**CHAPTER ONE**

**INTRODUCTION**

**Background of the study**

Soap is formed by chemical reaction involving caustic soda and fatty acid by a process known as saponification. In this reaction, salt of fatty acid is formed. There are two different caustic soda, potassium hydroxide which forms soft and liquid soap, sodium hydroxide that forms hard when used in production.

Longman (2000) viewed soap as class of product that serve and clans surrounding with a high demand of foaming agent in the society. It is a cleansing agent described chemical as an alkaline metal salt of a long carbon chain mono carboxytic acid. The hydrocarbon portion is hydrophobic while carboxylate portion is hydrophilic.

Vin Pansky and Glady's (2001) in England generalized soap as a class of substances known as surface agent or surfactants. These are substances which when dissolved in a solvent even at very low concentration have the property of hovering the surface energy and hence alter the surface behaviour of the solvent to an extreme degree. In general, the surface active agents are composed of fairly large molecules which contain separate groups of dissimilar nature, one group being of hydrophilic or water alternating character which the other group has a hydropholic or oil attracting character and it also exhibits its actions in aqeous and non aqeous system .

Slieves et al (2004) said that high quality industrial soap can be produced using sodium hydroxide and vegetable oil. Ordinarily, soap today is simply a mixture of sodium salts of long chain fatty acid. Fatty acids are the basic raw materials such as caustic soda and various sodium phosphates. A large number of additives aiming towards the production of high quality soap include various herbal extract.

In the production of toilet soap involving herbal extracts, fat slitting and distillation of plant upstream is required and is therefore mostly found in integration of plant chemistry with fine chemicals. This soap can be kept for a long duration still maintaining very high quality and cleaning effectiveness which is the criteria of patronage by quality soap buyers.

**Statement of the Problem**

Nowadays, people are using different herbal toilet soaps that are expensive and less effective. The expensive nature of the herbal soaps in the market is due to the costly integration of specific extracts with fine chemicals used in their production. Furthermore, it is a challenge to device an easy way of producing cheap and affordable effective herbal toilet soap for human skin care.

**Purpose of the Study**

The purpose of this study is to produce an effective and less expensive or affordable toilet soaps using Aloevera, Basil, and Guava leaf extracts. These herbs contain major antioxidant pigments, antimicrobial properties carotene and polyphenols giving them high dietary antioxidant values among plants. The benefits in using these herbs in soap production are that they have properties that can prevent and cure many chains of infections and dual diseases. They also have the capability of restoring healthy skin in individual whose skins are diseased. Vin Pansky and Glady's (2001).

The general purpose of the study is practical appraisal to effective teaching and learning of production of soap.

Specifically, the study intends:

1. to determine simple methods of producing cheap and effective toilet soaps using herbs extracts.
2. to find out the best combination of local herbal extract for producing quality soap that should be suitable to various skin types.
3. to ascertain the effect of the various herbs in treatment of skin rashes.
4. to identify herbs that has skin smoothness and cleansing properties.

**Significance of the Study**

The study would be of immense significance to the following categories of people:

1. Students: Students are to benefit from this study in the sense that when they acquire the skill on how to produce soap and the target, it will make them not be independent/depend on their parents for survival even while in school. Their parents might not be financial buoyant to provide all they need in school, with this skill they have acquired, they can provide other things which a student needs in school. Example, handout, textbooks and other little payments.
2. Teacher: With the current economic recession in Nigeria, many teachers especially those working under the government schools are not able to meet up with their livelihood due to underpayment or rather late payment by government. Acquisition of soap making skill will serve as an addendum to the teachers’ revenue or income.
3. Parents: When parents have the skill of soap making, it will enable them to take care of their children’s skin without much suffering and they could make extra income from soap selling to augment their meager salaries.
4. Society: Everything is not all about education. No matter the level of one’s knowledge/certificate, one needs to be trained or aware of such skills for the betterment of his/her family, and society because if people will have the knowledge of this skill, it will reduce the idea of people stealing. When one has this skill and seeing little money every day, he/she will never be tempted to steal or take property that does not belong to them.

**Scope of the Study**

The scope of the study covers the effect of three different herbal extracts on the production of toilet soap with their controls. The study finds out their impact on various soap properties on its treatment. It also finds out the differential effect on the proportion of combinations on students body bearing in mind two sample methods of producing soap.

**Research Questions**

1. What are the effects on various herbal soaps on the skin?
2. What are the best combinations that give the best soap smoothness of the skin?
3. What are the effects of various herbs in the treatment of skins rushes?
4. What are herbs that have skin smoothness and cleansing properties?

**CHAPTER TWO**

**REVIEW OF RELATED LITERATURE**

Among many chemical industries, it is known from the available records that synthetic soap has not been long since it was discovered developed naturally and gradually from crude mixture of alkaline fatty materials.

Pompii Excavation (2006) revealed that soap, dates back to over 0 years ago. As early as 2500BC, soap was being used in ancient Mesopotamia.

Vomass (2009) reviewed that in first century the Roman chancellor described the manufacture of both hand and soft soaps which they prepared by boiling fallow from goats with beech wood shes. He called it soap and it was used as hair cream not for washing.

In (2011), Nicholas Leblanc in 50th America discovered by process of making sodium carbonate (Na2, co3) from sodium chloride (Nacl) and this laid the corner stone of the gigantic soap concerns. Thus, oil mainly fallow and other animal fats which were hitherto, solely used in soap production. Almost 1,800 people believed that soap, was a mechanical mixture of salt and alkaline not until a French chemist showed that soap formation was actually a chemical reaction.

Domir (2012) in France completed his research on the recovery of glycerin from saponification mixture.

During late Vectoria era (1837-1901)W.H lever had unquestionable become the dominating figure in the soap trade because of her good productions.

**Conceptual framework**

Most toilet soaps contain basic raw materials including:

* Caustic soda: Caustic soda is known to be one of the strongest bases, examples are sodium hydroxide or potassium hydroxide. Since the realm of chemistry, it is one most corrosive and hazardous chemicals which find application in soap production and laboratory chemical experiments. Soda, it tends to soften and dissolve fatty materials. This neutralization reaction and it is commonly known in chemistry as saponification reaction. This process is the principle exploited in production of all soap and other cleaning material in the market today.
* Fat and oil: Soap makers use different types of oil in soap production depending on the quality of soap required. For example, palm kernel oil (p.k.o) is one of the commonest vegetable oil that gives soap a creamy latter and contains natural vitamins and antioxidant properties with omega-3, omega 6 and other conditioners that serves as skin nourishing oil in skin cream product.
* Silicate: The source of silicate is sodium silicate and soap is studied in an attempt to reexamine its brightening properties. Early indication is that silicate completes the production by virtue of common ion effect. This is done as a result of high concentration of soap in the pulping process than could be the case, if silicate were not present.
* It is postulate that silicate leads to improved desperation of any colorant and hence improves the limitation of the family in soap. Silicate is also an additive which protects against the corrosion of applications on surfaces.
* Color: It improves the visual attractiveness of the soap for self advertisement and this is by individual choice.
* Glycerin: Glycerin acts as a hydroscopic agent that drains in moisture from the air and also acts as emollient in many personal care products which is skin moisturizing on the other hand, when there is insufficient moisture in the atmosphere to keep skin lubricated, glycerin will pull moisture from the underlying layers of the skin up to the skin surface.
* **Vitamin E:** Vitamin E is a synthetic preservative that helps sustain shelf of products. It plays a very crucial role in protecting skin cells and membranes from environmental damage due to its anti oxidant property.
* **Perfume:** Fragrance for soap productions are base synthetic or natural occurring materials like lemon and strawberry. Ingredients are added to washing and cleansing products to produce a pleasant or distinctive aroma. Fragrance is used in all types of soap. The basic objective is to produce fragrance in keeping with the character of the product and to remove unpleasant water odour.
* **Hardner:** This includes phosphates, and zeoletes. Their key role is to combine with materials in the water which otherwise words, they soften the water.

**Theoretical study/framework**

According to Ooge (2010), soap is prepared by the reaction of natural fat and oil with a slight excess alkaline. Animal fat or vegetable oil (palm kernel oil and olive oil) are steam heated in large vats or open kettle with sodium or potassium hydroxide until sponification reaction is completed.

Fincer (2013) said that a concentrated Nacl solution is then added to decreases the solubility of the soap (i.e.) the alkaline salt as it separates out as a hard cake on the surface while cooling.

After when almost the whole soap curds have been separated, there should be liquid larger known as glycerin.

In 2004, Joel in Asia discovered that, the kinetic of specification reaction is greatly increased by addition of about 1% phenol, cuesol and B-naphithol, when highly unsaturated oil are saponified. For the past 2000 years saponification involved batch wise saponifictaion of fat and oil with alkaline salting out the resulting soap.

Continuous process came up through proctor and gamble in (2008) who installed a high pressure hydrolysis and continuous neutralization process in the production of soap. These people said that soaps are made usually from blends of oil though some are made from single oil.

**Empirical Studies**

Passkey and Gladys (2000) discovered that soap is made by the process called saponification reaction between ester and alkali to produce alcoholic and salt of carbohydrate acids.

Equation of the reaction in soap production R coor ± Aaoh H2 of Coo Na±ROH. Mirrison (2008) said that soap that soap is produced by double decomposition of glycosides from fats and oil and caustic alkalin yielding the useful product glycerol which is recovered by washing the mixture with salt (Nacl). The salt dissolves the glycerol and decreases the solubility of soap which separates upon cooling.

The equation of the reaction in soap production.

C17H35Coo CHz±3KoH=> 3C17H35±Cook±CHoH

**CHAPTER THREE**

**METHODOLOGY**

**Design of the Study**

In this chapter, the researcher adopted survey research method. It was observed that different herb extract cure skin infection. It involves the production of toilet soap with different herb extracts and distributing to a number of people for data analysis which will be analyzed based on their effect or action on affected skin for a result.

**Area of the Study**

The area of study was at Godfrey Okoye University Thinkers Corner Enugu state. This school has a very good laboratory and equipments that help in testing the acidity and alkalinity of an experiment for accuracy.

**Population of the Study**

The population for the study is the number of students in Godfrey Okoye University, Thinkers Corner Enugu that were affected in the year 2017 was 200 students.

**Sample and Sampling Procedures**

Sample and sampling procedure was selected in Godfrey Okoye University in Enugu state. 60 students were randomly selected from a sample size drawn from the population of 200.

**Sample size**

60 students were selected randomly from the school administer 15 sachets of toilet soap of one make up to each group while we have 4 groups in student.

**Reliability and Validity**

The reliability and validity of the research was established by the administration of the product with questionnaire to people that were selected. The results of the respondents were compared in five different soap making and it was known that herb extract in soap making is very reliable.

**Experimental manipulation and intervention**

In the production of toilet soap, different herbs were used with the key materials that determined the quality of the soap which are caustic soda and vegetable oil. Different products were made.

**Quantities of raw materials**

1. Caustic soda = 1kg
2. P.K.Oil = 6 littres
3. Vitamin E = 7 6ml
4. Foaming agent = 216ml
5. Hardner = 59g
6. Glycerin = 85ml
7. Herb extract = 91ml
8. Silicate = 93ml

**Extraction of the herb**

Three herbal extracts were selected and used in the soap production. The herbs used were leaves, Guava , basil and Aloevera. Although Aloevera is not a leaf but a fruit of plant which serves as leafe to the plant that makes its own extraction procedure different. Aloevera is extracted by cutting and pressing out the Aloevera juice or fluid for soap production. Guava and basil leave have the same extraction method which is by squeezing and filtration of the liquid in the form of aqueous.

**Method of Preparation**

The production reaction involved soaking 1kg of soda in 4 litres of water for 24 hours.

The hardner was also soaked with two litres of water. Both were exothermic reaction (.e. release of heat).

During the production, the ratio of P.K.o to caustic solution was first the oil was mixed with the chosen color to ensure solubility of the color solution before thoroughly stirred. Other ingredients were added one after the other with continuous string for 25 minutes before the addition of the fragrance. The solution was then poured into appropriate moulds. After 20 minutes of production the soap was removed from mould, cutting and packaging for use was then carried out.

**Method of data collection**

In general, SA (strongly agreed) and AG (agreed) and the positive responses SD (Strongly disagree) and DA (disagree) are the negative responses.

The analysis carried out was based on four different soaps produced under this study which include: soap A (Aloevera extract soap) soap B (Basil leaves extract), soap C (Normal soap (i.e.) control, soap D (Guava leaves extract soap).

**CHAPTER FOUR**

**RESULT**

**Analysis of Research Questions**

Personal profiles of the Respondents were collected for this study. The questionnaires were given to various students volunteers according to items of various questionnaires recorded. The data were collected and analyzed with respondents responses to research questions that were answered and presented in a table. Similar questionnaire but different soap with code A, B, C and D were collected from volunteers and analyzed after using soap for 14 days by volunteers, number of respondents is15.

The data obtained were tallied and analyzed using ground mean, standard deviation and percentage. A table was used for the presentation of the results.

**Research question 1**

What are the effect of various herbal soap on skin infection?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S/N** | **Item description**  | **SA** | **A** | **Sd** | **D** |
|  | **Analysis of Soap A** |  |  |  |  |
| (a) | Soap A clear rashes  | 4 | 2 | 2 | 2 |
| (b) | Soap A prevents skin infection | 6 | 2 | 0 | 2 |
| (c)  | Soap A has an antiseptic quality | 6 | 3 | 1 | 0 |
|  | **Analysis of Soap B** |  |  |  |  |
| (a) | Soap B clears rashes. | 5 | 2 | 1 | 2 |
| (b) | Soap B prevents skin infection | 7 | 1 | 0 | 1 |
| (c)  | Soap B has an antiseptic quality | 6 | 3 | 1 | 0 |
|  | **Analysis of Soap C** |  |  |  |  |
| (a) | Soap C clears rashes. | 2 | 0 | 6 | 2 |
| (b) | Soap C prevents skin infection | 3 | 2 | 4 | 1 |
| (c)  | Soap C has an antiseptic quality | 0 | 2 | 7 | 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Analysis of Soap D** |  |  |  |  |
| (a) | Soap D clears rashes. | 6 | 2 | 1 | 1 |
| (b) | Soap D prevents skin infection | 4 | 4 | 2 | 0 |
| (c)  | Soap D has an antiseptic quality | 7 | 2 | 0 | 1 |

|  |  |  |
| --- | --- | --- |
| **Items**  | **Mean of the positive response (SA &A)** | **Mean of the positive responses (SD & D)** |
| Soap A | 3.8 | 1.2 |
| Soap B | 4 | 1 |
| Soap C | 1.5 | 3.5 |
| Soap G | 4.2 | 0.8 |

**Statistical table question 1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| What are the effects of the various herbal extract soap on skin infection? | Positive responses meant SD  | % | Negative responses  | % |
| Soap A = soap incorporated with Aloevera extract  | 3.8±0.72 | 15.2 | 1.2±0.81 | 4.8 |
| Soap B = soap incorporated with Basil leaf extract  | 4±1.08 | 16 | 1±0.81 | 4 |
| Soap C = Toilet soap with no extract (control) | 1.51.03 | 6 | 3.5$\pm 1.23$ | 3.2 |
| Soap D = Soap incorporated with basil leaf extract  | 4.2±0.92 | 16.8 | 0.8±0.78 | 3.2 |
| Total mean  | 2.7 | 6.5 |  |  |

Overall total mean of both positive and negative responses = 33.5

% = Mean responses on items of each soap type

 Total means of both positive and negative responses

**Explanation**

Considering the positive response values on the explanation:

The most effective herbal extract soap on skin infection was soap D with positive percentage respondent value of 16.8 and mean ± SD value of positive response 4.2± 0.9.2. Followed by soap B with positive percentage respondent value of 16 and mean ± SD value of 4±1.08. The next soap is soap A with percentage value of 15.2 and mean ± SD positive value 3.8±0.72 respectively. Soap C with percentage value of 6 and mean ± SD value of 1.5±1.03

**Research question 2**

What are the effect of the various soap on the smoothness of skin?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S/N** | **Item description**  | **SA** | **A** | **Sd** | **D** |
|  | **Analysis of Soap A** |  |  |  |  |
| (a) | Soap A is a skin ageing preventative soap. | 4 | 4 | 2 | 0 |
| (b) | Soap A has a skin moisturizing effect. | 7 | 2 | 0 | 1 |
| (c)  | Soap A gives clearness and suppleness of the skin after using. | 6 | 2 | 1 | 1 |
|  | **Analysis of Soap B** |  |  |  |  |
| (a) | Soap B is a skin ageing preventative soap. | 4 | 4 | 2 | 0 |
| (b) | Soap B has a skin moisturizing effect. | 7 | 2 | 0 | 1 |
| (c)  | Soap B gives clearness and suppleness of the skin after using. | 6 | 2 | 1 | 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Analysis of Soap C** |  |  |  |  |
| (a) | Soap C is a skin ageing preventative soap. | 4 | 3 | 2 | 1 |
| (b) | Soap C has a skin moisturizing effect. | 5 | 2 | 2 | 1 |
| (c)  | Soap C gives clearness and suppleness of the skin after using. | 7 | 2 | 0 | 1 |
|  | **Analysis of Soap D** |  |  |  |  |
| (a) | Soap D is a skin ageing preventative soap. | 4 | 3 | 2 | 1 |
| (b) | Soap D has a skin moisturizing effect. | 6 | 3 | 1 | 0 |
| (c)  | Soap D gives clearness and suppleness of the skin after using. | 6 | 2 | 0 | 2 |

|  |  |  |
| --- | --- | --- |
| **Items**  | **Mean of the positive response (SA &A)** | **Mean of the positive responses (SD & D)** |
| Soap A | 3.0 | 0.83 |
| Soap B | 3.8 | 1.2 |
| Soap C | 1.5 | 3.5 |
| Soap G | 3.8 | 1.2 |

**Statistical Table Question 2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| What are the effects of the various herbal extract in skin smoothness? | Positive responses meant SD  | % | Negative responses  | % |
| Soap A = soap incorporated with Aloevera extract  | 3.0±0.0.08 | 12.59 | 0.83±0.75 | 3.45 |
| Soap B = soap incorporated with Basil leaf extract  | 3.8±0.9.10 | 15.95 | 1.2±0.64 | 5.04 |
| Soap C = Toilet soap with no extract (control) | 1.50.91 | 6.30 | 3.5$\pm 1.09$ | 14.69 |
| Soap D = Soap incorporated with basil leaf extract  | 3.8±0.77 | 15.95 | 1.2±0.69 | 5.04 |
| Total mean  | 12.1 | 6.73 |  |  |

Overall total mean of both positive and negative responses = 18.83

% = Mean responses on items of each soap type

 Total means of both positive and negative responses

**Explanation based on the positive responses**

The herbal extract that has highest positive effect on skin are soap B and D with positive percentage values 15.95%.

**Research Question 3**

Which of the herbal soap has the highest cleansing tendency?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S/N** | **Item description**  | **SA** | **A** | **SD** | **D** |
|  | **Analysis of Soap A** |  |  |  |  |
| (a) | Soap A washes out sticky dirt trace from the skin. | 4 | 4 | 2 | 2 |
| (b) | The foaming capacity of toilet soap A is good | 2 | 3 | 0 | 0 |
| (c)  | Soap A removes body blemishes and skin spots after using. | 6 | 2 | 2 | 3 |
|  | **Analysis of Soap B** |  |  |  |  |
| (a) | Soap B washes out sticky dirt trace from the skin. | 5 | 2 | 1 | 2 |
| (b) | The foaming capacity of toilet soap B is good | 4 | 3 | 2 | 3 |
| (c)  | Soap B removes body blemishes and skin spots after using. | 3 | 2 | 1 | 2 |
|  | **Analysis of Soap C** |  |  |  |  |
| (a) | Soap C washes out sticky dirt trace from the skin. | 5 | 2 | 3 | 2 |
| (b) | The foaming capacity of toilet soap C is good | 3 | 4 | 1 | 0 |
| (c)  | Soap C removes body blemishes and skin spots after using. | 1 | 4 | 3 | 2 |
|  | **Analysis of Soap D** |  |  |  |  |
| (a) | Soap D washes out sticky dirt trace from the skin. | 6 | 2 | 2 | 0 |
| (b) | The foaming capacity of toilet soap D is good | 2 | 4 | 0 | 3 |
| (c)  | Soap D removes body blemishes and skin spots after using. | 2 | 4 | 3 | 2 |

|  |  |  |
| --- | --- | --- |
| **Items**  | **Mean of the positive response (SA &A)** | **Mean of the positive responses (SD & D)** |
| Soap A | 3.5 | 1.5 |
| Soap B | 3.2 | 1.8 |
| Soap C | 3.2 | 1.8 |
| Soap G | 3.3 | 1.7 |

**Statistical table Question 3**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Which of the herbal soap has highest cleansing extract? | Positive responses meant SD  | % | Negative responses  | % |
| Soap A = soap incorporated with Aloevera extract  | 3.5±0.74 | 4.11 | 1.5±0.91 | 6.05 |
| Soap B = soap incorporated with basil leaf extract  | 3.2±0.6 | 12.9 | 1.8±0.50 | 7.26 |
| Soap C = Toilet soap with no extract (control) | 3.20.75 | 12% | 1.8$\pm $0.79 | 7.26 |
| Soap G = Soap incorporated with basil leaf extract  | 3.3±0.83 | 13.31 | 1.7±0.78 | 6.85 |
| Total mean  | 13.2 | 6.8 |  |  |

Overall total mean of both positive and negative responses = 20

% = mean responses on items of each soap type

 Total means of both positive and negative responses

**Explanation on the positive responses**

The herbal extract that has the highest cleansing tendency is soap A with positive percentage value of 14.11% and mean ± SD value 3.5±0.74 followed by soap B and soap G with percentage value of 12.90, 12% and mean ± SD value 3.2±0.6, and 3-2±0.75 respectively. Lastly, soap C which has the percentage value of 9.27% and mean ± SD value 2.3±0.81.

**Research Question 4**

How do we find out the best combination of local herb extracts for quality toilet soap most suitable to various skin?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S/N** | **Item description**  | **SA** | **A** | **Sd** | **D** |
|  | **Analysis of Soap A** |  |  |  |  |
| (a) | Soap A has a pleasant smell on the skin | 4 | 5 | 0 | 2 |
| (b) | Soap A clears body odour | 3 | 3 | 2 | 3 |
| (c)  | Soap A has a lasting effect on the skin. | 3 | 2 | 0 | 2 |
|  | **Analysis of Soap B** |  |  |  |  |
| (a) | Soap B has a pleasant smell on the skin | 5 | 3 | 0 | 3 |
| (b) | Soap B clears body odour | 4 | 2 | 0 | 0 |
| (c)  | Soap B has a lasting effect on the skin. | 5 | 2 | 3 | 2 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Analysis of Soap C** |  |  |  |  |
| (a) | Soap C has a pleasant smell on the skin | 2 | 3 | 6 | 3 |
| (b) | Soap C clears body odour | 0 | 1 | 3 | 4 |
| (c)  | Soap C has a lasting effect on the skin. | 1 | 0 | 3 | 4 |
|  | **Analysis of Soap D** |  |  |  |  |
| (a) | Soap D has a pleasant smell on the skin | 5 | 2 | 2 | 0 |
| (b) | Soap D clears body odour | 4 | 5 | 0 | 4 |
| (c)  | Soap D has a lasting effect on the skin. | 3 | 3 | 0 | 2 |

|  |  |  |
| --- | --- | --- |
| **Items**  | **Mean of the positive response (SA &A)** | **Mean of the positive responses (SD & D)** |
| Soap A | 3.3 | 1.7 |
| Soap B | 3.5 | 1.5 |
| Soap C | 1.2 | 3.8 |
| Soap G | 3.7 | 1.3 |

**Statistical Table Question 4**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| How do we find out the best combination of local herbal extract for quality toilet soap most suitable to various skin? | Positive responses meant SD  | % | Negative responses  | % |
| Soap A = Soap incorporated with Aloevera extract  | 3.3±0.51 | 13.2 | 1.7±0.93 | 6.8 |
| Soap B = soap incorporated with basil leaf extract  | 3.5±0.72 | 14 | 1.5±1.22 | 6 |
| Soap C = Toilet soap with no extract (control) | 1.2±0.98 | 4.9 | 3.8±0.46 | 15.2 |
| Soap D = Soap incorporated with basil leaf extract  | 3.7±0.29 | 14.8 | 1.3±1.29 | 5.2 |
| Total mean  | 11.7 | 8.3 |  |  |

Overall total mean of both positive and negative responses = 20

% = mean responses on items of each soap type x 100

 Total means of both positive and negative responses

Soap with D herbal extract is the quality, suitable to various skin with percentage value 14.8% and mean ±SD value 3.7±0.29 followed by soap B with 3.5±0.72 and the next is soap A with percentage value 13.2 and mean ± SD value 3.3±0.51 followed by soap C with percentage value 4.8 and mean ±SD value 1.2±0.98.

**Data Analysis**

In analyzing the data collected, mean percentage was used to achieve this, the four points rating scale was given values as follow:

SA = Strongly agree 4

AG = Agree

DA = Disagree

SD = Strongly disagree

Mean = 4+3+2+1

 4

­ = $\frac{10}{4}$

 = 2.5

From 2.5 and above

The cut of mean percentage was 2.5. This form the standard for accepting or rejecting any items on the questionnaire. Any items that attracted a mean response of 2.5 and above was accepted which those that recorded a mean response of below 2.5 was rejected.

The mean percentage was presented in a tabular form.

**CHAPTER FIVE**

**Discussion, Conclusion, Implication and Recommendation**

The aim of this research is to produce an effective and less expensive toilet soaps using Aloevera, Basil, and Guava leaf extracts.

1. To discover simple method of producing effective and less expensive toilet soaps using herb extracts.
2. To find out the best combination of local herbal extract for producing quality soap most suitable to various skin types.
3. To know the effect of various herbs in the treatment of skin rashes.
4. To identify herbs that have skin smoothness and cleansing properties

The results for the research are as follows:

In table one above, the respondents agreed that extracts given to them for use, the soap produced with Guava leaf extract is the most effective against skin infection more than others.

The percentage positive response showed that Guava leaf extract is most effective with 16.18% or mean and standard deviation value of 4.2±0.95 followed by Basil leaf extract with 16% or mean ± SD of 4± 1.08. Aloevera extract has the positive percentage of 15.2% or mean ±SD of 3.8 or 70 and lastly, soap C (control) 6% or mean ± SD of 1.5 ± 1.03.

In table two, the items discussed the effects of the various herbal extract on skin smoothness. The result shows that the positive response value for Basil leaf extract is 15.95% or 3.8±0.91 which shows the high quality of Guava leaf extract with 15.95% or 3.8±0.77. Aloevera has positive response of 2.59% or 3.0±0.08 while the soap C has the least value of 6.3% or 1.5± 0.91.

Moreover, the third table has the result of items answering the question of soap that has the highest cleansing tendency. Soap with Aloevera extract has positive response value of 14.11% or mean ±SP 3.5±0.74 followed by Guava leaf extract soaps with the same percentage value of 13.31% or mean ±SD of 3.2±0.83 then Basil leaf extract with 12.9% or 3.2±0.6 respectively.

The soap C (control) has the least percentage value of 12% or mean SD 3.2±0.75.

Lastly, the best combination of local herbal extract for quality soap most suitable to various skins. Guava leaf extract is most suitable to various skin with 14.8% or mean ± SD 3.7±0.29. Followed by Basil leaf with 14% or 35±0.72. The Aloevera has positive values of 13.2% or mean ±SD 3.3±0.51 while the soap C has the positive value of 4.8% or mean ±SD 1.2±0.98.

**Conclusion**

Based on the above question result and the discussion, the research questions were administered, the number of respondents on the side of agreement showed the researcher the effectiveness of herbal extract on the skin, because all the extracts reported positively.

**Implication of the Study**

As we have seen in the aim of the research, manufacturers of raw materials should consider cost of raw materials and the effect of ingredients on properties of the soap.

Thus, accuracy of the right raw materials is a direct function of material that tells the quality of the soap.

On the part of herbal extract, the researchers, government and manufacturers should encourage incorporation of herbal extracts in soap production after establishing the properties of the various herbal extract on the skin.

Lastly, having obtained herbs that are good, funds are needed for the production of herbal soaps to keep increasing skin beauty and healthy skin care products as well as looking for possibility of producing toilet soap in Nigeria using 100% of locally sourced and readily available raw materials in our environment so as to improve quality and reduce cost of production.

**Recommendation**

From the above findings, the researcher recommends that, government, individual and community should make the above motivational factors (illustrated implication of the study and limitation) available for research of this magnitude, so that there will be improvement in the development of healthy herbal skin soaps.

**Limitation of the Study**

To effectively carry out the research work, one school was selected in Ugwuomu Local Government area, Education zone in Enugu state- Nigeria.

Some of the limitations encountered were those of time and finance.

Limited fund also affect production of soap and extracts thereby limiting the samples given as well as the reduction in number of volunteer size used in the study.

However, these limitations did not in any way affect the result of the study as it was scientifically carried out and presented without bias by the research.

**Suggestion for further Study**

The researcher suggests that further study should be done on the following:

1. Herbal extracts that can give positive effect on skin when incorporated in body cream production.
2. Other extracts (herbal, roots, backs and fruits) that have potential in health care industry.

**Summary of the Result**

The effect of herbal toilet soap on skin has become a successive measure to a healthy skin achievement so far, as established by result of this research. Being natural resources herbs, people are increasingly accepting products that are form natural resources in reference to chemically synthesized ones. Due to health reasons and environmental factors; manufacturers should be encouraged to create natural products.

The researcher recommends that: since soap has become an essential commodity in our country especially soap produced with herbal extracts for the healthy skin.

Government, industries and community should fund such research as this, adequately as done in other countries such s Malaysia, Singapore and China to enable quality research in soap production in Nigeria.

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**APPENDIX I**

Department of Science and Vocational Education

Godfrey Okoye University

Thinkers corner Enugu State.

Dear Respondents,

I am a student of the above department carrying out a research on the students’ perceptions of three differential herbal extracts on the production toilet soap in Godfrey Okoye University.

Please kindly fill the items in the questionnaire to enable me complete the work. Whatever information you give me will be treated confidentially.

Yours faithfully,

**Ugwu Patience C.**

**APPENDIX II**

**QUESTIONNAIRE**

The instrument contains section A and Section.

Section A contains pro-Data of the students while section B contains the main items numbering 1 to 20 items.

Section A

Name of student (optional):

Sex: Male [ ] female [ ]

Yea of student:

Year 1[ ]

Year 2 [ ]

 Year 3 [ ]

Year 4 [ ]

**Section B**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S/N** | **Item Description**  | **SA** | **A** | **Sd** | **D** |
| 1 | Soap A clear rashes  |  |  |  |  |
| 2 | Soap A prevents skin infection |  |  |  |  |
| 3 | Soap A has an antiseptic quality |  |  |  |  |
| 4 | Soap B clears rashes. |  |  |  |  |
| 5 | Soap B prevents skin infection |  |  |  |  |
| 6 | Soap B has an antiseptic quality |  |  |  |  |
| 7 | Soap C clears rashes. |  |  |  |  |
| 8 | Soap C prevents skin infection |  |  |  |  |
| 9 | Soap C has an antiseptic quality |  |  |  |  |
| 10 | Soap D clears rashes. |  |  |  |  |
| 11 | Soap D prevents skin infection |  |  |  |  |
| 12 | Soap D has an antiseptic quality |  |  |  |  |
| 13 | Soap A is a skin ageing preventative soap. |  |  |  |  |
| 14 | Soap A has a skin moisturizing effect. |  |  |  |  |
| 15 | Soap A gives clearness and suppleness of the skin after using. |  |  |  |  |
| 16 | Soap B is a skin ageing preventative soap. |  |  |  |  |
| 17 | Soap B has a skin moisturizing effect. |  |  |  |  |
| 18 | Soap B gives clearness and suppleness of the skin after using. |  |  |  |  |
| 19 |  |  |  |  |  |
| 20 | Soap C is a skin ageing preventative soap. |  |  |  |  |