



Assessment of tolerability and acceptability of alcohol-based solution according to World Health Organization (WHO) Protocol among Employees and Students of Kalinga State University (KSU)

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Abstract— *The present pandemic threatens not only the people's health but the demand of ABHR (Alcohol Based Hand-rub) which can lead to improved compliance of hand hygiene practices. This study was designed to determine the acceptability and tolerability of ABHR for the hand hygiene of employees and students of Kalinga State University. 40 participants were enumerated according to the WHO protocol which comprised primarily of faculty and staff (60%), the majority were female (58%). Few of the respondents reported asthmatic conditions (10%) and any non-work activity/ies (7.5%) that would damage their skin in the duration of the test period. The majority of the criteria set by the WHO for the acceptability of the product were deemed acceptable except for the two parameters, texture (45%) and drying effect (50%) which is below the recommended percentage of the WHO. The said parameters were suggested to be improved for the next study. The respondents reported their satisfaction with the produced ABHR and added that the test product improved their hand hygiene practices (75%). A separate study should be considered to assess the Product tolerability and skin compatibility with a trained medical staff per WHO Protocol so that objective assessment by an independent observer as well as subjective assessment will be assessed.*

Keywords— *Alcohol-based solution, product tolerability, Hand-hygiene practices.*

I. INTRODUCTION

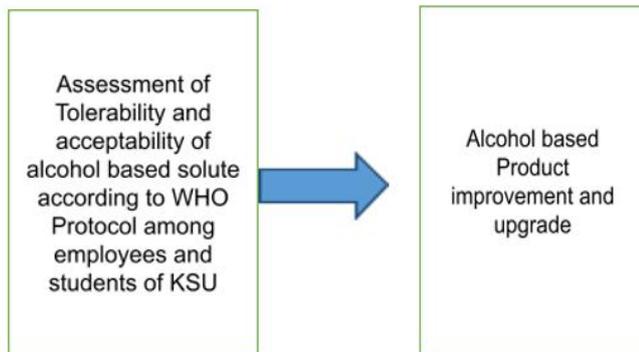
Background of the study

The unexpected coming of COVID-19 gave an instant problem nationwide that leads to the cramming of people to have a panic buying to the supermarkets to their necessity needs especially for the disinfectants that believe to kill right away the virus. Because of this panic buying, it cannot denied that there was scarcity of supply to sanitizers. Some businesses even hoard their products and some gave overprice to their products. Though body soaps are still available for hand hygiene, they still play a central role in the prevention of infections. Some have the irked in using them because they are not as handy as the rubbing alcohol or other hand sanitizers. However, in healthcare and cosmetology, hand hygiene is insufficient, which is

associated with increased morbidity, mortality, and healthcare costs.

Because of this scenario, the initiatives of everyone was enjoined. Many of them resorted in making or manufacturing their own hand sanitizers and gels, believing that these could help kill and disinfect virus and bacteria. It is well known, however, that sanitizers can be done at home as readily made available or what we call as the Do it by Yourself a.k.a DIY. However, not all sanitizers and gels are tolerated by users. Some of the users have allergies that could lead not to use these sanitizers. Hence, this research was conceptualized to assess the tolerability and acceptability of the users of alcohol based solution among the employees and students of Kalinga State University, of which in accordance to the protocol of the World Health Organization (WHO).

A. Conceptual Framework



B. Objectives of the Study

The study aims to evaluate the acceptability and tolerability of alcohol based antiseptic solution among KSU: Employees and students using WHO Protocol. Specifically, it aims to

1. Assessed the hygiene practices of the selected respondents
2. acceptability and tolerability of alcohol based antiseptic solution in terms of:
 - a. color
 - b. smell
 - c. texture
 - d. irritation
 - e. drying effect
 - f. ease of use
 - g. speed of drying
 - h. application and
 - i. overall evaluation
3. Assessed the skin after use of the test product

C. Scope and delimitation of the study

Test product to be used the study will be produced at the Central Science Laboratory of the Kalinga State University from the period of June 2020-July 2020. The said project which is funded by CHED is a joint project of KSU and Department of Science and Technology (DOST). The project aims to produce alcohol based solution from raw materials available amidst COVID-19 pandemic which includes sugar and bread yeast. The process relies on fermentation in ethanol conversion of sugar by the yeast and will be distilled to attain higher alcohol percentage. The antiseptic solution will be utilized by the employees and students of this institution from the period of April 2020 up to present.

The study will include 30 employees and 10 students to meet the 40 participants mentioned in WHO Protocol for Assessment of Tolerability and Acceptability of an alcohol based hand rub in use. Testing period will be measured and considered from June-July 2020. The assessment and data validation will be from August to December 2020.

Self-administered questionnaire will be given to the respondents who received the product last June-July 2020. Questionnaire 1 will include the demographic information of the participant and its evaluation of skin tolerance and frequency of hand hygiene practices a month after the use of the product.

Self-Assessment through self-administered questionnaire will also be given to answer Questionnaire 2 which will evaluate the test product, skin condition and frequency of hand hygiene practices 3-5 days after use and a month of product use.

The following will be the respondents identified based on acknowledgement receipt documented by the Central Science Laboratory:

COLLEGE/OFFICE/UNIT	NO. OF RESPONDENTS
CEIT	3
CCJE	3
CA	2
CHNS	2
CLA	2
COED	2
LHS	3
ADMINISTRATION - GSO - Registrar - Finance Office - Guard House - Supply	10
STUDENTS	10

II. REVIEW OF RELATED LITERATURE

The result of the study of Donoghue, Margaret, et.al. (2019) revealed that the elderly residents preferred both of the test products to the usual one used by the home, which was a liquid rinse formulation containing glycerol as humectant. It was also found out that subjects in their study found the portable bottles of gel with plastic caps difficult

to manipulate. This may explain why the product was rated lower overall than the foam with some elderly misplacing their bottles of gel during the test period. The authors further disclosed that Product tolerability and skin compatibility are also critical, and studies have demonstrated that a product that is not well tolerated will not be well-accepted.

In the study by Wolfensberger, Aline, et. al., they concluded that the new ABHR (EVO9; Ecolab) was well tolerated and user-accepted with a potential for improvement regarding texture, i.e. stickiness. They added that while the subjective usability and tolerability rating by the users should be interpreted with caution, the skin tolerability assessed by a trained observer may be more reliable. The WHO protocol proved to be useful but demanding for everyday application.

III. METHODOLOGY

Locale of the Study

All information needed to answer the objectives will be conducted solely at Kalinga State University for the period of April 2020 to December 2020. Faculty and students will be asked to answer the prepared questionnaire during their vacant time.

Research Design

This is a survey-based study where a self-administered questionnaire through self-assessment will be adapted and modified from the study of WHO Protocol for Evaluation of Tolerability and Acceptability of Alcohol-based Hand Rub in Use.

Questionnaire 1 would include the demographic information of the participant and its evaluation of skin tolerance and frequency of hand hygiene practices a month after the use of the product.

Self-Assessment through self-administered questionnaire will be also given to answer Questionnaire 2 which evaluate the test product, skin condition and frequency of hand hygiene practices 3-5 days after use and a month of product use.

Descriptive statistics like mean median and standard deviation will be used to analyze the data gathered.

Respondents of the Study

The survey population included 40 participants based on the recommendation of WHO Protocol for Evaluation of Tolerability and Acceptability of Alcohol-based Hand rub in Use. Three (3) respondents were selected from the College of Engineering and Information technology (CEIT); two (2) from the

College of Forestry (CF); three (3) from the College of Criminal Justice Education (CCJE); two(2) from the College of Health and Natural Sciences (CNHS); two(2) from the College of Agriculture (CA); two (2) from the College of Liberal Arts; two (2) from the College of Education (CoEd); three (3) from the Laboratory High School (LHS); ten (10) from the administration and ten (10) students will be selected as well.

Instrumentation

A self-administered questionnaire adapted and modified from the WHO Protocol for Evaluation of Tolerability and Acceptability of Alcohol-based Hand rub in Use will be used in the study.

Data Gathering Procedure

The modified and adapted questionnaire for gathering will be used after due consultation with the Office of the Central Laboratory and Office of the Director of Research and may be adjusted.

Data Analysis

Data collected will be analysed using descriptive statistics, which included the calculation of measures of central tendency (means and medians), standard deviations and frequency counts; these were displayed using frequency tables and bar charts. To analyze the responses to questionnaire, a score will be assigned on each responses that can be calculated which included the following variables:

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QUESTIONNAIRE – PART 1

(To complete once per participant, after 1 month)

Participant no:	
Date of questionnaire's return: (day / month / year)	

Section 1. EVALUATION OF FACTORS INFLUENCING SKIN TOLERANCE

Age

Sex:

Female

Male

Group:

STUDENTS

FACULTY- NON SCIENCE MAJOR OTHERS

FACULTY-NATURAL SCIENCE MAJOR STAFF

SKIN TYPE:

VERY FAIR WITH FRECKLES

LIGHT BROWN

BLACK

FAIR ± FRECKLES

BROWN

DARK BROWN

PRESENT SEASON:

DRY

COLD

INTERMEDIATE

HUMID

HOT

Do you have non work-related activity (ies) likely to cause damage to your skin?

Yes • No

Do you develop irritative dermatitis?

Never Sometimes (depending on season/activity) Always

Do you develop atopic dermatitis?

Yes No

Do you develop rhinitis / allergic conjunctivitis?

Yes No

Are you asthmatic? Do you have a known intolerance to alcohol?

Yes No Yes No

Section 2. EVALUATION OF FREQUENCY OF HAND HYGIENE PRACTICES

1. Do you usually use a hand lotion?

- As often as possible
- Several times/day
- Rarely
- Once/day
- Sometimes, depending on the season
- Never

2. Do you think that a lack of time has an effect on hand hygiene?

- Yes
- No

3. Do you think that a lack of time has an effect on hand hygiene?

- Always
- Do not know
- Very often
- Seldom
- Often
- Very seldom
- Never

4. Do you think that skin damage has an effect on hand hygiene?

- 3 days
- 4 days
- 5 days
- 6 days
- 7 days

> 7 days

Never

5. During how many consecutive days have you used the test product? (days)

- Often
- Very seldom
- Always
- Do not know
- Never
- Very often
- Seldom

6. For how long have you been using an alcohol-based hand hygiene product at work?

- It's the first time
- Since < 1 year
- Since > 1 year and < 5 years
- Since > 5 years

7. Do you think you can improve your own hand hygiene compliance?

- Yes
- No
- Perhaps

8. It may be difficult for you to use an alcohol-based hand hygiene product because of:

1. *Forgetfulness*

Always - - - - - - - Never

2. *Lack of time*

Always - - - - - - - Never

3. *Damaged skin*

Always - - - - - - - Never

QUESTIONNAIRE – PART 2(To be completed after the first 3–5 consecutive days of product use)

Participant n°:		Product:	Alcohol based antiseptic solution
Date of questionnaire's return (day / month / year):		Participant name:	
Number of distributed bottles		Amount of Product used (ml):	

Section 1. EVALUATION OF FREQUENCY OF HAND HYGIENE PRACTICES

1. Do you usually use a hand lotion?

As often as possible 4 days 5 days 6 days 7 days > 7 days

2. In what percentage of times where hand hygiene is recommended, do you really clean your hands?

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

3. Has the present study changed your hand hygiene practice?

Yes No

4. During your last 5 opportunities for hand hygiene, how many times did you use hand rubbing to clean your hands?

0 1 2 3 4 5

5. On average, how often do you practise hand hygiene during a working hour (during the test period)?

< 1 Between 1 and 5 Between 6 and 10 Between 11 and 15 > 15 **Section**

2. EVALUATION OF THE TEST PRODUCT

What is your opinion of the test product for hand hygiene?

1. Colour

<input type="checkbox"/> Strongly Unpleasant	<input type="checkbox"/> More or less Pleasant
<input type="checkbox"/> Unpleasant	<input type="checkbox"/> Pleasant
<input type="checkbox"/> More or Less Unpleasant	<input type="checkbox"/> Strongly Pleasant
<input type="checkbox"/> Undecided	

Smell

<input type="checkbox"/> Strongly Unpleasant	<input type="checkbox"/> More or less Pleasant
<input type="checkbox"/> Unpleasant	<input type="checkbox"/> Pleasant

<input type="checkbox"/> More or Less Unpleasant	<input type="checkbox"/> Strongly Pleasant
<input type="checkbox"/> Undecided	

2. Texture

<input type="checkbox"/> Very sticky	<input type="checkbox"/> More or less not sticky
<input type="checkbox"/> Sticky	<input type="checkbox"/> Somewhat not sticky
<input type="checkbox"/> More or Less sticky	<input type="checkbox"/> Not sticky
<input type="checkbox"/> Undecided	

3. Irritation (stinging)

<input type="checkbox"/> Very much irritating	<input type="checkbox"/> Undecided
<input type="checkbox"/> Much irritating	<input type="checkbox"/> Somewhat irritating
<input type="checkbox"/> Irritating	<input type="checkbox"/> Not at all irritating

4. Drying effect

<input type="checkbox"/> Very much	<input type="checkbox"/> More or less no
<input type="checkbox"/> Much	<input type="checkbox"/> Somewhat
<input type="checkbox"/> More or Less	<input type="checkbox"/> Not at all
<input type="checkbox"/> Undecided	

5. Ease of use

<input type="checkbox"/> Very difficult	<input type="checkbox"/> Easy
<input type="checkbox"/> More or less difficult	<input type="checkbox"/> More or less easy
<input type="checkbox"/> Difficult	<input type="checkbox"/> Very easy
<input type="checkbox"/> Undecided	<input type="checkbox"/>

6. Speed of drying

<input type="checkbox"/> Very slow	<input type="checkbox"/> Fast
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<input type="checkbox"/> More or less slow	<input type="checkbox"/> More or less fast
<input type="checkbox"/> Slow	<input type="checkbox"/> Very fast
<input type="checkbox"/> Undecided	

7. Application

<input type="checkbox"/> Strongly Unpleasant	<input type="checkbox"/> More or less Pleasant
<input type="checkbox"/> Unpleasant	<input type="checkbox"/> Pleasant
<input type="checkbox"/> More or Less Unpleasant	<input type="checkbox"/> Strongly Pleasant
<input type="checkbox"/> Undecided	

8. Overall evaluation

<input type="checkbox"/> Very satisfied	<input type="checkbox"/> Dissatisfied
<input type="checkbox"/> More or less satisfied	<input type="checkbox"/> More or less dissatisfied
<input type="checkbox"/> More or Less Agree	<input type="checkbox"/> Very dissatisfied
<input type="checkbox"/> Satisfied	

9. Are there differences between the test product and the commercial product?

<input type="checkbox"/> Strongly agree	<input type="checkbox"/> More or less disagree
<input type="checkbox"/> Agree	<input type="checkbox"/> Disagree
<input type="checkbox"/> More or Less Agree	<input type="checkbox"/> Strongly disagree
<input type="checkbox"/> Undecided	

10. Which product do you prefer?

- Usual product
- Test product
- No preference

11. Do you think that the test product could improve your hand hygiene compliance?

<input type="checkbox"/> Strongly agree	<input type="checkbox"/> More or less disagree
<input type="checkbox"/> Agree	<input type="checkbox"/> Disagree
<input type="checkbox"/> More or Less Agree	<input type="checkbox"/> Strongly disagree
<input type="checkbox"/> Undecided	

Section 3. EVALUATION OF SKIN CONDITION

Self-assessment of the skin on your hands (after use of the test product):

1. **Appearance**(*Supple, red, blotchy, rash*)

Abnormal Normal

2. Intactness (abrasions, fissures)

Abnormal Normal

3. Moisture content (dryness)

Abnormal Normal

4. . *Sensation (itching, burning, soreness)*

Abnormal Normal

5. **How would you assess the overall integrity of the skin on your hands?**

Very altered Perfect

Thank you for your participation!

The Researchers