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Infection prevention on cargo ships

A guide in Finnish for the seafaring crew

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ABSTRACT

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Knowledge of infection prevention among seafaring crews in cargo ships has seemed to be lacking. This can, at worst, pose a health risk to both the crew and other people as well. The purpose of this thesis was to develop an infection prevention guide in Finnish for cargo ship crews who travel short journeys.

The objectives are to lessen infections and their spread on cargo ships by raising awareness among seafaring crew of infection prevention on cargo ships. This was done by making a guide for the crew so that they can use the guide to help them protect themselves and others from infections. The guide should also help to prevent the spread of infections.

The guide is in Finnish. It is nine pages long and has basic information about different types of infections. The main part of the guide is about how infections spread and how they can be prevented in a cargo ship environment.

Keywords: infection prevention, cargo ship, cargo ship crew, infection prevention on cargo ships, pandemic, and guide.

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1 INTRODUCTION

The topic of this thesis is infection prevention in cargo ships. This is a project thesis, and the end-product is a digital guide for cargo ship crew in Finnish. This topic is important because cargo ships are an infection hazard if prevention is not done well. Infections are a safety hazard to cargo ship crew but also to the populations of different countries because these ships can transport infection from one country to another.

Infections are a common issue. The COVID-19 pandemic showed that both cargo and cruise ships are vulnerable to infections. These ships can visit different ports and thus transfer infections from port to port. The pandemic also made it clear that there is not enough research or knowledge on infection prevention in cargo ships. (Mulića et al., n.d.)

A cargo ship is a ship that transports materials or goods from one port to another. Cargo ships usually do not have passengers on them, only the crew is aboard the ship. (What Are Cargo Ships?, n.d.-a.) The target group for this thesis and guide is the seafaring crew on cargo ships, specifically those who make shorter journeys in the Baltic Sea area.

The co-operation partner for this thesis is the Maritime Logistic Center of Satakunta University of Applied Sciences. The center is located at the Rauma campus. It does research and product and service development to improve safety and efficiency in seafaring. (Etusivu - Merilogistiikan Tutkimuskeskus - Merilogistiikka.Fi, n.d.)

The purpose of this thesis was to develop an infection prevention guide in Finnish for cargo ship crews who travel short journeys. The objectives are to lessen infections and their spread on cargo ships by raising awareness among the seafaring crew of infection prevention on cargo ships.

2 THEORETICAL BASIS OF THE PROJECT

In this part, the key concepts are defined, and the literature retrieval, inclusion and exclusion area, and project method are described. Lastly, the previous literature is shown.

2.1 Key concepts

The key concepts of this project are infection prevention, cargo ship, cargo ship crew, infection prevention on cargo ships, pandemic, and guide.

2.1.1 Infection prevention

Infection prevention can be defined as a practical, evidence-based approach that prevents people from contracting an avoidable infection, and thus prevents them from being harmed by said infection (WHO - Infection Prevention and Control, n.d.). Some ways an individual can prevent infection include good hand hygiene, coughing correctly, and getting vaccinated if possible. Good hand hygiene is composed of hand washing and disinfection. Good hand hygiene can prevent 10 to 50 % of infections. Coughing correctly also helps prevent infection. Coughing correctly means covering one's mouth with one's elbow or a handkerchief, never with one's palm. One should also always wash their hands after coughing. (Infektioiden Ehkäisy Ja Hygienia | Keuhkotalo | Terveyskylä.Fi, n.d.) Isolation practice and using protective gear, like masks, can also prevent infection from spreading (Tavanomaiset Varotoimet Ja Varotoimiluokat - THL, n.d.).

2.1.2 Cargo ship

A cargo ship can be defined as “any ship or vessel that transports heavy goods and materials from one port to another” (What Are Cargo Ships?, n.d.-b). The voyages’ lengths vary. Some voyages last a week while others can last many months. In this case, there might be some differences in how to prevent infections in different ships depending on the voyage’s length.

There are many different types of cargo ships. The most common ones are container ships. Other ones include general cargo ships (that carry mostly packaged goods), tankers (that carry liquids), dry bulk carriers (that carry loose, dry cargo), multi-purpose vessels (that carry all kinds of goods), reefer ships (that carry frozen goods) and roll-on/roll-off vessels (that carry wheeled cargo like cars). (“What Are 7 Types of Cargo Ships?,” n.d.)

2.1.3 Cargo ship crew

The number of seafarers can differ depending on the cargo ship and follow the principles of minimum safe manning. These principles define the number of seafarers necessary to maintain the safety of the ship and the people in it (Principles of Minimum Safe Manning, n.d.) In any cargo ship, there is a captain. The captain has the highest responsibility, they steer the ship, do management work, and also paperwork in the ports. Then there is one first mate, and also a differing amount of other mates. The first mate is in charge of loading and unloading the cargo. They also plan the daily maintenance work. Mates supervise the loading and unloading of the cargo, as well as steering the ship while on the sea but not in the docks. One mate will be responsible for life-aiding equipment and radios, while another is responsible for the ship’s “hospital” and navigation equipment. There will also be a differing number of deckhands who do maintenance work on the ship. One of them will be a bosun, who is in charge of the rest of the deckhands. The ship will also have engineers on-board. There will be a chef-steward as well. The chef prepares the meals

and also ensures the cleanliness of living spaces and the kitchen. (Mankinen, 2022.)

There are always crew members who know first-aid on-board. The bosun and the mate that is in charge of the ship hospital, go to a medical course every five years. The whole crew has first-aid training regularly. They also have basic medical training every 5 years. (Mankinen, 2022.)

2.1.4 Infection prevention on cargo ships

As previously stated, cargo ships and its' crews are vulnerable to different infections. There has been more attention on this issue now that the world has been dealing with the COVID-19 pandemic. However, there is still a lack of knowledge on this issue.

Center for Disease Control and Prevention (CDC) has guidelines on how to prevent and deal with COVID-19 on board of cargo ships. These guidelines do also work with the prevention of other infectious diseases as well. People who show signs of infectious diseases should not be let on the ship as to prevent these diseases from spreading. People that are ill on the ship, should be isolated. Prevention of infectious disease on board of cargo ships also includes good hand hygiene, wearing masks if needed, and good disinfection of the ship. (Guidance for Maritime Vessels on the Mitigation and Management of COVID-19 | Quarantine | CDC, n.d.-a.)

2.1.5 Pandemic

A pandemic is an epidemic that has spread worldwide. An epidemic is a situation where a contagious disease is found in a large number of a group of

people (Pandemiat Ja Epidemiat | Työterveyslaitos, n.d.) The COVID-19 pandemic has raised the issue of lack of knowledge of infection prevention in cargo ships. When COVID-19 started infecting people in 2020, it became clear that when it comes to infections, the crews of cargo ships are at risk. Guidelines have been created on how to handle this pandemic in cargo ships. These guidelines have been quite similar to other such guidelines in other places, like schools and workplaces. These guidelines include promoting vaccination to the seafarers, not letting COVID-19 positive seafarers board the ship, and isolation in the vessel if a seafarer gets symptomatic during the journey. (Guidance for Maritime Vessels on the Mitigation and Management of COVID-19 | Quarantine | CDC, n.d.-b.)

2.1.6 Guide

A good guide should be clear, and easy to read. The information should be in order so as to not confuse the reader. Using demonstrations is recommended because they make the guide clearer. The language used should not be too complicated for the reader. The title should tell what the guide is about. The guide should be useful and work in practice. A guide that cannot be implemented in practice has no use. When making a guide, it is also important to focus on whom you are making it for. (Paakkunainen, 2021.)

2.2 Literature retrieval

2.2.1 Search words and databases

The databases used are Google Scholar, PubMed and Finna. The search words are “infection prevention” and “cargo ship” or “communicable disease prevention” and “cargo ship”. The databases and search words are shown in Table 1.

Table 1. Databases and search words

Database	Keywords	Results	Accepted articles/ projects/ researches
Google Scholar	"Infection prevention" AND "cargo ship"	29	2
	"communicable disease prevention" AND "cargo ships"	4	0
	"Infektio" JA "rahtialus"	1	0
PubMed	Infection prevention cargo ship	22	3
	"Infektio" JA "rahtialus"	0	0
Finna	"infection prevention" AND "cargo ship"	11	2
	"Infektio" JA "rahtialus"	0	0
Terveyskirjasto	"Infektio"	479	3

2.2.2 Inclusion and exclusion criteria

The inclusion and exclusion criteria are as follows. Inclusion criteria: The text is on infection prevention in cargo ships, the whole text is available, and the text is written in Finnish or English.

The exclusion criteria include: The text is not about infection prevention on cargo ships, the whole text is not available, or the text is not in Finnish or English.

2.3 Project method

The project method used in this thesis is the Waterfall method which is a method where every stage is completed linearly. That means that before a new stage begins, the older stage must be completed. (Project Management Methodologies - Everything You Need To Know, n.d.) This method has been chosen because it is clear and works well with the thesis, as the tasks will be completed in a linear order.

2.4 Previous literature

As shown in Table 3. literature search, that can be found in Appendix 1, Marimoutou et al. (2017) conducted a research on how common infections are and how they spread on cargo ships. This information was collected from a large cargo ship over a period of four years. In this research, they found that out of 322 cases of illness, 72 were caused by an infectious disease. Out of these 25 were gastrointestinal infections, 17 were skin infections and 8 were urinary tract infections. (Marimoutou et al., 2017.)

Schlaich, Oldenburg & Lamshöft (2009) also conducted a research meant to estimate the amount of infections on cargo ships. The research found that of all visits, 21.1% (1880 visits) were due to suspected contagious diseases. Of these, 75% (1410) were respiratory tract infections. There were about 141 cases of gastrointestinal infections. The remaining diseases were various ear infections, genito-urinal infections, varicella, herpes, scabies, ringworm, and minor skin infections. Sexually transmitted diseases were diagnosed 4 times. A doctor was needed in 6.5% of cases. (Schlaich et al., 2009.)

Clara Schlaich et al. (2012) conducted a research article during the influenza epidemic on the prevalence of influenza and its' control measures on cargo ships. They concluded that there are some control measures in place but they were lacking. One crucial thing to note is that if many people in the crew fall ill,

quarantine will not be possible which makes wearing masks and taking care of hand hygiene that much more important. (Clara Schlaich et al., 2012.)

Kordsmeyer et al. (2021) systematically estimated the amount of COVID-19 on cargo ships. When this research was done, there was one infection cluster. In order to prevent infection, it is important for the crew to follow good hygiene and to recognize the symptoms of COVID-19. (Kordsmeyer et al., 2021.)

Codreanu et al. (2021) conducted a research on successful control of Covid-19 outbreaks on board four different cargo vessels. In this research, it was outlined that good quarantine principles, like using personal protective equipment (PPE) and sanitizing the ship well, can help control outbreaks on cargo ships. It was also pointed out that it is not always possible for the infected to leave the ship, or stop working, if many of the crew are sick because then the principles of minimum safe manning could not be followed. This would be a risk to the safety of the vessel. In these situations, using PPE, and cleaning the ship often, are very crucial. (Codreanu et al., 2021.)

WHO made a guide for cargo ships on how to act in case of COVID-19 infection. This is currently one of the only researches on infection prevention in cargo ships, which is why it is useful for this project. (An Implementation Guide for the Management of COVID-19 on Board Cargo Ships and Fishing Vessels Interim Guidance, 2021.)

Articles from Terveyskirjasto have been used as a knowledge base for infection prevention for the guide. An article that was quite useful is "Infektioiden tartunta, taudin synty ja leviäminen" by Veli-Jukka Anttila (Terveyskirjasto, 2022) which explains how infections are born and how they spread. Another useful article is about protective gear in stopping infections (Hengityssuojaimet Ja Suojakäsineet Virusinfektion Torjunnassa - Terveyskirjasto, 2022). One more article used was about food poisoning. This was used because, in a cargo crew environment, there is a possibility of food or water contamination. (Ruokamyrkytys, Terveyskirjasto, 2020.)

3 PURPOSE AND OBJECTIVES

The purpose of this thesis was to develop an infection prevention guide in Finnish for cargo ship crews who travel short journeys. The objectives are to lessen infections and their spread on cargo ships by raising awareness among the seafaring crew of infection prevention on cargo ships.

4 IMPLEMENTATION PLAN

4.1 Target group

Target group can be defined as the group that this thesis is made for (Finto: Metatietosanasto: Kohderyhmä, n.d.). The target group of this thesis are the seafaring crews of cargo ships. This thesis focuses on the crews of cargo ships that do shorter journeys, like ones that sail the Baltic Sea. The product of this project is in Finnish, so this guide is especially targeted towards Finnish cargo ship crews. The guide will be accessible through a link.

With this target group in mind, it is important to notice that they are not healthcare professionals. Therefore, the provided information must be presented in a way that they can understand. As opposed to the information being full of healthcare jargon.

4.2 Stages of the project

The stages of the project are as follows; preparation phase, planning phase, writing phase, and then completing the project (Mäntyneva, 2016). This is where the previously mentioned Waterfall method comes into use, as these stages were gone through linearly. They were somewhat modified from the most usual Waterfall stages but sufficed well in this thesis project.

4.2.1 Preparation phase

The preparation phase is the first phase of the project and marks the beginning of the journey to select the thesis topic. This phase included getting to know the subject and making a plan for the project thesis.

4.2.2 Planning phase

In the planning phase, the purpose and objectives were defined. It is important to have a clear purpose and clear objectives because those are the basis of a thesis. In this phase of the project, the literature retrieval was conducted. Quality assessment was done on the retrieved literature. For this assessment, the Critical Appraisal Skills Programme (CASP) was used. CASP has been made to help check health research for trustworthiness, relevance, and results. CASP has made checklists that can be used to assess the quality of different researches. (CASP - Critical Appraisal Skills Programme, n.d.) It seems that the literature, that has been retrieved for this thesis, is quite trustworthy and relevant. All the literature used had clear aims, good methodology, and the findings had been clearly described. The literature used gave much-needed information on this subject. However, there is limited research on this subject which means that finding good quality sources was difficult.

In the planning phase, SWOT-analysis was done as well. A SWOT -analysis is a framework that is used to identify the strengths, weaknesses, opportunities, and threats of the project. It is a crucial part of project planning because it helps to both avoid and prepare for different problems that could arise during

the project. The SWOT is seen in Table 2. The risks are explored more later on in this document. (What Is a SWOT Analysis? Definition and Examples - TechTarget, n.d.)

Table 2. Swot -analysis

Strengths	Weaknesses
-Knowledge gained in lectures	-Not much information on the subject -Project done alone
Opportunities	Threats
-Need for this guide -Knowing a maritime captain	-Possibility of unforeseeable events - The assessment of the quality of the literature used was done by one person

It was also important to plan how this project and its' product were assessed. This meant planning how to gather feedback on the project, especially from the cargo crews that this project was done for.

4.2.3 Writing phase

In the writing phase content analysis was used to analyze the literature that had been retrieved. In content analysis, the literature was gone through to find common words and themes. Through this, the literature was summarized and common themes, and also differences, were shown. (Content Analysis Method and Examples | Columbia Public Health, n.d.) After the content analysis was done, the guide was written. The language of the guide is Finnish. The digital guide was developed using Venngage®.

4.2.4 Completion phase

In the completion phase, the thesis and the product were finished. Feedback from the people who ordered this product was obtained. This feedback was gathered using the Satakunta University of Applied Sciences' feedback form for clients. A cargo ship captain and some other cargo ship personnel were asked about whether they found the guide relevant and understandable. There is a questionnaire form that they could answer, it can be found in Appendix 3. Self-evaluation was also done and then there was discussion of the thesis and how it went.

4.3 Structure of the digital guide

The structure of the digital guide will be explained here. At first, there is an introduction. Then there is information on different types of infections and how they spread. After that, ways to prevent infections have been listed. This guide is for cargo crews, so the information has been written in a way that applies to this specific environment. References can be found at the end of the guide. There are also QR-codes in the guide which can be scanned to see the sources of the information used in the guide.

4.4 Resources (personnel and others) and risks

Resources in project work can be defined as different physical or psychological assets without which it would be impossible to make the project. Resources can be physical (buildings, equipment), technological, financial, or human resources. (Kymäläinen et al., 2016a.) There are different resources that were available during this thesis, they are in Table 2. In the table, these resources are listed under "strengths" and "opportunities". The computer this thesis was written on, is a resource. The 'Research and Developing methods in nursing' -lectures and seminars have given insight into how to do a project thesis. Help

with citing and information on this subject was available in the library. There was a cargo ship captain who could be contacted regarding this thesis.

A project will always have its' risks. Risks in project work can be defined as the probability of unfavorable events occurring while doing the project. Risks can come from outside the project, or within the project and its workers. Different risks can include; risks concerning the content of the project (confusion on the purpose of the project), personnel risks (falling ill, burning out, lack of knowledge), technical risks, risks concerning the use of time, and ethical risks. The probability and harm of risks can be calculated in advance, which can help both avoid risks but also be prepared for them. (Kymäläinen et al., 2016b.)

The risks have been laid out in Table 2. SWOT-analysis, under the labels of "weaknesses" and "threats", and are as follows; There is not much information on the subject which means that it was difficult to make a comprehensive literature retrieval. The quality assessment of the literature used has been done by one person only which can make the assessment weaker. This project was done alone, which means there was more work to do than if there were two people making this project thesis. There was also always the possibility of unforeseeable events in the future that could have delayed or hindered the progress of this project thesis.

4.5 Timetable and financing plan

No money has been used in the making of this thesis. If some costs were to arise, they would have been handled by the maker of this thesis. To manage this project better, and to track the progress better, ClickUp® was used. ClickUp® is a website that you can use to manage projects. It has been created to make time planning easier. There it is possible to write down the timetable, and also mark down whether a task is to-do, in progress, or completed (ClickUp Software Reviews, Demo & Pricing - 2023, n.d.)

In the pictures below, there is the schedule of this project thesis. The due dates can be seen on the right side. There are three pictures because the time used to develop this thesis has been divided into three sections: Autumn 2022, Spring 2023, and Autumn 2023. Each section has a part of the timetable in it, meaning that there it was outlined what needed to be done and when it needed to be completed.

This first section shows the timetable for autumn 2022 (figure 1). That autumn was when this thesis was started. The first literature retrieval was done, and the objectives and purpose were formed. The first project plan was also developed. In this part of the timetable, there have been listed the different things that needed to be completed during the Autumn of 2022, and the dates that they had to be completed by.

Task	Assignee	Due Date	Priority
Get to know your subject	Me	11/29/22	Low
Get to know your subject	Me	11/29/22	Low
Go through previous literature on the subject	Me	11/29/22	Low
Get to know your subject	Me	11/29/22	Low
Gather literature, that has been found, into a table	Me	11/29/22	Low
Get to know your subject	Me	11/29/22	Low
Form the purpose, objectives and research questions	Me	11/29/22	Low
First project plan done	Me	11/30/22	Low
First project plan done	Me	11/30/22	Low
First outline of the stages and structure of the thesis	Me	11/30/22	Low
First project plan done	Me	11/30/22	Low
Map resources and risks	Me	11/30/22	Low
First project plan done	Me	11/30/22	Low
Add timetable	Me	11/30/22	Low
First project plan done	Me	11/30/22	Low
Ethical part of the project	Me	11/30/22	Low
Look for more literature about infection prevention on cargo ships	Me	Feb 12	High

Figure 1. Autumn 2022. The tasks that needed to be completed during this time are shown here, with their due dates.

Figure 2 shows the timetable for Spring 2023. During spring 2023, an agreement on the preparation of the thesis was gotten. More theoretical information was gathered. During the spring, the writing of the thesis was started. In the

picture below, the different things that needed to be done, are listed by the date they needed to be completed.

Phase 2 - Spring 2023 ✓ HIC

Phase 2 - Spring 2023 + NEW TASK

STATUS	TASKS	ASSIGNEE	DUE DATE	PRIORITY
COMPLETE	Apply for an agreement on the preparation of the thesis	JL	May 29	High
	Gather theoretical information to base the project o 2	JL	Mar 12	High
	Gather theoretical information to base the project o	JL		High
	Contact the cargo ship captain to get a better picture of the cargo ship environment	JL		High
	Gather theoretical information to base the project o	JL		High
Start writing thesis 5	Use theory on infection prevention in general as a basis for infection prevention on cargo ships	JL	Jun 11	High

+ New task

Figure 2. Spring 2023. The tasks that need to be completed during this time, are shown here, along with their due dates.

Figure 3 shows the last part of the timetable; Autumn 2023 was the time this thesis was completed, and the product was developed. The thesis and product were showcased. Both of these tasks can be found listed in the picture below.

Phase 3 - Autumn 2023

Phase 3 - Autumn 2023 + NEW TASK

STATUS	TASKS	ASSIGNEE	DUE DATE	PRIORITY
COMPLETE	Make the guide and add it to the thesis	JL	Oct 8	High

+ New task

STATUS	TASKS	ASSIGNEE	DUE DATE	PRIORITY
TO DO	Showcase the finished product	JL	Sep 28	High

+ New task

Figure 3. Autumn 2023. The last remaining tasks are shown here, along with their due dates.

4.6 Assessment plan

The assessment includes how well the objectives and purpose were achieved. The feedback was obtained from the people who ordered this thesis, the people this product is for (a questionnaire in Finnish, shown in Appendix 3), from the supervisor, and from peers. This feedback helps assess how the goals of this project were reached. The timeframe is also assessed. (Vilka, 2004.)

5 ETHICAL VIEWPOINTS OF THE PROJECT

This project focused on making a guide for seafaring crew on cargo ships. As with all theses, it was important to make sure the work and its results are reliable. The agreement on the preparation of the thesis was gotten. (Thesis Instructions - SAMK - Satakunnan Ammattikorkeakoulu, n.d.)

This subject is not well-researched which posed an ethical issue as finding legitimate sources was harder. There was a contact link with a cargo ship captain who agreed to be a source for this thesis and has given informed consent to be cited in this thesis. This source gave great insight into the world of seafarers and their thoughts on infection prevention on ships. However, this source does not represent any organization but is rather the experience of an individual person. (Tutkimuslupa, Suostumus, Informointi Ja Tietosuoja - Tietoarkisto, n.d.)

In this thesis, good ethical standards were followed. The Finnish Advisory Board on Research Integrity defines the responsible conduct of research, which applies to thesis work. It is crucial to cite your sources clearly. (TENK, 2012.) It is important to always respect the copyrights of original primary sources of literature, and owners of pictures and videos. Everything that somebody has made, has copyrights. When using somebody else's literature or creations, citing must be done. When this thesis is finished, the author will have copyrights to it as well. (What Is Copyright? | U.S. Copyright Office, n.d.)

6 PROJECT RESULT

This thesis has been made over the course of a year, starting in August/September 2022 and finishing in September 2023. The first step in making this thesis was choosing the topic which was easy as the topic that was chosen

was very interesting. From the beginning, it was clear that there was not much previous literature on the topic of infection prevention in cargo ships, which made this topic challenging in a good way. This project gave a good chance to learn about a new field and use information learned about healthcare which made this project a great learning possibility.

After choosing the topic, and getting to know to thesis work, a thesis plan was made. When the plan was accepted in May 2023, an agreement on the preparation of the thesis was gotten. During summer 2023, the thesis report was created and finalized. The guide was also created.

The finished product of this project is a Finnish guide that explains some common infections, and then how to prevent them, and what to do in case somebody falls ill. The guide was made for cargo crews that travel short distances.

7 EVALUATION AND DISCUSSION

7.1 Evaluation

There are different evaluators in this thesis: the author of this thesis, the supervisor, the people who ordered this thesis, and the people this thesis is for. Satakunta University of Applied Sciences has an evaluation questionnaire for the people who order a thesis, the people who ordered this thesis were asked to fill it. Some workers from cargo ships were asked to fill out a different evaluation questionnaire (in Appendix 3). They did not have time to answer the questionnaire but gave some feedback and seemed to think the guide was quite useful. They said the guide was relevant and gave important information.

On 28th of September there was a DESSEV (DEcision Support System regarding the risk of Epidemic threats on a sea-going Vessel) –project meeting where

people who work on cargo ships and healthcare workers met up. The person who ordered this thesis was also there. These people are working together to find ways to make sea-going vessels safer regarding infections. In this meeting, this project thesis and its product, the guide, were presented. Feedback was gotten from professionals attending the meeting, and they seemed to think that the guide had good information in it. They liked that it was quite easy to read, and had good, basic information in it. They thought the guide was easy to access through the link, and would thus be on-hand for crews when needed. The QR –codes in the guide were complimented because through them it is easy to find the sources used.

In the author’s point of view, the process of making this thesis went according to plan though the process was difficult at times. From the start, it was clear that there is little literature on this subject. But still, there was enough information to base this guide on which means the literature retrieval was successful. The end product is quite simple but still has relevant and crucial information in it.

7.2 Discussion

This guide will surely be needed because there is so little information on this subject. With a guide like this, the cargo crews will be a little safer and will know how to deal with, and prevent different infections. This guide can also be used as information when someone else is doing a similar project as this.

The process of making this thesis was quite long, a bit over a year. This was a good thing because it made it so that there was a lot of time to get knowledge on this topic. During this process time, the author was able to deepen their knowledge on infection prevention, and also got to know a lot about cargo ships. Knowing so little about cargo ships was a challenge but it also helped to understand how to apply knowledge in different situations.

Making this thesis was a learning experience, and it definitely helped the author see and understand the research side of nursing. During this process, it was concretely shown how much has been learned during this nursing diploma. Infection prevention skills were strengthened.

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APPENDIX 1: GUIDEBOOK





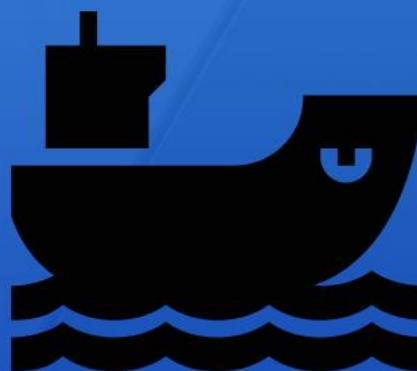
Sisällys

03	Johdanto
04	Infektio
05	Erlaisia infektioita
06	Infektion ehkäisy rahtialuksella
07	Ympäristö, ruoka, juoma ja suojavälineet
08	Viittaukset



Johdanto

Tämä opas on Satakunnan ammatikorkeakoulun Merilogistiikan tutkimuskeskuksen tilaama opinnäytetyö. Opas on tarkoitettu rahtilaivojen henkilökunnalle tukemaan infektioiden torjunnassa. Oppaassa esitellään erilaisia infektioita, eli tarttuvia sairauksia, ja miten niitä voi ehkäistä.





Infektio



Infektiotauti, tai tartuntatauti, on tauti, jonka aiheuttaja on mikrobi. Se voi tarttua ihmisestä, eläimestä tai ympäristöstä. 1. Infektioiden tartunta, taudin synty ja leviäminen, Terveyskirjasto



Infektion ehkäisy tarkoittaa kaikkia tutkimukseen perustuvia toimia, joilla yritetään välttää infektiota, ja sen leviämistä.

2. What is infection prevention? - Infection Prevention Solutions



Erilaisia infektioita

Infektioaudit voidaan luetella aiheuttajan mukaan virusten, bakteerien, sienien tai loisten aiheuttamaksi. Tässä oppaassa keskitytään lähes pelkästään virus-, ja bakteeritauteihin, sillä ne ovat yleisimpiä tartuntatautien aiheuttajia. 1. Infektioiden tartunta, taudin synty ja leviäminen, Terveyskirjasto



Virustaudit

Virustaudit aiheuttavat monenlaisia infektioita. Esimerkiksi suurin osa hengitystieinfektioista on virusten aiheuttamia. Flunssat, influenssat, ja korona ovat kaikki virusinfektioita. Virukset tarttuvat usein pisaratartuntana, jolloin niitä voi ehkäistä esimerkiksi maskien käytöllä.

- Pisaratartunta: Infektio tarttuu ilmassa olevien pisaroiden välityksellä ihmisestä toiseen.

3. Pisaratartunta - Terveyskirjasto



Bakteeritaudit

Useimmat bakteeritaudit leviävät kosketustartuntana. Toisin kuin virustauteja, bakteeritauteja voidaan hoitaa antibiooteilla.

- Kosketustartunta: Tartunta tapahtuu kosketuksen välityksellä, joko suoraan ihmisestä toiseen, tai taudinkantajan koskettaman esineen kautta toiseen ihmiseen. Kosketustartuntaa on helppo välttää hyvän käsihygienian avulla.

4. Kosketustartunta - Terveyskirjasto



-Vaikka yllä on lueteltu virusten ja bakteerien yleisimmät tartuntatiet, kannattaa muistaa, että poikkeuksia on aina. Jotkut bakteerit voivat tarttua myös pisaroiden välityksellä, kun taas jotkut virukset voivat tarttua kosketuksessa. Myös muita tartuntareittejä on olemassa.

Infektion ehkäisy rahtialuksella

Infektion ehkäisyyn on monia erilaisia tapoja, ja monet niistä ovat melko yksinkertaisia. Infektion ehkäisyyn kuuluu:

Hyvä käsihygienia



Hyvään käsihygieniaan kuuluu sekä käsienpesu, että mahdollinen käsien desinfiointi. Käsien pesu saippualla ennen ruokailua/ruoanlaittoa, käsien likaistuessa tai kun on ollut lähellä sairastunutta ihmistä, vähentää infektion riskiä. Kädet on myös hyvä pestä, kun yskii tai niistää nenäliinaan. Koskaan ei saa myöskään aivastaa/yskiä kämmeneen, vaan mieluummin kyynärtaipeeseen, jos nenäliinaa ei ole saatavilla.



Sairastunut työntekijä

Jos huomaa jo ennen laivaan tuloa, että on sairastunut, on tärkeää jäädä kotiin. Näin välttyy tartuttamasta muita työntekijöitä. Jos taas sairastuu laivalla, pitää sairastunut työntekijä laittaa "eristykseen", eli pitää huolta, että hän ei ole kontaktissa muihin työntekijöihin. Eristyspaikkana toimii varsin hyvin sairastuneen työntekijän hytti, jossa työntekijän on hyvä pysyä koko loppumatkan ajan. Hytissä ei saa olla muita ihmisiä, eli jos työntekijät jakavat hyttejä muiden kanssa, täytyy muut työntekijät majoittaa toiseen hyttiin.



Rokottautuminen

Rokotukset ehkäisevät joitain tartuntatauteja, joten niiden ottaminen ylläpitää työntekijän terveyttä.

5. WHO, 2021



Ympäristö, ruoka, juoma ja suojavälineet

Ympäristön siisteys, ruoan oikea säilytys, sekä juomaveden puhtaus ovat tärkeitä infektioiden ehkäisyssä.

Joissain tilanteissa suojavälineiden käyttö on suositeltavaa.



Ympäristön puhtaus

Laivan tilojen hyvä siivous ehkäisee infektioita. Tilojen desinfiointi on tärkeää, jos laivalla on sairastunut ihminen.



Ruoka

Ruoan hyvä säilytys on tärkeää suolistoinfektioiden ehkäisyssä. Esimerkiksi eläinperäistä ruokaa ei saa seisottaa pöydällä pitkiä aikoja. Säilytystilojen tulee myös olla puhtaat.



Suojavälineet

Maskien käyttö, esimerkiksi jos on kontaktissa sairastuneen kanssa, vähentää sairastumisen riskiä. Myös suojahanskojen käyttö voi joissain tapauksissa vähentää sairastumisen riskiä.



Vesi

Laivalla juotavan veden täytyy olla puhdasta, jotta kukaan ei sairastu vedessä olevan mikrobiston takia.



6. Käsihygieniä, hengityssuojaimet ja suojakäsineet virusinfektion torjunnassa - Terveyskirjasto



7. Ruokamyrkytys - Terveyskirjasto

Lyhyen matkan rahtialukset

Infektion ehkäisyssä lyhyiden matkojen aluksella on omia ominaispiirteitä:

1) Lyhyiltä matkoilta pääsee nopeammin kotiin sairastuessa

2) Ruoan ja juoman säilömiseen liittyvät infektiot ovat todennäköisesti harvinaisempia

Tämä johtuu siitä, että ruokaa ei tarvitse säilöä aluksella pitkiä aikoja.

3) Infektiotaudit saattavat levitä maihin useammin

Jos aluksessa on sairastuneita, saattaa infektio levitä maihin helpommin kuin pitkällä matkalla. Tämä johtuu siitä, että lyhyen matkan alukset käyvät satamissa useammin.



Viittaukset

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<https://www.terveyskirjasto.fi/dlk00569>
2. What is infection prevention? - Infection Prevention Solutions:
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3. Pysähtymä - Terveyskirjasto: <https://www.terveyskirjasto.fi/ltt02618>
4. Kosketustartunta - Terveyskirjasto:
<https://www.terveyskirjasto.fi/ltt01759/kosketustartunta>
5. WHO, 2021 An implementation guide for the management of COVID-19 on board cargo ships and fishing vessels: https://www.who.int/publications/i/item/WHO-2019-nCoV-Non-passenger_ships-2021-1
6. Käsihygieniat, hengityssuojaimet ja suojaesineet virusinfektion torjunnassa - Terveyskirjasto: <https://www.terveyskirjasto.fi/dlk01193>
7. Ruokamyrkytys - Terveyskirjasto: <https://www.terveyskirjasto.fi/dlk00608>
8. Kuvat: ©Venngage, Venngage.com



Kuva: ©Pexels, pexels.com, Tom Fisk

Link to guide: <https://infograph.venngage.com/pl/Pq7JoDeIdIA>

APPENDIX 2 LITERATURE RETRIEVAL

Author of research, publication year, country	The purpose of research/project/literature review	Target group, number of participants, data collection method, analyzing method/project method	Results/product of project	References
Codreanu TA, Pingault N, O'Loughlin E, Armstrong PK, Scalley B, 2021, Australia	The purpose of this research was to study how to successfully control of COVID-19 on cargo ships.	<p>This research was made for ship personnel, and people in charge of cargo ships.</p> <p>The research was made by establishing management principles the cargo crew can follow in case of outbreaks.</p>	In this research, it was outlined that good quarantine principles, like using personal protective equipment (PPE), and sanitizing the ship well, can help control outbreaks on cargo ships. It was also pointed out that it is not always possible for the infected to leave the	(Codreanu et al., 2021)

			<p>ship, or stop working, if many of the crew are sick because then the principles of minimum safe manning could not be followed. This would be a risk to the safety of the vessel. In these situations, using PPE, and cleaning the ship often, are very crucial.</p>	
Kordsmeyer et al., 2021	The purpose of the study has been to systematically examine COVID-19 infections on ships	<p>The study is made for ship personnel and medical personnel.</p> <p>The study was conducted by collecting data on reported Covid-19 infections on ships.</p>	<p>During this study, 1 cluster of infections has been detected on cargo ships.</p> <p>When it comes to preventing infec-</p>	(Kordsmeyer et al., 2021a)

			<p>tion, it is important that the crew follows good hygiene and recognizes the symptoms of the coronavirus. In this case, the spread of the virus slows down</p>	
Marimoutou et al., 2017,	The purpose of the study is to examine and determine the prevalence of infections on cargo ships.	The guide is intended for ship workers. Its data has been collected from a large cargo ship over a period of 4 years.	Of the 322 cases, 72 were caused by a contagious disease. Of these, 25 were gastrointestinal infections, 17 were skin infections, 8 were urinary tract infections.	(Marimoutou et al., 2017)
Petersen, Eskild; Chen, Lin Hwei and	The book is made so that the reader can get to know to different infectious diseases.	The book was meant for ship nurses and cargo ship crew.	The book collects various diseases and information about their	(Petersen et al., 2017, pp. 35–44)

Schlagenhauf-Lawlor Patricia,			identification and treatment on cargo ships.	
Clara Schlaich, Bettina Gau, Nicole J. Cohen; Kazunobu Kojima; Nina Marano & Daniel Menucci 2012	This research article is about infection control measures during the influenza A pandemic during 2009.	The target group of this research article are the seafarers and different ship companies. There were 31 ship companies that answered the questionnaire. The data from this questionnaire was analyzed with the help of Microsoft Excel.	From the answers to the questionnaire, it seems like most ship companies did have health safety protocols in place to reduce the spread of Influenza A.	(Clara Schlaich et al., 2012)
Schlaich, Clara; Ol-denburg, Marcus & Lamshöft, Maïke 2009, Germany	The purpose of the study is to assess the risk of infection on cargo ships.	Cargo ship workers are at the heart of this, as well as, of course, the owners and managers of shipping companies. The study is also intended for healthcare personnel on-board ships. Data collection: The researchers analyzed 49 drug	Of all visits, 21.1% (1880 visits) were due to suspected contagious diseases. Of these, 75% (1410) were respiratory infections. There were about 141 cases of gastrointestinal	(Schlaich et al., 2009)

		logbooks between 2000 and 2008.	infections. The remaining diseases were various ear infections, genitourinary infections, varicella, herpes, scabies, ringworm, and minor skin infections. Sexually transmitted diseases were diagnosed in 4. A doctor was needed in 6.5% of cases.	
Terveyskirjasto, 2022, "Infektioiden tartunta, taudin synty, ja leviäminen"	The aim of this article is to explain what an infection is, how they are born, and how they spread.	This article is meant for anyone interested in learning about different infections.	The result is a good, scientific article on infections.	(Infektioiden Tartunta, Taudin Synty Ja Leviäminen - Terveyskirjasto, n.d.)
Terveyskirjasto, 2022, "Käsihygienia, hengityssuojaimet	The aim of this article is to explain some ways to stop virus infections from spreading.	This article is meant for anyone interested in learning how to prevent infections.	The result is a good, scientific article on infections.	(Käsihygienia, Hengityssuojaimet Ja Suojäkäsineet Virusinfektion Tor-

ja suojakäsi- neet virusin- fektion tor- junnassa”				junnassa - Ter- veyskirjasto, n.d.)
Terveyskir- jasto, 2020, ”Ruokamyr- kytys”	The aim of this article is to explain what food poisoning is, and why someone might get food poisoning.	This article is meant for anyone who wants to understand how food poisoning works, and how it can be prevented.	The result is a good, scientific article on food poisoning.	(Ruoka- myrkytys – Ter- veyskirjasto, 2020.)
WHO, 2021	The aim is to make a guide that will allow the cargo ship to operate in the event of a COVID-19 infection.	The guide is intended for ship workers, managers of shipping companies, and all who in one way or another are responsible for the well-being of cargo ship workers.	The end result is a clear guide on what to do to prevent coronavirus infection and what to do if one of the staff falls ill.	(An Implemen- tation Guide for the Manage- ment of COVID- 19 on Board Cargo Ships and Fishing Vessels, n.d.)

APPENDIX 3 QUESTIONNAIRE

ARVIO- INTI	Täysin sa- maa mieltä	Osittain sa- maa mieltä	Neutraali	Osittain eri mieltä	Täysin eri mieltä
Oppaan ulkoasu herättää mielenki- innon					
Oppaan teksti ja tausta sopi- vat yhteen, niin että tekstiä on helppo lu- kea					
Oppaan kuvat sopivat op- paaseen					
Tieto op- paassa on ymmärettä- vässä muo- dossa					
Tästä op- paasta oli apua mi- nulle					
Voin käyt- tää oppaan					

tietoa erilaisissa tilanteissa myös tulevaisuudessa					
Muita kommentteja/huomioita:					