



2nd ICHMS & 2nd LSC

PROCEEDING

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The 2nd International Conference of Medical and Health Sciences (ICMHS) and The 2nd Life Sciences Conference (LSC) 2016

*"Towards a Better Quality of Life
through Interdisciplinary Research"*

Yogyakarta, 9th-10th December 2016
The Alana Hotel and Convention Center

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**The 2nd International Conference of Medical & Health Sciences
and
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**Chair person of The 2nd International Conference of Medical and
Health Sciences and The 2nd Life Sciences Conference 2016**



Welcome to Jogja, sugeng rawuh!

For the second time, the Faculty of Medicine and Health Sciences Universitas Muhammadiyah Yogyakarta is going to conduct the 2nd International Conference of Medical and Health Sciences (ICMHS) this December in vibrant Yogyakarta, Indonesia. This year we are going to collaborate with the Life Sciences Society of Pakistan for their 2nd Life Sciences Conference (LSC) with Dr. Zahid Iqbal as the general secretary.

This year's conference theme "Towards a better quality of life through interdisciplinary research" will be celebrating an era of seamless interdisciplinary integration and collaboration in scientific innovations with the involvement of more extensive topics and disciplines in the conference. We aim to exhibit the products of that kind of approach in solving challenges, improving the quality of life, and creating sustainable developments. We are happy to announce that our conference is filled with Invited speakers from Pakistan, United States of America, Uni Emirates Arab, Malaysia and Indonesia. Presentations will be conducted in oral as well as poster that covers topics from medicine, public health, dentistry, pharmacy, biomedical to agriculture. To put more credibility to the conference we are collaborating with Isra Medical Journal and the Asian Journal of Agriculture and Biology to publish selected papers from the event. Other paper will be published in the ISBN Proceeding book.

The last but not least, enjoy the conference, start networking and sharing ideas, and let immerse yourself to the heritage cultural ambient of Jogja, sumonggo!

Yogyakarta, 1st December 2016

dr. Iman Permana, M.Kes, Ph.D.

**The 2nd International Conference of Medical & Health Sciences
and
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**Dean of Faculty of Medicine and Health Sciences,
Universitas Muhammadiyah Yogyakarta**



Assalamu'alaikum Wr. Wb.

Science, especially in the areas of health and life growing more rapidly. We need to work together in the research of various disciplines to the advancement of science and to provide benefits to human life.

After successfully organized international scientific meeting last year, the Faculty of Medical and Health Sciences Universitas Muhammadiyah Yogyakarta, held the second scientific meeting ICMHS along with "2nd Life Sciences Conference". In this second scientific meeting, FKIK UMY collaborates with various researchers, among others from Pakistan, Malaysia, and the United States. Taking the theme "Towards a better quality of life through interdisciplinary research" we hope to establish cooperation with various parties to be able to contribute ideas to the civilization of human life.

Finally, we congratulate the scientific meeting in the city of Yogyakarta Indonesia. Enjoy the beautiful city of Yogyakarta with priceless historical relics. We hope that this meeting can run smoothly and provide benefits to the advancement of knowledge.

Wassalamu'alaikum Wr. Wb.

Yogyakarta, 1st December 2016

dr. Ardi Pramono, M.Kes, Sp.An.

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and
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Rector of Universitas Muhammadiyah Yogyakarta



Assalaamu'alaikum Wr. Wb.

Ladies and Gentlemen,

Welcome to the 2nd International Conference on Medical and Health Science in conjunction with the 2nd Life Sciences Conference 2016

Welcome to Yogyakarta City of Tolerance

Our Faculty of Medicine and Health Sciences has been doing such international conference almost every year for the last ten years. This and other previous conferences are the things that supporting our vision as an excellence and Islamic university, a young and global university. We will always try to keep monitoring the development of science through sending more lecturers to do the sabbatical leave overseas, doing international research collaborations and also the international conference. Each department should do this strategy of internationalization so that each department has its own network. Faculty of medicine and health science is one of the most progressive units in implementing this strategy by inviting international experts on a regular basis. This program will certainly strengthen our vision.

International conference on medicine and health sciences is a smart choice to offer our lecturers access to the most recent development of the subjects. The participants will also gain the same knowledge and latest information on medicine and health sciences. As everyone knows that the development of science and technology are faster today compared to the previous period. Information technology, computer, and other development havefastened the transformation of medicine and health science into the different and more complex stage.

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Cellular technology, for instance, can be used for several functions including those that directly impacts our daily life. There is no long distance call anymore today because cellular phone can do everything we need to contact other people far from where we stand anytime anywhere. People will finally innovate cellular phone for the sake of personal health services. We will in the future using our simple cellular phone to detect our body temperature, blood pressure, even how much fat we have in our body and how much it is supposed to be. We may also be able to check the health of our body without leaving our house and order medicine without going into the drug store. Everything is almost possible as long as we think hard for the better of people in the future. Enjoy the conference and don't forget to visit our rich tourist destinations, mountains, beaches or caves (underground waterways).

Thank you

Wassalaamu'alaikum Wr. Wb.

Prof. Dr. Bambang Cipto, MA

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Keynote Speech

**by Head of Provincial Health Office Special Region of Yogyakarta
in International Conference
of Medical and Health Sciences and Life Sciences Conference**

The Alana Hotel and Convention Center, Yogyakarta, December 9-10, 2016

The honorable:

- Rector of Muhammadiyah University of Yogyakarta,
- The Dean of Medical and Health Sciences Muhammadiyah University of Yogyakarta,
- The chairman of organizing committee of the international conference of medical and health,
- Distinguished guests and colleagues.

Assalamu'alaikum Warahmatullahi Wabarakatuh,

First of all, we thank God for His blessings that today we may attend the International Conference of Medical Health Towards a Better Quality of Life Through Interdisciplinary Research in Yogyakarta.

My distinguished colleagues,

In Indonesia National Long Term Development Plan (2005-2024), the Indonesian Ministry of Health have determined a paradigm shift that have governed health services in health development plan. There has been a shift from Curative Health Services to Preventive and Promotive Health Services.

Recently, Indonesia suffers from a triple burden of diseases as health development challenges. The triple burden of diseases are: 1) the backlog of common infections, undernutrition, and maternal mortality; 2) the emerging challenges of non-communicable diseases (NCDs), such as cancer, diabetes, heart disease; and 3) mental illness, and the problems directly related to globalization, like pandemics and the health consequences of climate change.

Dear colleagues,

Here are some data that show several health problems in Indonesia:

1. Maternal mortality rate in 2015 is 4,809 cases, infant mortality rate in 2015 is 22,267 cases;
2. Regarding to children under the age of five, the national stunting rate is 37.2% which consists of 18% for very short dan 19.2% for short (Riskesdas 2013);

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3. HIV testing coverage is 14% dan antiretroviral (ARV) therapy coverage is 65.58% (Directorate General of Disease Control and Prevention Ministry of Health, 2015);
4. Tuberculosis (TB) notification rate in 2015 is 73.5% and tuberculosis treatment success rate is 72% (Directorate General of Disease Control and Prevention Ministry of Health, 2015).

Distinguished guests,

Indonesia Health Development Program in 2015-2019 strengths in improving human quality life through Health Indonesia Program with family approach. The Indonesian Ministry of Health issued The Minister of Health Regulation (Permenkes) No. 39 Year 2016 as a Guideline of Implementation of Health Indonesia Program with Family Approach. This program has 12 main indicators as markers of a family health status. Currently, many health programs have been implemented by Indonesian Ministry of Health, Provincial Health Offices, and District Health Offices. However, many health problems, some as mentioned above, still become health burdens. We may ask a question whether the programs that we conducted have answered the health problems we have in Indonesia.

It would be better if all health programs that we implement based on scientific health research, especially interdisciplinary research. The research should be related to detection, prevention, and treatment of diseases or problem solving for better health.

My dear colleagues,

Being a province with speciality, Special Region of Yogyakarta placed Traditional Medicine as one of the priority programs in Provincial Medium Term Development Plan (2017-2022). We still encounter many challenges in developing Traditional Medicine, especially in providing services which are based on scientific evidence.

Distinguished colleagues,

We look forward to results of interdisciplinary research which would support health problem solving, especially by developing traditional medicine in Yogyakarta. We believe that collaboration in interdisciplinary research would improve quality of human life.

Finally,

Thank you for your attention. We wish you a successful conference.

Wassalamu'alaikum Warahmatullahi Wabarakatuh,

On behalf of
the Head of Provincial Health Office
Special Region of Yogyakarta

Drg. Pembajun Setyaningastutie, M.Kes

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**SPEAKER OF
INTERNATIONAL CONFERENCE**

Zahid Iqbal

Al-Nafees Medical College Isra University Islamabad Campus Islamabad, Pakistan
"One Health Program for Public Health Benefit"

Prof. Dr. Abdul Khaliq

Professor, Department of Agronomy, University of Agriculture, Faisalabad
"Role of Agriculture in Poverty Alleviation of Rural Areas"

Fitri Arofati

Universitas Muhammadiyah Yogyakarta, Indonesia
"Continuing Professional Development of Practicing Nurses in Indonesia"

Tri Wahyuliati

Universitas Muhammadiyah Yogyakarta, Indonesia
"Diabetic Neuropathy - A Chance Towards A Better Treatment"

Mohammad Khalid Ashfaq

University of Mississippi, USA
"Natural Products –Use or Misuse"

Muhammad Mukhtar

American University of Ras Al Khaimah, United Arab Emirates
"Emerging Biotechnologies and Genomic Medicines in Human Health and Well-Being"

Muhammad Sasmito Djati

Brawijaya University Malang, Indonesia
"Herbal Medicine a Holistic Approach: in case of food supplement formulation of Sauropusandrogynus and Elephantopuscaberto modulate immune and hormonal system in pregnant Salmonella typhi infected mice"

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REVIEWER

1. Dr. Zahid Iqbal, Ph.D (Isra University, Islamabad, Pakistan)
2. Prof. Dr. Abdul Khaliq (University of Agriculture, Faisalabad)
3. Dr. Mohammad Khalid Ashfaq, DVM, DTVM, MS, Ph.D (University of Mississippi, USA)
4. Dr. Muhammad Mukhtar, Ph.D (American University of Ras Al Khaimah, United Arab Emirates)
5. Dr. Ir. Muhammad Sasmito Djati, MS. (Brawijaya University Malang, Indonesia)
6. Fitri Arofiati, S.Kep., Ns., MAN., Ph.D (Universitas Muhammadiyah Yogyakarta, Indonesia)
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14. Dr. dr. Tri Wahyuliati, Sp.S, M.Kes (Universitas Muhammadiyah Yogyakarta, Indonesia)
15. Dr. Elsy Maria Rosa, M.Kep (Universitas Muhammadiyah Yogyakarta, Indonesia)
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20. Drh. Tri Wulandari K, M.Kes (Universitas Muhammadiyah Yogyakarta, Indonesia)
21. Dr. dr. Wiwik Kusumawati, M.Kes (Universitas Muhammadiyah Yogyakarta, Indonesia)
22. Sabtanti Harimurti, S.Si., M.Sc., Ph.D., Apt. (Universitas Muhammadiyah Yogyakarta, Indonesia)

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**SPEAKER OF
INTERNATIONAL CONFERENCE**

ICMHS-P-3-10

Effectiveness of Alcohol 70%, Clorhexidine Gluconate 4% Soap and Irgasan DP 300 as Hand Sanitizers in Reducing Bacterial Growth

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Abstract

The microorganisms in the hand can cause the spreading of nosocomial infection. Washing hands is the most effective way to control infection and it is important to check the effectiveness of antiseptic hand sanitizer to reduce bacteria growth in the hands. This study determine effectivity of 70% alcohol, Clorhexidine Gluconate 4% soap and Irgasan DP 300 and to know most powerful of theme in reducing bacteria growth. Research method quasi – experimental on one group (one group pre test – post test design). There are 3 groups consist of 20 healthcare worker each group. The sample is taken from hand before and after hand washing with hand sanitizer, then be cultured in TSA media during 24 hours in 37°C, and count the number of bacteria. Data analyzed by paired sample T test and One way ANOVA. The average number of bacteria before hand washing with Clorhexidine Gluconate 4% Soap, 70% Alcohol and Irgasan DP 300 are 161.9 cfu/ml, 168.7 cfu/ml, and 129.6 cfu/ml respectively, and after hand washing are 47.4 cfu/ml, 45.6 cfu/ml, 69.7 cfu/ml respectively. The average of reducing bacteria growth after hand washing by Clorhexidine Gluconate 4% Soap is 69.4%, by 70% Alcohol is 72.61% and by Irgasan DP 300 is 46.80 %. The p-value in statistic T paired sample test is 0.00 and ANOVA test is 0.01. There are differences between 3 hand sanitizer to reduce bacteria growth in hands . Alcohol is the best hand sanitizer to reduce bacteria growth and to prevent spreading of nosocomial infection

Keywords: Hand washing, 70% Alcohol, Clorhexidine Gluconate 4% Soap, Irgasan DP 300

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INTRODUCTION

Washing hands is an important procedure in preventing nosocomial infection and infection control, but this simple procedure often did not be done.¹ The majority of nosocomial infections occur through the transfer from healthworkers hands who are not correctly washing hands.^{2,3} Some research determine the transfer of infection through hand by tested the ability of some antiseptics in reducing the number of bacteria in the hands⁴

The skin contains transient microorganisms. Most of the skin resident microorganisms is differoid aerobic and anaerobic bacilli (eg, *Corynebacterium*, *Propionibacterium*); Staphylococcus non hemolytic aerobic and anaerobic (*Staphylococcus epidermidis*, *Staphylococcus aureus* occasionally and *Peptosreptococcus species*); as well as gram-negative coliform bacteria and *Acinetobacter*. The number of microorganisms on the skin can be reduced by washing with soap containing hexachlorophene or other disinfectants materials every day.⁵

Antiseptic is defined as a chemical that can inhibit or kill the growth of microorganisms such as bacteria, fungi and other at the tissue.⁶ Alcohol is a material widely used in addition to the aldehyde. Some ingredients of which is ethanol, propanol and isopropanol. Alcohol mechanisme is denatured microorganisme and the action in the range of seconds to minutes and for the virus takes over 30 minutes.⁶

The aim of this research to determine the effectiveness of some antiseptic 4% Clorhexidine Gluconate Soap, 70% Alcohol and Irgasan DP 300 to decrease the number of bacteria and determine the most effective antiseptic as hand sanitizer.

MATERIALS AND METHODS

Research metode is quasi - experimental laboratory on one group (one group pre test - post test design). Materials and tools used in the research were injection syringes, test tubes, ose round/taper, and the holder, refrigerators, lamps bunsen, Incubator "Mommert, gloves and masks.

The steps of this research is as follows: Take a sample of 60 respondents were divided into three test groups. The first group is the respondents who wash hands with soap with active ingredients Clorhexidine gluconate 4%, the second group is of respondents washed their hands using alcohol 70%, and a third group of respondents washed their hands using Irgasan DP 300. Sampling is done aseptically swab of the palm of respondents using a sterile cotton stick that has been soaked in sterile saline. Samples were taken at the time before and after patient hand washing. Sampling was conducted in the same area and spacious. Swab samples have been taken put it into 1 ml of sterile saline. Measurement the number of bacteria by the pour plate metode.

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Pouring the sample swab in 1 ml of sterile saline on TSA media, then petri placed on a tilted position, so that the residual urine that has been wetting the media gathered at the bottom. The residual urine were collected taken with a sterile pipette and discarded. It is estimated that the urine attached to the media is 1/10 of 1 ml (0,1ml) for further incubated for 24 h, 37 ° C. The number of bacteria is calculated by the following formula:

$$\text{Bacteria Number} = \text{Number of colonies} \times \text{dilution factor} \times 10 \text{ CFU} / \text{cm}^2.$$

Description: CFU: Colony Forming Unit

Data analysis using paired T-test with a confidence level of 0.05% and One way Anova.

RESULTS

The number of bacteria on the 20 respondents hands before and after hand washing with antiseptic Soap Gluconate 4% Clorhexidine shown in Chart 1.

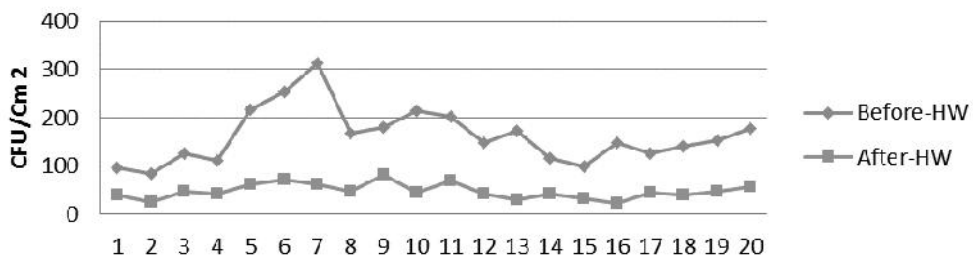


Figure 1. Number of Bacteria Before & After Handwashing with 4% Clorhexidine gluconate (CFU/Cm²)

The number of bacteria on 20 respondents hands before and after hand washing with antiseptic 70% Alcohol shown in Chart 2.

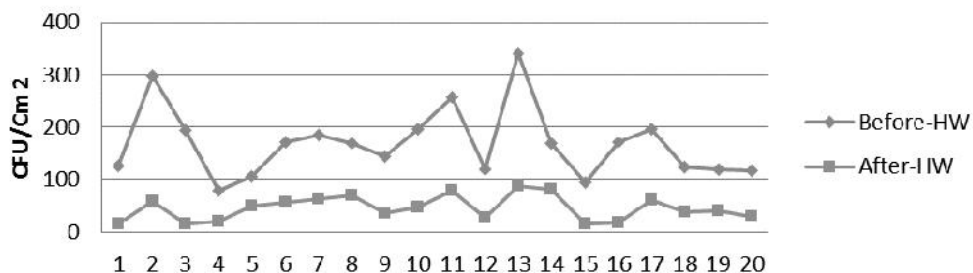


Figure 2. Number of Bacteria Before & After Handwashing with 70% Alcohol (CFU/Cm²)

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The number of bacteria on 20 respondents hands before and after hand washing with antiseptic Irgasan DP 300 shown in Chart 3.

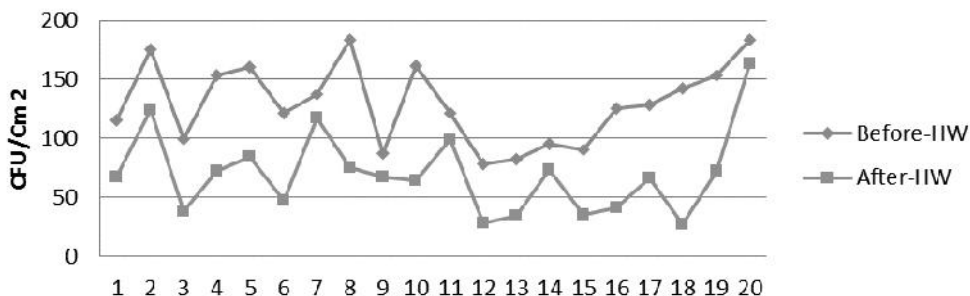


Chart 3. Number of Bacteria Before & After Handwashing with Irgasan DP 300 (CFU/Cm²)

The average and the decrease percentage number of bacteria on the hands before and after hand washing with three antiseptics shown in table 1.

Table 1. The Average and the Decrease Percentage Number of Bacteria Before and After Hand Washing with 3 Kinds of Antiseptics.

	4% Clorhexidine Gluconate soap (CFU/cm ²)	70% Alcohol (CFU/cm ²)	Irgasan DP 300. (CFU/cm ²)
The average number of bacteria before hand washing	161.9	168.7	129.6
The average number of bacteria after hand washing	47.4	45.6	69.7
The reduce percentage of bacteria number	69,5	72,6	46,8
p value on the T test paired sample test	0.00	0.00	0.00

The average number of bacteria before hand washing with 4% Clorhexidine Gluconate soap was 161.9 (CFU/cm²) and the average number of bacteria after hand washing is 47.4 (CFU/cm²) with p value is 0.00 (P <0.05). It can be concluded that there is a significant difference between the average number of bacteria before and after hand washing with antiseptic 4% Clorhexidine Gluconate soap

The average number of bacteria before hand washing with 70% Alcohol was 168.7 (CFU/cm²) and the average number of bacteria after hand washing is 45.6(CFU/cm²) with p value is 0.00 (P <0.05). It can be concluded that there is a significant difference between the average number of bacteria before and after hand washing with

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antiseptic 70% Alcohol.

The average number of bacteria before hand washing with *Irgasan DP 300* was 129.6 (CFU/cm²) and the average number of bacteria after hand washing is 69.7 (CFU/cm²) with p value is 0.00 (P <0.05). It can be concluded that there is a significant difference between the average number of bacteria before and after hand washing with antiseptic *Irgasan DP 300*.

Statistical analysis *t Paired Sampel Test* showed that there are significant differences between the number of bacteria before and after hand washing with all antiseptics tested and all anticeptics tested are effective in reducing the number of bacteria .

Statistical analysis using One Way Anova be done to determine whether there are differences in the percentage of reducing bacterial number after hand washing with 3 antiseptics. Table 2 show that probability value is 0.01 (< 0.05). It means there is a significant differences in the percentage of reducing bacterial number after hand washing with 3 antiseptics.

Table 2. One Way Anova Test to the Percentage of Reducing Bacterial Number after Hand Washing with 3 Antiseptics.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1237.266	2	618.633	7.853	.001
Within Groups	4490.227	57	78.776		
Total	5727.493	59			

Table 3. shows the average of percentage reducing bacteria number after hand washing with 4% Clorhexidine Gluconate soap is 69.4%, hand washing with 70% Alcohol is 72.61% and hand washing with *Irgasan DP 300* is 46.80%.

Table 3. An Average of Percentage Reducing Bacteria Number after Hand Washing with 3 Antiseptics

Antiseptics	An average of percentage reducing bacteria number
4% Clorhexidine Gluconate soap	69.4
70% Alcohol	72.61
<i>Irgasan DP 300</i>	46.80

Alcohol 70% is the best antiseptic in reducing bacteria number than 4% Clorhexidine Gluconate soap and *Irgasan DP 300*

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DISCUSSION

Alcohol can be prepared by make a mixture of 70% plus emollient which can reduce hands irritation. Soap antiseptics used in this study is commonly use in the operating room with active ingredient Clorhexidine gluconate 4%. Hand washing using 70% alcohol more effective than using 4% Clorhexidine Gluconate soap in reducing bacteria. number. Hands washing with Irgasan DP 300 significantly can reduce bacteria number than hands washing with plain soap. Irgasan is an active ingredient of instant hand washing can reduce bacteria number in the hands significantly ⁷

Irgasan DP 300 has less ability in reducing bacteria number than 4% clorhexidine gluconate soap and 70% alcohol. Once hands washing with Irgasan DP 300 can reduce 46.80%. bacteria number.⁷ Lily et al, (1974) Once hands washing with Irgasan have less ability in reducing bacteria number, but has good ability when 7 times repetition hands washing. Use the hand wash Irgasan DP 300 requires repetition to get better results. In this research not be repeated hand washing due to time constraints.⁷

Alcohol is the most excellent antiseptic in reducing bacteria number also has an ideal antiseptic criteria are: 1. Have a most excellent antibacterial potency, 2. The antimicrobial activity at room temperature or at body temperature, 3. Only react on the surface, 4. Do not cause the color or rust, 5. It has a uniform composition, 6. Availability and 5. affordable prices.

Alcohol is an antiseptic with denaturation mechanism. Antimicrobial potency of Alcohol will be occurred in range of seconds to minutes but against the virus takes over 30 minutes.⁶ Alcohol is very effective to reduce the bacteria number on hands, which is an average 3.5 log¹⁰ after the application for 30 seconds and 4.5 to 5.0 log¹⁰ after the application for 60 seconds.⁸ Hands washing with 70% alcohol and be dried for 15 seconds, 30 seconds and 60 seconds have the same efficacy killed hands bacteria.⁹ Washing hands with Irgasan DP 300 is able to reduce bacteria number significantly lower than regular soap, but it requires 7 times repetition to get better results.⁷

Antimicrobial activity of Chlorhexidine is precipitate a bacterial cell components and better killed Gram-positive bacteria than Gram-negative bacteria, fungi and tubercle bacillus. Chlorhexidine Antimicrobial activity is influenced by organic materials, because Chlorhexidine is a cationic molecule and its activity can be reduced by natural soaps (natural soap), various organic anions, nonionic surfactants and hand creams containing anionic emulsion material.⁸ Hands washing with Chlorhexidin 1.5% + cetrimide 15% 1: 150 v / v can be used if good drying after hands washing.¹⁰

The difference of three antiseptis in reducing bacteria number because of the manner and duration of hand washing. Recommended time to wash your hands is 30 seconds to one minute. Health workers must adhere to proper hand washing procedures to reduce the incidence of nosocomial infections. Selection of appropriate

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antiseptic can improve the effectiveness of the prevention of nosocomial infections and cost effectiveness

CONCLUSION

Antiseptics 70% Alcohol, 4% Chlorhexidine Gluconate Soap and Irgasan DP 300 has effectiveness in reducing bacteria number. There are differences between 3 hand sanitizer to reduce number of bacteria in hands. 70% Alcohol is most effective to reduce number of bacteria and to prevent spreading of nosocomial infection.

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