

**ASSESSMENT ON INGREDIENTS OF SKIN LIGHTENING PRODUCTS ON  
SALEIN THIKA TOWN**

**PERIS WAMBUI NDUYU**

**BPHARM/34197/2015**

**A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF PHARMACY IN  
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE  
AWARD OF BACHELOR OF PHARMACY OF  
MOUNT KENYA UNIVERSITY**

**DECEMBER 2020**

## DECLARATION AND APPROVAL

### Declaration by the Student

I declare that this project is my own original work and has not been submitted in any other institution of higher learning for academic or any other person. I further declare that any other material cited in this paper has been duly acknowledged.

Signature ..... Date .....

**Peris Wambui Nduyu**

**BPHARM/34197/2015**

### Supervisor Approval

This project has been submitted for examination with my approval as University supervisor

Signature ..... Date .....

**Dr. Michael Mungoma**

**Dean of Pharmacy**

**Mount Kenya University**

## **DEDICATION**

I dedicate this project to my family and friends for their encouragement, moral support and understanding during the entire research period.

## **ACKNOWLEDGEMENT**

I want to thank God first for giving me strength, courage and good health throughout the entire research period. I greatly acknowledge Mount Kenya University for allowing me to further my studies.

I am also thankful to my good friends who helped me with ideas of how they would prefer it to be, I really appreciate all that they did for me.

My sincere gratitude goes to my supervisor Dr. Michael Mungoma for his inspiration, mentorship and continuous support in guiding me to complete my research study.

Finally, I submit my profound gratitude, respect and love to all those who provided me with moral support and constant encouragement throughout the entire study.

## **ABSTRACT**

With the public's growing interest in skin whitening, lightening ingredients only used under dermatological supervision until recently, are more and more frequently incorporated into cosmetic formulas. The active agents that lighten skin tone are either natural or synthetic substances. They are used to treat various skin pigmentation disorders or simply to obtain a lighter skin tone as whiter skin may be synonymous of wealth, health, youth, and/or beauty in different cultures. However, recent studies demonstrated the adverse effects of some of these ingredients, leading to their interdiction or restricted use under the regulations. After an overview of skin whitening practices and the associated risks, this article provides insight into the mechanisms involved in melanin synthesis and the biological assays available to attest the lightening activity of individual ingredients. The legislation dealing with the use of skin lighteners is then discussed. As traditional depigmenting agents such as hydroquinone and corticosteroids are of safety concern, the potential of natural extracts has been investigated more and more.

## TABLE OF CONTENTS

DECLARATION AND APPROVAL .....	ii
DEDICATION.....	iii
ACKNOWLEDGEMENT .....	iv
ABSTRACT .....	v
TABLE OF CONTENTS .....	vi
LIST OF TABLES.....	viii
CHAPTER ONE: INTRODUCTION.....	1
1.1 Background information.....	1
1.2: Problem Statement.....	1
1.3 Justification.....	2
1.4 Objectives .....	3
1.4.1 General objectives .....	3
1.4.2 Specific objective.....	3
1.5 Research questions.....	3
1.6 Significance of the study .....	3
CHAPTER TWO: LITERATURE REVIEW.....	5
2.1 Introduction.....	5
2.2 Skin.....	6
2.3 Skin disorders that led to hyperpigmentation .....	7
2.3.1: Causes of hyperpigmentation .....	7
2.4 Psychology of skin lightener .....	7
2.5 ADRS of skin lighteners.....	8
2.6 Regulation of cosmetics in Kenya .....	9
CHAPTER THREE: METHODOLOGY .....	10
3.1 Study area .....	10
3.2 Study design.....	10

3.3 Sampling procedure .....	10
3.4 Data collection .....	10
3.5 Data analysis .....	10
3.6 Ethical consideration .....	10
3.7 Limitations .....	11
CHAPTER FOUR: RESULTS .....	12
CHAPTER FIVE: DISCUSSION, CONCLUSION, AND RECOMMENDATION.....	16
5.1 Discussion.....	16
5.2 Conclusion .....	16
5.3 Recommendation .....	17
REFERENCES .....	18

## LIST OF TABLES

Table 4.1: Skin lightening ingredients with their mechanism of action and toxic effects	12
Table 4.2: Products with skin lightening ingredients and skin lightening claim.....	14
Table 4.3: Products without skin lightening ingredients but with skin lightening claim .	15
Table 4. 4: Products with label claim .....	15

## **CHAPTER ONE: INTRODUCTION**

### **1.1 Background information**

Skin bleaching refers to the use of chemical agents to lighten skin color. Such products can be prescribed to treat hyperpigmentation disorders, but are more frequently used intentionally to lighten skin complexion. The regular and sustained use of skin bleaching products has been practiced in African and Asian contexts for decades, with prevalence estimates from 25% to 96%. While traditionally a female practice, use has become more popular also among men in recent years

Skin bleaching products include creams, ointments, soaps, capsules/pills, and injections. The most commonly used products contain hydroquinone, corticosteroids or mercury. These agents act in different ways to lighten skin, but generally work by suppressing the production of melanin, the pigment which gives human skin its color. While effective in lightening skin color, the products are also associated with health risks, such as dermatitis, impaired wound healing and adrenal suppression. Mercury is associated with adverse neurological, psychological and renal effects and organic mercury compounds also have the ability to cross the placenta with toxic effects for the fetus.

Medical concerns about safety have resulted in more stringent regulations and prohibitions on the production and trade of certain products in many countries. These efforts, however, appear to have done little to curb the growing popularity of skin bleaching around the world, nor the widespread availability of the products. Health problems are regularly observed, and globalization continues to fuel the flow of goods.

### **1.2: Problem Statement**

Skin lightening or skin bleaching is a cosmetic procedure that aims to lighten dark areas of skin or achieve a generally paler skin tone. Several chemicals have been shown to be effective in skin whitening while some have proven to be toxic or have questionable safety profiles. This includes mercury compounds which may cause neurological problems and kidney problem.

Active ingredients in skin lighteners have ranged from acidic compounds like lemon juice and milk to harsher chemicals like sulfur, arsenic and mercury. It can be expensive,

time-consuming and the results are not fully guaranteed. Chemically lightened skin is also more highly susceptible to sun damage and dermal infection.

Long -term users of skin bleachers can easily develop fungal infections and viral warts. They work by reducing the concentration or production of melanin in the skin. The technique used can result in serious side effects and complications especially those with dark skin tones. They contain side effects such as redness and swelling (skin irritation and inflammation), a burning or stinging sensation and itchy and flaking of the skin.

Many skin-lightening products are available online or in shops or pharmacies without prescriptions and they may be harmful to the user. Creams that contain hydroquinone, corticosteroids or mercury which are not prescribed by the doctors are banned because they can cause serious side effects if used incorrectly.

If Arbutin, Kojic acid, ascorbyl glucoside or magnesium ascorbyl phosphate are used above the permissible levels they cause pigmentation increasing to the joints at the finger, toes, buttocks and ears.

### **1.3 Justification**

Bleaching practices and women motivations for it are described as constant and ubiquitous both in women home and social circles in Thika town a common daily activity similar to “brushing one tooth”. On the surface, the primary motivation for skin bleaching is simply as a means ‘to be beautiful’.

There is a lot of commendation on the role of local media and marketing influences in transporting and perpetuating a Western image and how producers attempt to appeal to local standards of beauty by using models.

People are following celebrities and all the Advertisements. All those people on those posters look almost White. If it were not for their other physical features, they would pass for white people. And who does not want to become as popular as them?

A commonly shared explanation for the positive correlation between fair skin and beauty was that extended to a range of tangible social and economic benefits, including access to better job opportunities, higher social status, better marriage proposals and better life circumstances in general.

Women who are lighter skinned are seen to be more beautiful, some do it to be able to get rich men for marriage or even to get good. In the youth, light skinned girls are called beauties and given more affection than dark tone skin girls hence making them to have the urge to use them.

Skin bleaching practices is a common practice thus the use of skin lightening products becomes culture and the beliefs underlining it seems to follow with the generation. Sales of dangerous cosmetics online can be harmful since they contain chemical banned under safety regulations. I want to urge consumers to understand their instructions before using them.

## **1.4 Objectives**

### **1.4.1 General objectives**

1. To assess the ingredients of skin lightening products sold in Thika Town.

### **1.4.2 Specific objective**

1. To identify the skin lightening ingredients among products sold in Thika Town.
2. To establish the connections of skin lighteners ingredients sold in Thika Town.
3. To highlight the toxic effects of skin lighteners ingredients among products sold in Thika Town.

## **1.5 Research questions**

1. What are the side effects of skin lightening ingredients among products sold in Thika Town?
2. What are the main ingredients of skin lightening sold in Thika Town?

## **1.6 Significance of the study**

- I. This study can be used to differentiate between toxic and non-toxic ingredients of skin lighteners products.
- II. This study can help us to understand the psychology behind the practice of skin lightening.
- III. The study provides the need to understand how the government regulates the skin lighteners products in the market.

IV. The study provides an understanding on how the skin lightening ingredients can reduce the concentration or production of melanin.

## CHAPTER TWO: LITERATURE REVIEW

### 2.1 Introduction

Skin lightening refers to the practice, deeply embedded in many ethnic groups (Naidoo,2016) Of using natural or synthetic substances to lighten the skin tone or provide an even complexion by reducing the melanin concentration in the skin (Couteau,2016). The use whitening agents can be driven by medicinal necessity in the case of persons suffering from dermatological conditions linked to an abnormal accumulation of Melanin (e.g., melasma, senile lentigo, etc.) or simply by culture-specific beauty preferences.

Numerous chemical substances have already been proved as effective skin whiteners and some even display beneficial side effects (antioxidants (Lee, H.J2015), antiproliferative activity, protection of macromolecules such as collagen against UV radiation etc.) but others have recently raised safety concerns leading to their ban in some Countries. The search for non-cytotoxic natural whitening compounds benefits from the fact that Natural ingredients have become more prevalent nowadays in cosmetic formulations due to consumers' concern about synthetic ingredients and the risks they may represent for human health (Kerdudo,2016).

In recent years, the quest for fairness has led to the identification of a number of whiteners originating from various biological sources that work as well as the synthetic ones with few or no side effects [Ribeiro et al,2015]. However, there is still a long way to go from the discovery of an active ingredient to its incorporation into cosmetics and its commercialization.

In fact, ingredients' cytotoxicity, insolubility and instability as well as development costs are some of the difficulties encountered when establishing a formulation.

The therapeutic uses of whitening agents include the treatment of hyperpigmented skin zones to achieve a more uniform appearance. People suffering from skin afflictions such as senile/solar lentigo (small pigmented spots on the skin, varying in diameter from 1 mm up to a few centimeters) (Fernandez,2015) or wishing to reduce freckles (irregular clusters of melanin containing cells) and birthmarks often resort to skin lightening. Lightening agents are also often used to treat melasma (also known as chloasma), a skin

discoloration that can affect anyone, especially people with a genetic predisposition (James,2015).

Most common in pregnant women, it is suspected to be linked to the stimulation of melanin production by female sex hormones when the skin is exposed to the sun.

On the contrary, vitiligo is a chronic skin condition characterized by portions of the skin losing their pigment cells die or are unable to function (Iannella, 2016) the surrounding unaffected skin may be lightened to match to the tone of the affected. Hence, the intensive use of whitening agents constitutes a real public health risk and can lead to severe pathologies including burns, acne, stretch marks, hypopigmentation and even cancer (Fernandez, 2015)

## **2.2 Skin**

The skin acts as an envelope to the body and is closely integrated to be the underlying fascial endoskeleton through retinacular ligaments (Herlin c, 2015), vessels, nerves and lymphatics. Human skin is composed of three distinct layers: epidermis, dermis and hypodermis with varying degrees of specialization within each layer. The epidermis is the most superficial and biologically active of these layers as the of the epithelium (stratum Basale) is constantly renewing. The dermis is usually 2-4 mm thick and provides most of the mechanical strength to the skin.

The hypodermis mainly consists of loose connective tissue which depending on site forms gliding layers or large pockets of adipose tissue that insulates and protects the skin. The hypodermis has an important role in adipose tissue that insulates and protects the skin. The hypodermis has an important role adipose homeostasis and is particularly rich in G protein- coupled receptors which regulate lipolysis, adiponectin and leptin secretion (Amisten, 2015). The ‘microvacuolar’ tissue that makes up the hypodermis acts as an active reservoir for interstitial fluid that can dynamically alter the structural stiffness of the tissue. The hyaluronan, glycosaminoglycan and proteoglycan composition of the matrix acts as a sponge for interstitial fluid when the capillary osmotic pressures are exceeded, for example during inflammation.

## **2.3 Skin disorders that led to hyperpigmentation**

Hyperpigmentation occurs when the skin produces more melanin, the pigment that gives the skin color. This makes spots or patches of the skin appear darker than surrounding areas.

### **2.3.1: Causes of hyperpigmentation**

#### a. Sun exposure

The body produces more melanin to protect the skin from prolonged exposure to the sun. this can cause dark spots or patches on the skin called age spots or sunspots.

#### b. Skin inflammation

Areas of the skin can darken after people have had inflammation of the skin. This can include acne, eczema, lupus or an injury to the skin.

#### c. Melasma

Darker places of the skin can form when people experience hormonal changes. This type of hyperpigmentation is commonly during pregnancy.

#### d. Disease

Hyperpigmentation is also symptomatic of certain illness such as some autoimmune and gastrointestinal diseases, metabolic disorders and vitamin deficiencies.

## **2.4 Psychology of skin lightener**

The practice of skin lightening may be deeply rooted in an individual's overall emotional and cognitive evaluation of his/her own worth (self-esteem), their collections of belief about themselves and forces that influence thoughts, behavior and personality. The desire to lighten one's skin is related to some aspects of self-hate (extreme dislike or hatred against oneself) and low self -esteem. Even though colonialism and apartheid have the transgenerational psychological scars still persist and have been internalized by many.

Many women still regard lighter skin as beautiful and associated dark skin with negative connotations such as evil, disease, dirt ugliness.

Many individual mimics the behavior and attitudes of others with the hope of being like them. For example, many women compare themselves with celebrities and turn to skin lighteners because they are dissatisfied with their appearance and are under the impression that they could be just as successful as the celebrities engaging in skin-lightening practices (Hendricks, 2015). In that sense skin-lightening practices can be perceived as an external (social) factor which dictates standards of beauty because having a light skin complexion is associated with elegance, beauty, attractiveness especially towards the opposite sex. Lightness can be associated with youth, innocence, purity virginity.

## **2.5 ADRS of skin lighteners**

Some of these lightening agents have proven to be toxic or to have questionable safety profiles over long-time exposure. Skin-lightening agents have been associated with both systemic and cutaneous complications. Currently, the active ingredients in skin lightening products are hydroquinone, mercury and corticosteroids. Most products on the market include 1 or all of these ingredients at concentrations that exceed the recommended value (M.Amyot, 2016). These ingredients have been linked to systemic complications such as hypertension. These ingredients have been linked to systemic complications such as hypertension, diabetes, adrenal insufficiency, membranous nephropathy, nephrotic syndrome, insomnia and memory loss. (Abdul-Rahman, et al, 2017). Cutaneous complications include leukomelanoderma, exogenous ochronosis, squamous cell carcinoma, dermatitis, fungal and bacterial infections, patchy pigmentation, elastosis, extensive striae, telangiectasia and body odor (F. Baiden, 2018).

Numerous cutaneous adverse effects (e.g., atrophy, striae, telangiectasias, acne vulgaris, allergic and irritant contact dermatitis, hirsutism, hypertrichosis, perioral dermatitis, steroid rosacea, dyschromias, ochronosis and infections) and even systemic complications (e.g., Cushing's syndrome, diabetes, hypertension and ocular changes (cataract and glaucoma) have been associated with the use of these products (Vashi et al., 2018).

Significant complications of glutathione including hepatic, neurologic and renal toxicity, Stevens Johnson Syndrome, and air emboli have been reported (Dadzie, 2016). For preparations containing mercury, systemic concerns may include neuropsychiatric

toxicity and nephrotoxicity as well as pneumonitis, nail dyspigmentation and mercurial baboon syndrome (Hamann et al., 2015).

## **2.6 Regulation of cosmetics in Kenya**

Kenya Bureau of Standards (KEBS) is a statutory body established under the Standards act, CAP 496 Laws of Kenya mandated to offer, among other services, quality inspection of imports based on Kenya Standards or approved specifications. The Pharmacy and Poison Board (PPB) is the National Drug Regulatory Authority established under the Pharmacy and Poison Act, Chapter 244, the laws of Kenya. PPB is mandated to regulate the practice of Pharmacy and the trade in Drugs, Poisons, Medical Products and Health Technologies.

In an effort to protect the public against imported that do not comply with local quality standards and technical regulations, all imported Medical Devices, Food Supplements, Medical Cosmetics, Herbal Products falling under the regulated mandate of Pharmacy and Poison Board must comply with Pre-Export Verification of Conformity (PVoC) to standards programme implemented by KEBS.

## **CHAPTER THREE: METHODOLOGY**

### **3.1 Study area**

The study area targeted consumers of the skin lightening products in Thika Town. The target population was between 18-39 years who were willing to participate. Questionnaires were distributed among the target population. This study focused mainly on women because they were consuming skin lightening products.

### **3.2 Study design**

A descriptive cross-sectional area design was used in the study to shoppers along the Whitelaine street, Thika Town. Participants were selected in a randomized convenience sampling method. The shoppers were approached and invited to participate in the study.

### **3.3 Sampling procedure**

Products were sampled from shelves in cosmetics shops. Random sampling method was employed. Purposive sampling method was used to collect information. This method also considered cases that were particularly informative since it was reliable and convenient.

### **3.4 Data collection**

Contents of ingredients on skin lightening were noted down. Concentration and amounts were collected per product and entered into an excel sheet for analysis. Information on use of the products was collected. Photographs were taken of the products where consented. Structured questionnaire was used for the educated respondents while structured interviews were conducted for illiterate respondents. The questions were in both open and close form in order to give respondents the opportunity to give adequate answers.

### **3.5 Data analysis**

Data was entered into EXCEL (Microsofty, Redmond, WA, USA). Data was summarized in contingency table. Data analyzed presented median, mean and ranges of ingredients. Literature review from authentic sources was done online to determine toxicity of the ingredients.

### **3.6 Ethical consideration**

Permission to carry out study was sought from the school of Pharmacy, MKU. Content to study the products were sought from the shop owners. Maintaining the principles and

adherence to ethical values in product marketing especially where relevant to human life was crucial.

### **3.7 Limitations**

- I. Shops refused entry to carry out the study.
- II. Skin lightening products which contain banned ingredients posed a serious threat to the consumers' health.

Error! Bookmark not defined.

**Table 4.1: Skin lightening ingredients with their mechanism of action and toxic effects**

INGREDIENT	MECHANISM OF ACTION	TOXIC EFFECT
Kojic acid	It decreases production of melanin causing light skin tone	Its long term can cause cytotoxicity resulting in skin diseases.
Niacinamide	It decreases the number of melanin transferred to pigment-inducing cells.	Mild itching, redness and burning.
Salicylic acid	It suppresses the melanin production.	It may cause carcinogens and hormone disruptors.
Glycerin	It has exfoliating properties which lightens the skin tone.	Skin irritation.
Azelaic acid	It prevents interaction of tyrosine in the active site of tyrosinase acting as inhibitor.	Skin irritation and sensitivity to sunlight.
Antioxidants	It reduces the direct photooxidation of pre-existing melanin.	Allergic reaction.
Glycolic acid	It removes pigmentation from the outer layers of the skin.	Allergic reaction, milia, acneiform.
Lineolic acid	It suppresses the melanin production.	It makes the skin susceptible to sunburn.
Retinoids	It causes inhibition of tyrosinase and epidermal melanin dispersion.	Its irritant reaction causes paradoxical hyperpigmentation.
Alcohol	It suppresses the melanin production.	It disrupts the skin renewal production.
Mulberry Extract	It causes inhibition of dopa oxidase activity of tyrosinase.	It has harmful ingredients such as mercury which are harmful to the body
Lactic acid	It penetrates the skin causing mild	It has a thermal exposure which

	exfoliation. It's also a melanin suppressor.	induces severe irritation to the skin.
Aleosin	It competitively inhibits tyrosinase, TH and DOPA oxidase activities.	Allergic reactions and skin irritation.
Polythene glycol (PEG)	It inhibits melanin production.	It can cause cancer and respiratory disorders.
licorice	It inhibits tyrosinase activity in B16 murine melanoma cells.	It causes allergic reaction when mixed with other ingredients.
Glycolic acid	It inhibits melanin formation in human melanoma cells	It causes slight tingling sensation.
Dimethicone	It inhibits tyrosinase enzyme.	It contains amounts of siloxane toxic ingredients which are harmful
Gigawhite	It inhibits tyrosinase enzyme (enzyme responsible for melanin production).	Skin irritation.
Arbutin	It blocks the activity of tyrosine enzyme.	It may cause skin irritation in people with sensitive skin.

**Table 4.2: Products with skin lightening ingredients and skin lightening claim**

NO	PRODUCT	INGREDIENTS WITH SKIN LIGHTENING PROPERTIES
1	Wow Fairness Cream	It contains saffron that helps lighten the skin while mulberry curbs melanin production.
2	Himalaya Herbals Day Cream	It contains licorice extracts which are natural skin brightening agents.
3	PapyBlem Face gel Cre'me	It contains papaya extract and saffron which have a skin lightening effect.
4	Pond's White Beauty Day Cream	It has pro-vitamin b3 is a potent skin lightening agent proven to reduce stubborn dark spots.
5	Lotus Herbals Whiteglow	Its milk enzymes act as natural fairness agents, lightens the skin tone with a visible difference
6	Garnier Skin Natural	It contains pure lemon essence which is a natural bleaching agent that smoothens skin.
7	Olay Natural White Glowing Cream	Vitamin B3 acts as a bleaching agent by inhibits transfer of melanin to the surface of the skin.
8	Lakme' Absolute perfect radiance	It has skin lightening vitamins that lightens, enriches and gives a fairer skin.
9	Clonovate cream	It is a strong lightening cream for lightening pimples and scars.
10	Kojic acid soap	It has a kojic acid that lightens the skin.
11	Meladerm	It has skin lightening agents such as bearberry, lemon extract that lightens the skin.
12	Neutrogena Fine Fairness Cream	It contains Vitamin C which help detect and lighten pigmentation.
13	Glutathione whitening lotion	It contains concentrated glutathione, co-enzyme Q10 that helps brighten the skin.
14	Clean and clear fairness cream	It is enriched with cherry extract & multi-vitamins instantly brightens and lightens skin.
15	Olay White Radiance Tone	It contains niacinamide that lightens and brightens the skin.

**Table 4.3: Products without skin lightening ingredients but with skin lightening claim**

NO	PRODUCTS	WITHOUT SKIN LIGHTENING INGREDIENTS BUT WITH SKIN LIGHTENING CLAIM
1	Fair & Lovely	It is not a skin bleaching product but uses a combination of vitamin B3, glycerin, UVA and UVB sunscreens.
2	Neutrogena Fine Fairness cream	It has retinol that reduces or lightens black spots but have a skin lightening effect.
3	Olay White Radiance Tone Essence	It has retinol and glycerin to hydrate and strengthen the skin's moisture barrier for better complexion.
4	Lotus Herbals Whiteglow	It is intended to reduce dark spots but has a skin lightening effect.
5	Clean and Clear Fairness Cream	It claims to reduce dark spots but have a skin lightening effect.
6	Granier Skin Natural	It claims to have vitamin C that has a bleaching effect.

**Table 4. 4: Products with label claim**

No	PRODUCTS	LABEL CLAIM
1	Plum E- Luminence Moisturizing	100% recyclable. Once used up all the goodness in the Plum bottles, send your empties to us and we'll recycle them
2	Garnier light complete	It also includes vitamin C that brightens your skin with regular use.
3	PapyBlem Face gel Cre'me	It made from natural ingredients and free form of all chemicals such as parabens and sulphates.
4	Pond's White Beauty Day cream	It's anti-spot formula with pro-vitamin b3 is clinically proven to fade stubborn dark spots from within.
5	L'Oreal Paris Skin Perfect	It uses superior vitamin 3x technology that work on improving skin tone to give healthy looking skin at any age.

Error! Bookmark not defined.

## **5.1 Discussion**

A variety of cutaneous and systemic adverse reactions were reported by participants. SL use in this population may be influenced by certain beliefs, including that a lighter skin color gives a woman more confidence, helps her have better job opportunities, and increases her chances of getting married. Although many participants who have used SL products use them to treat pigmentary disorders, more than one-third used them only to achieve a lighter skin color in the absence of a pigmentary disorder. The vast majority of participants, including those who have used SL products, realize that SL products may cause undesirable local and systemic adverse effects.

Specific education for consumers is needed on the proper use of SL products, how to avoid harmful products, and how to prevent complications. Additionally, health care professionals, including pharmacists who dispense SL products, need to be educated on local SL practices and the numerous potential complications associated with misuse of SL products (particularly those that contain corticosteroids and hydroquinone). This training will help health care professionals identify adverse effects, provide counseling, and recommend safe and effective alternative treatment options, including high-quality and affordable sunscreen.

Interestingly, 8% of participants have family members who own a business that sells SL products. Health care professionals with family members who sell SL products may be a special target for education.

## **5.2 Conclusion**

Among the skin lightening products sold, the ingredients were kojic acid, niacinamide and salicylic acid. All products sample in this study did not include the concentration of the active ingredients. Most of the ingredients of skin lightening product have a potential to cause toxic effect in humans.

Lightening/whitening cosmetics are largely represented in the global cosmetics landscape. Mainly used to alleviate hyperpigmentation problem. This quest for whiter skin can lead to major health issues, largely due to the use in high concentrations of very aggressive compounds, some of which have been progressively banned by the Cosmetic Regulations. Regarding the adverse effects of many of those traditional whitening

products, consumers await safer and more effective preparations for lightening and/or depigmenting skin.

Persistent research into skin lightening has recently led to the identification of a number of whitening agents originating from biological sources (plants, fungus, bacteria, and algae). From my own results, it appears clear that some plant extracts are able to inhibit melanogenesis at least in vitro, hence suggesting their whitening potential as single ingredients. The success of whitening treatments may lie in the combination of two or more active ingredients that may be eventually effective at different levels of melanogenesis to achieve a synergistic effect.

### **5.3 Recommendation**

Specific education for consumers is needed on the proper use of SL products, how to avoid harmful products and how to prevent complications. There is a need exists for targeted public health campaigns to raise public awareness about the uncontrolled use of skin lighteners. The intensive use of lightening agents constitutes a real public health risk and can lead to severe pathologies including burns, acne, stretch marks, hypopigmentation and even cancer.

## REFERENCES

1. N. Craddock Colour me beautiful: examining the shades related to global skin tone ideals *J Aesthet Nurs*, 5 (6) (2016), pp. 287-289.
2. A.R. Zota, B. Shamasunder The environmental injustice of beauty: framing chemical exposures from beauty products as a health disparities concern *Am J Obstet Gynecol*, 217 (4) (2017), pp. 418.e1-418.e6.
3. H. Shroff, P.C. Diedrichs, N. Craddock Skin color, cultural capital, and beauty products: an investigation of the use of skin fairness products in Mumbai, India *Front Public Health*, 5 (2018), p. 365.
4. S.F. Alrayyes, S.F. Alrayyes, D.U. Farooq Skin-lightening practices behind the veil: An epidemiological study among Saudi women *J Cosmet Dermatol*, 19 (1) (2020), pp. 147-153.
5. D. Sagoe, S. Pallesen, N.C. Dlova, M. Lartey, K. Ezzedine, O. Dadzie The global prevalence and correlates of skin bleaching: a meta-analysis and meta-regression analysis *Int J Dermatol*, 58 (1) (2019), pp. 24-44.
6. N.A. Vashi, N. Patzelt, S. Wirya, M.B.C. Maymone, R.V. Kundu Dermatoses caused by cultural practices: cosmetic cultural practices *J Am Acad Dermatol*, 79 (1) (2018), pp. 19-30.
7. Assael, H., 1993. *Marketing Principles and Strategy*. The Dryden Press Harcourt Brace and Co., USA.
8. Global Industry Analysts, Inc. *Skin Lighteners – A Research Brief* (2017). Available from: [http://www.strategyr.com/MarketResearch/Skin\\_Lighteners\\_Market\\_Trends.asp](http://www.strategyr.com/MarketResearch/Skin_Lighteners_Market_Trends.asp)