and by means of face-to-face surveys of two types: unstructured informal interview (N=1) and depth semi-structured interviews (N=6).

The results have shown several positive dimensions: high prevalence of risk assessments carried out for zoonotic diseases; very low rate of zoonotic diseases obtained at workplace during last two years; and high availability of protective measures for animal bites and needlestick injuries. However, violations of 20 paragraphs of three applicable legal acts were detected in the course of the investigation.

This thesis is written in English and is 95 pages long, including 9 chapters, 17 figures and 1 table.

Annotatsioon

Kokkupuude Töökeskkonna Riskiteguritega ja Kaitsemeetmete Rakendamine Lemmikloomaarstide Praksises

Käesoleva magistritöö eesmärgiks oli uurida, kuidas on lemmikloomaarstide praksises töötervishoid ja -ohutus korraldatud ning millised meetmeid on vastu võetud kaitsmaks töötajate füüsilist ja vaimset tervist töökeskkonnas; samuti hinnata vastavust kohaldatavate juriidiliste nõuetega. Uuritavaks töökeskkonnaks valiti veterinaarmeditsiin - ennetava meditsiini, zoonoosi, parasitoloogia ja epidemioloogiaga seotud meditsiiniharu.

Käesolevas töös kasutati mitut uurimismeetodit. Esiteks, analüüsiti asjakohast akadeemilist kirjandust, et kindlaks teha valdkonna kõige ohtlikumad kutsealased riskid ning olemasolevad ohutuseeskirjad. Teise sammuna koguti andmeid Eesti veterinaarkliinikutelt: koostati veebipõhine küsimustik, mida levitati veterinaararstide ja assistentide hulgas veebikeskkonna Vetist Sõbrad vahendusel; mittediskrimineeriva lumepalliefekti abil (N=162). Samuti viidi läbi kahte liiki näost-näkku küsitlusi: struktureerimata mitteametlik intervjuu (N=1) ja põhjalikud poolstruktureeritud intervjuud (N=6).

Analüüsi tulemusel jõuti mitme positiivse järelduseni: zoonootiliste haiguste puhul viiakse enamjaolt läbi riskianalüüs; viimase kahe aasta jooksul on töökohalt saadud zoonootiliste haiguste arv väga väike; ning loomahammustused ja nõelatorkest vigastused väga harva esinevad. Seevastu avastati uurimise käigus kolme kohaldatava õigusakti rikkumine 20 paragrahvi lõikes.

Lõputöö on kirjutatud inglise keeles ning sisaldab teksti 95 leheküljel, 9 peatükki, 17 joonist, 1 tabelit.

Acknowledgements

I would like to express my sincere gratitude to my teacher and supervisor Tarmo Koppel for his guidance and engagement throughout overall writing process. Mr Koppel has taught me a lot during these two academic years and showed by his example what a real scientist and a good person should be.

Furthermore, I would like to offer my special thanks to outstanding Ganna Filipova, companion animal veterinary practitioner, for her priceless contribution in the data collection process, thus making conduction of this research possible.

Moreover, I wish to acknowledge the help and valuable assistance provided by Prof Piia Tint throughout my study process.

In addition, I would like to thank Jaanika Jelistratov for her guidance through Estonian occupational health and safety management tools.

Finally, after an intensive period of two academic years, I would like to express my very great appreciation to Prof Peeter Ross along with each and every member of HCT team for making this journey so fascinating.

List of abbreviations and terms

EU-OSHA	European Agency for Safety and Health at Work
HSE	Health and Safety Executive
OHS	Occupational Health and Safety
OHSA	Occupational Health and Safety Act
OHSMS	Occupational Health and Safety Management System
RA	Risk Assessment
VITS	Virtual Working Environment Specialist

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1 Introduction

The first chapter of the present thesis, introductory one, defines the reasoning behind the choice of topic; explains its relevance and necessity for contemporary research. In addition, the chapter also presents aims to be achieved and the research questions developed by the author.

1.1 Statement of problem

According to Statistics Estonia, as of year 2017 the employment rate of working-age persons was 67.5% [58], which means that this amount of the population spend significant part of their lives at work. It is pretty obvious, that every single person who leaves to work in the morning should be expected to return back home in a good health condition [70] which is the most important reason to create safe and comfortable working environment; and which is why the field of occupational health and safety (OHS) is an issue of extreme importance. The Republic of Estonia has established very strong and consistent legal basis for OHS, which consists of:

- The Occupational Health and Safety Act[1] (OHSA) [3] which provides OHS requirements for work performance: rights and obligations of the employer and employee in creation and ensurance of safe working environment; organisation of OHS in enterprises and at state level; the liability for violation of the occupational health and safety norms,[2] and
- Twenty six related legal acts, regulating health and safety at work regarding training, health examination, organization of first aid at enterprises, management of occupational accidents and diseases, selection and use of personal protective equipment, use of safety signs, requirements for workplaces, procedure for measuring hazard parameters and other specialized issues of concern [52].

[1] Töötervishoiu ja Tööohutuse Seadus (TTOS) RT I, 28.04.2017, 9

[2] TTOS, RT I, 28.04.2017, 9, Chapter 1, § 1 (1)

However, very often the actual state of affairs is very far from what is prescribed by law, especially in the context of occupational health and safety. So, the aims to be acheived with this thesis are:

- To investigate to what extent occupational health and safety is being managed;
- To ascertain what is being done to protect physical and mental health of employees within a certain working environment;
- To assess if there are any noncompliances with applicable legal norms.

Working environment chosen for the aforementioned purpose is veterinary medicine. Veterinary medicine (also called a veterinary science) is a medical specialty concerned with control and treatment of diseases affecting health of animals, and with prevention of transmission of animal diseases to humans; veterinarians are competent in preventive medicine, parasitology, zoonosis and epidemiology [13]. The history and traditions of this profession have always focused on protecting and improving animal and human health, biomedical research and food safety [50]. As of today, veterinarian practitioners serve worldwide in private clinical practice, different academic programs, government services and public health [39]. In Estonia a significant number of veterinarians are employed by Veterinary and Food Board, the main objectives of which are:

- To prevent the occurense of zoonotic diseases [59];
- To protect animals from human activity endangering their welfare [59];
- To ensure productivity of farm animals and increase their genetic value [59];
- To arrange laboratory analyses in order to diagnose infectious animal diseases and assess the properties of food and drinking water [59];
- To perform supervision over animal breeding [59];
- To issue the activity licences for the provision of veterinary services [59].

Furthermore, in Estonia it is very popular to keep companion animals (such as dogs, cats, ferrets, rodents) as pets, and the latter are in need of lifelong medical attention. Thereby, the majority of veterinarian professionals in private clinics contribute to public health during their daily practice: companion animal veterinarians are skilled diagnosticians for acute and chronic diseases of animals which may affect pet owners, their families and the surrounding community. Public health activities include performing routine health examinations, implementing parasite control, maintaining

vaccinations, conducting health care of service dogs for disabled people and animals employed in creation of human-animal bond for people suffering from post-traumatic stress disorders. In addition to these services, veterinarains report cases of diseases to regulatory agencies and collaborate with human medical practitioners on zoonotic diseases [53]. Thereby, veterinarian professionals in general and those involved in companion animal pracitce are very important for the overall well-being of the society. Representatives of this profession often face a considerable amount of health hazards on their working paths: physical, physiological, chemical, biological and psychosocial risk factors, which may lead to causation of harm to an exposed person. The nature of working processes in veterinary medicine is highly demanding and constitutes a high risk of being traumatized and/or getting occupational disease, so creation and maintenance of appropriate working environment and proper management of occupational health and safety, which is in compliance with applicable law, is very important for the welfare of practitioners and high quality work performance.

Unfortunately, personal experience of the author of this paper as well as various studies on veterinary profession demonstrate, that actual situation in the field is often far from perfect. Sometimes the administration is unable to adequately respond to emerging hazards, risks and complexities associated with the profession. This may cause occupational burnouts and development of chronic diseases, which inevitably lead to a drop in the number of veterinarian practitioners, and the attenuation of succession and experience. A veterinarian may leave the practice even before becoming an absolute professional in it, or due to becoming less responsible than nature of the profession requires, which is a serious loss for the society, since the role of companion animals and the relationship between humans and their pets has significantly changed during the last few years. Nowadays, in the majority of cases, pet animals are fully accepted family members and have a great influence on the mood and health of their owners [10]. Moreover, companion animals have a very special meaning for single and older persons, who lack social contacts in the course their daily activites: pets may give their days a structure, may initiate meeting with other pet owners [10]. Along with the greater importance of companion animals, demands of pet owners have also grown regarding veterinary medicine: caring pet owners want every effort to be made so that their animals remain healthy as long as possible. Everyone wants not only to have a possibility to treat their pets, but also to have a choice where to turn.

In this regard, it is particularly important to shed some light on how companion animal veterinary practices are being managed from occupational health and safety perspective and to highlight the existing possibilities to manage the occupational hazards with the aim to improve the existing situation and decrease the risk levels.

1.2 Research questions

In order to acheive the aims explained above, four research questions were set forth:

- What are potentially harmful occupational hazards which tend to occur in companion animal veterinary practice in Estonia?
- To what extent safety measures are available in companion animal veterinary practice in Estonia?
- To what extent previously mentioned safety measures are being followed?
- What are the existing possibilities to manage the aforementioned hazards?

2 Review of the existing literature

This chapter contains several comments on the sources chosen: defines an appropriate context for reviewing the literature; points out overall trends in what has been published about the topic and explains the criteria used in analyzing literature in order to compare and contrast views of different authors regarding the topic.

2.1 Criteria for analysis

There are several reasons for reviewing the literature, thus, working with sources: to get a better understanding of the subject matter, to identify methods used in previous research and to critically summarize the current knowledge in the area of investigation. Thereby, in order to use the sources properly, there is a need to evaluate these sources from the perspective of a certain criteria to make sure that information contained is valuable. These criteria refer to:

- Applicability - is the information relevant to the issue of concern?
- Accuracy - is the information reliable in a sense of where it is published? Is information based on proven facts or on opinions?
- Authority - who is the author: does s/he have enough qualification to argue on the topic?
- Currency - does currency matter in this topic? If yes, when was the information published, is the information current enough?
- Coverage - does the information covered meet the exact information needs, does it provide only basic or also in depth coverage?

2.2 Literature review

The main aim of this chapter is to explain the overall trends and group research studies according to common denominators and summarize these studies. Relevant academic literature was gathered via online databases from such academic journals as Veterinary

Science & Technology, Preventive Veterinary Medicine and Occupational Medicine. Speaking about the trends, it is possible to state that quite a lot of academic articles have been published about the topic. All of these are focused on different aspects: in some articles researches are conducted about all the occupational hazards in general, in others the focus is on one particular type of hazard or on one agent. The majority of researches are conducted in such a way that if topic is more general, then it is narrowed down to the particular country or region. On the contrary, if the topic is concentrated on one particular hazardous risk factor or agent, then its impact is usually reviewed as a whole in broader terms, without being narrowed down to any particular place; grouping is provided below. Firstly, study conducted by Bonini, et al. (2016) [6] provides detailed overview of three occupational hazards (physical, chemical and biological) in veterinary medicine.

Secondly, following five are narrowed down to a certain place. The first one, written by Jeyaretnam et al. (2000) [15], highlights occupational hazards to veterinarian professionals in Australia while the second one, written by Shirangi et al. (2007) [32], investigates almost the same issue but only in female employees. The third one, by Langley et al. (2008) [17], investigates the state of affairs in North Carolina, USA, while the fourth one, by Weaver et al. (2010) [34], is narrowed down to the one particular veterinary teaching hospital in Colorado, USA. The fifth research, D'Souza et al. (2009) [7], focuses on the sources of health and safety information used and how occupational health risks are managed by practices in Hampshire, UK.

Thirdly, next five articles are narrowed down to a certain specific risk factor or/and specific agent. The first one, written by Samadi et al. (2013) [29], highlights the exposure to one very specific agent, bio-aerosol; while the second one, written by Epp & Waldner (2012) [8], focuses on one type of agents in particular (zoonosis) and other types of agents within one risk factor in general (biological hazards, respectively). The third one, by Kutlu et al. (2014) [16], investigates specific agent (occupational brucellosis) within one country, Turkey, while the fourth and fifth, by Platt et al. (2010) [27] and Fink-Miller & Nestler (2018) [11] are dedicated to the consequences of severe exposure to psychosocial hazards.

2.3 Appropriateness of criteria

The essence of this part is to summarize major contributions of significant studies to the body of knowledge under the review, maintaining the focus established in the introduction; evaluate the current state of art for the body of knowledge reviewed; and to a draw a line under all mentioned above. In this regard, it is necessary to state that all publications were assessed to be covered in the review when the following criteria applied:

- Applicability - studies concerning health aspects of veterinarians and other professionals involved, associated with exposure to risk factors connected with treating animals, not general population;
- Accuracy - the information is reliable, as all the articles are published in relevant academic journals and findings are based on proven facts;
- Authority - authors of the research papers are qualified enough to argue on the topic as clearly demonstrated in descriptions of research papers;
- Currency - currency, of course, does matter in this area of expertise, but only to a certain extent, because older publications contain a lot of useful materials; not only very up-to-date articles are relevant. Moreover, the majority of the articles published range approximately from early 2000s till year 2016.
- Coverage - the information covered meets the exact needs and provides both basic and in depth coverage.

2.4 Findings

Although publications, as mentioned previously, are a bit outdated, these helped to understand the area of expertise more deeply; served as an example of how the data might be gathered and provided a proper explanation of how to build a critical analysis on the basis of gathered data. Authors of researches, reviewed in this thesis, based their findings on the data obtained from relevant literature, on the data obtained through a self-administered mailed questionnaires and interviews with representatives of target groups (which were the same – veterinarian practitioners). The main findings of the aforesaid researches are following:

- There is a need to assess accurately the occupational hazards in veterinary practice from time to time in order to determine the actual occurrence of injuries in various veterinarian facilities and to develop strategies to prevent them.
- There is a high prevalence of potentially harmful exposures among veterinarians; in addition to already known and expected occupational hazards in veterinarian professions (zoonosis, radiation and trauma) which remain the main occupational risks - new emerging hazards, such as psychosocial hazards, are becoming increasingly important, thus, opening the room for further research.
- Veterinarian professionals tend to underestimate the probability of a workplace hazards to cause harm, so there is a high prevalence of injuries and trauma due to the lack of use of personal protective equipment.
- There is a need for trainings for all veterinary personnel on both occupational hazards and the importance of using personal protective equipment in order to minimize the harm.
- There is a need for studies, which might be useful in guiding development of optimal workplace safety strategies to spread into veterinary practice.

Consequently, the author of the present paper came to the conclusion that although the relevant sources are very useful, these are a bit outdated (as was briefly mentioned above, these range approximately from early 2000s till year 2016), so there is need for an up-to-date research, which will take into consideration changing reality of today and the attitude towards occupational health and safety in Estonian veterinary practice.

3 Methodology

This chapter explains the methods used along with limitations, which define the parameters of the study. In order to conduct a proper scientific investigation, several research methods were used. Firstly, relevant academic literature was studies in order to determine the most dangerous occupational hazards and existing safety practices within the profession; and the way these have been analyzed by other researchers. As a second step, the data was supposed to be collected from Estonian veterinary practices through:

- Self-administered online questionnaire of veterinarians and assistants spread in the specialized online community Vetist Sõbrad (target group of 392 members) and in online community of Estonian Veterinary Association (target group of 572 followers);
- Face-to-face surveys of two types: unstructured informal interview (N=1) and depth semi-structured interviews (N=6).

3.1 Questionnaire

Self-administered questionnaire from the research paper titled Management of Occupational Health Risks in Small-animal Veterinary Practices written by D'Souza, et al. (2009) [7] and published in Occupational Medicine, was used for aforementioned purposes in the present paper. D'Souza et al. aimed to investigate how occupational health hazards are being managed in small-animal veterinary practices in Hampshire, the United Kingdom. The questionnaire D'Souza et al. used for the purposes of their research was composed by the Health and Safety Executive (HSE), a non-departmental public institution of the UK. HSE is responsible for the prevention of work-related death, ill health and trauma and for the promotion of occupational safety and welfare [48]. This is the reason why questionnaire composed by this institution was chosen for the present paper among several questionnaires of other authors of similar content. The author of the present paper did not use all the questions provided in the questionnaire, some were deleted as for being irrelevant for Estonia; the rest were translated into

Estonian language with the aim to receive the highest possible response rate (as some veterinarians and assistants may not be familiar with specialized lexis in English and, thus, skip completion of the survey). The questionnaire contains standardized set of questions, designed to measure dichotomous responses in form of yes or no; semantic differential responses in a form of often, sometimes, rarely, never; and checkboxes, where participants have a possibility to choose several answers regarding their working conditions and protective measures. In addition, comment boxes are also present so that respondents are able to provide more detailed text answers if necessary.

The questionnaire, opened for responses, was published in online veterinarian community Vetist Sõbrad accompanied with a short introduction, objectives of the research, confidentiality statement and overall appeal for cooperation. The same wording was simultaneously sent to the official representative of Estonian Veterinary Association, asking for an assistance, since only authorised person has an access and possibility to publish in Association's online community. However, instead of providing acceptance or refusal in assistance, the official representative ingnored the appeal and posted very aggressive statement regarding the author and the research in Vetist Sõbrad, thus, sabotaging the survey. Although before that response rate in Vetist Sõbrad was pretty high, the discrediting statement affected the attitude towards the study in a negative way turning the response rate to relatively low. Since then exponential non-discriminative snowball sampling technique was used to continue data collection. The total amount of collected responses is 162.

3.2 Interviews

Interviews with veterinarian practitioners were carried out in a form of face-to-face surveys of two types:

- Firstly, one unstructured informal interview was conducted as a preparatory step in the very beginning of research process for purposes of better understanding how to manage other interviews;
- Secondly, six depth semi-structured interviews were conducted, in which a set of questions was used to guide the discussion - self-administered questionnaire by D'Souza, et al. (2009) [7], explained in the previous chapter, served as a basis.

The aim was to study deep-rooted emotions and attitudes towards the topic, since it covers at some point sensitive issues and respondents may provide vague or misleading information when questioned via formally structured standardised interviews.

3.3 Limiations

As occupational exposures in veterinary medicine is very wide area to operate at, this research is limited. In general terms, animal health care is conducted in such facilities as private veterinary clinics and animal shelters; pet hotels and kennels; zoos and aquariums; captive and more free-ranging wildlife settings. Moreover, there are various job titles and related career options in this area (which appear in academic articles from all over the world), such as: veterinarian, veterinary technologist, veterinary technician, veterinarian assistant, animal behaviorist, etc). In Estonian companion animal veterinary practice working process is usually organized by veterinarians and veterinarian assistants (in some cases administrator and/or accountant is also present). Thereby, the research is limited to veterinarians and veterinatian assistants, who perform their works in private clinics with companion animals (those spicies which are kept with people as pets) and whose working processes consist of emergency medical care of animals along with therapeutical care and treatment of animals. Furthermore, although there is a considerable variety of workplace risk factors relevant for occupation in question, in the present thesis only those relevant to Estonia are discussed.

4 Health and safety in animal care

Before starting the direct investigation, it is necessary to explain specifics of the body of knowledge in question. Occupational health and safety refers to all concerns connected with physical and mental health at workplace. Almost every working environment presents different types of safety risks to its employees: these may range from milder hazards to more severe ones. Milder hazards are those related to well-being of employees in the most general terms, which usually take place in office environments; while severe hazards may cause serious injury and death in other sort of facilities, directly connected to agents dangerous to human health [65].

4.1 OHS in the context of overall welfare

Although veterinary medicine is not considered as a very dangerous profession, in which employees risk their lives on a daily basis, the possibility of work-related accidents always exists due to the occupation's specifics. Moreover, it is clear that serious injury or disease obtained at workplace may be either effectively treated or may change lives forever – for professionals themselves, their families and, in this sense, for community as a whole. In order to escape that, certain procedures should be undertaken by both employers and employees. In this regard it is necessary to point out, that success in creation and maintenance of safe working environment depends not only on the employer (who is usually the first associated with OHS), but on the employee as well. The Occupational Health and Safety Act provides rights and obligations of both employer[1] and employee[2] which are especially relevant for animal care personnel, since the nature of the job itself is not only about certain type of service provision but also a communication of a very special kind.

[1] TTOS, RT I, 28.04.2017, 9, Chapter 3, § 13

[2] TTOS, RT I, 28.04.2017, 9, Chapter 3, § 14

4.1 Veterinary practitioner characteristics

Although veterinarian profession is valuable and rewarding, there are certain risks associated with it. However, if veterinarian is ready to accept those risks, is well-prepared and knows how to foresee and tackle existing dangers, it is possible to avoid falling victim. In order to proceed with further narrative, it is necessary to highlight by what type of personalities and what kind of skills veterinarian professionals are usually characterized by:

- Scientific medical knowledge is crucial: it is necessary to gain a degree with coursework in anatomy, chemistry, biology, epidemiology, parasitology and other scientific disciplines [37].
- Motor skills and strong hands are vital in many animal care careers, veterinarians are not an exception – they have to not only use their knowledge by solving medical cases through various scientific methods, but also work physically, using their hands to perform dexterous movements such as precise surgical moves or inserting needles [37].
- Veterinarians should apply logic, reasoning and decision-making skills to make up best treatment options for ill or injured pets [37].
- Working with pets requires good communication skills, since veterinarians and assistants have to deal with pet owners almost as much as they work with animals. Veterinarians should be able to explain diagnosis and treatment options as well as to express solicitude to stressed owners. Administrative tasks and computer work are also part of the daily routine in animal care working environments [37].
- In addition, quite a lot of veterinarians own or somehow manage a practice, so they have to deeply understand all (not only medical) operations of a working environment, such as budgeting and OHS concerns [37].

Moreover, in this regard animal skills should be explained separately. Although usually animal caretakers gain some sort of satisfaction from working in close contact with animals, enjoy spending time and communicating with them, not all veterinarians are alike: some wanted to treat people but failed to obtain relevant degree and thus decided to study veterinary medicine instead, some prefer to get a position in Veterinary and Food Board but cannot do so for some reasons and thus work in companion animal

practice. Anyway, not everyone has strong feelings of empathy and solicitude towards animals (who might be cute at home, but are usually scared and thus aggressive in veterinarian facilities), which are crucial in creation of human-animal bond necessary for proper treatment. Generally speaking, any activity of a human being depends on the perception of surrounding world: colour, acquired behavioural skills and application of those skills in specific situations. Animal behaviour is not an exception: understanding animal behaviour and its causes is one of the most important factors in veterinary medicine. Those veterinarians who have a good understanding of animal behaviour and who are able to build trustworthy human–animal bond (important connection between a person and an animal) play a vital role in overall well-being of their patients and in choosing correct treatment options [31]. Animal care requires a lot more than just identification of health problem and finding way how to fix it, which is also tricky – an animal cannot simply explain its symptoms. Thereby, behaviour is external display of animal's internal physiological processes. Behaviour and posturing shown by the animal is the outcome of neural and endocrine activity; these factors indicate what the animal is feeling and that there may be indication of new or altering disease processes [31].

Furthermore, even when veterinarian knows for sure the correct diagnosis, it is still necessary to think about physical possibility of the treatment: some animals are very patient or well-trained and allow doing everything necessary, while others do not accept injections or owners cannot make them eat prescribed medications. In such scenario veterinarian has to suggest another options. Therefore, a lot depends on veterinarian's capability of understanding behaviour of his or her patients.

Besides, behaviour of animals in veterinary practice can affect not only clinic personnel, but also other animals who are there for treatment, and who may obtain bad experience of visiting veterinary clinic if they are exposed to other aggressive animals during their visit. The last but not least, the working environment for veterinarians and veterinary assistants is significantly more dangerous if they are constantly exposed to highly stressed animals [22]. That is why interpretation of animal behaviour, knowledge of relevant techniques to cope with it and capability to perform these techniques is of significant importance in the context of occupational health and safety.

4.2 Prevalence of occupational exposures in Estonian practice

Along with aforementioned difficulties, veterinarian profession is also full of traditional occupational hazards: physical, chemical, biological. In order to be more precise, it is necessary to point out that all agents, processes and situations, which may cause harm to human health at workplace, are called hazards; probability or likelihood, from low to high, that a hazard will actually cause harm, is called risk [49]. An overview of hazards, which tend to occur in companion animal veterinary practice, is provided below.

Physiological hazards are usually first to think about in the context of animal care:

- Trauma, caused by animal bites, kick and scratches;
- Needlestick injuries and cuts caused by scalpel blades;
- Burns obtained from contact with sterilisers;
- Ergonomic and musculoskeletal hazards: animal care professionals tend to suffer from repetitive strain injuries or musculoskeletal disorders caused by various reasons, such as frequent lifting; necessity to use too much force while restraining animals (especially relevant for assistants) [9]; awkward postures and movements due to incorrectly adjusted working stations or due to a necessity to accomplish surgeries, especially if carried out on a regular basis. All of these factors along with extensive computer use, are significant hazards for the development of musculoskeletal disorders in the upper extremities and backbone [6];
- Animal facilities have slippery surfaces once in a while, which put employees at risk of injury from slips, trips and falls.

Second, physical hazards, which are present in veterinary medicine in a form of ionizing radiation: a lot of practicing veterinarians use radiographic equipment and are being frequently exposed, as pretty often animals must be restrained, so the operator could be very close to the source of radiation [6].

Third, chemical hazards:

- Exposure to cleaning chemicals: in Estonian clinics, veterinary assistants (mostly women) are usually those who perform cleaning using hazardous chemicals on a daily basis. The research, conducted in University of Bergen, has

recently proved that cleaning women had accelerated decline in lung function and that exposures related to regular cleaning with potentially harmful chemical agents may constitute a risk to long-term respiratory health [33].

- Allergic reactions, caused by animals or to latex gloves. Although the latter have proved effective in prevention of transmission of various infectious diseases to health care workers, for some employees exposures to latex may result in allergic reactions [64].
- Pesticide poisoning: veterinarians and assistants are exposed while treating animals from fleas and ticks, which may happen during spring and summer in Estonian climate.

Fourth, biological hazards, with refer to zoonosis. Zoonotic diseases are those transmissible from animals to humans: bacteria, fungi, viruses and parasites [72]. So, veterinarians and assistants are exposed to various biological hazards in their everyday work:

- Bacterial diseases, such as leptospirosis [42].
- Mycotic diseases, caused by fungi, such as dermatophytosis [30].
- Viral diseases, such as rabies. Although Estonia is declared rabies-free country since 2013 [74] and according to Infectious Animal Disease Control Act [2] all pets living in Estonia have to be vaccinated against it,[1] rabies still should be highlighted as biological hazard in veterinarian occupation.
- Helminth diseases, such as roundworm, tapeworm and hookworm [41].
- Protozoan diseases, such as cryptosporidiosis [35], giardiasis and toxoplasmosis [41].
- Tick-borne encephalitis and Lyme borreliosis, infectious diseases spread by ticks [56], are also a serious occupational hazard, since veterinarians may have to remove ticks from their patients during their work.

Local infections, consequent of local trauma, caused by accidental needlestick injury or animal bite, are also an issue of concern.

[1] Loomatauditõrje seadus (LTTS), RT I, 23.03.2015, 264, Chapter 4, Division 3, § 43^1

5 Results of the investigation

This chapter explains the results of the assessment of occupational health hazards and safety measures obtained in two ways: through self-administered online questionnaire (in numeral form) and face-to-face interviews (of more explanatory character).

5.1 Self-administered online questionnaire

Figure 1 demonstrates the amount of participants (where 100% is 162), who stated Yes or No to Questions 1, 3, 5 and 10 (of the online questionnaire, respectively) whether risk assessment (RA) has been done at their workplace regarding animal bites and scratches, needlestick and scalpel injuries, lifting large dogs, and zoonotic occupational diseases.

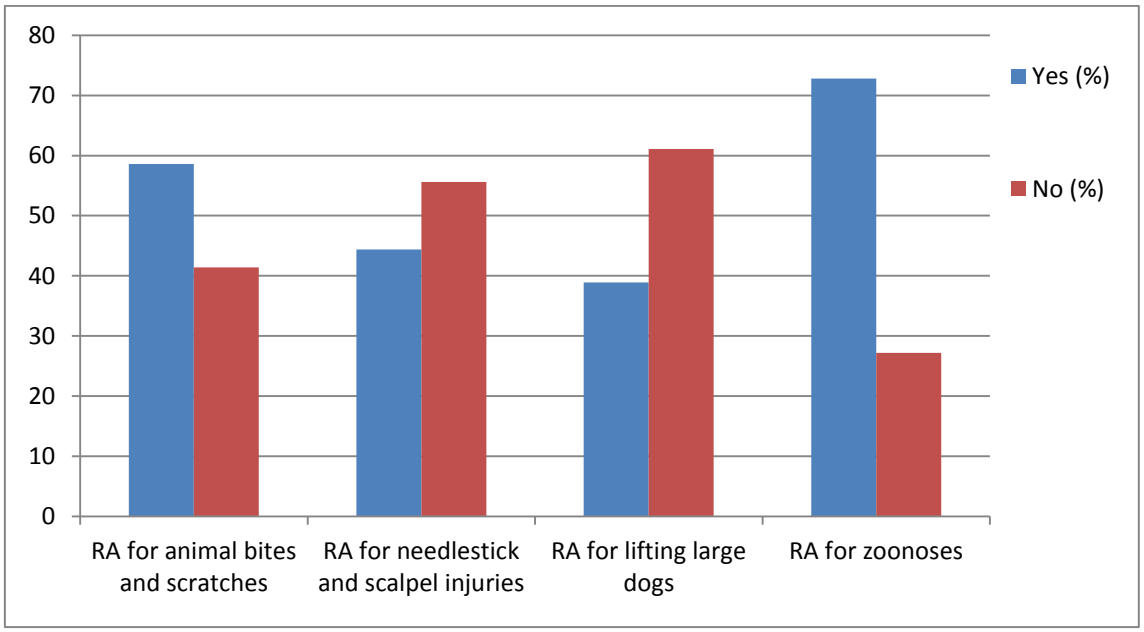

Figure 1. Prevalence of RA in veterinary practices (vertical scale – percentage of the respondents).

It is possible to see on Figure 1, that amount of those who stated No is relatively high: 41.4%, 55.6%, 61.1% and 27.2%, respectively. This is the first example of a case, in which the actual situation in the field is very far from what is prescribed by law -

according to §13(1)(3)[1] of the Occupational Health and Safety Act, the employer is obliged to carry out risk assessments to identify occupational hazards, measure their parameters and evaluate the risks to the health of employees, whereas assessment of the results shall be arranged in a written form.

To the Question 2 about how the risk from animal bites and scratches is minimised in the practice, 99.4% of the participants stated they use muzzles for dogs; 97.5% stated they sedate animals for stressful procedures; 97.5% stated they use towels or other textile to cover the head of an animal; 72.2% stated they use protective gloves/gauntlets; 67.9% stated they practice training of junior staff by more experienced animal handlers; 74.7% stated they provide an advice to seek medical help in case of any sign of infection, which is illustrated below on Figure 2.

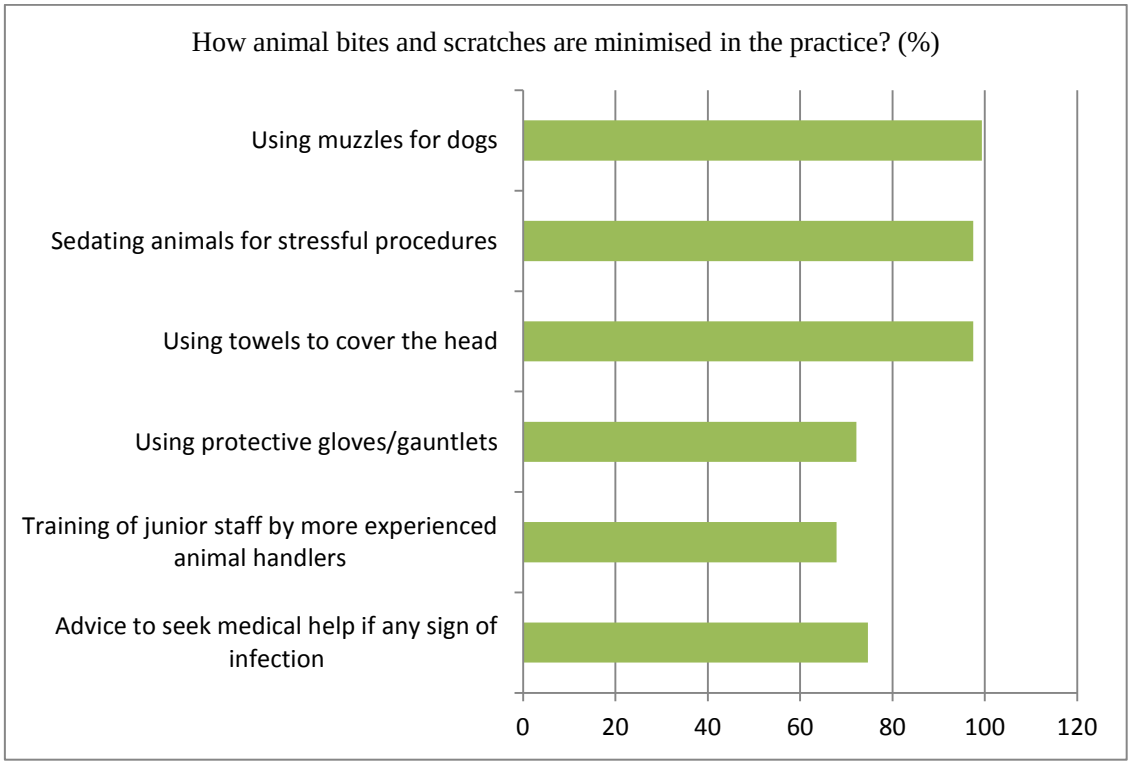

Figure 2. Minimisation of animal bites and scratches (horizontal scale – percentage of the respondents).

Moreover, in addition to the options presented on the Figure, 3 of the respondents added following comments:

[1]TTOS, RT I, 28.04.2017, 9, Chapter 3, § 13 (1)(3)

- We use stress-reduction techniques, try to avoid stress at all, safety equipment is being used - scoop-net if necessary, an injection cage[1], etc. The correct working techniques are important.
- Education of owners, in order to cope with stressful situation and tame the animal.
- Sharing information about a dangerous animal, training dedicated to animal behaviour, reducing stress in animals, by structure of the clinic, optimal performance of procedures and personnel training.

In this regard, it is possible to state that very wide range of protective measures is available and is being actively used throughout the practice.

To the Question 4 about how the risk from so called sharps is minimised in their practice, 74.1% of the respondents stated they have a sharps policy which is followed by personnel; 32.1% stated that needles are disposed of directly rather than being re-sheathed; 98.8% stated they use approved bins for sharps; 80.2% stated the sharps-bin is always close to where the needle is being used, which is illustrated below on Figure 3.

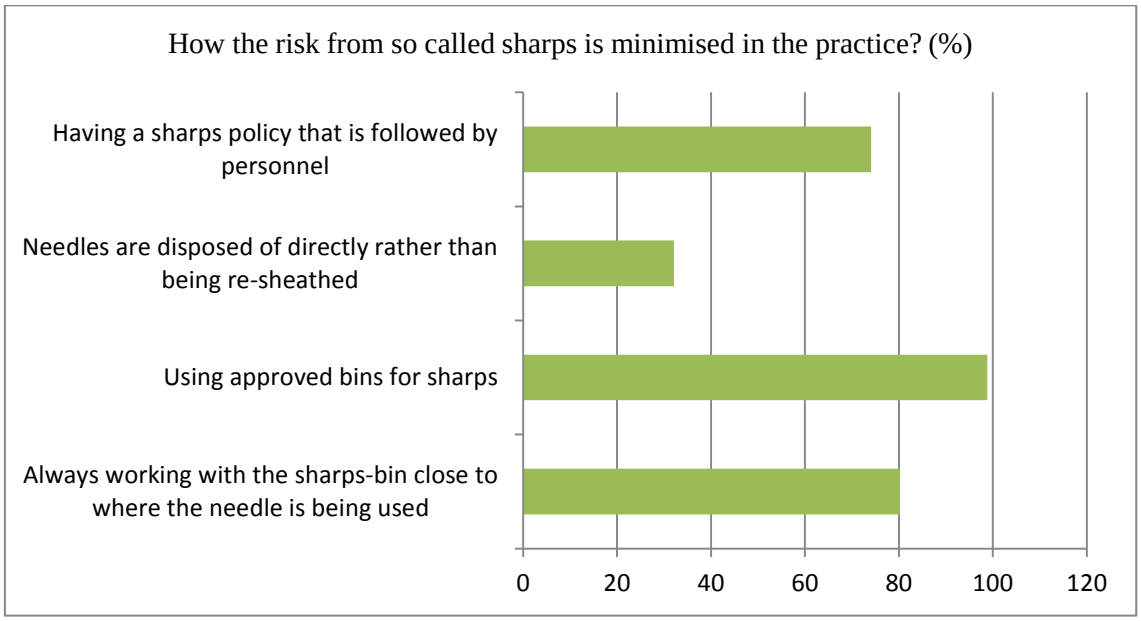

Figure 3. Minimisation of needlestick and scalpel injuries (horizontal scale – percentage of the respondents).

[1] The injection cage is a cage with a special adjustment, which provides the possibility to make an injection safely to those cats which behave aggressively.

Although percentages are pretty high and almost all participants use approved bins for sharps, 25.9% of the participants do not have a sharps policy to follow at their practice, 19.8% do not always work with the sharps-bin close to where the needle is being used and only 32.1% stated that needles are disposed of directly than re-sheathed. This elevates the risk to being needlestick injured, which is not only very unpleasant itself, but can also lead to a serious consequences as this is the easiest way to get a zoonotic disease. This is the second example of a case, in which the actual situation in the field is different from what is prescribed by law – according to § 4(2)[1] and § 4(4)[2] of the Occupational Health and Safety Act, the employer should do everything realizable to design the workplace in a way to avoid occupational damage to health to the maximum possible extent, and provide all the necessary equipment for the same purpose.

To the Question 6 about how the risk from lifting large dogs and required heavy weights is minimised in the practice, 83.3% of the respondents stated that more persons are there to assist in lifting required heavy weights; 91.4% stated they treat heavy dogs on the floor where possible; 13.6% stated they use a hoist; 66% stated they use adjustable tables; 11.7% stated they use trolleys; 6.2% stated they use stretchers; 45.7% stated there is a training on correct lifting technique; 29.6% stated that pet owner may be asked to assist in lifting, which is illustrated below on Figure 4.

[1] TTOS, RT I, 28.04.2017, 9, Chapter 2, § 4 (2)

[2] TTOS, RT I, 28.04.2017, 9, Chapter 2, § 4 (4)

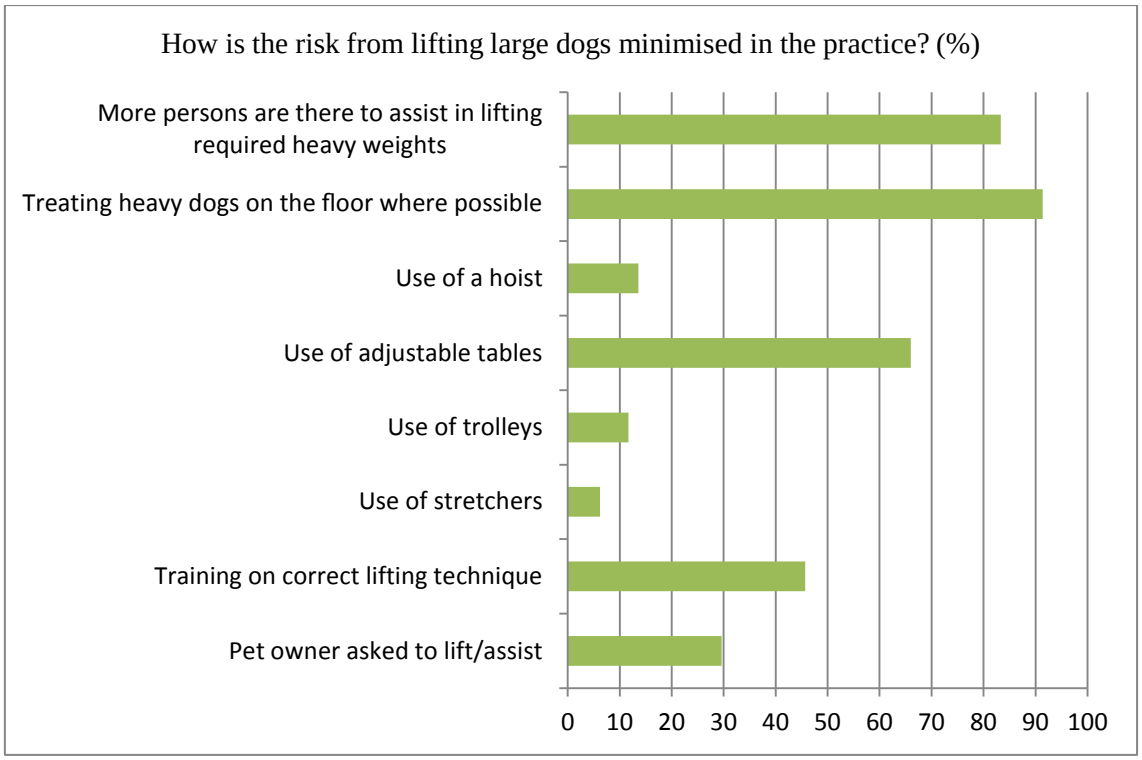

Figure 4. Prevalence of protective measures for lifting required heavy weights (horizontal scale – percentage of the respondents)

It is possible to see on the Figure, that a very wide range of protective measures is available, but not all of the measures are used in the same way: some are used more, some are used less. This may be due to impossibility to allocate enough resources. Those measures which do not require additional investments, such as asking other professionals to assist or treating heavy dogs on the floor, is much more widespread than usage of hoists or trolleys. This may be is a sign of a situation, where there is enough personnel and no need to ask pet owner to assist in lifting, since only 29.6% of participants stated they do so. Nevertheless, adjustable tables, which are a good solution to the problem in question, are used by 66% of participants, which is definitely a good indicator. However, only 45.7% stated that there is training on correct lifting technique in the course of their practice, which disadvantageous since incorrect lifting technique is one of the most widespread reasons of lower back injury, especially if performed on a regular basis, which is exactly the case.

The survey contained the Question 7 whether participants have ever worked with radiographic equipment. Figure 5 demonstrates how often manual restraint is used during an X-ray of an animal.

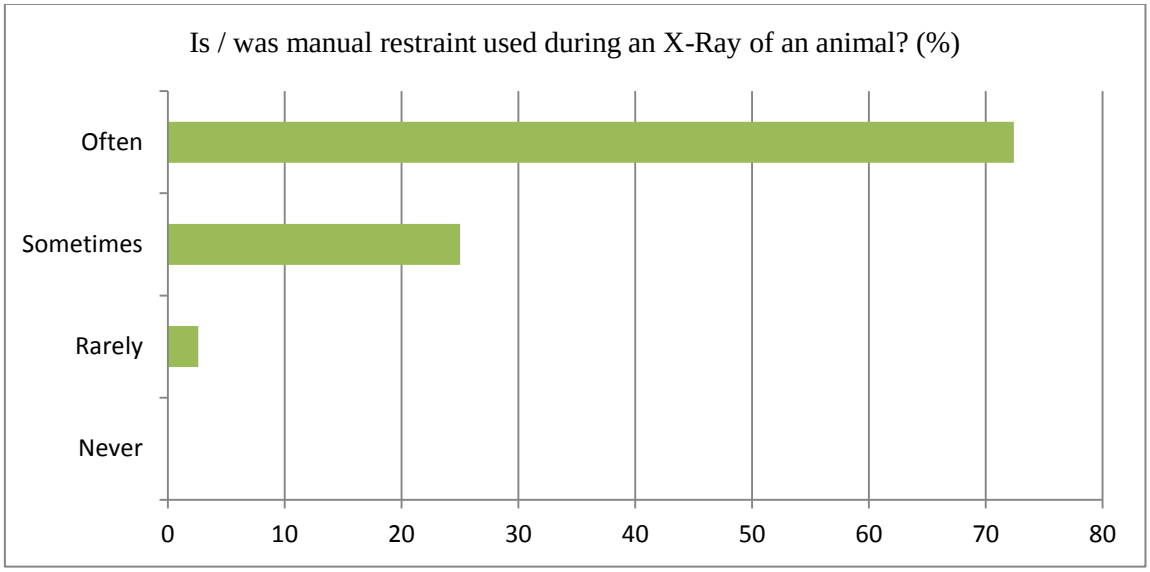

Figure 5. Prevalence of manual restraint during an X-ray of an animal (horizontal scale – percentage of the respondents).

A lot of practicing veterinarians are being frequently exposed, as pretty often animals must be restrained while making the X-ray image and the operator could be very close to the source of radiation while using radiographic equipment (under § 7(1)[1] of the Radiation Act [4], source of radiation is any equipment, radioactive substance or installation emitting ionizing radiation or radioactive substances).

While answering the question whether participants have ever worked with radiographic equipment 45.7% stated Yes and 54.3% stated No. Figure 6 demonstrates (out of those participants, who stated they work or worked with radiographic equipment, N=74) the number of those respondents who wear a dosimeter and who stated the numbers of X-ray exposures performed are subject to regular review in their practice (with a purpose to limit the number to as low as reasonably possible).

[1] Kiirgusseadus (KiS), RT I, 28.06.2016, 2, Chapter 1, § 7 (1)

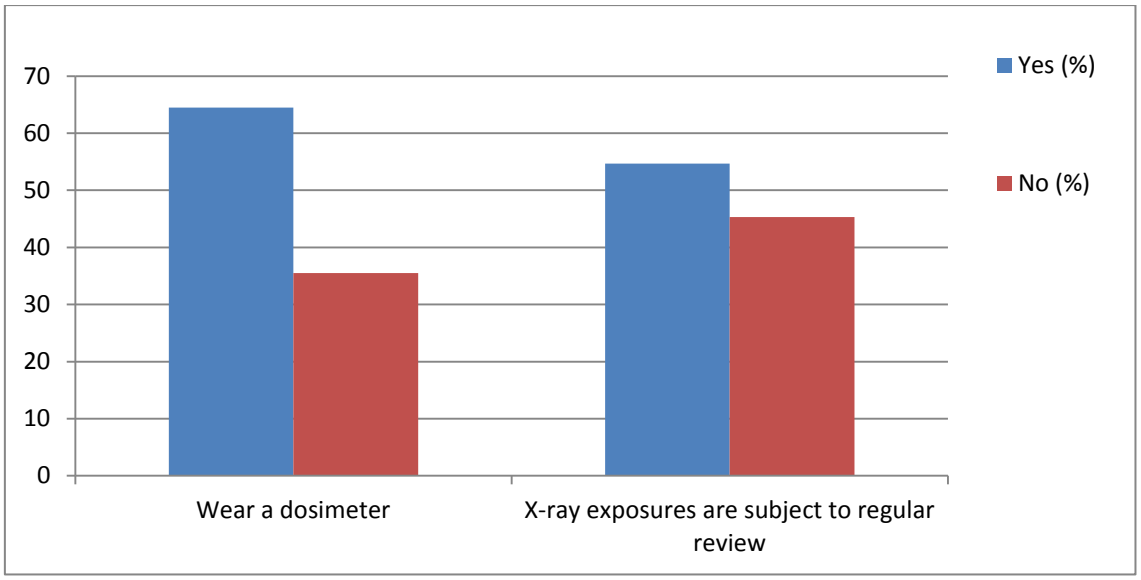

Figure 6. Prevalence of wearing dosimeters and review of X-ray exposures (vertical scale – percentage of the respondents).

It is possible to see on the Figure, that 35.5% (27 real people) stated they do not or did not wear a dosimeter. This is the third example of a case, in which the actual situation in the field is very far from what is prescribed by law, since according to § 50 (1)[1] of the Radiation Act, a holder of a radiation practice licence, in other words the employer, is obliged to organise monitoring of individual doses incurred by exposed workers, and according to § 50 (5)[2] of the Radiation Act make sure measurements conducted during individual dose monitoring are accredited. Under § 23 (1)[3] of the Radiation Act, the sum of exposure doses shall not exceed established limits, which is technically impossible to control without wearing a dosimeter. Moreover, 45.3% (34 real people) stated the numbers of X-ray exposures performed are not subject to regular review in order to limit the number to as low as it is reasonably practicable, which makes wearing dosimeters literally pointless and which is contradictory to:

- § 6 (2)[4] of the OHSA, under which the employer has to implement necessary measures to prevent health risks arising from physical hazards or reduce it as much as possible; and

[1] KiS, RT I, 28.06.2016, 2, Chapter 3, § 50 (1)

[2] KiS, RT I, 28.06.2016, 2, Chapter 3, § 50 (5)

[3] KiS, RT I, 28.06.2016, 2, Chapter 1, § 23 (1)

[4] TTOS, RT I, 28.04.2017, 9, Chapter 2, § 6 (2)

- § 32 (1)(1)[1] of the Radiation Act, under which a holder of a radiation practice licence, in this case the employer, has the obligation to comply with the radiation safety principles.

The survey contained the Question 8 whether the use of computers is a significant part of the daily work. While answering, 72.2% of all the respondents stated Yes and 27.8% stated No to that question. Figure 7 demonstrates what is done to maximise the ergonomic comfort for those participants who answered Yes to the previous question (N=120).

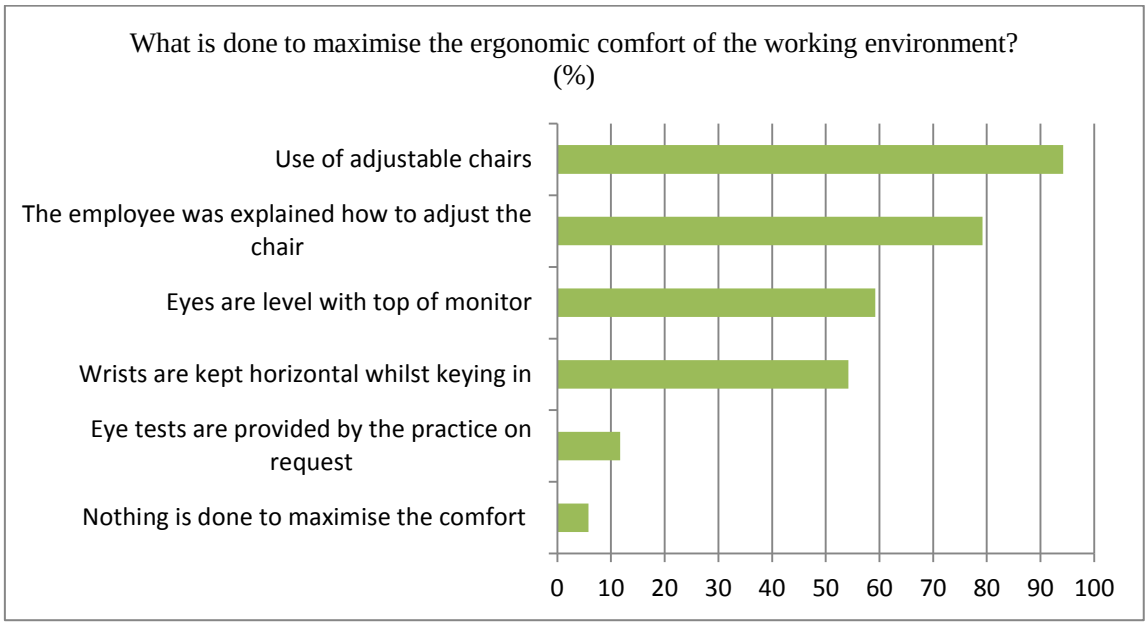

Figure 7. Prevalence of protective measures for computer work (horizontal scale – percentage of the respondents).

In addition, one of those respondents provided a comment:

- We can choose suitable equipment and accessories for ourselves, such as mouse, mouse pad, keypad and monitor.

It is very good that some practices provide eye tests on the request; that 94.2% of the participants have a possibility to use adjustable chairs and 79.2% were explained how to adjust it, but only 59.2% stated their eyes are level with top of monitor and 54.2% stated their wrists are kept horizontal whilst keying in. It basically means that probably all the

[1] KiS, RT I, 28.06.2016, 2, Chapter 3, § 32 (1)(1)

rest perform their computer work sitting on the chair with a tablet, which is a common practice in Estonian clinics and which is not very useful for human body from ergonomic perspective. Furthermore, 5.8% of the participants (7 real people) stated nothing is done to maximise their ergonomic comfort, meaning that none of the options are present at their workplace. This is contradictory to already mentioned article §4(2)[1] of the Occupational Health and Safety Act, according to which the employer should do everything possible to furnish the workplace in a way to avoid any sort of occupational damage to health to the maximum possible extent in order to maintain employee's working ability and well-being.

The survey contained Question 9 about what is done to ensure a member of staff with an existing animal allergy is protected from further exposure. Results are illustrated on the Figure 8.

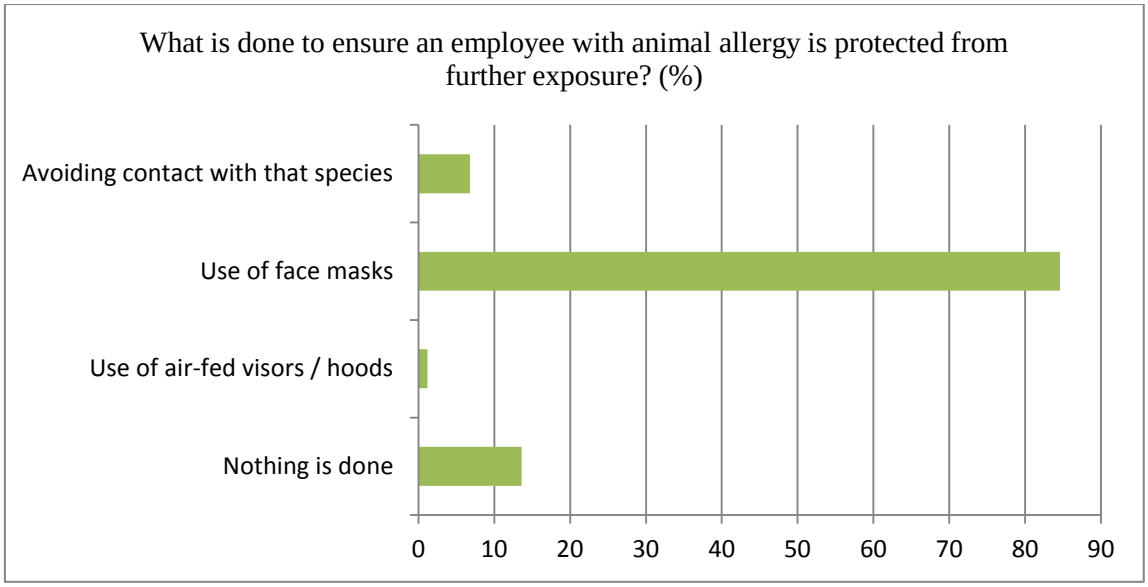

Figure 8. Prevalence of protective measures for animal allergy (horizontal scale – percentage of the respondents).

In addition, one of the respondents provided a comment:

- The presence of anti-allergic agents (both for contact dermatitis and general allergic reaction).

[1] TTOS, RT I, 28.04.2017, 9, Chapter 2, § 4(2)

In this regard it is necessary to mention that this occupational hazard is pretty rare since those who have animal allergy usually do not work in animal care, though there are exceptions. For 6.8% of the respondents it is possible to avoid contact with species causing allergy in their working environment. Speaking about personal protective equipment, no surprize 84.6% of the respondents stated it is possible to use face masks, which is the cheapest way to manage this hazard, while only 1.2% (2 persons) stated there is a possibility to use air-fed visors/hoods in their practice, which are way more expensive than masks. At the same time, 13.6% of the respondents stated nothing is done to minimize this hazard, which is again contradictory to aforementioned article §4(2)[1] of the OHSA.

Figure 9 demonstrates the amount of participants (N=162), who stated Yes or No to Questions 11 and 12 whether any of the staff had any zoonotic illnesses during the last 2 years and whether they have a reporting system for health symptoms that could signify an occupational allergy or zoonotic diseases.

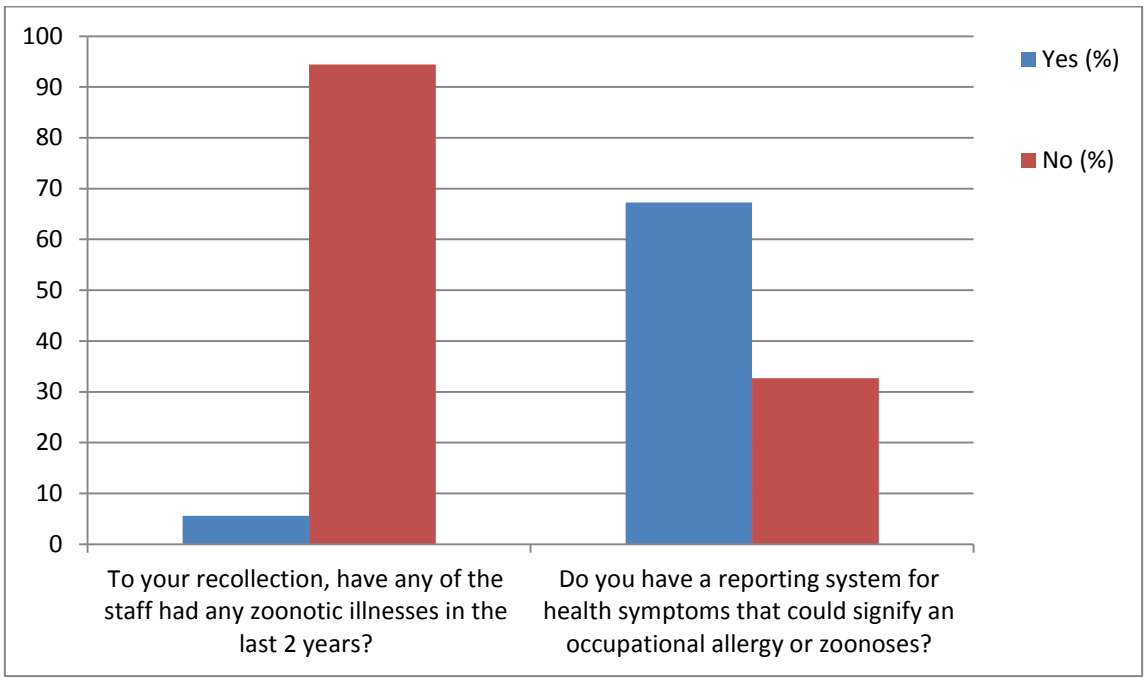

Figure 9. Prevalence of zoonotic diseases and use of reporting systems (vertical scale – percentage of the respondents).

[1] TTOS, RT I, 28.04.2017, 9, Chapter 2, § 4 (2)

It is possible to see on the Figure 9, that 5.6% of the respondents (9 persons) stated Yes and 94.4% stated No (which is a very high indicator) to the question whether any of the staff had any zoonotic illnesses in the last 2 years. This basically means that although 32.7% of the respondents do not have a reporting system for early detection of allergy or zoonosis, the most serious (and dangerous to human health) occupational hazard in veterinary medicine is managed very well. Nevertheless, out of those 9 participants who stated someone had zoonotic illness during last 2 years, 7 listed which illnesses occurred:

- Dermatophytosis (3 cases)
- Fungi (cat ringworm)
- Cryptosporidiosis
- Trichophytosis
- Ringworm

Out of 7 responses, 6 (except for cryptosporidiosis) are just different titles (more or less scientific) of the same disease, dermatophytosis. Dermatophytosis, also commonly known as ringworm, is a fungal infection of skin and is the most frequent fungal infection obtained from pets [26]. It is transmitted by direct contact with an infected animal or surface which was in contact with infected animal [26]. Since fungi are very tenacious, the only options not to get infected are to wear gloves and long-sleeved cloves while in contact with infected animals to eliminate the direct skin contact and properly disinfect surfaces.

Speaking about cryptosporidiosis, it is necessary to mention that this is a protozoan disease which usually affects small intestine; a human can get infected after swallowing the parasite. Cryptosporidium may be found in food, water, soil or surfaces that have been in contact with the feces of infected humans and animals [43]. Hereby, the disease is not only zoonotic but also waterborne: it is possible to get infected by swallowing water contaminated with cryptosporidium, such as water in swimming pools, fountains, lakes and rivers [43]. Since zoonotic reservoirs for the disease are cattle, sheep and goats [18], companion animals are not regarded as a risk factor for cryptosporidiosis throughout various researches [35]. In such a way, it is more likely to get infected in a swimming pool by accidentally swallowing the water or by eating raw vegetables

washed with contaminated water than in the course of companion animal veterinary practice.

The survey contained Question 13 whether participants have ever worked alone or at night at their current/previous workplace. While answering, 43.8% of the respondents stated Yes and 56.2% stated No to that question. Figure 10 demonstrates what is or was done to reduce the psychosocial burden while working alone or at night for those who answered Yes to the previous question (N=75).

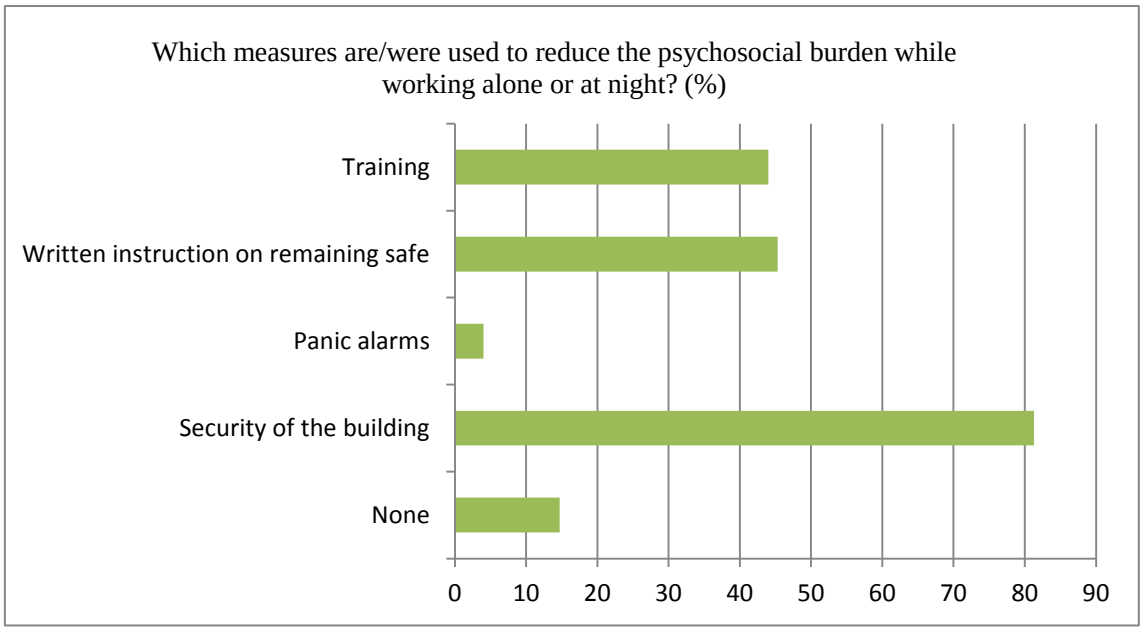

Figure 10. Prevalence of protective measures for psychosocial burden (horizontal scale – percentage of the respondents).

It is possible to see on Figure 10, that only 44% named training as a control measure used to reduce the psychosocial burden; only 45.3% named written instruction on how to remain safe; only 4% named panic alarms and 14.7% stated no measures are used at all. This is contradictory to § 9 (3)[1] of the OHSA, according to which the employer has to organise the work and design the workplace in a way to suit the employee as much as possible to prevent the physical and mental stress of an employee.

The survey contained Question 15 whether participants have a written OHS policy at their workplace. While answering, 82.1% of the respondents stated Yes and 17.9%

[1] TTOS, RT I, 28.04.2017, 9, Chapter 2, § 9(3)

stated No to that question. This is again the example of a situation in which real state of affairs is different from what is prescribed by law, since according to article §13(1)(4)[1] of the OHSA, a written action plan, designating the activities organised in all fields of expertise and at all management levels of the clinic with the aim to prevent or decrease health risks and allocate the necessary resources, should be prepared. Moreover, Figure 11 demonstrates when was the OHS policy last reviewed by those who answered Yes to the previous question (N=133).

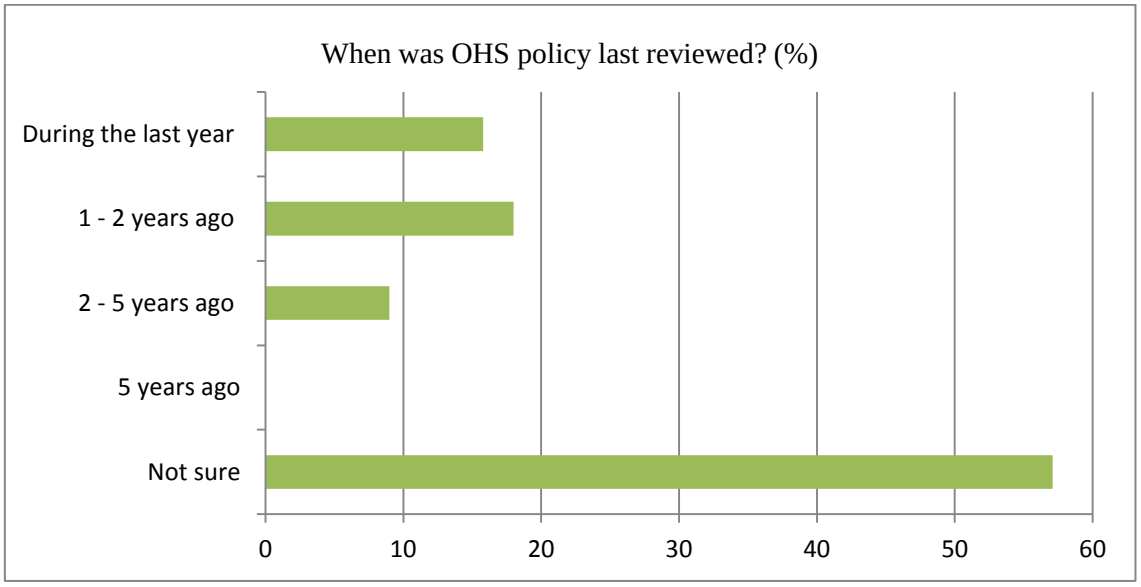

Figure 11. Written OHS policy time indicators (horizontal scale – percentage of the respondents).

It is possible to see on the Figure, that only 15.8% of the respondents stated OHS policy was last reviewed during the last year; 18% stated it was last reviewed 1 - 2 years ago; 9% stated it was last reviewed 2 - 5 years ago; 57.1% of the respondents were not sure when was it last reviewed. At the same time, according to article §13(1)(2)[2] of the OHSA, the employer has to review the organisation of internal control of OHS situation in the working environment *annually*. So, only 15.8% of the respondents indicated that prescribed duties are performed in their practices. Regarding those 57.1% who were not sure - these participants might be unaware about the review. Which means that even if the policy is regularly reviewed, employees are so out of the overall OHS management

[1] TTOS, RT I, 28.04.2017, 9, Chapter 3, § 13 (1)(4)

[2] TTOS, RT I, 28.04.2017, 9, Chapter 3, § 13 (1)(2)

of the clinic, albeit each employee has the right to be aware of such issues of concern under §14 (5)(2)[1] of the OHSA.

Furthermore, the same amount of participants (those who have OHS policy, N=133) provided the response to the question whether OHS policy fully covers the way work is organised, where 59.4% stated that it fully covers it; 17.3% stated it does not fully cover it; 23.3% stated they are not sure about the coverage of work organisation, which is illustrated on Figure 12.

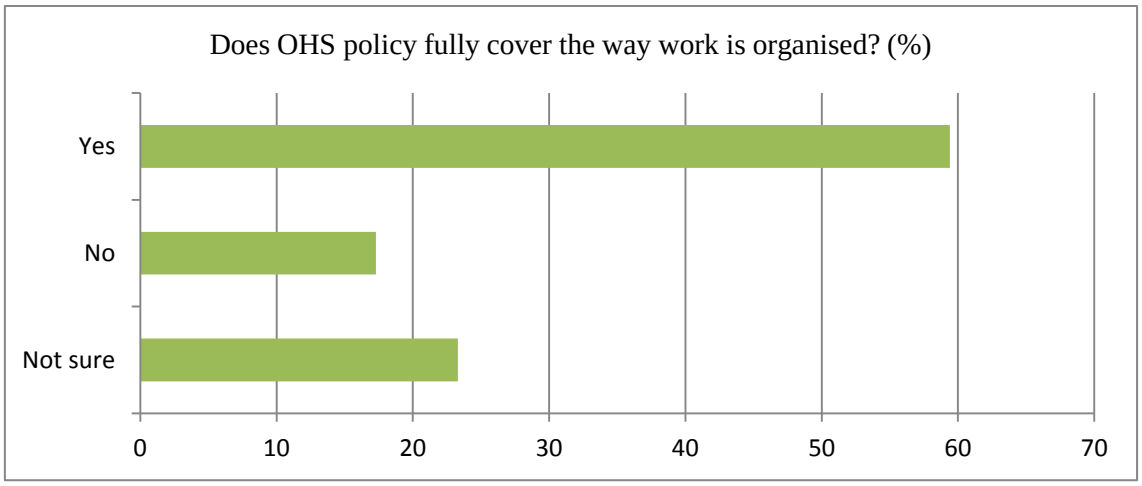

Figure 12. Coverage of the work organisation by OHS policy (horizontal scale – percentage of the respondents).

Since 23.3% of the participants stated they are not sure about the coverage of work organisation, they are most likely unaware of health and safety situation in their clinics. On the example of those 17.3% who stated OHS policy does not fully cover the way work is organised, it is possible to conclude that some working conditions have changed or new working practices were introduced and the policy was not updated after that, which is also contradictory to the §13 (1)(5)[2] of the OHSA, according to which a new risk assessment should be carried out in such cases.

The survey contained Question 16 whether any member of staff has been allocated as responsible for OHS. While answering, 45.6% of all the respondents stated Yes and

[1] TTOS, RT I, 28.04.2017, 9, Chapter 3, § 14 (5)(2)

[2] TTOS, RT I, 28.04.2017, 9, Chapter 3, § 13 (1)(5)

54.4% stated No to that question. According to §16 (2)[1] and §16 (4)[2] of the OHSA, the employer is obliged to allocate a person responsible for OHS, called a working environment specialist, from among the employees or perform these obligation him-/herself. Working environment specialist should be familiar with relevant legislation and working conditions of the clinic, be able to monitor these conditions and take measures to decrease the effect of working environment hazards. In the absence of a competent employee, an employer shall obtain a competent external OHS advice. Although 54.4% of the participants stated no one is allocated as responsible for OHS, it may also mean that the employer considers himself/herself as a working environment specialist but employees are just unaware of that. It should not be like that.

Figure 13 outlines whether the practice has obtained external the OHS advice by those who answered Yes to the previous question (N=77).

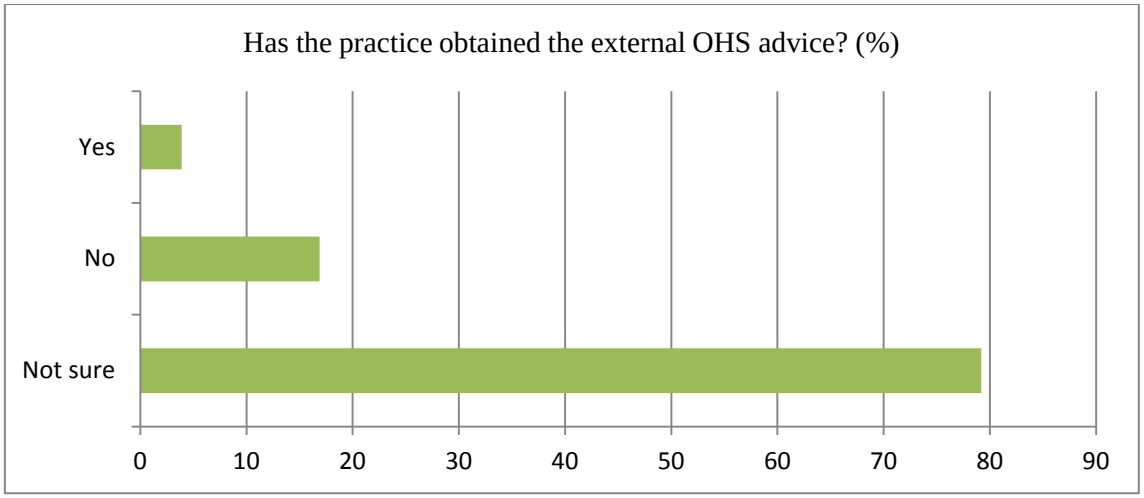

Figure 13. Prevalence of obtained external OHS advice (horizontal scale – percentage of the respondents).

Again, although 3.9% of the participants stated that the practice obtained external OHS advice, 79.2% of the participants are unaware if their practice has obtained it and 16.9% stated that the practice did not obtain the external OHS advice even though under §13(1)(6[2])[3] of the OHSA, the employer is obliged to organise the provision of occupational health services and bear the related costs.

[1] TTOS, RT I, 28.04.2017, 9, Chapter 4, § 16 (2)

[2] TTOS, RT I, 28.04.2017, 9, Chapter 4, § 16 (4)

[3] TTOS, RT I, 28.04.2017, 9, Chapter 3, § 13 (1)(6[2])

Figure 12 below illustrates percentage of the respondents, who stated Yes or No to the Questions 19, 17 and 14:

- Have participants ever been involved in risk assessment or solving OHS concerns?
- Does their practice have regular meetings?
- Was the pre-employment health screening done for them at their current or previous workplace?

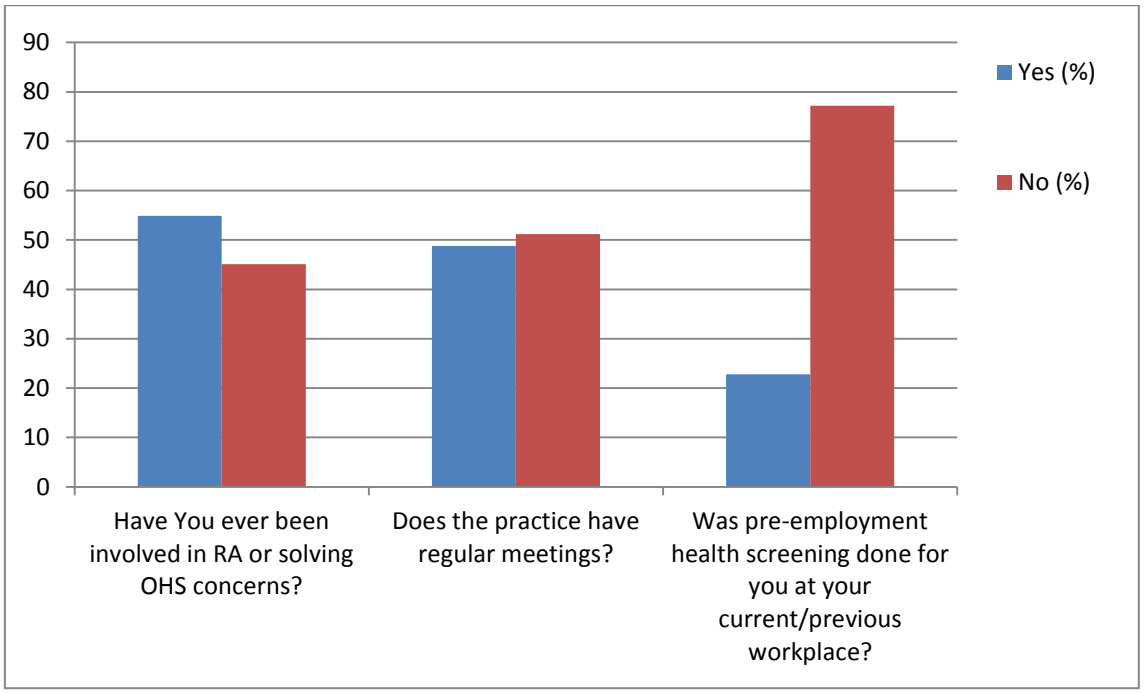

Figure 14. Prevalence of personnel involvement into OHS activities (vertical scale – percentage of the respondents).

Firstly, it is possible to see on Figure 14, that to the question whether participants had ever been involved in risk assessment or solving OHS concerns, 54.9% of the participants stated No, which should not be so: under § 12 (5)[1] of the OHSA, the employer and employees are required to co-operate for the sake of a safe working environment; the employer has to consult with employees in advance in all concerns related to the working environment and take into consideration (where possible)

[1] TTOS, RT I, 28.04.2017, 9, Chapter 3, § 12 (5)

submitted proposals, as well as to involve the employees in the implementation of these plans.

Secondly, it is possible to see on Figure 14 the approximate attitude towards OHS: to the questions whether their practice has regular meetings, 48.8% of the respondents stated Yes and 51.2% stated No. Out of those who stated Yes (N=93), 19.4% stated OHS is a fixed item on the agenda; 80.6% stated it is not. Without a bond to legislation, 19.4% is a very low indicator.

Thirdly, it is possible to see on the Figure whether pre-employment health screening was done for participants at their current or previous workplace: only 22.8% of the respondents stated Yes and 77.2% stated No. This is another example of the case, in which the actual situation in the field is very far from what is prescribed by law, since:

- Under Appendix 1[1] of the Regulation 74 of the Minister of Social Affairs on the Order of Employees Medical Examination [5], employees of veterinarian clinics fall within the scope of application of the regulation thereof;
- Under § 5 (2)[2] of the Order of Employees Medical Examination Regulation, medical examination of the employee starts from pre-employment health screening (initial health check), which should take place during the first month of employment.
- Under § 13 (1)(7)[3] of the OHSA, the employer is obliged to organise the provision of medical examinations for employees whose health may be affected during working processes by occupational hazards or the nature of the work itself.

Out of those who stated Yes (N=45), 35.6% stated that screening was performed by health care provider qualified in occupational medicine; 31.1% stated they are not sure about the exact qualification and 33.3% stated that professional was not qualified in occupational medicine. Which is inappropriate, since according to § 3[4] of the Order of

[1] Töötajate Tervisekontrolli Kord (TTK), RT I, 10.04.2015, 3, § 9, Appendix 1

[2] TTK, RT I, 10.04.2015, 3, § 5 (2)

[3] TTOS, RT I, 28.04.2017, 9, Chapter 3, § 13 (1)(7)

[4] TTK, RT I, 10.04.2015, 3, § 3

Employees Medical Examination Regulation, health examinations should be carried out by a specialist qualified in occupational medicine.

Figure 15 outlines the feedback to the Question 18 about how is OHS information passed onto the staff throughout the practice.

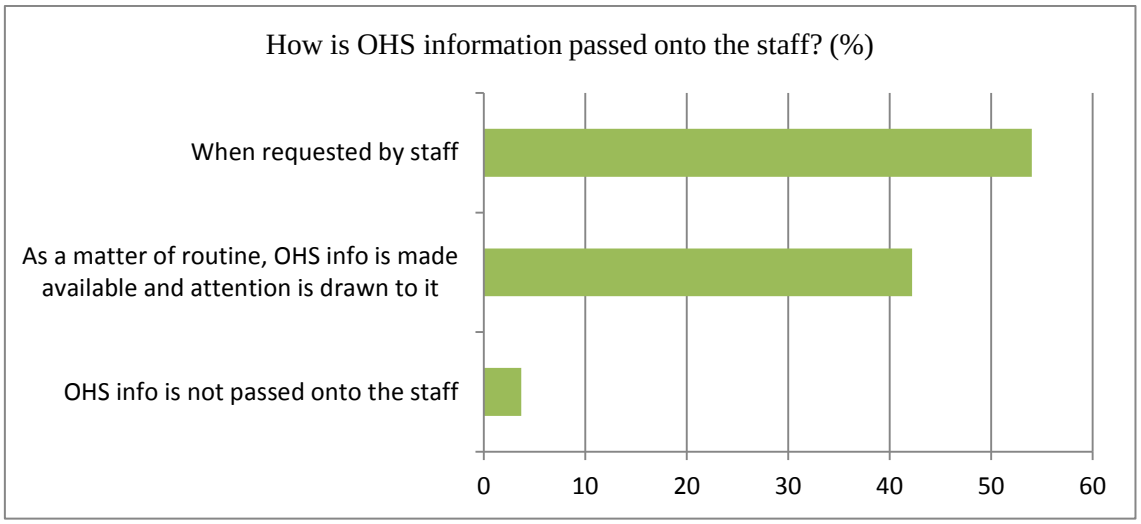

Figure 15. Means to pass OHS info onto the staff (horizontal scale – percentage of the respondents).

In addition to that, one person provided following comment:

- Information is provided if needed.

Figure 15 illustrates approximate attitudes towards OHS outlined in Question 18: 42.2% of the participants stated OHS is passed as a matter of routine, the information is made available and attention is drawn to it, meaning that overall attitude is very good; 54% stated it is passed when requested by staff, which is also acceptable and 3.7% (6 real people) stated OHS information is not passed onto the staff. Although the indicator is relatively low, it is still inappropriate that there are working environments, in which OHS is not relevant at all.

Figure 16 below outlines the feedback to the Question 20 whether OHS is taken into account before new working practices are adopted.

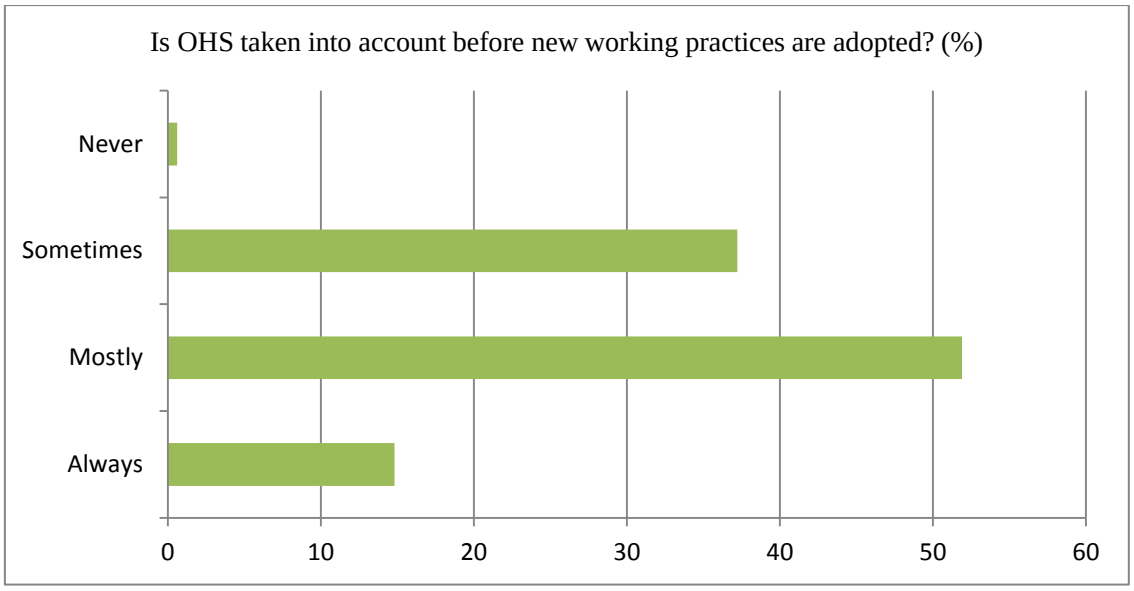

Figure 16. OHS before adoption of new working practices (horizontal scale – percentage of the respondents).

Figure 16 illustrates approximate attitudes towards OHS: although 32.7% stated Sometimes; 51.9% stated Mostly; 14.8% of the respondents stated Always, still 0.6% (1 person) stated Never. Although the majority of indicators are relatively acceptable, the case of that one person who stated Never still constitutes incompatibility with legal requirements: under § 12^1 (2)(8)[1] of the OHSA, the employer has to develop a prevention policy, which should covers various factors regarding the overall organisation of work, whereas taking OHS into account before adoption of new working practices has to be a part of it.

5.2 Depth semi-structured interviews

Face-to-face interviews were conducted with 7 veterinarians during the whole writing process: 1 was carried out in a form of unstructured informal interview as a preparatory step in the very beginning of research; and 6 interviews were carried out in a form of depth interviews, in which semi-structured set of questions (the same used for purposes of self-administered online questionnaire) was used as a basis to guide the discussion. These interviews were conducted during the overall writing period. Out of 7 veterinarians involved, 2 were male and 5 were female.

[1] TTOS, RT I, 28.04.2017, 9, Chapter 3, § 12^1 (2)(8)

So, the aim of personal discussions was to obtain deep-rooted emotions and attitudes towards the issue of concern, showing respondents that their honest opinion is highly valuable and would not affect their practice in any way. Thereby, results of the inerviews were following:

- All the respondents currently work in Tallinn, but were willing to speak not only about their current experience, but also previous, which in some cases took place in Tartu and Kohtla-Järve.
- All the respondents stated that a risk assessment for animal bites and scratches has been done at their workplace and all the listed options to minimize the hazard are present.
- All the respondents stated that a risk assessment for injuries from needles and scalpels has been done at their workplace and they follow a sharps policy, use approved bins; however, two of the respondents stated they had been working previously in places, where the sharps-bins were not always close to where needles were used, which resulted in needlestick injuries, luckily without causing infections.
- All the respondents stated that a risk assessment for lifting large dogs or heavy equipment has been done at their workplace and this hazard is minimized by calling more persons to assist, treating heavy dogs on the floor where possible, use of adjustable tables and training on correct lifting technique.
- All the respondents stated they have worked with an X-ray machine, and that manual restraint is often used during an X-ray of an animal; all of them currently wear a dosimeter, but four of them said they did not do so previously; everyone stated numbers of X-ray exposures performed are subject to regular review to limit the number to as low as it is reasonably practicable. Those two who said they did not wear a dosimeter previously pointed out, that in those previous workplaces numbers of X-ray exposures performed obviously were not subject to regular review.
- Three of the respondents stated they regularly use computers as a significant part of their daily work and that they use (and were explained how to use) adjustable chairs, that their eyes are level with top of monitor and wrists are

kept horizontal whilst keying in order to maximize the comfort of their working environment.

- All of the respondents said it is possible to use facemasks to reduce the exposure to animal allergy. At the same time all mentioned this hazard is pretty rare since those who have animal allergy usually do not work in animal care, though there are exceptions. Respondents in the amount of three also mentioned that in case of allergy to latex, it is possible to use latex-free gloves made of nitrile, other three said they use nitrile gloves only. In addition, all of the respondents said they have anti-allergic medications in their workplaces.
- All of the respondents stated risks are assessed for zoonoses at their workplace; none of the staff had any zoonotic illnesses during the last two years, and that they have a reporting system for health symptoms that could signify zoonotic diseases.
- Two respondents stated they have worked alone in the course of their practice and that they were provided with written instruction on how to remain safe and explanation of these instructions in a form of training; security issues of their clinics were already familiar before.
- All of the respondents stated pre-employment health screening was not done for them. However, one of the respondents added that he has made series of pre-employment rabies vaccinations, which he found necessary for his previous workplace and the employer covered the costs.
- All of the respondents stated they have a written OHS policy, which covers the way work is organised; but none of them could say for sure when it was last reviewed.
- All of the respondents stated there are member of staff allocated as responsible for health and safety, but three of the respondents said that there was no such person in their previous workplace; they are unaware if those previous practices obtained external health and safety advice.
- Four respondents stated their practice has regular meetings, out of which only one respondent said OHS is a fixed item on the agenda.
- Five respondents stated health and safety information is passed onto the staff when requested and only one respondent said aforementioned information is

spread as a matter of routine, the information is made available and attention is drawn to it.

- Four respondents stated they have been involved in risk assessments or in solving health and safety problems; five of the respondents stated OHS is mostly considered before new working practices are adopted in addition to one of the respondents, who said OHS is always taken into account.

6 Discussion of results

This chapter provides the interpretation of self-administered online questionnaire and face-to-face interview results, which constitute the basis for achieving the aims of this research.

6.1 Interpretation of online questionnaire results

In the beginning of online questionnaire distribution, the author of this thesis encountered with very negative attitude and standpoint towards interest and research regarding how occupational hazards are being managed and what is being done to protect health of employees, as if situation in Estonian clinics leaves a lot to be desired. Online questionnaire results showed that the overall situation in the country is much better than expected, and this was confirmed by resluts of the interviews as well. The most positive issues of concern are following:

- High prevalence of risk assessment carried out for zoonotic diseases (72.8%);
- Very low rate of zoonotic diseases obtained at workplace during last two years (5.6%);
- High availability of protective measures for animal bites and scratches (99.4%, 97.5%, 97.5%, 72.2%, 67.9% and 74.7%);
- High prevalence of protective measures for sharps (74.1%, 98.8% and 80.2%).

However, a lot of examples of noncompliance to prescribed legal requirements were detected in the course of investigation. Table 1 provides a summed up overview of exact violations of legal norms and numbers of questons, in which these violations where detected.

Table 1. Prevalence of noncompliance with legal requirements.

Question Number	Provisions of legal acts, which constitute noncompliance
Question 1, 3, 5 and 10 (illustrated on the same Figure)	§13 (1)(3) of the Occupational Health and Safety Act
Question 2	None
Question 4	§ 4 (2) and § 4 (4) of the OHSA
Question 6	None
Question 7	§ 32 (1)(1), § 50 (1) and § 50 (5) of the Radiation Act, § 6 (2) of the OHSA
Question 8	§4 (2) of the OHSA
Question 9	§4 (2) of the OHSA
Question 11 and 12 (illustrated on the same Figure)	None
Question 13	§ 9 (3) of the OHSA
Question 15	§13 (1)(2), §13 (1)(4), §13 (1)(5) and §14 (5)(2) of the OHSA
Question 16	§13 (1)(6^2), §16 (2) and §16 (4) of the OHSA
Question 14 (illustrated on the same Figure with 17 and 19)	§ 3, § 5 (2) of the Order of Employees Medical Examination Regulation and § 13 (1)(7) of the OHSA
Question 17 (illustrated on the same Figure with 14 and 19)	None
Question 19 (illustrated on the same Figure with 14 and 17)	§ 12 (5) of the OHSA
Question 18	None
Question 20	§ 12^1 (2)(8) of the OHSA

So, paragraphs presented on the Table 1 are following:

- § 4 (2), § 4 (4), § 6 (2), § 9(3), § 12^1 (2)(8), § 12 (5), §13 (1)(2), §13 (1)(3), §13(1)(4), §13 (1)(5), §13 (1)(6^2), § 13 (1)(7), §14 (5)(2), §16 (2) and §16 (4) of the Occupational Health and Safety Act;
- § 32 (1)(1) , § 50 (1) and § 50 (5) of the Radiation Act;
- § 3 and § 5 (2) of the Order of Employees Medical Examination Regulation.

In total, violations of 20 paragraphs of three aforementioned legal acts were detected in the course of the investigation.

6.2 Interpretation of interview results

In the course of conversations with respondents, majority of them expressed approximatelly the same opinion, which is following: proper managment of OHS concerns depends directly on the clinic resources and reputation. If the clinic is popular, hires experienced professionals who are able to perform serious surgeries and solve diffult cases – it is more likely that such clinic has a strong health and safety strategy, in which a lot of recouses and attention are allocated to well-being of personnel. In such clinics employers usually understand the value of highly qualified professionals and try to make everything possible to make employees feel comfortable. However, there are not so many of such clinics across the country; on the contrary, there are a lot of less wealthy clinics, in which the biggest part of the employees usually perform more general procedures, such as vaccinations and basic therapeutic screenings. In these clinics a lot depends on the employer and his or her willingness to think through so called adequate safety culture perspective. Habitually, safety culture refers to patterns of behaviour and values that are addressed in working environment regarding OHS [25]. Safety culture should be promoted by commitment of the employer to health and safety, realistic protective measures for dealing with occupational hazards and thorough caring about the workforce [45]. In other words, it is up to the employer how to act with personnel – to address health and safety whenever possible, show respect and care even in case of insufficient resources to invest in OHS; or act otherwise. Unfortunately, all of the respondents expressed the opinion, that there are plenty of these so called other attitudes towards OHS across the country, which was also proved by the numbers obtained through the online questionnaire.

In addition to above-mentioned, all the respondents pointed out that although they are very satisfied with their current workplaces, it has not always been like that: everyone of them stated to have previous experince of poorly managed OHS concerns. Respondents admitted, that among their colleagues for some it is a common practice to migrate from one clinic to another looking for better working conditions. At the same time, other employees cannot aford workplace change for personal reasons and thus

have to deal with managment, which does not treat them well. To the question what exactly they consider as a better conditions, all of the respondents said that although physiological, physical, chemical and biological hazards are always managed somehow, situation with psychosocial hazards is much worse. It was clarified during the discussion, that the overall level of wages within the profession is relatively high, so if practirioners leave the profession, this is most likely not due to the financial issues, but due to inadequate health and safety management or occupational burnouts. It is clear that there are certain issues which constitute the essence of veterinarian profession, and it is impossible to eliminate these. Nevertheless, there are quite a lot of factors which depend on the employer or overall clinic management strategy; these are relevant for current discussion.

6.3 Conclusions

Aims to be achieved with this research were following:

- To investigate to what extent occupational health and safety is being managed;
- To ascertain what is being done to protect physical and mental health of employees within a certain working environment;
- To assess if there are any noncompliances with applicable legal norms.

In order to do so, research questions were answered:

- Potentially harmful occupational hazards which tend to occur in companion animal veterinary practice in Estonia are highlighted and explained in the Chapter 4.3 of the present paper;
- Prevalence of safety measures available in companion animal veterinary practice in Estonia and to what extent these are being followed is discussed in Chapters 5.1, 5.2, 6.1 and 6.2 of the present paper.
- Existing possibilities to manage the aforementioned hazards are discussed in Chapters 8.1, 8.2 and 8.3.

Even though the results of self-administered online questionnaire and face-to-face interviews showed that the overall situation in the country is much better than expected, there are still a lot of dimensions for improvement. Although in several clinics all the occupational hazards are identified, risks are regularly assessed, effective OHS strategy

is implemented, employees are satisfied - such clinics are in the minority. As already explaine above, violations of 20 paragraphs of three applicable legal acts were detected in the course of the investigation, which constitutes the breach of § 12 (1)[1] of the OHSA, under which the employer is obliged to ensure the compliance with occupational health and safety norms in every work-related situation.

[1] TTOS, RT I, 28.04.2017, 9, Chapter 3, § 12 (1)

7 Psychosocial hazards in veterinary medicine

Since the results of the interviews showed that although occupational hazards to physical health of emloyees are always somehow managed, situtation with protection of their mental health is quite the opposite. Thereby, in this chapter psyhosocial hazards are discussed in more detail.

Generally speaking, psychosocial hazards are those which affect psychological health of employees in a negative way; those, which refer to a harmful emotional response. It occurs when employee feels some sort of contradiction and disagreement between the challenges faced at the workplace and his or her capabilities and needs [20]. Stress occurs under a wide range of circumstances during daily practices, but it is not always something bad – in a form of pressure and challenge it may also be motivating when it is caused by positive reasons: it helps to keep workers alert, may elevate their ability to learn. The situation turns into bad dimension if the stress is the reason of negative context, is used to excuse poor management practices, and is too high for the person in question or lasts for too long period of time. Furthermore, a clear understanding of occupational stress might be difficult because generally stress (and related consequences) depends on various circumstances: uncomfortable situation for one person may be suitable for another; some sort of task, which might be easily managed on one day can seem impossible to conduct due to personal problems [19]. However, there might be confusion between pressure or challenge and occupational stress in its worst scenario: pressure at the workplace is a normal case and thus unavoidable due to the demands of almost any profession, while with occupational stress it is quite the opposite. Psychosocial hazards are often underestimated in working environments full of other-type-hazards, which may severely damage physical health. Nonetheless, psychosocial hazards also cause serious consequences to human health and well-being, so occupational stress, as for being part of it, should be eliminated or managed as effectively as possible [12].

It is pretty obvious, that stress and burnouts may occur in any occupation. However, psychosocial risk factors have long been known as an important concern of animal care, which is characterized with prolonged effects of emotional stress and pressure that arise from a higher responsibility level [24]. Various researches show that animal care employees in general and veterinarians in particular have higher rates of depression and burnout linked to occupational stress [73]. Psychosocial hazards, which tend to occur in veterinary medicine, are following:

- Lack of training (characterized by being under-skilled for the job), which may lead to physical trauma or/and treatment errors [62].
- Monotonous tasks (characterized by lack of variety of these tasks) and disproportionate task demands: having too much/too little to do, or even uncertainty regarding what is expected at work [24], [62].
- Working under very aggressive time pressure, which is very hard not only mentally but also physically (for example when a veterinary surgeon has to perform several surgeries during the same day one right after another, with very small amount of time for rest between these surgeries) [62].
- Poor organizational climate, which constitutes in unfair management practices and conflicting communication styles - in other words, the absence of agreed procedures for dealing with problems, which leads to fear of discussing problems with superiors [24], [62].
- Lack of opportunity for career development.
- Very long, inflexible or otherwise poorly designed shifts, which end up in work overload and feeling of insecurity from being exposed to poor pet discipline, infectious diseases and other traditional hazards to health [62].
- Lack of personnel at workplace, which may eventually lead to physical injury or affect treatment process (for example when assistant is needed to restrain an aggressive animal for minor procedures or to assist during surgeries, but the assistant is missing and veterinarian him/herself has to perform the task alone) [60].
- Insufficiency of resources needed for most effective work performance (such cases happen if there is no relevant equipment or medications needed to treat an animal, so veterinarian has to turn the patient elsewhere) [60].

- Bad relationship with colleagues characterized by conflicts with other employees, or by different personal values from those in the working environment, which is especially relevant in veterinary medicine due to a necessity to make psychologically hard decisions [60].
- Decreased pet owner satisfaction, caused by unreasonably onerous attitude towards animal health. Some people just do not realize (probably due to the lack of relevant knowledge) that animal organism is very complex from biological perspective, and is exposed to a variety of diseases. Owners of this type are usually very surprised and dissatisfied with the fact that they have to dedicate a lot of time and effort to take care of an ill animal in need of a serious treatment, which costs a lot. Dissatisfaction is usually expressed to a veterinarian.
- Inadequate and cruel patient owner behavior. In some cases people notice that something is wrong with an animal (refuse to eat and/or drink, impaired digestion, untypical behavior) and just do not react. As a consequence, they appear in the clinic when it is too late and the animal, who has been suffering for a long while, is dying or very serious and expensive treatment is needed. Some owners then agree with treatment plan, some prefer not to spend money on that and ask for euthanasia. Such cases are especially hard, since the purpose of veterinarian profession is to treat animals and to save lives. There is big difference between euthanasia in case when it is impossible to help, and in case owners themselves had been leaving an animal in a helpless state by inactivity which transformed into critical condition, and do not want to act responsibly with the consequences. This is, by the way, prohibited under the Animal Protection Act[1] of the Republic of Estonia [1] and happens every once in a while. In both scenarios patient owners usually act aggressively and blame veterinarians.
- Dealing with seriously ill patients and, respectively, death. The situation is especially sharp in emergency cases, as it involves in its practice dealing with vulnerable conditions of the patients, multiple sources of uncertainty, mixed with a very stressful environment [36].
- Performance of euthanasia. Termination of life of a living creature with one's own hands is certainly a stress for a healthy psyche, especially when performed

[1]Loomakaitseseadus (LoKS), RT I, 18.12.2012, 18, Chapter 2, § 4 (1)

on a regular basis. Some research studies in the US found the direct link between the necessity to regularly euthanize animals and the development of post-traumatic stress disorders [54]. Furthermore, sometimes pet owners bring absolutely healthy young well-behaving animals and ask for euthanasia just because these owners are bored and do not like their animals anymore. Even though majority of veterinarians refuse to do so, they still know there is always someone who is ready to do that for high price, or such owners will just throw the animal away on the street or forest and it will eventually die. This is just exhausting.

- Dealing with client grief. Fortunately not all the pet owners behave like those described above. The majority of them are very caring and truly love their animals, thus, become absolutely broken-hearted then they receive sorrowful news about health of their pets. Explaining the medical side and being there for pet owners in such moments, holding their hands, dealing with tears and emotional pain may be very distressing for a veterinarian or veterinarian assistant.
- Overall imperfection of results. Veterinarian profession usually attracts perfectionist personality types, who are very emotionally involved in their work and to whom it is especially hard to cope with failure. It is hard to admit that their performance in practice is not perfect when their patients do not recover as they were supposed to. In some cases veterinarians are not able to admit that they are unable to cope or do not feel well, thus, worsening their mental health early symptoms [66].

7.1 Effects on physical and mental health

There is no secret, that stress affects different people in different ways: some people are more emotionally stable, some are less. At the same time, the long exposure to work stress can cause unusual behavior and contribute to poor physical and mental health. In extreme cases, traumatic events at work may lead to psychological problems, loss of career satisfaction and a further decrease in personal accomplishment and professional efficacy [14]. While being exposed to work-related stress, it becomes difficult to differentiate and strike the balance between working and non-working environments,

not take work problems back home, which is not surprising considering how occupational stress can affect human organism in three ways:

- Psychological, which causes job dissatisfaction, difficulties in decision making, demotion of self-esteem, depression, depersonalization or cynicism (associated with withdrawal, lack of motivation and emotional distance with pet owners, patients or co-workers) [62].
- Behavioral, which may cause sleep problems leading to irritability, inability to concentrate, deep feeling of fatigue [62].
- Physical, which may cause headaches and changes in blood pressure [62].

7.2 Effects on practice

Psychosocial hazards at workplace affect not only physical and mental health of employees, but also the organization itself. If a large number of fellow colleagues are exposed, performance of the whole clinic is then challenged [19]. Clinics with unhealthy working environments are usually characterized by decreased commitment to work, damaged reputation among its workers and externally (due to the fact that Estonia is a small country, there are not that many specialists in the area in question, so they share opinions), all of which lead do impaired overall performance. Moreover, such clinics usually have a lot of complaints from clients (pet owners) and may even start to lose their clients, as in animal care both patients and clients are very sensitive. There are cases, when one or another veterinarian changes workplace, and clients, whose pets are already familiar with that veterinarian, follow this person and thus change the clinic.

Furthermore, one of the most dangerous effects of occupational stress provides as follows: it makes employees less caring about their health and thus less attentive to protective measures [20]. It is not an easy task to tackle psychosocial hazards in veterinary practice due to the specific nature of this occupation and variety of factors depending on clients, animals and illnesses. Thereby, it is exceptionally important for both employees and employers to do their best to make determined efforts to deal with hazards in question in order to create pleasant and friendly working environment to the maximum possible extent.

8 Occupational health and safety management systems

In order to keep personnel safe so that people would not have to leave the labor market prematurely there is a need to create safe and comfortable working environment. In order to do so, certain staregy or management system should be introduced and implemented. The notion of occupational health and safety management system (OHSMS) is known throughout the research in the field [23] and refers to a systematic approach for OHS management, which helps to create safer working environments, comply with applicable law, enhance the reputation and, thus, improve OHS performance [47]. The OHSMS could be effective in case if:

- There is a commitment to manage OHS expressed by the employer, who should demonstrate the care towards well-being of personnel by involvement of employees into the development of OHSMSs [44]; and
- OHSMS fits into overall management system of the clinic [71].

8.1 Foreword to risk assessment

In order to implement effective OHSMSs in Estonian veterinary clinics, it is first necessary to review all the existing hazards within the framework of risk assessment. In OHS risk assessment is a method used to identify and analyse all occupational hazards, and evaluate the risk that a hazard will actually cause harm [49]. So, identification and analysis are made within a certain working environment, evaluation is then conducted to find out how severe the risk is. Prioritization of occupational hazards, risks and calculation of impacts are also parts of risk assessment. To be more concrete, the most widespread tool used to prioritize risks is so called risk matrix. The risk matrix is a tool which aims to prioritize occupational risks by estimating the probability of occurrence and severity of impact of these risks [38].

There are a lot of risk matrix variations and templates throughout the research and relevant online sources; Figure 17 presents the example of such template.

(F) Frequency				(S) Severity				Hazard Rating	Estimated Risk	(R) Risk Rating	Level of Risk
1	=	Zero to Very Low	x	1	=	No Injury or Illness	=	0 - 5	MINOR RISK	1	LOW
2	=	Very unlikely		2	=	Minor Injury / ies or Illness		5 - 11	ACCEPTABLE RISK	2	
3	=	Unlikely		3	=	'Lost Time' Injury or Illness		12 - 17	MODERATE RISK	3	MEDIUM
4	=	Likely		4	=	Over 3 Day' Injury or Illness		18 - 23	SIGNIFICANT RISK	4	
5	=	Very likely		5	=	Major Injury or Illness		24 - 29	HIGH RISK	5	HIGH
6	=	Almost certain		6	=	Fatality, Disabling Injury / Illness etc		30 - 36	EXTREME RISK	6	

Figure 17. General risk assessment matrix for risk prioritization and impact assessment in London Zoo Veterinary Department, June 2015 [75]

When determination is ready, it becomes possible to discuss what measures should be implemented to effectively control existing dangers. There are several steps to make while performing risk assessment, these are provided below [21].

Step 1: identification of hazards that may potentially cause harm in that particular clinic and determination of who might be harmed and how [49]. Is it only veterinarians who are exposed to one or another hazard, or assistants as well; what about visitors of the clinic – clients (pet owners), workers who deliver medications or come to maintain the equipment?

Step 2: evaluation of the likelihood of hazards in normal operational situations, less standard events and potential situations [49]. The essence of veterinarian profession is to treat animals, so those who provide animal care are exposed to bites and scratches on a daily basis, so the likelihood is very high. At the same time, speaking about pesticide poisoning, which may occur while treating animals from fleas and ticks, situation is quite the opposite. Probability of poisoning depends on packaging of that pesticide, behaviour of an animal and virtuosity of the performer. Moreover, the issue is mostly relevant in spring and summer, not during the whole year. Thereby, the likelihood of pesticide poisoning is relatively low.

Step 3: overview of all the relevant health and safety information about the hazard, such as manufacturer literature in case of equipment, similar workplace inspection reports and, if possible, workplace statistics [28].

Step 4: determination of the most suitable ways to eliminate the hazard; necessity to tackle the risk if the hazard cannot be eliminated due to the specifics of work performed [49]. For instance it is impossible to eliminate radiation exposure while making X-ray images, but it is possible to minimize it by correct use of protective garments, forehanded maintenance of the equipment and by wearing dosimeters [28].

Step 5: monitoring the assessment on a regular basis and modernization when necessary to make sure the it is still valid [40], since new practices are always introduced once in a while.

Health and safety practices are usually seen as inconvenience, but these are in place for one and only, but very important purpose: protect people at work. Risk assessments are significant part of the effective OHSMS and help to:

- Prevent injuries and occupational diseases, especially if carried out already during planning stage of one or another working environment [28];
- Elevate awareness of occupational hazards and risks;
- Understand who else might be at risk and explain necessity of protective measures;
- Validate if existing control measures are appropriate or further work on it should be conducted [40].
- Ascertain whether any special control program is needed for management of a particular hazard [40].

Following factors also should be taken into account:

- Duration and frequency of tasks to be accomplished [28];
- Location of tasks to be accomplished[40];
- What training employees received previously, what is their overall experience [49];
- Human factor: how the majority of people conceivably might react in particular circumstances [49].

The last factor is especially relevant in the context of veterinary medicine, as it is about communication of a very special kind, in which both humans and animals have typical behavioural responses and thus affect each other.

8.2 Occupational health and safety management tools

On the basis of the aforesaid the logical question arises: how to perform the OHSMS (with risk assessment as a part of it), who is qualified enough to perform duties of this kind? On one hand, it is possible to purchase advice and other necessary services from traditional enterprises competent in OHS. On the other hand, today, in the 21st century, means of information and communication technology provide more diverse range of possibilities. For example, in 2014 a review of online OHSMS tools was conducted for the European Agency for Safety and Health at Work (EU-OSHA), in which researchers reviewed several OHSMS tools to gain a better understanding of available instruments which might be used by the citizens of the European Union [68]. Use of such instruments could be a good alternative, since for small private companies, such as companion animal veterinary clinics in Estonia, the costs for implementation of OHSMS with help of traditional OHS services may be unbearably expensive. Herewith, EU-OSHA supports development of hands-on instruments to adjust and improve working environments, which are web-based and at some point interactive, since there is a need for some active decision-making from the user, and the tool has to guide the user throughout the process (as opposed to a traditional instruments such as factsheets) [68].

8.3 Estonian OHS management solutions

It is pretty obvious, that while applying some online tool, the most convenient option to perform the OHSMS is to use the tool produced in Estonia. Two examples of such tools are discussed in this paper.

The first one, Tööbik, is a tool designed in Estonia for workplace administration, which was ordered by the Ministry of Social Affairs. Tööbik is a web-based solution designed for enterprises, which enables to observe company's working environment and various work related activities (such as personnel training and conduction of medical examinations) and carry out risk assessments [46]. In addition to that, Tööbik allows to link the data entered and personnel of the company; get notifications about working environment activities related to employees; get information about events related to the overall working environment [69]. Moreover, if correctly filled Tööbik provides an overview of occupationa hazards within a working environment visible not only to the

employer, but also each employee is able to see the overview of hazards and workplace risks involved, relevant exactly for that person in question [46]. Hence, Tööbik is one of the dimensions to make implementation of OHSMS as effective as possible.

The second tool, Virtual Working Environment Specialist (VITS), is a software designed in Estonia in March 2017, by Jaanika Jelistratov and Kristi Jõeorg, with the aim to make the organization of occupational health and safety at work easier, cheaper and more efficient [57]. VITS helps enterprises to compose and manage their OHS documentation in a convenient way: it provides the possibility to review the employees who have completed occupational health and safety guidance and allows to reduce manual typing to the maximum possible extent, since in VITS many operations are automated. Moreover, VITS helps to recall up-coming health checks, so it is no longer necessary to manually work through the Excel data, approaching whom and when to send to health check: 60-days-early notification, that medical examination of a certain employee is about to expire, appears in the e-mail instead. In addition, as of today it is also possible to keep records of personal protective equipment [67].

8.4 Changing the attitude towards OHS

Regardless of the existing possibilities to improve OHS concerns if these are far from perfect, the most important are will and willingness of the employer to go to that dimension. Sometimes the employer is interested in increasing the profit and often sees employees as means of fulfilling this goal only. According to the results of the investigation conducted for the present paper, employees highly appreciate a good attitude towards them and migrate from clinic to clinic looking for better working conditions and better treatment. Employers described above tend to forget that care may not necessarily be expressed financially, but it always provides a greater feedback and better work performace.

Thereby, changing the attitude towards OHS and the establishment of a consistent safety culture should become number one priority. In order to do so, several steps should be undertaken. First, everyone should share the same values and be in the same boat: employees have to take care of their own health and the employer should take care of their health. Second, employees should be educated about the importance of reporting accidents, even if these are just small scratches or clean needlesticks. Here comes also

the accident/incident investigation process to eventually get to the root cause of accidents/incidents. If statistics of such cases is collected, it would be easier to find out why these happen, may be the workplace is not designed in the most convenient manner or just provision of an extra sharps bin (which is very cheap and easy) would solve the problem. Third, there should be trust – employees should feel free to notify the superior about their concerns, not to hide these out of fear of further problems. Finally, creation of a healthy safety culture should be visible to everyone – it keeps personnel motivated throughout the process [45].

9 Summary

This chapter presents the main results of this master thesis and draws a line under all discussed above. The aims to be acheived with this thesis were to investigate how occupational health and safety is being managed and what is being done to protect physical and mental health of employees within a certain working environment; to assess if there are any noncompliances with applicable legal norms. Working environment chosen was veterinary practice - a medical specialty concerned with preventive medicine, zoonosis, parasitology and epidemiology.

The results of self-administered online questionnaire have shown several positive dimensions: the overall situation in the country is much better than expected, there is a high prevalence of risk assessments carried out for zoonotic diseases; very low rate of zoonotic diseases obtained at workplace during last two years; and high availability of protective measures for animal bites and needlestick injuries. However, violations of 20 paragraphs of three applicable legal acts were detected in the course of the investigation. Moreover, the results of face-to-face interviews showed that although physical and biological occupational hazards are still main for companion animal veterinary professionals, as of today psychosocial hazards have become the most controversial. Namely these hazards make veterinarian practitioners feel deeply unsatisfied with their working conditions, migrate from clinic to clinic looking for better working conditions and may even serve as a reason for prematurely leaving the profession, which is a serious loss for the overall well-being of society, since nowadays pet animals are fully accepted family members, who have a great influence on their owners and who are in need of lifelong medical attention.

Summing up, it is necessary to state that research conducted within the framework of this thesis helped to gain a deeper understanding of fundamental problematics of veterinarian profession and correlation of all the main nuances and features of this discipline. Conclusions identified in the present paper provide a clearer overview of the state of affairs in this area of expertise in Estonia, so the research may also have a

practical advantage for general informative utility, and for companion animal veterinarian professionals to be - as a guide for better perception of their future practice.

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Legal acts

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[2] Infectious Animal Disease Control Act
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Appendix 1 - Self-administered online questionnaire in English

Questionnaire from the research paper Management of Occupational Health Risks in Small-animal Veterinary Practices, written by D'Souza, et al. (2009) and published in Occupational Medicine, is illustrated below.

INTRODUCTION

Dear Veterinarians and Veterinarian Assistants,

Occupational health science and ergonomics master student is in need of Your help! Could You please spent 10 minutes of Your time on helping me to collect the data for my research paper, titled **Prevalence of Occupational Exposures and Protective Measures in Companion Animal Veterinary Practice**

The survey is aiming to find out how occupational health hazards are being managed and what is being done to protect physical and mental health of employees.

The survey is anonymous and does not contain any questions related to sensitive personal data.

I would highly appreciate Your contribution and thank You in advance!

Assessment of Occupational Health Hazards and Safety Measures

1. Has a risk assessment for animal bites and scratches been done at your workplace? (please tick one)

   - Yes
   - No

2. How is the risk from this hazard minimised in the practice? (please tick one or more)

   - Using muzzles for dogs
   - Sedating animals for stressful procedures
   - Using towels etc. to cover the head
   - Using protective gloves/gauntlets
   - Training of junior staff by more experienced animal handlers
   - Advice to seek medical help if any sign of infection

- The risk is not minimized
- Other; please specify

3. Has a risk assessment for injuries from needles and scalpels been done at your workplace? (please tick one)

   - Yes
   - No

4. How is the risk from so called sharps minimised in the practice? (please tick one or more)

   - Having a sharps policy that staff follow
   - Needles are disposed of directly rather than being re-sheathed
   - Using approved bins for sharps
   - Always working with the sharps-bin close to where the needle is being used
   - The risk is not minimized
   - Other; please specify

5. Has a risk assessment for lifting large dogs or heavy equipment been done at your workplace? (please tick one)

   - Yes
   - No

6. How is the risk from this hazard minimised in the practice? (please tick one or more)

   - More persons are there to assist in lifting required heavy weights
   - Treating heavy dogs on the floor where possible
   - Use of a hoist
   - Use of adjustable tables
   - Use of trolleys
   - Use of stretchers
   - Training on correct lifting technique
   - Pet owner asked to lift/assist
   - The risk is not minimized
   - Other; please specify

7. Have you ever worked with an X-Ray machine? (please tick one)

   - Yes
   - No

   If No, please proceed to the question No. 8

   If Yes,
   a) Do / Did You wear a dosimeter? (please tick one)

- Yes
- No

b) Is / was manual restraint used during an X-Ray of an animal? (please tick one)

- Often
- Sometimes
- Rarely
- Never

c) Are the numbers of X-Ray exposures performed subject to regular review, in order to limit the number to as low as is reasonably practicable? E.g. by reducing the number of under/over exposures (please tick one)

- Yes
- No

8. Do you regularly use computers as a significant part of your daily work? (please tick one)

   - Yes
   - No

   If Yes, what is done to maximise the comfort of Your working environment? (please tick one or more)

   - Use of adjustable chairs
   - The employee has been told how to adjust the chair
   - Eyes are level with top of monitor
   - Wrists are kept horizontal whilst keying in
   - Eye tests are provided by the practice on request
   - Nothing is done to maximise the comfort of working environment
   - Other; please specify

9. What is done to ensure a member of staff with an existing animal allergy would be protected from further exposure? (please tick one or more)

   - Avoiding contact with that species
   - Usage of face masks
   - Air-fed visors / hoods
   - Nothing is done
   - Other; please specify

10. Zoonoses are a well-known hazard in veterinarian profession. Has the risk been assessed at Your workplace? (please tick one)

    - Yes
    - No

11. To Your recollection, have any of the staff had any zoonotic illnesses in the last 2 years? (please tick one)

    - Yes
    - No

    If Yes, please list which illnesses occurred.

    _

12. Do you have a reporting system for health symptoms that could signify an occupational allergy or zoonoses? (please tick one)

    - Yes
    - No

13. Have You ever worked alone or at night at your current/previous workplace? (please tick one)

    - Yes
    - No

    If Yes, what control measures are used to reduce the psychosocial burden? (please tick one or more)
    - Training
    - Written instruction on how to remain safe
    - Panic alarms
    - Security of the building e.g. intruder lights, locks, entry phone system

14. Was pre-employment health screening done for You at your current or previous workplace (please tick one)

    - Yes
    - No

    If Yes, was the nurse or doctor qualified in occupational medicine?

    - Yes
    - No
    - Not sure

15. Do you have a written Health and Safety Policy? (please tick one)

    - Yes
    - No

    If No, please proceed to the question No. 16
    If Yes,
    a) When was it last reviewed? (please tick one)

- During the last year
- 1 - 2 years ago
- 2 - 5 years ago
- 5 years ago
- Not sure

b) Does it fully cover the way work is organised? (please tick one)

- Yes
- No
- Not sure

16. Has any member of staff been allocated as responsible for Health and Safety? (please tick one)

- Yes
- No

If No, has the practice obtained external Health and Safety advice? (please tick one)

- Yes
- No
- Not sure

17. Does the practice have regular meetings? (please tick one)

- Yes
- No

If Yes, is Health and Safety a fixed item on the agenda?
- Yes
- No

18. How is Health and Safety information passed onto the staff? (please tick the option that best fits your practice)

- When requested by staff
- As a matter of routine, the information is made available and attention is drawn to it
- Health and Safety information is not passed onto the staff
- Other; please specify.

19. Have You ever been involved in risk assessments or solving health and safety problems? (please tick one)

- Yes
- No

20. Is health and safety considered before new working practices are adopted? (please tick one)

- Never
- Sometimes
- Mostly
- Always

Thank You for Your time and contribution!

Appendix 2 - Self-administered online questionnaire in Estonian

SISSEJUHATUS

Austatud Loomaarstid ja Loomaarsti Abilised,

Töötervise teaduste magistriõppe tudeng tervitab Teid!

Leidke palun 10 minutit aega, et aidata mul koguda andmeid uurimistöö jaoks, mille pealkiri on **Töökeskkonna Ohutegurite Levimus ja Kaitsemeetmed Lemmikloomaarstide Praksises**

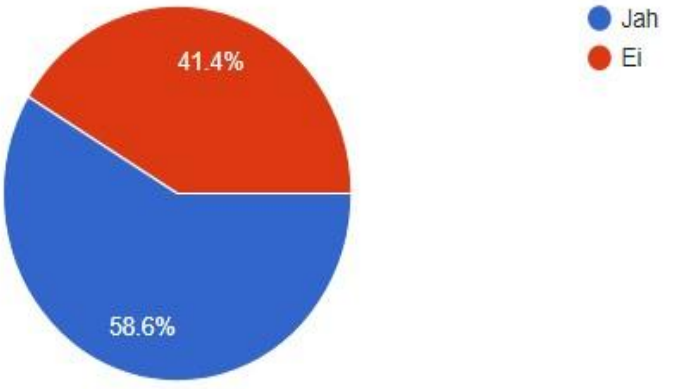
Uurimus püüab selgitada, kuidas hallatakse töötervishoiu riske ja mida võetakse ette töötajate füüsilise ja vaimse tervise kaitseks.

Küsitlus on anonüümne ja ei sisalda küsimusi delikaatsete isikuandmete kohta.

Hindan Teie panust küsitluse täitmisel väga kõrgelt ja olen Teile vastamise eest ette tänulik!

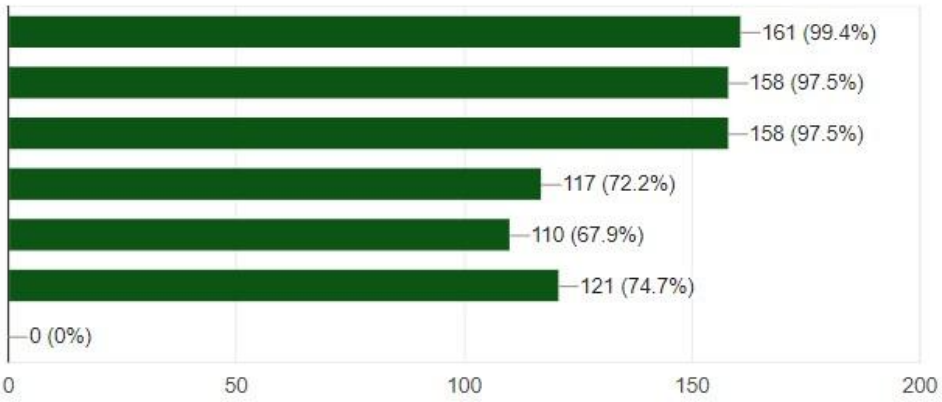
1. Kas teie töökohas on tehtud riskianalüüs loomahammustuste ja kriimustuste kohta? (palun valige üks vastus)

162 responses



2. Kuidas maandatakse teie praksises seda riski? (vajadusel valige rohkem kui üks variant)

162 responses



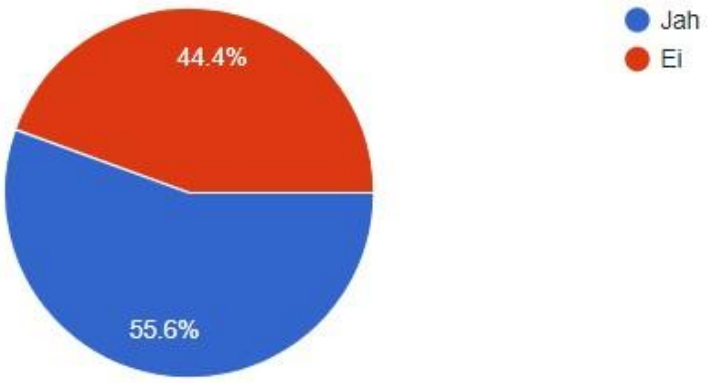
Midagi muud (palun täpsustage)

3 responses

Kasutame stressi vähendavaid võtteid, püüame vältida stressi tekitamist üldse, kasutusel on ohutusvahendid - vajadusel kahv, süstimispuur jne. Olulised on õiged töövõtted.
Omanike harimine , stressi olukorraga toimetulekuks ja loomaohjeldamiseks.
Ohtliku looma kohta teabe jagamine, loomade käitumist käsitlev väljaõpe, stressi vähendamine loomadel nii kliiniku ehutusliku poole, protseduuride optimaalse teostamise kui ka töötajate väljaõppe abil

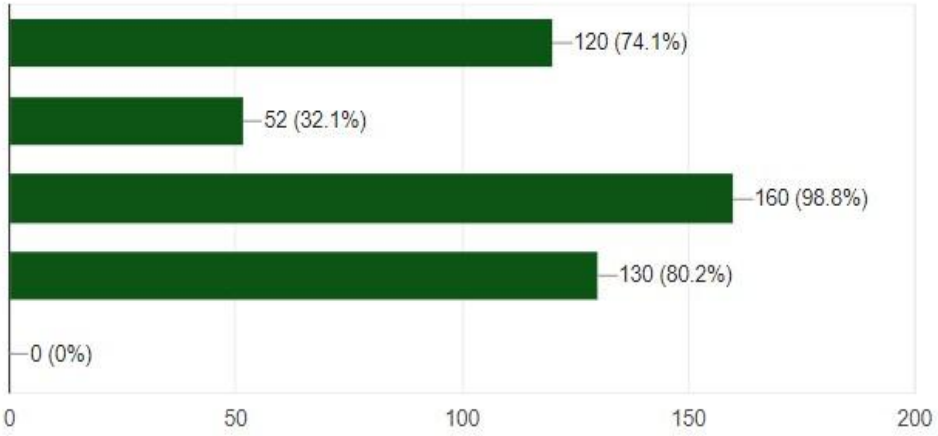
3. Kas teie töökohas on tehtud riskianalüüs nõelte ja skalpellide põhjustatud vigastuste kohta? (palun valige üks vastus)

162 responses



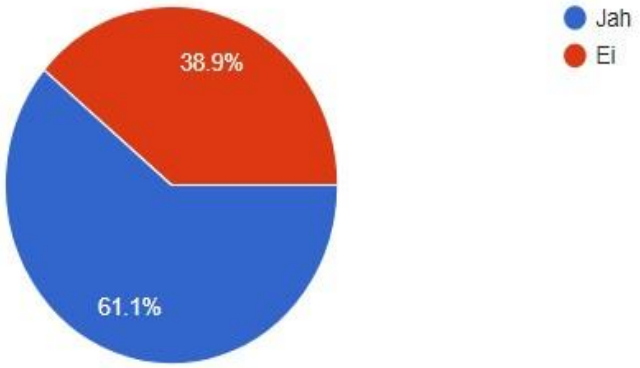
4. Kuidas maandatakse teie praksises terariistadest põhjustatud vigastuste riski? (vajadusel valige rohkem kui üks variant)

162 responses



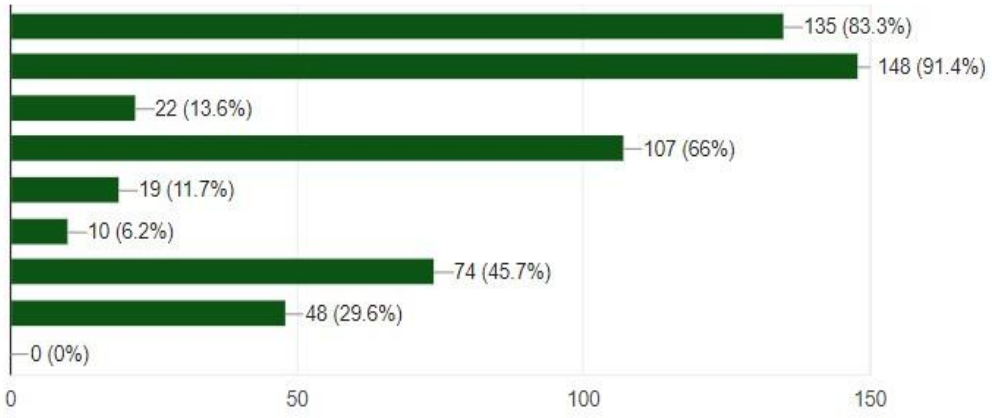
5. Kas teie töökohas on tehtud riskianalüüs suurte koerte või raskete seadmete tõstmise kohta? (palun valige üks vastus)

162 responses



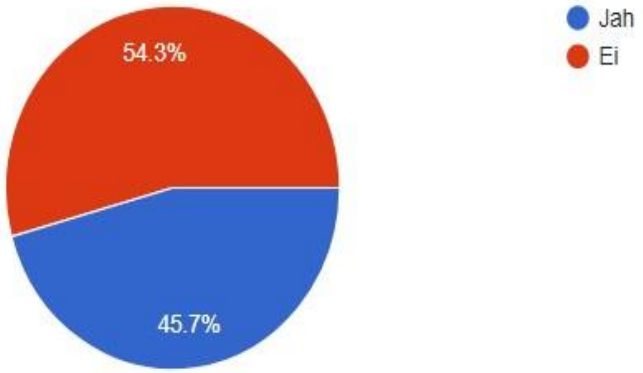
6. Kuidas seda riski teie praksises maandatakse? (vajadusel valige rohkem kui üks variant)

162 responses



7. Kas te olete kunagi töötanud röntgeniaparaadiga? (palun valige üks vastus)

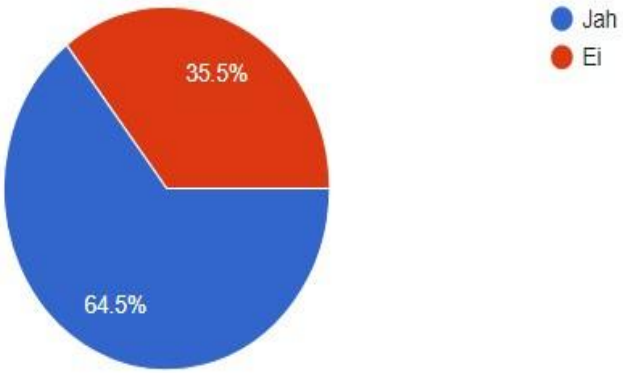
162 responses



Kui Ei, siis palun jätkake küsimusega nr 8.Kui Jah, siis ...

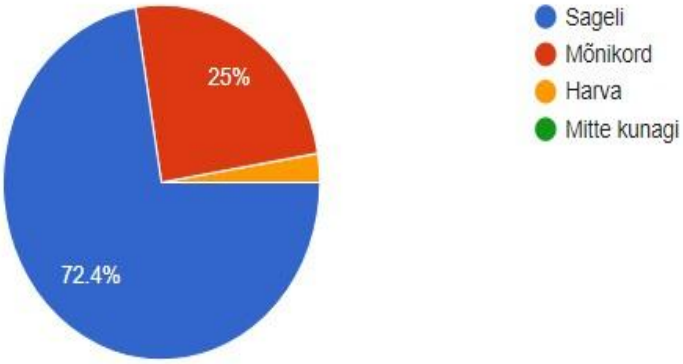
a) Kas te kasutate / kunagi kasutasite tosimeetrit? (palun valige üks vastus)

76 responses



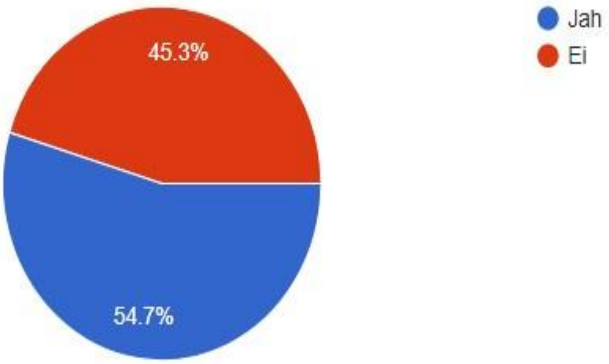
b) Kas röntgeni tegemise ajal hoitakse / hoiti loomi vaos käsitsi? (palun valige üks vastus)

76 responses



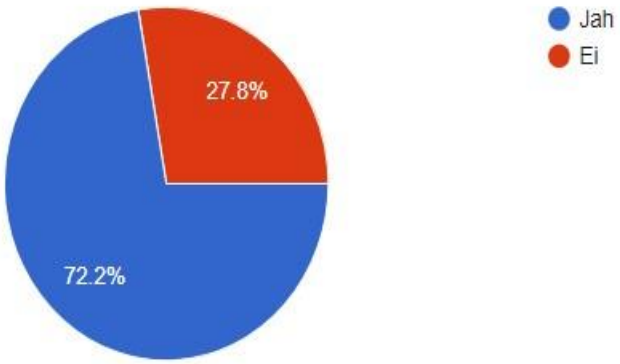
c) Kas röntgenkiirgusega kokkupuudete arv vaadatakse korrapäraselt läbi, et hoida see nii madalal tasemel kui mõistlik? Nt vähendades üle- või alasärituste arvu. (palun valige üks vastus)

75 responses



8. Kas regulaarne arvuti kasutamine on teie igapäevase töö oluline osa? (palun valige üks vastus)

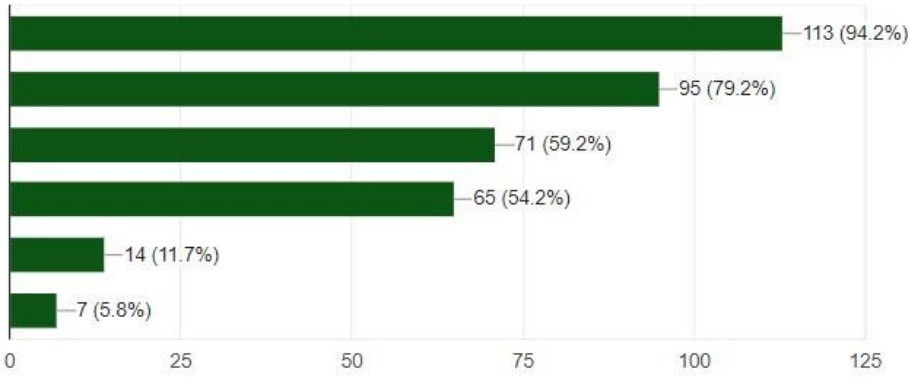
162 responses



Kui Ei, siis palun jätkake küsimusega nr 9. Kui Jah, siis ...

Mida on tehtud, et muuta teie töökeskkond võimalikult mugavaks? (vajadusel valige rohkem kui üks variant)

120 responses



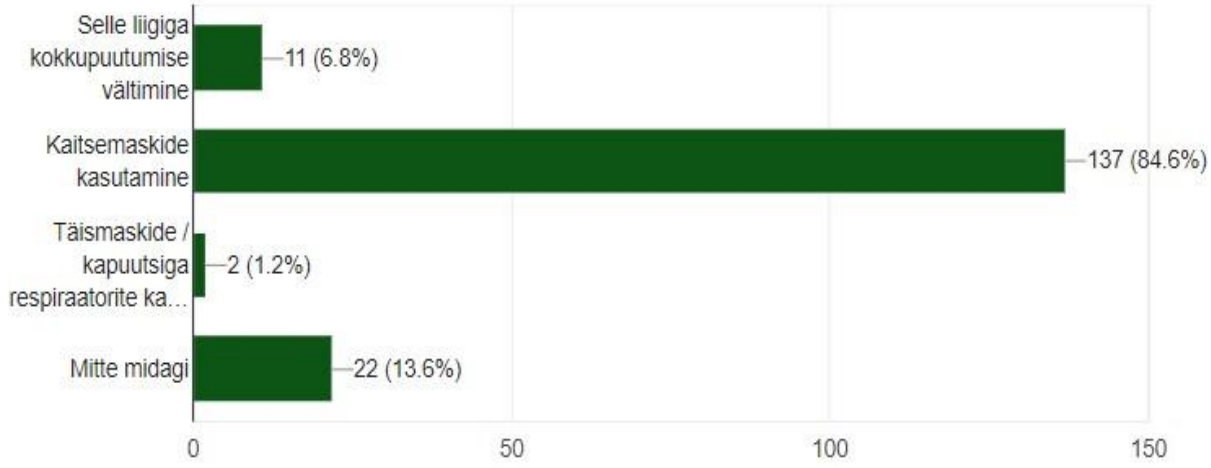
Midagi muud (palun täpsustage)

1 response

Saame endale valida sobivad seadmed ja tarvikud, nt hiire, hiiremati, klavituuri ja kuvari

9. Mida on võetud ette, et tagada loomaallergiaga töötaja kaitse edasise kokkupuute vastu allergiatekitajaga? (vajadusel valige rohkem kui üks variant)

162 responses



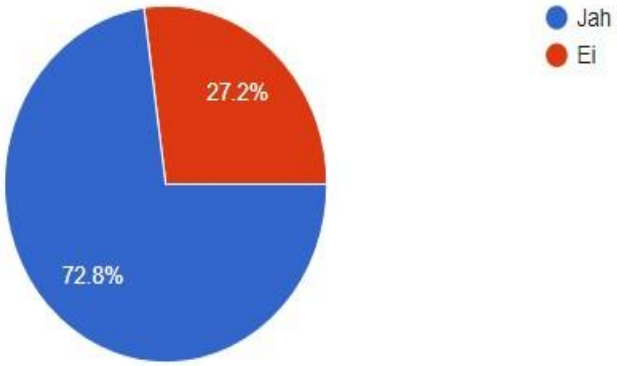
Midagi muud (palun täpsustage)

1 response

Allergiavastaste ainete olemasolu (nii kontakdermatiidi kui üldise allergilise reaktsiooni vastu)

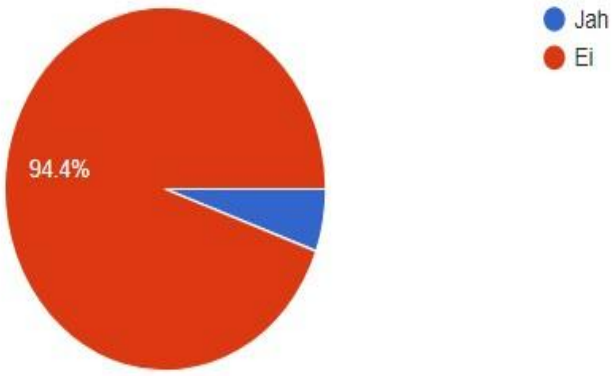
10. Zoonoosid on loomaarsti elukutse juures üks üldtuntuim risk. Kas teie töökohas on tehtud sellega seoses riskianalüüs? (palun valige üks vastus)

162 responses



11. Palun meenutage, kas kellelgi teie töötajatest on viimase kahe aasta jooksul esinenud mõni zoonootiline haigus? (palun valige üks vastus)

162 responses



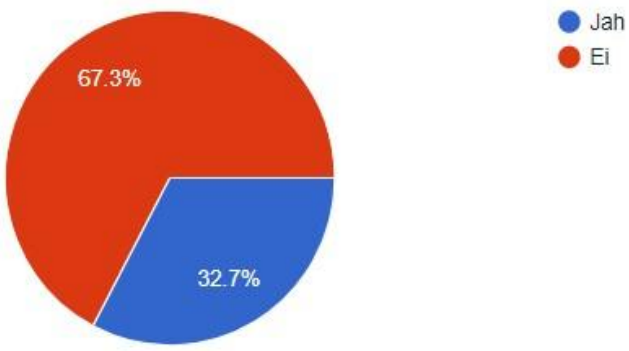
Kui Jah, siis palun kirjutage, milliseid zoonootilisi haigusi on esinenud.

7 responses

Dermatofütoos (3)
Seen (fungi - kassi haigus)
Krüptosporidioos
Trihhofüütia
Pügaraig

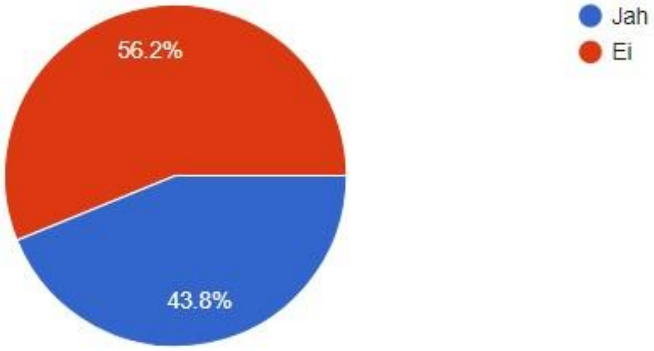
12. Kas teil on aruandlussüsteem, milles on märgitud haigussümptomid, mis võivad viidata kutsetööga seotud allergiatele või zoonoosidele? (palun valige üks vastus)

162 responses



13. Kas te olete kunagi oma praeguses või kunagises töökohas töötanud üksi või öösiti? (palun valige üks vastus)

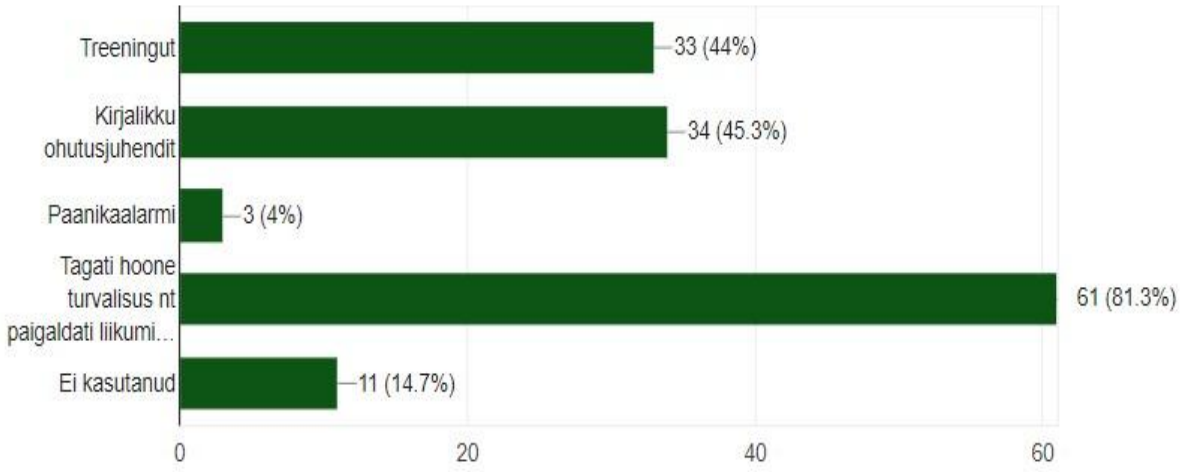
162 responses



Kui Ei, siis palun jätkake küsimusega nr 14. Kui Jah, siis ...

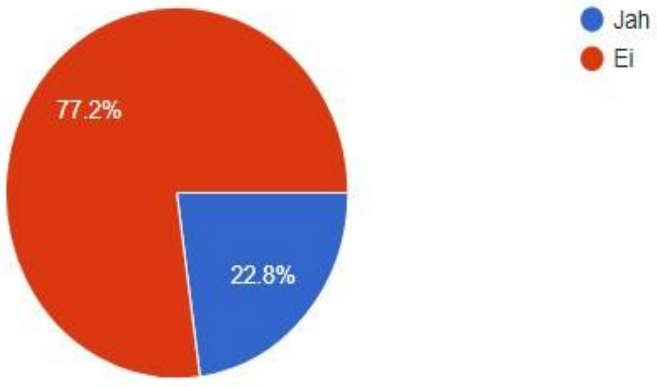
Mis kontrollimeetmeid kasutati, et vähendada psühhosotsiaalset koormust? (vajadusel valige rohkem kui üks variant)

75 responses



14. Kas teile tehti enne praegusesse või varasemasse töökohta tööle asumist tervisekontroll (palun valige üks vastus)?

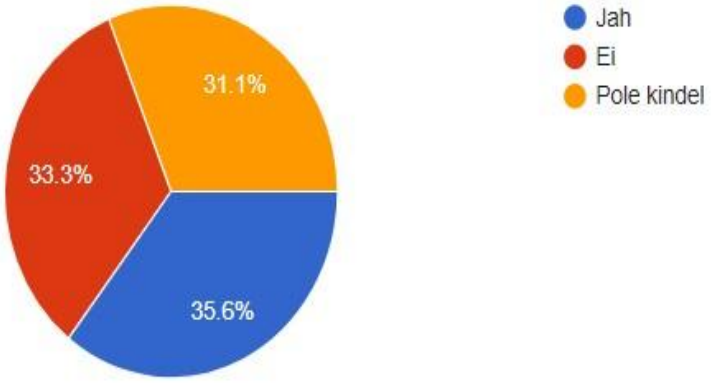
162 responses



Kui Ei, siis palun jätkake küsimusega nr 15. Kui Jah, siis ...

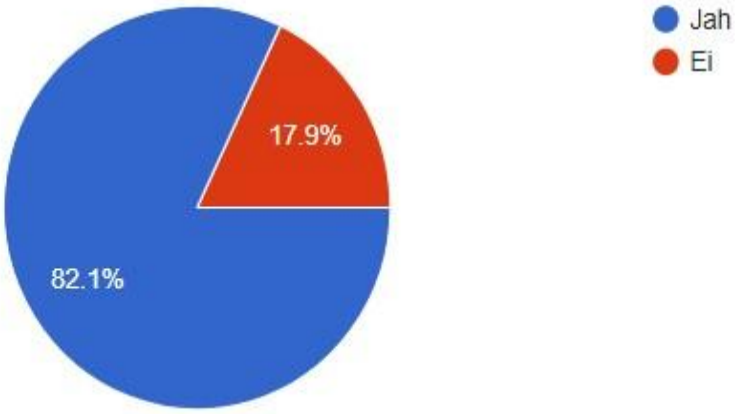
Kas kontrolli teostanud arst või õde oli töötervishoiu kvalifikatsiooniga? (palun valige üks vastus)

45 responses



15. Kas teie praksises on kirjalikult vormistatud tervise- ja ohutusnõuded? (palun valige üks vastus)

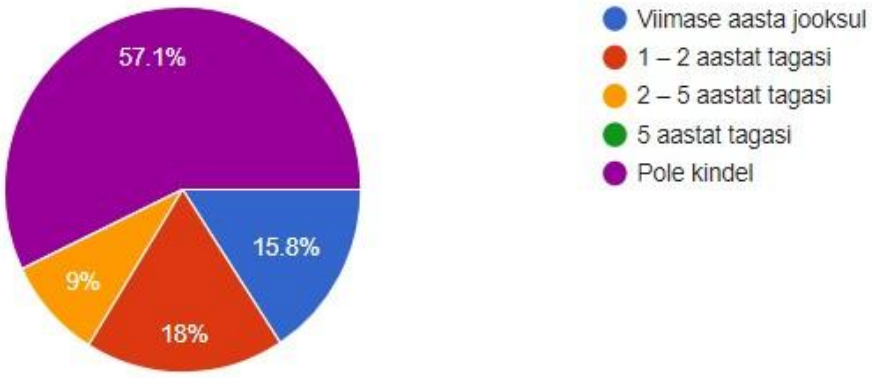
162 responses



Kui Ei, siis palun jätkake küsimusega nr 16. Kui Jah, siis ...

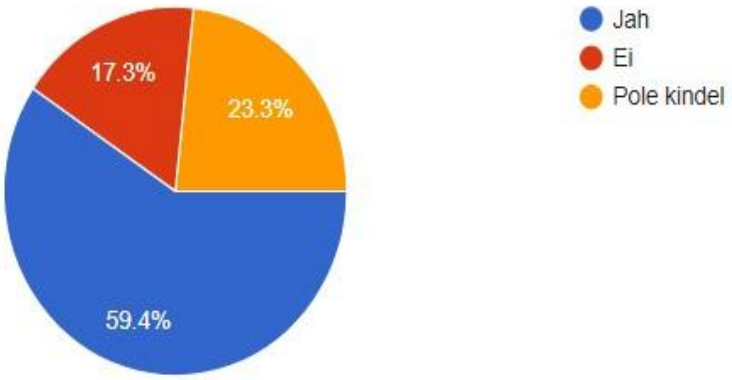
a) Millal vaadati see viimati üle? (palun valige üks vastus)

133 responses



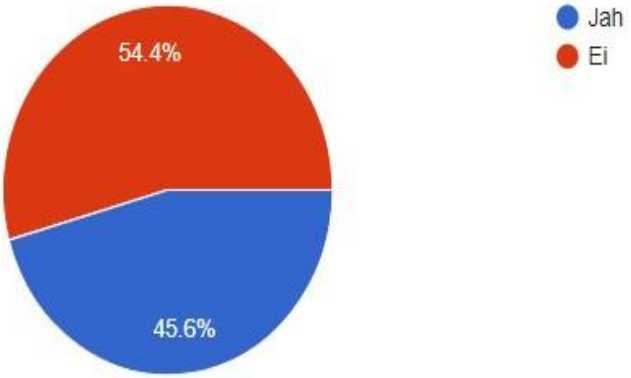
b) Kas need hõlmavad kogu töökorraldust? (palun valige üks vastus)

133 responses



16. Kas mõni töötaja on vastutav töötervise ja tööohutuse eest? (palun valige üks vastus)

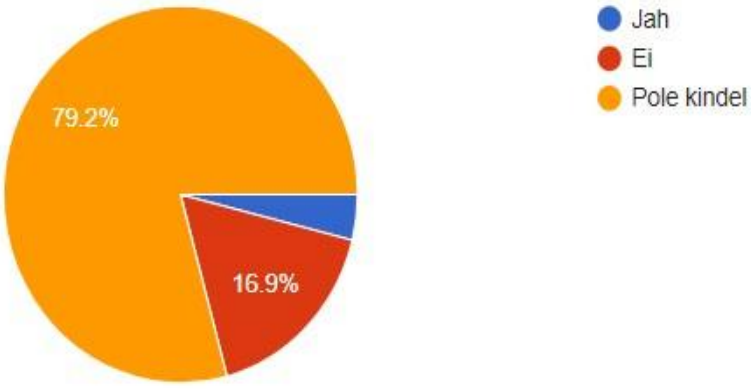
160 responses



Kui Jah, siis palun jätkake küsimusega nr 17. Kui Ei, siis ...

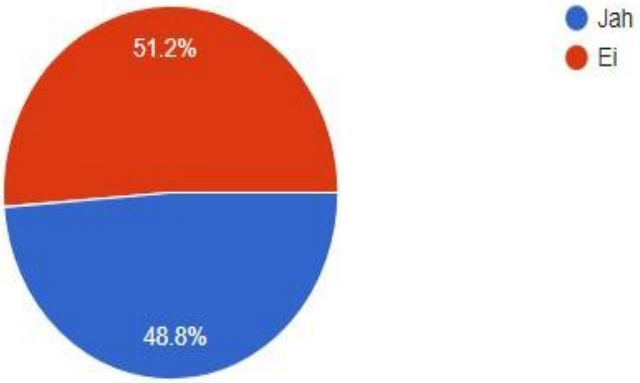
Teie praksises oli kunagi tervise- ja ohutusnõustamine kätte saadud väljastpoolt? (palun valige üks vastus)

77 responses



17. Kas teie praksises korraldatakse regulaarselt koosolekuid? (palun valige üks vastus)

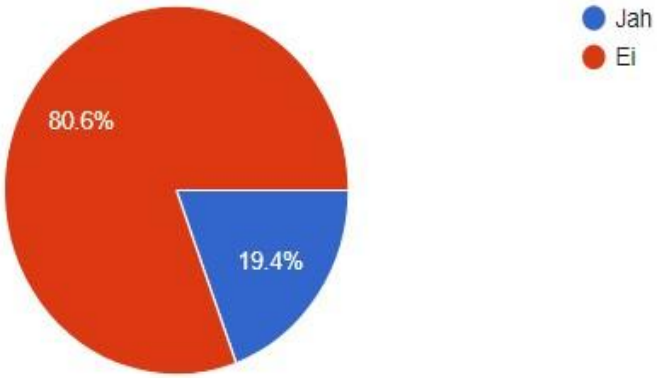
162 responses



Kui Ei, siis palun jätkake küsimusega nr 18. Kui Jah, siis ...

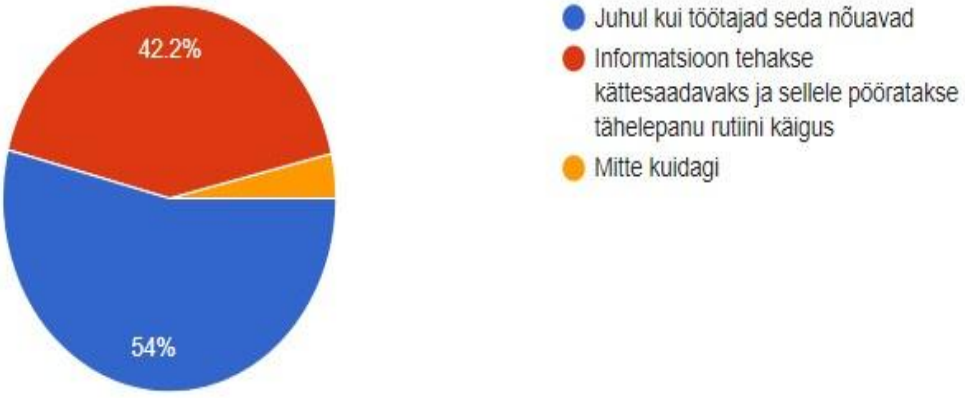
Kas tervis ja ohutus on üheks päevakava kinnitatud teemaks? (palun valige üks vastus)

93 responses



18. Kuidas jagatakse töötajatele informatsiooni tervise ja ohutuse kohta? (palun valige variant, mis sobib teie praksise puhul kõige rohkem)

161 responses



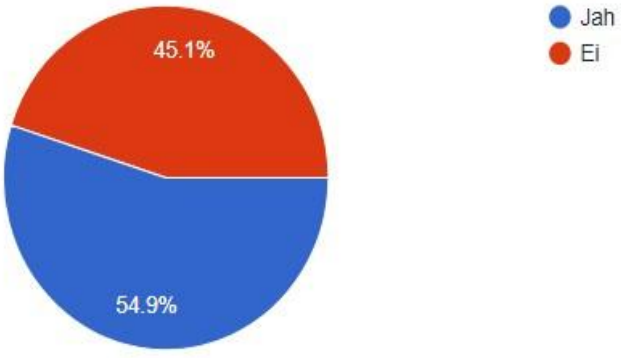
Midagi muud (palun täpsustage)

1 response

Informeeritakse vastavalt vajadusele.

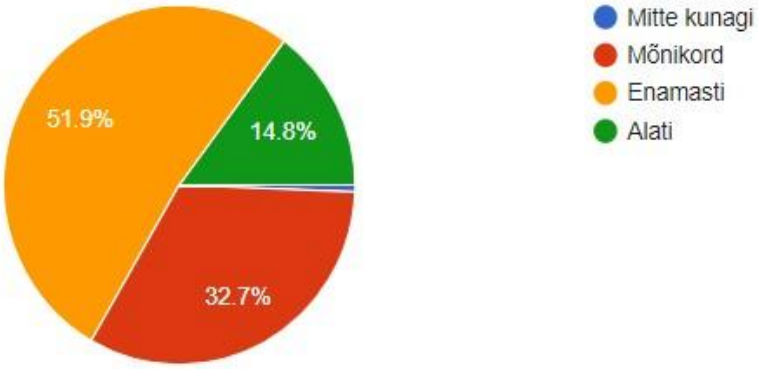
19. Kas teid on kunagi kaasatud riskianalüüsi tegemisse või tervise ja ohutusega seotud probleemide lahendamisse? (palun valige üks vastus)

162 responses



20. Kas tervis ja ohutus võetakse arvesse enne uute töömeetodite kasutusele võtmist? (palun valige üks vastus)

162 responses



Suur aitäh Teie aja, tähelepanu ja panuse eest!