



HAND HYGIENE

A booklet for the students

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Pirkanmaan Ammattikorkeakoulu
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ABSTRACT

Pirkanmaan Ammattikorkeakoulu
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INGALSUO, MERLITA:
Hand Hygiene. A booklet for the students

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Hand hygiene is an important, economic and easy procedure for the prevention of hospital acquired infections. It is a general terminology of hand washing, hand rub disinfection and a surgical hand washing. Hand hygiene is an intriguing issue towards the healthcare workers and also to the nursing students. Based from the previous study is the reason to make this thesis which concerned about the knowledge of the nursing students. The purpose of this thesis is to produce a booklet for the nursing students.

The approach used in this thesis is functional. Functional Bachelor thesis is composed of three parts: report, theory and the final part is the booklet. The report part concerned about the whole process of the thesis. The second part which is the theory consists of general information about hand hygiene from the previous studies. Finally the outcome of the product is the booklet.

The result of the thesis was the booklet, which serves as a reading material for the nursing students about the hand hygiene. It will increase their knowledge about the importance of hand hygiene and its implementation.

It is very important for the students to implement their education and knowledge for what they learned in schools about hand hygiene. Nursing students should have enough knowledge about different kind of diseases and their nursing care in relation to implementation of hand hygiene. A further study is recommended in able to evaluate the attitudes of the nursing students towards the implementation of hand hygiene.

Keywords : hand hygiene, nursing students, skills, knowledge

ABSTRAKTI

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INGALSUO, MERLITA:
Käsihygieniä. Opaskirja materiaali opiskelijoita varten

Opinnäytetyö 34+8 sivua
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Käsihygieniä on tärkeä, taloudellinen ja helppo menettelytapa ehkäistä sairaalainfektioiden esiintymistä. Käsihygieniä on yleistermi tarkoittaen käsipesua, käsien desinfiointia sekä käsien kirurgista pesua. Käsihygieniä on erittäin tärkeää terveydenhuollon työntekijöille sekä-opiskelijoille. Aikainen tutkimus on tuonut esiin huolen sairaanhoidon opiskelijoiden tietotasosta koskien käsihygieniä. Tästä syystä tämä tutkimus on tärkeä. Tutkimuksen tarkoituksena on tuottaa opaskirja sairaanhoidon opiskelijoille.

Tutkimus on toiminnallinen loppuyhteenveto. Toiminnallinen loppuyhteenveto koostuu kolmesta osasta: raportti, teoria ja opaskirja. Raportti osa keskittyy loppuyhteenvetoon. Teoria osa perustuu aikaisempiin tutkimuksiin ja tieteen käsihygieniästä. Viimeinen osa on opaskirja.

Loppuyhteenveto tuloksena syntyy opaskirja joka tarjoaa tietoa sairaanhoidon opiskelijoille käsihygieniästä. Opaskirja lisää heidän tietoaan käsihygieniän tärkeydestä ja toteutuksesta käytännössä.

On tärkeää, että opiskelijat osaavat toteuttaa koulussa oppimiaan asioita käytännössä. Sairaanhoidon opiskelijoilla tulisi olla tarpeeksi tietoa erilaisista sairauksista ja niiden hoitotyöstä suhteessa käsihygieniän toteutukseen. Jatkossa tutkimuksia voisi tehdä sairaanhoidon opiskelijoiden asenteista koskien käsihygieniän toteutusta

Avainsanat : käsihygieniä, sairaanhoidon opiskelijat, taidot, tieto

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PART 3 : THE BOOKLET

1 INTRODUCTION

Hand hygiene is a complex issue nowadays. There are about 5378 articles of initial keyword about hand hygiene that had been studied (Aiello, Coulborn, Perez and Larson 2008, 1374). Despite of many proven studies, the hand hygiene compliance is still low in the field of healthcare setting (Boyce & Pittet 2002, 1-4; Aiello et al. 2008, 1379). Different campaigns and strategies used to improve the compliance of hand hygiene, but still the implementation of hand hygiene to the healthcare workers is very low. This is why a hand hygiene issue is captivating for the healthcare workers and for the nursing students about their implementation towards the procedure.

The incidences of hospital infections such as urinary tract, respiratory and skin infections increase in Finland during 2002 (Silvennoinen 2003, 763). Hospitalization is one risk to get these infections because of which hospital expenses have increased in the country (Silvennoinen 2003, 763). In addition the patients suffer because of complications caused by these hospital infections or even death.

The Centers for Disease Control 2000 confirmed that hand hygiene practice decreases nosocomial infections (Trunnell & White JR 2005, 80). In addition, it is a simple and important procedure to reduce the spread of infection in the healthcare environment (Silvennoinen 2003, 763). Furthermore it is part of Standard Precautions Guidelines of the Center for Disease and Control Prevention (Siegel, Rhinehart, Jackson, & Chiarello 2007, 49). The hand of the healthcare workers is a very important instrument during patient care. Proper practice and implementation of hand hygiene is a part of good quality of care and safety during the treatment (Silvennoinen 2003, 763).

The purpose of this Functional Bachelor thesis is to produce a booklet. This booklet will be introduced to the nursing students of Pirkanmaan University of Applied Science. The booklet provides specific information about the importance of hand hygiene and its proper implementation. Previous research about the knowledge of the nursing students is the reason for making this

booklet. According to Von Schanz, college students have not enough information about the proper application of hand hygiene (2005, 76-92).

Sufficient information for the nursing students about the prevention of hospital infections is necessary. So, education is a central aspect for the nursing students during the entire learning process. Its help them to be aware in every action when handling the patient. Because of different life style of the different students their knowledge is also diverse. Therefore a short guideline for important procedure is essential (Torkkola, Heikkinen & Tiiainen 2002, 25)

The Functional Bachelor thesis is composed of three parts: the report, the theory part and the final part which is the booklet. The booklet will be given to Pirkanmaan University of Applied Science, and it will serve as a reading material for the nursing students.

2 THE PURPOSE OF THE FUNCTIONAL BACHLEOR'S THESIS

The purpose of this Functional thesis is to produce a booklet. The booklet will be introduced to the nursing students of Pirkanmaan University of Applied Science with the purpose of helping them in their clinical training or in community health center.

The aim of this Functional thesis is to increase the knowledge of the nursing students. The booklet will serve as the guidance to provide the nursing students with the importance of hand hygiene.

This work addresses questions of implementation of proper hand hygiene with the use of the booklet.

3 THEORETICAL FRAMEWORK

The theoretical framework of this Functional Bachelor thesis is concerned with the different factors that affect the compliance of the nursing students towards hand hygiene. Making a mind map is easy to figure out the important factors in promoting hand hygiene compliance. See figure 1.

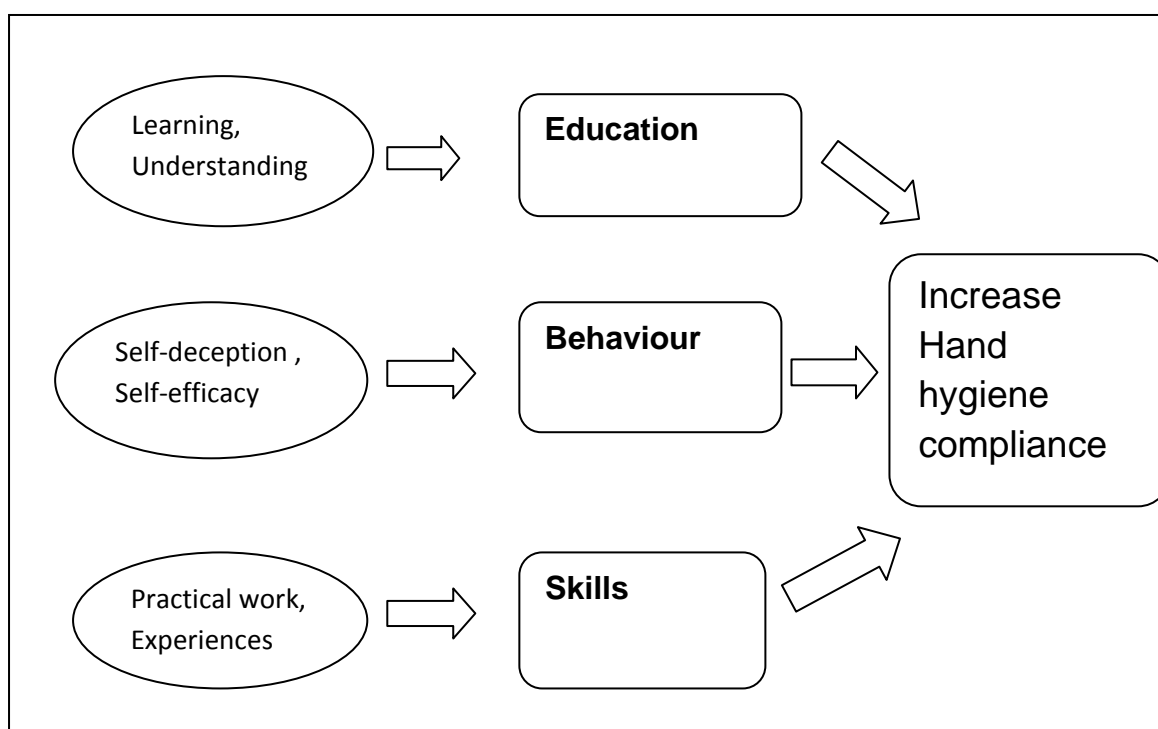


Figure 1 based on different studies: Curtis, Cairncross, & Yonli 2000; Salmela 2004; Pittet 2005; Trunnell & White JR 2005; von Schantz, 2005; Kurvinen & Routamaa 2006.

3.1 Education

Education can be promoted in schools, hospitals and administrative organizations. When providing educational information about hand hygiene, it must be considered that the information is reliable and it includes all necessary contents (Kurvinen & Routamaa 2006, 300).

Hand hygiene education is important for each individual because it gives proper and effective information which can enhance the knowledge of the

individual. Moreover, according to Parini (2004) and Pittet et al. (2004) sufficient information must be provided for the nursing students. At the same time monitoring the hand hygiene practice is recommended to improve the compliance (Akyol 2005, 436).

Improving hand hygiene compliance to the nursing students needs both understanding and motivation about their individual's behaviour. Furthermore, to evaluate specific actions that contribute to the risk factors of the patient's health (Curtis, Cairncross, & Yonli 2000, 22).

3.2 Behaviour

The individual behaviour affects the compliance of hand hygiene practice. The healthcare workers reported that they practiced hand hygiene accordingly to the given information provided by the hospital (Trunnell & White JR 2005, 80). According to Trunnell and White Jr.(2005), the result of their study that during actual observation of hand hygiene practice it showed that about 40% of the healthcare workers implement the procedure(Trunnell & White JR 2005, 80).

Individual behaviour is not easy to change. It takes more time to improve (Pittet, 2005, 186). Nobody can teach the individual's attitude neither easy to acquired from others. It influences own's faith and experience in life (Kurvinen & Routamaa 2006, 300).

3.2.1 Self-deception

“Self-deception means holding an inaccurate belief or idea in spite of the availability of more accurate information does not carry with it the same moral implications as simple lying (Trunnell & White JR 2005, 80).” Students have enough knowledge towards hand hygiene but it is not implemented in practice. In addition, self-deception is a part of the subconscious which is not easy to

control when it comes to behavioural change. Self-deception is a huge contribution towards human behaviour. Therefore, an individual can pretend or self-reported to the others that they perform hand hygiene effectively.

3.2.2 Self-efficacy

Self-efficacy theory was established by Bandura (1997) according from Trunell & White, who assigned four qualities that affect the behavioural change of an individual: “performance enactment, vicarious learning, verbal perfusion and emotional arousal”. Self-efficacy belief is significant for the improvement of hand hygiene compliance. It plays an important role to the individual’s behaviour. Self-efficacy is ones individual belief in performing certain action to achieve its certain goal. Further investigation about the aspects of self-efficacy can contribute to the improvement of hand hygiene compliance (Trunnell & White JR 2005, 82).

3.3 Student Skills

It is difficult to distinguish between skills and education when it comes to learning. Skills can be used at work where it is easy to learn or adopt. They can be practiced during practical work and can be evaluated by doing an effective performance. One example of this skill is doing proper hand hygiene (Kurvinen & Routamaa 2006, 300).

The skills of the students are at an average level which is systematically higher than the given amount of teaching. Education and skills are correlating to each other between the student and teacher (Salmela 2004, 119).

3.4 Ethical issues in hand hygiene

Ethics is concerned about the study of human behaviour. It provides a structure for dealing with different kinds of issues, dilemmas and problems. Understanding the ethical concepts helps the individual to decide the necessary action to provide in the situation (Rumbold 2005, 3). According to the International Council of Nurses (1973), it is the healthcare workers' responsibilities to give quality of care to prevent infection and to ensure the holistic care of the patient (Rumbold 2005, 80).

Hand hygiene practice is the responsibility of each individual who is working in the healthcare settings. The quality of care of the patient relies on personal beliefs and values of the healthcare worker.

It is the right and responsibility of the healthcare workers, including nursing students, to work with proper safety precautions (Työturvallisuuslaki 8 §, 2002/738). Every individual living in Finland has the right to receive a proper treatment and care. The patient will receive quality of care without further complications and prevention of infections during hospitalization (Potilaan oikeudet 3 §, 1992/785; Laki tartuntatautilain muuttamisesta 6 §, 2002).

4 IMPLEMENTATION OF FUNCTIONAL BACHELOR'S THESIS

To make the Functional Bachelor's thesis is a challenging work, the author must possess professional skills and will have the possibility to continue in working life (Vilkka & Airaksinen 2003, 16-17). Professional skills can also give an impact to your own ideas and itself in making the thesis. Making a thesis must be based from own educational background, and the topic can be useful in the connection of working life (Vilkka & Airaksinen 2003, 16). The Functional Bachelor's thesis is a collection of ideas combining all important information that is related to the professional background. Defining clear objectives in making the thesis, choosing the topic and its resources, and finally the process concerning in working life. To make the project it gives additional task and to learn in managing the project, which includes proper planning, knowing the project conditions and goals. In addition, the schedule is needed so that the project will be organized effectively (Vilkka & Airaksinen 2003, 17).

Functional Bachelor's thesis is a part of making a report. The final process or the product of the project is usually done in writing. In making the reading material it is important to know who the reader is. A booklet needs to be educative and concise information for the reader. In addition, the terms will be used according to the readers' level (Vilkka & Airaksinen 2003, 65). The final thesis can tell to the reader what kind of personality and professional skills the author possesses (Vilkka & Airaksinen 2003, 65).

Using pictures or images will be useful to the readers as part of an effective communication. According to Snell (2009), "A picture is worth a thousand words". Comprehensive resources are pictures and images (Snell 2009). The pictures give more attraction and communication to the reader. Furthermore, images and photos are visual materials which are useful for the readers. A visual learning is one way for learning (DeWit 2005, 116).

When reading a text it does not mean that it is necessary to understand. The information may be probably too complicated and can also be understood in

different way that the sender has intended. That is why, when planning a guideline it needs thorough attention. Understanding and standard language must combine together (Torkkola, Heikkinen & Tiiainen 2002, 25).

4.1 Planning of the thesis

The Functional Bachelor's thesis is the choice of the author to produce booklet which will serve as a reading material for the target group. The target group is the nursing students who studied in the Pirkanmaan University of Applied in Science. The booklet will be presented in the school mentioned earlier. This booklet is meant for the nursing students and it is useful to increase their knowledge about the topic. Organizing the gathered information and be systematic is beneficial for the planning process.

4.2 Process of the thesis

The whole process of the thesis takes about a year to finish. It started last August 2008 and was finished by September 2009. First it started by presenting the ideas about the chosen topic to the group and to the thesis supervisors, including a five-page plan. The first presentation seminar was presented last October 2008. Enough information and recommendations were given by the group and the thesis supervisors. The process continues until spring 2009. At this time the theory and the report part are done. The second presentation seminar was held last May 25-27, 2009. Last August 11, 2009 the final meeting with the supervisor teachers was run to discuss the progress of the thesis. Enough guidance and comment was given during the last meeting. In which was helpful to improve the thesis. The final product which is the booklet will be presented on September 2009.

4.3 Structure and final product of the booklet

The layout of the booklet will be based on gathered information from different journals, textbooks and articles. And it will be written in the booklet. The educational information must be educative, concise and clear. The booklet may consist of 6-8 pages. The final size of the booklet will be a half size of A4 paper in horizontal form. The font will be used is Arial with the size of 16. Key words will be in bold or bigger font. Some pictures will be used to give more specific illustration about the topic. The author asks help to the other person to did drawings for the exact illustration of some specific action about the hand hygiene. The most important part of the guidelines for readability is the title. The guideline starts with the title that gives the meaning of the guide.

Finally, after producing the booklet feeling of relief and proud was felt by the author despite of the hectic schedule in school and clinical training. The time schedule was achieved and the project was done.

5 CONCLUSION

This thesis finds out that there are several issues about the hand hygiene practice of the healthcare workers and the skills of the students. The individual attitude is one of the factors that influence the compliance of the hand hygiene. Commitment and motivation to one's self are imperative to achieve in promoting the hand hygiene. The compliance of this important procedure also depend to the hospital administration, different wards how they strictly follow the rules of prevention of hospital infection. Cooperation of every organization and healthcare workers is needed to achieve the goal.

It is very significant for the students to implement their education and knowledge for what they learned in schools. Knowledge of different diseases and their nursing care, especially the application of hand hygiene, must be implemented during practical work. Practicing proper hand hygiene as students in the clinical area is important for the feedback of the schools and teachers.

Hand hygiene is a vital issue to every individual. The purpose of this procedure is very clear for the prevention of hospital infections. Hand disinfection is useful in the hospital settings and it is more convenient to the healthcare workers. But hand washing is more effective as a traditional way for the prevention of hospital infections.

Therefore, the author conclude about this project that more posters, leaflets, and videos about the hand hygiene which make as a reminder to the healthcare workers as well as the nursing students to give importance to their hand hygiene practice when giving care for the patient. And more updated information about hand hygiene can be read in www.WHO.com. A further study is recommended in able to evaluate the attitudes of the nursing students towards the implementation of hand hygiene.

6 DISCUSSIONS

The purpose of this Functional Bachelor's thesis to produce a booklet for the nursing students in Pirkanmaan University of Applied Science (PIRAMK) was a challenge for the author. Because a number of guidelines about the hand hygiene were available in different hospitals in Finnish, it did not produce sufficient information for schools, and was targeted at Finnish-speaking audience. This booklet is beneficial to all nursing students especially to the exchange students who do not understand the Finnish language.

During the whole process in completing this thesis the author encountered different kinds of challenges. One of the hindrances is the time schedule and at the same time the clinical training. But it is a part of the task that needs to accomplish for becoming a qualified professional. The goal and objective in making this thesis was achieved by the author. Concentration, commitment and at the same time enjoyment in making the booklet are useful.

The author appreciates the last process of making the booklet. Giving the best to produce the booklet for the nursing students which will make easy for them to understand and remember the importance of hand hygiene. It also proved that the author itself can handle different kinds of tasks and responsibilities in the working future. Positive attitudes possess by the author makes the project successful.

Finally, this thesis helps the author to remind itself every time during the clinical training about the proper implementation of hand hygiene. At the same time the author also gains more confidence and awareness during patients contact by not spreading any bacteria from the other patient.

REFERENCES

Aiello, A., Coulborn, R., Perez, V., Larson, E. 2008. Effect of Hand Hygiene on Infectious Disease Risk in the Community Setting: A Meta-Analysis. *American Journal of Public Health* August Volume 98 Number 8 , 1372-1381.

Akyol, A. 2005. Hand hygiene among nurses in Turkey: opinions and practices. *Journal of Clinical Nursing* 431-436.

Boyce, J. & Pittet, D. 2002. Guideline for Hand Hygiene in Health-Care Settings. www.cdc.gov. October 25, 2002 Volume 51(RR16); 1-44. Cited and saved 19.09.2009 . Updated last 16.09,2009.

Curtis,V., Cairncross, V., & Yonli, R. 2000. Domestic Hygiene and Diarrhoea-pinpointing the problem. *Journal of Tropical Medicine and International Health*. January Volume 5 No. 1, 22-32.

DeWit, S. 2005. *Fundamental Concepts and Skills For Nursing* 2nd edition, 116.

Kurvinen, T. & Routamaa, M. 2006. Miksi infektioiden torjuntaan liittyvä koulutus on vaikeaa? *Suomen Sairaalahygienialehti* 24 , 299-303.

Laki potilaan asemasta ja oikeuksista 17.8.1992/785. 2 LUKU Potilaan oikeudet. <http://www.finlex.fi/fi/laki/ajantasa/1992/19920785>. Read and saved 04.09. 2009.

Laki tartuntatautilain muuttamisesta 6 §, 2002. <http://www.finlex.fi/fi/laki/alkup/2002/20020408>. Read and saved 04.09.2009.

Pittet, D. 2005 Clean Hands Reduce the Burden of Disease. Read May 28, 2009 . www.thelancet.com Volume 366 July 16, 185-187.

Rumbold, G. 2005. *Ethics in Nursing Practice Text book*. 3rd Edition. Baillière Tindall.

Salmela, M. 2004. Sairaanhoidajaopiskelijoiden hoitamisen taidot ja niiden opetus ammattikorkeakoulussa: Opiskelijoiden, opettajien ja ohjaajien arvoit. *Turun Yliopisto Julkaisuja* , 29, 118-119.

Siegel, J., Rhinehart, E., Jackson, M. & Chiarello, L. 2007.

2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings. 1-225 Read and saved 02.06.09.
<http://www.cdc.gov/ncidod/dhqp/pdf/isolation2007.pdf>.

Silvennoinen, E. 2003. Käsihygienia terveydenhuollossa. Suomen Lääkärilehti Volume 7 /58, 763-767.

Snell, S. 2009. Clear and effective Communication in Web designs February 3
<http://www.smashingmagazine.com/2009/02/03/clear-and-effective-communication-in-web-design/> Read 02.08.09.

Torkkola, S., Heikkinen, H. & Tiainen, S. 2002. Potilasohjeet ymmärrettäviksi. Tampere: Tammer –Paino Oy. 25.

Trunnell, E.P. & White JR, G.L. 2005. Using Behaviour Change Theories to Enhance Hand Hygiene Behaviour. Education for Health Volume 18, Number 1 March, 80-84.

Työturvallisuuslaki 8 §. <http://www.finlex.fi/fi/laki/ajantasa/2002/20020738>.
Read 04.09.2009.

Vilka, H., & Airaksinen, T., 2003. Toiminnallien Opinnäytetyö 1st -2nd Edition (Eds). Helsinki: Tammi 9, 16-17; 46-50.

Von Schantz, M. 2005. Sairaalainfektioiden Torjunta Hoitotyön Toimintona: hoitotyön opiskelijoiden, hoitotyöntekijöiden sekä potilaiden tiedot ja käsitykset. Turku, 76-92.



THE THEORETICAL PART

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1 INTRODUCTION

Hand hygiene is a general terminology of hand washing or hand rub disinfectant or either surgical hand washing (DeWitt 2005, 209). Hand hygiene issues cannot be interesting without the involvement of the main problem which is the spreading of hospital acquired infection (Pyrek 2004, 2). These universal issues are also related to the effectual compliance and commitment of hand hygiene practice in which it will help to decrease the hospital acquired infections. In addition, it can save the economic crisis of the country because of the short hospitalization of the patient (Beggs, Shepherd, & Kerr 2008, 1471-2334).

The second part of the Functional Bachelor's thesis is the theory. In this section it will give detailed information to the nursing students about the importance and proper implementation of hand hygiene.

And finally, the booklet is the product, which will serve as the guidelines for the nursing students in PIRAMK. The content of the booklet was based on the theoretical part of the Functional Bachelor's thesis.

2 CONCEPTS OF HAND HYGIENE

Hand hygiene is the simplest intervention to prevent the cross infection of micro bacteria and it decreases the incidence of healthcare associated infection within the community. This important procedure will avoid the increase of hospital acquired infections from the health care workers to the patients (Akyol 2005, 431-432; Karhumäki, Jonsson& Saros 2005, 56; Ahmed, Memish, Allegranzi & Pittet 2006, 1025-1027; Goss 2007, 56; Beggs, Shepherd, & Kerr 2008, 1471-2334).

Hand hygiene is a key method to an individual especially to the healthcare workers including the students who are involved in the healthcare setting. This is a very essential practice for the control of micro bacteria to transmit from healthcare workers to the patient or vice versa. Hand hygiene is also a part of personal hygiene (Syrjälä, Teirila, Kujala & Ojajärvi 2005, 611).

Since hospital infection was discovered in year 1840, a Ukrainian citizen and gynecologist named Ignaz Semmelweis, together with Joseph Lister the Englishman and a surgeon, brought an idea that the hands as well as the instruments must be disinfected before prior to the surgical procedure. The hand washing and disinfection practice is the reason that the incidence of post operative mortality rate decreases from 80-90% for many years. Until recently, the hand rub disinfectant is the replacement for hand washing (Beggs et al. 2008, 1471-2334).

According to the study of Sarvikivi (2008), as part of poor hand hygiene practice in Helsinki University Central Hospital it showed about 80 incidence of post operative hospital associated infections discovered including some severe infections during hospitalization after open heart surgery; this hospital associated infections are about 34% of surgical site infections and 25% were in bloodstreams infections. It was also found out that 65 incidences of infections were related after post discharged hospitalization. Re-admission is needed in which it is about 89% are caused by viral respiratory or either

gastrointestinal infections. The incidence of infection was found out after discharged that about 20% from the post surgical cases (Sarvikivi 2008, 8-9).

The effectiveness of hand hygiene practice depends on both implementation of hygiene prevention and the symptoms of the infectious diseases. The continuous practice of hand hygiene during the risk transmission of infections had a significant role for the prevention of infections. (Aiello et al. 2008, 1378).

2.1 Hand washing

According to Routamaa & Hupli (2006), there are the two stages of hand hygiene or hand washing which means: washing hands with soap and water then finally by disinfectant with using alcohol. But later, these two stages of hand hygiene are not recommended anymore, because the final result is not much better than only alcohol disinfectant. Using soap and water is recommended to the health care workers only for removing of dirt as the named mentioned earlier (Routamaa & Hupli 2006, 6).

According to Boyce and Pittet (2002), hand washing is the application of water and soap without any contains of antiseptic agents (Boyce & Pittet 2002, 32; DeWit 2005, 208; Routamaa & Hupli 2006, 5). Hand washing is recommended when there is visible dirt presence and to remove transient micro bacteria from the skin. Transient micro bacteria from the skin can be considered as the result of infections which caused by the microbes (Syrjälä, et al. 2005, 614; Routamaa & Hupli 2006, 5).

According to Von Schantz (2005), in her doctorate research about the "Infection control as a nursing intervention: Nursing students, nurses' and patient's knowledge and perceptions. She investigated knowledge and compliance of hand hygiene in students of different school levels, the healthcare workers as well as the patient. The participants were students from colleges (n=190; response rate 77%), polytechnics (n=219; response rate 71%) and healthcare workers (n=287; response rate 61%) about their

knowledge of hand hygiene. It was proven that students followed the recent recommendation of hand washing as well as avoiding frequent hand washing. In the healthcare workers part, instead of performing hand washing in out-patient ward before and after contact to the patient or in any situations it is more convenient for them to apply hand rub disinfection (Von Schantz 2005, 74-77).

The Center of Disease of Control (2002), states that it takes about 15 seconds to 1minute to perform the hand washing by soap and water dried up with paper towel. And for those healthcare workers who are working in the special wards like infectious, surgical areas it is recommended to wash their hands at least 2 minutes (DeWit 2005, 208; Syrjälä et al. 2005, 614).

2.2 Hand rub disinfectant

A hand rub disinfectant is an effective alternative for hand washing as long as it is invisible to dirt (Boyce & Pittet 2002, 1-44). According to Von Schantz 2005, and Syrjälä et al. 2005 they stated, hand disinfection is the latest recommendation towards hand hygiene to increase the compliance (Von Schantz 2005, 78; Syrjälä et al. 2005, 614).

The disinfectant consists of alcohol either isopropanol, ethanol, n-propanol or a combination of these products. A hand rub disinfectant must contain 60% - 95% of alcohol. This concentration of alcohol is more efficient, competent and higher accumulation for the removal of microorganism (Boyce & Pittet 2002, 1-44).

Hand rub disinfection is more effective and less time consuming than performing the traditional way of hand washing. In addition, Johnston regards it as being less irritating for the skin, preserving the skin condition (Johnston 2007, 1-3).

The frequent use of hand rub disinfection has been tested by the dermatologist. The result showed no significant alteration in the skin barrier or erythematic, whereas skin hydration decreased significantly. The test confirmed that alcohol application caused extensively less skin irritation than hand washing with soap. Therefore, in the dermatologic point of view hand rub disinfection is preferred for hand hygiene practice (Lachenmeier 2008, 3-26).

The proper application of hand rub disinfectant is when the hands are dry. Enough amount of the hand disinfection is about three to five pumps of the disinfectant. Vigorously spread to the both palms, in between the fingers, fingernails then let it dry (Routamaa & Hupli 2006, 5-6; Hannuksela 2007, 216). Hand disinfection progression can be achieved within 10-15 seconds and its efficiency is an adequate time for the ward and outpatient department (Syrjälä et al. 2005, 615; Routamaa & Hupli 2006, 5-6). Using a hand disinfectant must not be economized. In the study of Karvinen (2006), it stated that disinfectant is cheaper compared to the cost of one infection which declared by Tarja Varis, hygiene nurse (Karvinen 2006, 3). Proper application of hand disinfection with sufficient quantity and technique should be implemented correctly so that it is more effectively (Von Schantz 2005, 74).

“Hygienic hands rub” is the standard name called in Europe for hand disinfectant (Routamaa & Hupli 2006, 5). It is practically used before and after patient contacts in outpatient department, different wards, ICU and also in surgical and treatment ward (Syrjälä et al. 2005, 615). According to the Center of Diseases Control and Prevention, the general guidelines of hand washing are recommended: (www.cdc.gov/handhygiene; DeWit 2005, 208-209).

The hands of the healthcare workers and patient's relatives must apply hand disinfectant which contains chlorhexidine alcohol after contacting with the MRSA patient or their personal things (Philpott-Howard & Caswell 2004, 56). Application of hand disinfection is necessary before and after contact to MRSA patient is a given instruction for the healthcare workers and visitors

(Karhumäki et al. 2000, 146). It was reported in the studies of Pittet (2001) that the campaign of hand hygiene promotion which emphasizing the application of hand disinfectant as successful. Furthermore, the incidence of MRSA was decrease (Pittet 2001, 32; 2005, 185-186).

Simple procedures to the patient such as measuring blood pressure, temperature, touching the patient do not require hand washing. Instead, using hand rub disinfectant is recommended during these procedures (Von Schantz 2005, 78). It makes the work faster and less time consuming because it does not need to go to the sink for hand washing (Karhumäki et al. 2005, 57). It is also useful to use alcohol in cleaning the hands of the healthcare workers during preoperative procedures (Boyce and Pittet 2002, 1-44).

In Europe, alcohol hand disinfectant is a standard used in hospital and health care environment. But this hand rub disinfectant is not common in households' environment. While in some countries such as Australia standard hand washing is more applicable (Widmer 2007, 106). The reason why hand rub disinfectant is more convenient for the healthcare workers is because its rapid effect kills micro bacteria from the hands, and therefore it is called "waterless hand disinfection" (Pittet 2001, 44; 2005, 185-186).

2.3. Gloves

Gloves should be wearing when handling with body substances such as bloods, secretions, mucous membranes, open wounds or contaminated objects or surfaces of the patient (www.cdc.handhygiene.com; DeWit 2005, 208). They should be disposed after patient contact and never reused or washed (Boyce & Pittet 2002, 1-44; DeWit 2005, 216). Gloves should be put on the last, when it combined with the personal protective equipment (Siegel, Rhinehart, Jackson, & Chiarello 2007, 51).

Von Schantz (2005) states that polytechnic students from the have better information about the usage of gloves rather than the college students level. The college students have also lack of information about the gloves materials and their important participation in aseptic procedure (Von Schantz 2005, 79).

The study of Silvennoinen (2003) shows that about 96% agreed or almost agreed that gloves should be changed after patient contact, 4% partly or disagreed that they are not needed in every new patient contact. Almost 93% agreed that gloves cannot be washed or reused again, but 7% think that gloves can be washed and reused (Silvennoinen 2003, 763-767).

3 INDIVIDUAL PARTICIPATION IN HAND HYGIENE

3.1 Healthcare workers

The healthcare workers hands can transfer micro bacteria after direct contact to the infected or colonized part of the body of the patient or any contaminated things once hand hygiene is not implemented before direct contact to the next patient (Siegel et al. 2007, 7). In one study about the hand hygiene compliance of the healthcare workers it showed that about 59% of total average practices the hand hygiene. The reasons behind this of low compliance are because of over workload and understaffing in the hospital (Trunell & White JR. 2005; Akyol 2007, 432; Beggs et al. 2008).

In Peru, the nurses have good knowledge about the purpose of hand hygiene. But despite this knowledge, the Peru nurses cannot implement the hand hygiene practice because of some factors that cause the poor compliance (Kunnas de Pineda & Niinimäki 2003, 3). On the other hand, according to Widmer (2007), and Ahmed et al.(2006), hand hygiene compliance of health care workers improves about 60% by using the hand rub disinfectant and its effectiveness rather than soap and water (Ahmed et al. 2006, 1025; Widmer 2007, 106).

According to Routamaa and Hupli (2006), nurses have better information of hand hygiene rather than the basic nurses. In addition, healthcare workers who are working in university hospitals have enough information of hand hygiene rather than those healthcare workers who are in rural hospitals (Routamaa & Hupli 2006, 60).

The effectiveness of hand hygiene practice depends on both implementation of hygiene prevention and the symptoms of the infectious diseases. The continuous practice of hand hygiene during the risk transmission of infections had a significant role for the prevention of infections (Aiello et al. 2008, 1378).

The hygiene nurse is the one who provides information and gives training to the nurses about the basic infection control in the hospital area. The primary role of the hygiene nurse is to provide the bedside caregiver in the ward. She or he is the one who increases information about the prevention of infection in the hospital ward. The hygiene nurse is specialized in implementing new policies or interventions for controlling the infections because of the given report by the staff in the ward. She or he has the capacity to promote campaign or strategies which usually effective to control the infection (Siegel et al. 2007, 43).

3.2 Nursing Students

In study of Celik and Kocasli (2008), 71.9% of the students have reported that they implement hand washing for about 1 minute or longer. But the final outcome of the study gives the different results. The students neither implement it nor give significance to the issue despite the educational program given to them about important control measure of hand hygiene and its updated information, (Celik & Kocasli 2008, 207-211).

According to Von Schantz (2005), the students' knowledge and given information about hand hygiene practice are different from those who graduated from polytechnic and colleges school. Polytechnic students have sufficient information about hand hygiene unlike the college students do. Furthermore, college students used small amount of hand rub disinfection. Moreover, students wipe their hands after the application of hand rub disinfectant (Von Schantz 2005 76-92).

The students' assessments towards nursing skills when it comes to nursing care level need to be improved. The skills level of the students can be seen during giving of care to the different patients with the different kinds of diseases (Salmela 2004, 118).

3.3 Patient

Patient education is considered necessary for entire treatment, in which healthcare workers give information so that the patient can understand the giving treatment and cooperation during hospitalization. According to the Finnish research which is written by Salmela (2004), the nurses or the student nurses in their opinions have enough knowledge and skills to educate the patients (Salmela 2004, 23). Patients, relatives and visitors have a huge part for the prevention of hospital infections especially in hand hygiene compliance (Siegel et al. 2007, 48).

Patient's involvement in hand hygiene campaign is significant to develop the hand hygiene practice of the healthcare workers. Their participation together with their relatives concerning nursing care can minimize the poor compliance of the healthcare workers towards hand hygiene (www.who.int/patientsafety.com 2005).

Patients have an average knowledge that the use of disinfection is more effective for removal of micro bacteria from the hands. In addition, some patient knows that the healthcare workers have to put into practice the hand rub disinfection before patient's contact (Von Schantz 2005, 78).

4 SKIN CARE

Repetitive hand washing can cause dryness and roughness to our skin. Using hand creams is recommended immediately after performing the hand washing. It will protect the skins from any irritation which caused by the soap (Kampf & Ennen 2006, 1471).

When using the hand rub disinfection frequently, the hands of the healthcare workers can be irritated, dry or even get sore. Because of this dermatitis problem the health care workers have a poor compliance of hand rub disinfection. With the use of hand rub disinfection it is also possible to test skin condition. But, others healthcare workers preferred to use the traditional hand washing by using soap and water. With this idea of frequent hand washing, the skin condition is getting worse (Syrjälä et al. 2005, 621).

The uses of emollients should be added in alcohol disinfectant. They protect against cross-infection by maintaining the skin intact. Moreover, application of hand lotion is also suggested to help protect the skin from dryness (Pittet 2001, 44).

There is no reason to worry about the dryness or irritation of the skin because the disinfection contents of oil treatment. There is a small amount of oil in which it will not stain in the hands neither in the paper towel nor on clothes. Ethanol does not irritate the skin, neither the isopropanol solutions. These solutions when applied to the broken skin may cause a painful effect for about 20 seconds. It is a normal effect and there is no reason to stop using the hand rubs disinfection –vice versa. Irritation of the skin which causes itchiness and the painful effect will lessen (Hannuksela 2007, 217).

REFERENCES

Aiello, A., Coulborn, R., Perez, V., Larson, E. 2008. Effect of Hand Hygiene on Infectious Disease Risk in the Community Setting: A Meta-Analysis. *American Journal of Public Health* August Volume 98, Number 8, 1372-1381.

Ahmed, Q., Allegranzi, B Memish, Z.,,Pittet,D., 2006. Muslim health-care workers and alcohol-based hand rubs. *www.thelancet.com*. Volume 367, March 25, 1025-1027.

Akyol, A. 2005. Hand hygiene among nurses in Turkey: opinions and practices. *Journal of Clinical Nursing*. 431-436.

Beggs, C., Shepherd, S., Kerr, G., 2008. Increasing the frequency of hand washing by healthcare workers does not lead to commensurate reductions in staphylococcal infection in hospital ward . *Biomedical Central of Infectious Diseases*. September 2, Volume 8 <http://www.biomedcentral.com/1471-2334/8/114>. Read 02.06.2009.

Boyce, J. & Pittet, D. 2002. Guideline for Hand Hygiene in Health-Care Settings. *www.cdc.gov*. October 25,2002 Volume 51(RR16); 1-44. Cited and read 19.09.2009. Updated last 16.09.2009.

Celik, S. & Kocasli,S. 2008. Hygienic hand washing among nursing students in Turkey. *Applied Nursing Research*, November 21 (4): 207-211.

Center for Disease Control and Prevention. Hand Hygiene Interactive Education.

<http://www.cdc.gov/handhygiene/training/interactiveEducation/frame.htm>.

Read12.07.2009.

DeWit, S. 2005. *Fundamental Concepts And Skills For Nursing* 2nd edition, 208-220, 760.

Goss,L. 2007. Infection Control : it's in your hands. *Nursing Management* .June *www.nursingmanagement.com* 56-57. Read 26.06.2009.

Hannuksela, M. 2007. Käsisidesinfektioaineet sopivat ihon hoitoon yleisemminkin Suomen Sairaalahygienialehti 25: 216-218.

Johnston, G.A., 2007. Alcohol hand rub: A good soap substitute? British Journal of Dermatitis. Volume 157, number 1. 1-3.

Kampf, G.& Ennen, J. 2006. Regular use of a hand cream can attenuate skin dryness and roughness caused by frequent hand washing. <http://www.biomedcentral.com/1471-5945/6/1>. Read and saved 24.09.09

Karhumäki, E., Jonsson, A.,& Saros, M. 2005. Mikrobihyökkäys Elimistöön. Hoitotyön Haasteena. 54-67.

Karvinen, M., 2006. Desinfektio suojaa bakteereilta. Sorius Lehti.

Kunnas de Pineda, J. & Niinimäki, K. 2003. Hoitajien Käsihygienia Perussa. Terversalan koulutusohjelma Opinnäytetyö. Toukokuu. 1-42.

Lachenmeier, D. 2008. Safety evaluation of topical applications of ethanol on the skin and inside the oral cavity. J Occup Med Toxicol. 2008 Lachenmeier; licensee BioMed Central Ltd. Published online 2008 November 13. doi: 10.1186/1745-6673-3-26.

Philpott-Howard, J. & Casewell, M. 2004. Hospital Infection Control: Policies and Practical procedures. W.B. Saunders Company Ltd. , 56.

Pittet D. 2001. Improving Adherence to Hand Hygiene Practice: A Multidisciplinary Approach Emerging. Infectious Disease Journal Vol. 7, No. 2 March –April. Saved 02.04. 2009 url: <http://www.cdc.gov/ncidod/eid/vol7no2/pittet.htm>.

Pittet, D. 2005. Clean hands reduce the burden of disease www.thelancet.com. Volume 366 July 16. ,185-186. Read 21.07.2009.

Pyrek, K. 2004. Through Proper Hand Hygiene and Gloving. Infection Prevention. 01.10, 2004.

Routamaa, M. & Hupli, M. 2006. Hoitotyöntekijöiden tiedot ja käsitykset käsihygieniasuosituksen mukaisen käsihygienian toteutumisesta. Varsinais-Suomen sairaanhoitopiiri. Sarja A Number 1, 5, 5-7, 61-62.

Salmela, M. 2004. Sairaanhoitajaopiskelijoiden hoitamisen taidot ja niiden opetus ammattikorkeakoulussa: Opiskelijoiden, opettajien ja ohjaajien arvioit. Turun Yliopisto Julkaisuja . 29, 118-119.

Sarvikivi, E. 2008. Healthcare-Associated Infections in Pediatrics Department of Infectious Disease Epidemiology and Control National Public Health Institute and Pediatric Graduate School Hospital for Children and Adolescents University of Helsinki, Finland , 8-9.

Siegel, J., Rhinehart, E., Jackson, M. & Chiarello, L. 2007.

2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings 1-225

<http://www.cdc.gov/ncidod/dhqp/pdf/isolation2007.pdf>. Read 14.07.2009.

Silvennoinen, E. 2003. Käsihygienia terveydenhuollossa. Suomen Lääkärilehti Volume 7 /58 , 763-767.

Syrjälä, H., Teirilä, I., Kujala, P. & Ojajärvi, J. 2005. Käsihygienia. Teoksessa Infektioiden torjunta sairaalassa. Suomen kuntaliitto. Porvoo: WS Bookwell Oy. 611-615.

Trunnell, E.P. & White JR, G.L. 2005. Using Behaviour Change Theories to Enhance Hand Hygiene Behaviour. Education for Health Volume 18, Number 1 March. 80-84.

Widmer, A. 2007. Behavioural Explanation of noncompliance with hand hygiene. Infection Control and Hospital Epidemiology. January, Volume 28, No. 1 10-107.

World Health Organization. 2005. Second International Consultation on WHO Guidelines on Hand Hygiene in Health Care: Implementation Strategies

<http://www.who.int/patientsafety/events/05/Summary2ndConsultation.pdf>. Read 27.07.2009.

Von Schantz, M. 2005. Sairaalainfektioiden Torjunta Hoitotyön Toimintona: hoitotyön opiskelijoiden, hoitoyöntekijöiden sekä potilaiden tiedot ja käsitykset. Turku, 76-92.



PART 3: THE BOOKLET

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