

**Summer Training at
Institute of Health Management Research
Jaipur (Rajsthan)**

Market Study of Sunscreens

**By
Sanjeet Awate**

**Under the guidance of
Dr. Nirmal Kumar Gurwani**

**Post Graduate Diploma in Pharmaceutical Management
2011-2013**



**Institute of Health Management Research,
Jaipur
2012**

**INSTITUTE OF HEALTH
MANAGEMENT RESEARCH**

1, Prabhu Dayal Marg

Sanganer Airport, JAIPUR - 302 011, INDIA

Tel. : 3924700, 2791431-32

Fax : 91-141-3924738

E-mail : iihmr@iihmr.org

URL : <http://www.iihmr.org>

Gram : HEALTHINST

Certificate

This is to certify that Dr. Sanjeet Awate from Institute of Health Management Research, Jaipur has undergone Summer Training at Elder Pharmaceuticals Ltd, Mumbai from 9 May, 2012 to 28 June, 2012.

The candidate himself carried out the project. His approach to the study has been sincere, scientific and analytical. This summer training is partial fulfillment of the course requirement is recommended for the award of post graduate diploma in Pharmaceutical Management.

I wish him success in all his future endeavors.



Dr. P.R. Sodani
Dean (Academic and Students Affairs)
IHMR, Jaipur



Dr. Nirmal Kumar Gurbani
Associate Dean (PG Pharma)
IHMR, Jaipur

26th June 2012

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr. Sanjeet Awate** from Institute of Health Management Research (IIHMR), Jaipur had undergone for a Summer Training Project for the period from 09/05/2012 till 28/06/2012 with Elder Health Care Ltd.

During the training he has completed a project on “*Market Study on Sun Screens*” under our **Deputy General Manager – Marketing, Ms. Pallavi Gadnis**.

Dr. Awate has completed the project successfully

We found the Project work satisfactory.

Hence Certified,

For Health Care Ltd.



Kaushik Damania
Deputy General Manager
Human Resources & Administration

ELDER HEALTH CARE LTD.

Elder House, Plot No. C-9, Dalia Ind. Estate, Off Veera Desai Rd., Andheri (W), Mumbai - 400 053
Tel: + 91 22 2673 0058 - 67 Fax: +91 22 6675 6466 www.elderhealthcare.in

Regd. Office : A-38/3, MIDC industrial Area, Patalganga, Village Khaire, Dist. Raigad - 410 220. Tel.: 95219 2250017/18

TABLE OF CONTENT

1.0	Executive summary.....	4
2.0	Introduction	
2.1	Introduction to the study.....	6
2.1.1	Introduction to the industry.....	8
2.1.2	Introduction to the company.....	12
2.1.3	Introduction to the subject.....	14
2.1.4	Introduction to the project.....	29
2.2	Objectives.....	
2.3	Methodology.....	
2.4	Sampling design.....	
2.5	Limitations.....	
3.0	Analysis and findings.....	31
4.0	Conclusion.....	44
	4.1 Recommendations.....	
5.0	Questionnaire	45
6.0	List of Doctors.....	48

ACKNOWLEDGEMENT

This report bears the imprint of many people, right from the experienced staff of ELDER HEALTH CARE India whose support and guidance helped me to successfully complete my internship in this esteemed organization.

I express my sincere gratitude to **Mr. S.N. Kureshi** (VP-Sales & Marketing) without whose consent I would have ever got the opportunity to undertake this project in Elder Health Care India Ltd.

I am indebted for the rich guidance, knowledge and suggestions provided by my mentor **Mrs. Pallavi Gadnis** (DGM (Marketing) EHCL India) who in spite of her busy schedule took sincere efforts and illustrated the Marketing Concept, with her vast knowledge in the field, which helped me in carrying out my internship. My special thanks to **Mr. Jayesh Joshi** (GM (ACCOUNTS & TAXES) EHCL India) for providing me with the opportunity of doing summer internship program at EHC India.

I am deeply indebted to Mr. Satish Kesare (Brand Manager, EHCL India) and Mr. Dayanand Pyati (Senior Brand Manager, EHCL India) for their immense contribution in the successful completion of my project. They were kind enough to render their valuable time to me at each stage of my project.

I would like to express my sincere thanks to all the Dermatologists of Cities who contributed their time in helping me in my project and also for providing updated knowledge.

Last but not least I wish to avail myself of this opportunity, express a sense of gratitude and love to my friends and my beloved parents for their manual support, strength, help and for everything.

EXECUTIVE SUMMARY

The purpose of study to understand sunscreen market.

❖ Major -objectives:-

To know about sunscreen market in terms of doctor's perception towards prescribing sunscreens, its indications, SPF & PA factor requirement, recommendation for uses.

❖ Sub-objectives:-

To know about, in what indications doctors prescribe sunscreen?

To know about SPF requirement in a sunscreen.

To evaluate, what other attributes apart from sun protection are being considered before prescribing a sunscreen?

To know, doctor's opinion about PA factor in a sunscreen.

To evaluate preferred pack sizes of sunscreens.

To know, doctor's opinion about UltraGuard.

Research Methodology:-

The research involved is Primary research only.

Primary research: The approach followed for primary research data involved collecting information by interviewing the doctors through questionnaire.

❖ Survey :-

A survey is conducted among Dermatologist in Mumbai sub-urban, Thane and Navi-Mumbai.

- ❖ Method of Data collection – Data was collected on the basis of structured Questionnaire. Questions were both open ended and closed ended.

Sampling:

❖ Sample size –

Survey conducted among the doctors in Mumbai suburban, Thane and Navi-Mumbai.

City	Dermatologist covered
Mumbai	44
Thane	24
Navi-Mumbai	17

- ❖ Method of Data Analysis - Microsoft excel

Limitations-

- ❖ Since the study is conducted only in large cities for the validity of findings to other area need to be tested.
- ❖ The survey is restricted to only Dermatologist.

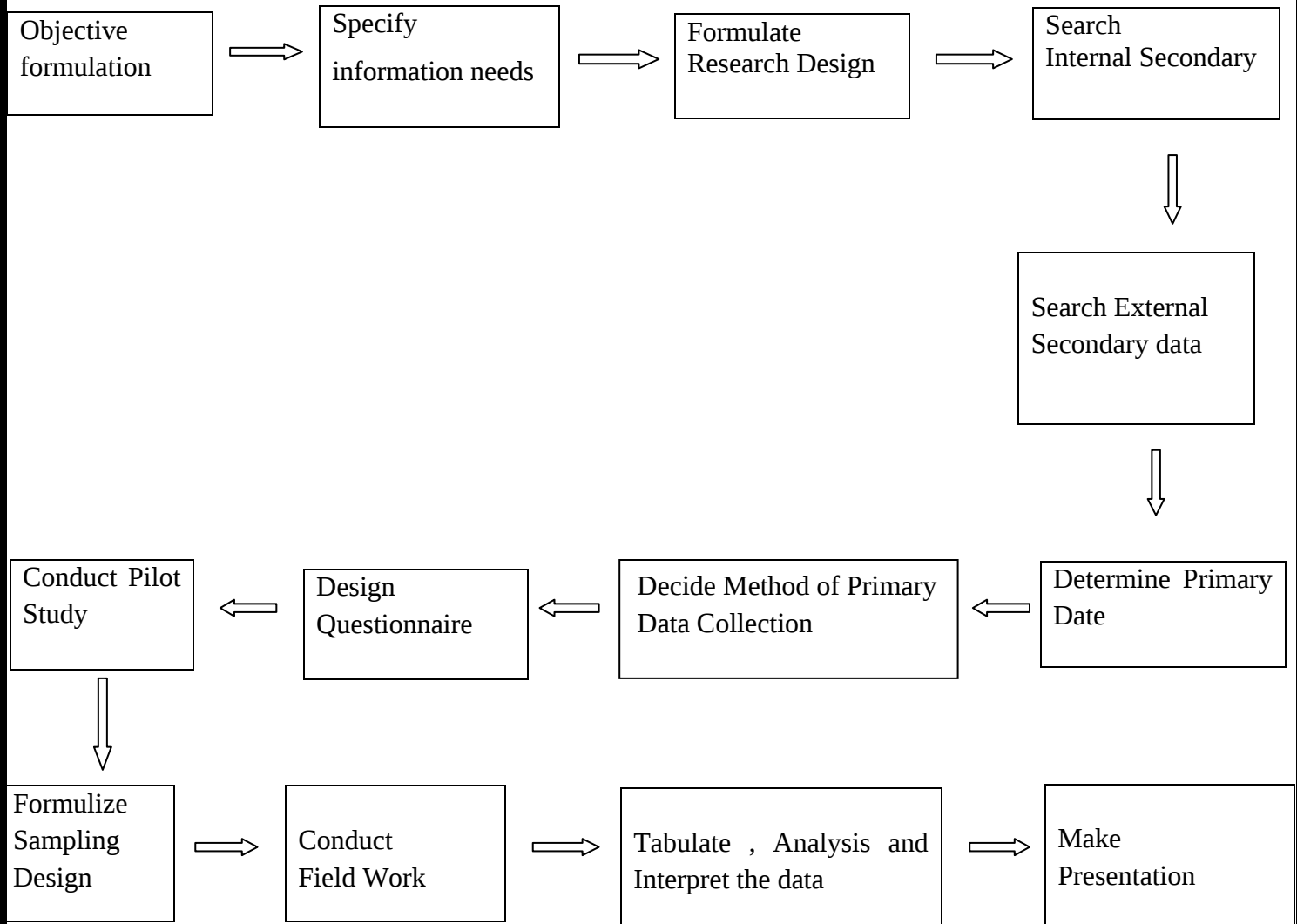
MARKETING RESEARCH

Marketing research is the systematic and objective identification, collection, analysis, and dissemination of information for the purpose of assisting management in decision making related to the identification and solution of problems and opportunities in marketing. The goal of marketing research is to identify and assess how changing elements of the marketing mix impacts customer behavior.

The task of marketing research is to provide management with relevant, accurate, reliable, valid, and current information. Competitive marketing environment and the ever-increasing costs attributed to poor decision making require that marketing research provide sound information. Sound decisions are not based on gut feeling, intuition, or even pure judgment.

Marketing managers make numerous strategic and tactical decisions in the process of identifying and satisfying customer needs. They make decisions about potential opportunities, target market selection, market segmentation, planning and implementing marketing programs, marketing performance, and control. These decisions are complicated by interactions between the controllable marketing variables of product, pricing, promotion, and distribution.

Stages in marketing



PHARMACEUTICAL INDUSTRY

The Indian Pharmaceutical Industry currently tops the chart amongst India's science based industries with wide ranging capabilities in complex field of drug manufacturing and technology. A highly organized sector, the Indian Pharma Industry is estimated to be worth ₹ 56,539 Cr. growing at about 14 percent annually. It ranks very high in the third world, in terms of technology, quality and range of medicines manufactured. From simple headache pills to sophisticated antibiotics and complex cardiac compounds, almost every type of medicine is now made indigenously.

Playing a key role in promoting and sustaining development in the vital field of medicines, Indian Pharma Industry boasts of quality producers and many units approved by regulatory authorities in USA and UK. International companies associated with this sector have stimulated, assisted and spearheaded this dynamic development in the past 53 years and helped to put India on the pharmaceutical map of the world.

The Indian Pharmaceutical sector is highly fragmented with more than 20,000 registered units. It has expanded drastically in the last two decades. The leading 250 pharmaceutical companies control 70% of the market with market leader holding nearly 7% of the market share. It is an extremely fragmented market with severe price competition and government price control.

The pharmaceutical industry in India meets around 70% of the country's demand for bulk drugs, drug intermediates, pharmaceutical formulations, chemicals, tablets, capsules, orals and injectibles. There are about 250 large units and about 8000 Small Scale Units, which form the core of the pharmaceutical industry in India (including 5 Central Public Sector Units). These units produce the complete range of pharmaceutical formulations, i.e., medicines ready for use for production of pharmaceutical formulations consumption by patients and about 350 bulk drugs, i.e., chemicals having therapeutic value.

The Pharmaceutical Industry, with its rich scientific talents and research capabilities, supported by Intellectual Property Protection regime is well set to take on the international market.

As global scenario is shifting every day, Indian pharma is also evolving in its shape, size and contribution. Basically, Indian pharma sector is very quick to respond to the opportunities available to them. It has been observed over four decades. It is a fact that almost every eighth year there is a convulsion in Indian pharma through regulatory mechanisms. It started in 1971 with the first Drug Price Control Order (DPCO) and it is almost repeated every eighth year coincidentally, with a lag of administrative delays. It is really remarkable to observe that every time Indian pharma responded with full zest.

THE INDIAN PHARMACEUTICAL INDUSTRY

Historically, the emergence of Indian Pharma was linked to its growth and excellence in generics. Almost up to 2006 patent regime had not affected Indian Pharma. Hence, growth of Indian Pharma with its entrepreneurial and opportunistic behavior has been significant with manufacturing as a focus. Being an intelligent nation, Indian Pharma has taken forward and backward integration steps to grow. In forward integration, Indian Pharma has taken steps towards CROs, NDDS and other platforms along with biosimilars. In backward integration, Indian Pharma has excelled in APIs and reduced the burden of imports of APIs. Risk taking ability of Indian Pharma also helped it to grow in international markets simultaneously, retaining their lead in domestic markets.

At the moment, it is observed that almost all big Pharma companies, except one or two, have really expanded their empire outside India very effectively in unregulated and regulated markets.

Along with manufacturing expertise, Indian Pharma has acquired trading and selling expertise. Hence, strategically Indian Pharma so far has used and succeeded in manufacturing, trading and selling strategies.

It is also observed that the amount of investment Indian Pharma has made in R&D is not comparable to the world. As it has to generate funds for R&D from generics business, it becomes challenging to provide investment in R&D. However, it was relevant and essential to grow in other driving factors such as selling, distribution and manufacturing in generics to create our edge.

Increasing R&D Investment by INDIAN COMPANIES

Now that Asia and India are centre stage, almost all big world's Pharma are eyeing India and China. Chances of big Indian Pharma maintaining an edge over big world Pharma will be tested. It all depends on what kind of branding and marketing strategies and skills Indian Pharma can evolve in comparison to global Pharma. Situation of global Pharma is also not so rosy that Indian Pharma will not be at par.

GLOBAL PHARMACEUTICAL INDUSTRY

Globally, it is observed that the presence of blockbuster model and its success for global Pharma locked them in huge investments. Today, even blockbuster model for value migration of global Pharma is not yielding results. Blockbuster model itself is at dying stage.

The ageing of the blockbuster model and other economic forces of each country has given birth to generics of equal quality. Biotech has opened a new chapter and it is also quickly getting skewed as biosimilars. Today, 24 percent of world market has been already captured by generics and as patents expire, global Pharma are also looking for their presence in global generics.

Global Pharma is facing a host of problems. Decreasing returns on increasing R&D spend, compounded by escalating sales and marketing expenditure and the impending loss of patent protection are adding to the financial burden of multi-national Pharma companies. Over a period of time, the dependence of blockbusters is getting reduced and the skills which global Pharma have in R&D has created limitations for themselves. Market needs and dynamics of every country are changing. Response time of big global Pharma is getting delayed and policies of flexible product mix and flexible pricing with all their advantages and disadvantages is becoming a major challenge for many big global Pharma to capture market share and also share of mind.

CURRENT SCENARIO

The Indian Pharmaceutical market grew at 14 per cent during April 2012. Globally, India ranks third in terms of manufacturing Pharma products by volume. The Indian Pharmaceutical Industry is expected to grow at a rate of 9.9% till 2010 and after that 9.5% till 2015. The Indian Pharma market is expected to touch US\$74 billion sales by 2020 from US\$ 11 billion.

Moreover, the increasing population of higher income group in the country will open a potential US\$8 billion market for multi-national companies selling costly drugs by 2015. Besides, the domestic pharma market is estimated to touch US\$20 billion by 2015, making India a lucrative destination for clinical trials for global giants.

Further estimates the health care market in India to reach US\$31.59 billion by 2020.



INTRODUCTION TO COMPANY

Elder Pharmaceuticals ranked as the 27th (ORG-IMS) largest pharmaceutical company commenced operations in 1989. It is rated as the third fastest growing company, by revenue, in the pharmaceutical industry in FY 2010 in India.

Elder Pharmaceuticals principal activities include the manufacturing and marketing of prescription pharmaceutical brands, surgical and medical devices. Shelcal Elder's No.1 brand is one of the top brands in the Indian Pharmaceutical industry. We believe that we are one of the leading players in the pharmaceutical formulation market in India, being a leading player therapeutic segments - Women's Healthcare, Wound Care and Nutraceuticals.

Our strategic alliances with a number of international pharmaceutical entities for marketing their products in India and overseas international acquisitions have strengthened and enabled us to become a true-global pharmaceutical company.

We have the necessary distribution Infrastructure and marketing capabilities to reach all corners of the country and thereby make our product offerings available to patients even in smaller towns and villages of India.

“Elder Group of Companies”, has strategic interests in Pharmaceuticals, Bulk Drugs, Healthcare, Consumer Products, Medical Equipments, and Process Instrumentation

The FMCG division of group is formed in 2004 known as Elder Health Care.

Elder Health Care Ltd India has three divisions

These are:-

- ❖ Consumer FMCG
- ❖ Elderemis
- ❖ Zerah

❖ **Work culture at Elder-**

❖ **AT ELDER WE BELIEVE IN NURTURING HEALTH**

To be an equal partner in the process of Business of the Organization and facilitate the growth of the Organization through value added H R initiatives.

❖ The strategy identifies three key objectives:

- To get the best people on the Board
- To Retain the Best People
- To Develop the Best People.

❖ As strong believer in protecting all rights of our Human Resources we follow:

- Respect for People
- Empathy
- Empowerment
- Quality

❖ Professional Excellence - "Quality Staff delivering a Quality Service"

- We define core aspects of our work and the service levels to be delivered against each
- To be the experts at these and monitor standards of delivery
- To revisit what we do and seek to improve things
- Measure results by quality and quantity
- Challenging the Status Quo

❖ Key Behaviors:

- One of the ways you can do your job better is by embracing the key behaviors that define and strengthen the way we interact.

INTRODUCTION

Sunscreens prevent excessive solar radiation from reaching the skin, and by doing so, reduce the risk of getting sunburns and cancer.

One of the oldest kinds of sunscreens recorded was olive oil, which was used in Ancient Greece thousands of years ago. However, it did not have quite the effective sun protection that was needed. There was no efficient sunscreen invented until 1944. During the Second World War many soldiers were getting sunburns. This led to the invention of something that could protect the soldiers from harmful sun rays.

A pharmacist Benjamin Greene created a sticky red substance that he called a "red vet pet." It was only a start. Later, he created a more user friendly sunscreen.

Franz Greiter is credited with introducing the concept of Sun Protection Factor (SPF) in 1962, which has become a worldwide standard for measuring the effectiveness of sunscreen when applied at an even rate of 2 milligrams per square centimeter (mg/cm^2).

Newer sunscreens have been developed with the ability to withstand contact with water and sweat. In an era of increased cancer awareness and a focus on disease prevention; photo-protection has taken on new significance. Studies have linked ultraviolet radiation (UVR) to photo aging, skin cancer, immune-suppression, and exacerbation of certain photosensitive disorders.

Absorption of Light by the Skin

Light that falls on the surface of the skin gets reflected, scattered & absorbed. The interaction between the cellular proteins & the nucleic acids (DNA) results in reactions termed as "Photo biological reactions"

The effect of these reactions depends upon the dose of the impinging light as well as their wavelength (longer wavelength, lesser energy & lesser damage)

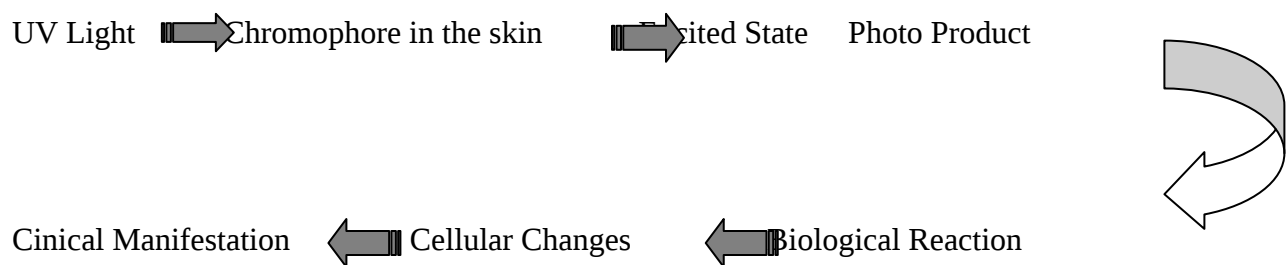
The entire chain of events leading to a photo biological reaction can be described as follows:

- When sunlight falls on the skin, it gets absorbed by certain cellular elements called Chromophores (ie. Proteins, DNA or porphyrins) & this is the first step. (Chromophore

literally means a chemical which absorbs light of a specific wavelength & each chromophore has its unique absorption spectrum)

- After absorption, the chromophore acquires more energy & rises to an excited state. Further irradiation causes further increase in energy & higher levels of excitation
- From the excited state, energy is dissipated in the form of heat, phosphorescence, etc. Here, a chemical change may occur in the excited chromophore transforming it into a photoproduct.
- These photoproducts initiate complex enzymatic reactions & cellular changes including release of reactive Oxygen species & free radicals. These radicals attack normal cellular structures & pair with their electrons. This in turn weakens cellular structure, function & nuclear material (DNA)
- Clinically, these changes manifest as erythema (redness), hyperplasia (skin thickening), tumorigenesis (onset of Cancers) etc. which are signs of inflammation.

The above steps can be explained as:-



SUN EXPOSURE

The UV exposure is not the same throughout the day & there are several factors affecting the amount of rays reaching the earth's surface.

These are:

1. **Diurnal variation:** At noon time, the sun is directly overhead & the UV rays have to traverse less distance to reach the earth's surface. Thus, maximum UV intensity is at noon time. UVB intensity is maximum from 11 a.m. to 1p.m.; UVA intensity is more or less constant throughout the day
2. **Seasonal Factors:** UV intensity is more during the Summer
3. **Latitude:** The annual UV intensity is maximum at the equator & it decreases as the distance from the equator increases. This variation is more applicable for UVB than UVA.
4. **Altitude:** With increasing altitude, the atmosphere gets thinner & the UV intensity increases. Hence trekkers are more prone to sunburns
5. **Weather Conditions:** Clouds scatter & reflect the UV rays & hence UV intensity is less in cloudy climates. Dust particles have a similar effect
6. **Surface Reflection:** Light gets reflected to a greater extent from snow, sand & metallic surfaces as compared to grass or water. Thus, in winters, although the heat is less, UV light still gets reflected from the snow & hence the need for sun protection
7. **Screening through glass:** Glass has a cut off of 320nm; hence UVA can pass through window panes, windshields while UVB gets screened.

TYPES OF SKIN

The tone of human skin can vary from a dark brown to nearly a colorless pigmentation, which may appear reddish due to the blood in the skin. Europeans generally have lighter skin, hair, and eyes than any other group on Earth, although this is not always the case. For practical purposes, such as exposure time for sun tanning, six skin types are distinguished following Fitzpatrick (1975)

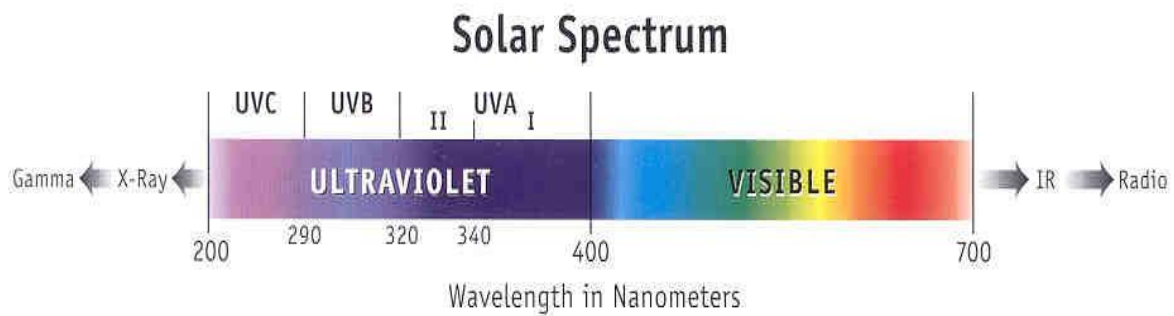
Type	Also called	Tanning Behavior
I	very light, also "Celtic"	Often burns, rarely tans.
II	light, or light-skinned European	Usually burns, sometimes tans
III	light intermediate, or dark-skinned European or "average Caucasian"	Sometimes burns, usually tans.
IV	dark intermediate, also "Mediterranean" or "Olive skin"	Sometimes burns, often tans.
V	dark or "Brown" type	Naturally black-brown skin
VI	very dark, or "Black" type	Naturally black-brown skin

What is UV Radiation-

Sunlight is made up of UV Radiation, visible light & infra red radiation. Visible light has wave length of 400-700nm. The UV represents only 5% of the total light spectrum, which is responsible for sunburns & associated long term skin damage.

The Sun emits ultraviolet radiation in the UVA, UVB, and UVC bands, but because of absorption in the atmosphere's ozone layer, 98.7% of the ultraviolet radiation that reaches the Earth's surface is UVA. (Some of the UVB and UVC radiation is responsible for the generation of the ozone layer.)

Ordinary glass is partially transparent to UVA but is opaque to shorter wavelengths while Silica or quartz glass, depending on quality, can be transparent even to vacuum UV wavelengths. Ordinary window glass passes about 90% of the light above 350 nm, but blocks over 90% of the light below 300 nm



The wave lengths of UV light are defined:-

UVC – 200nm – 290nm

UVB (10%) – 290nm – 320nm

UVA I – 340nm – 400nm

UVA II – 320nm – 340nm

(UVA – 90%)

UVC (200nm – 290nm)

Completely absorbed by the ozone layer & does not affect the skin

UVB (290-320 nm)

Well-established role in carcino-genesis and ability to produce erythema.

On unprotected skin, sunburns from UVB typically occur 4 hours post-exposure and peak within 24 hours

UVA (320-400 nm)

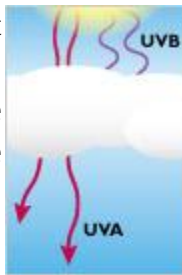
Less erythemagenic than UVB. In fact, 1,000 times more UVA is required to cause sunburn when compared with UVB. Tanning is the more common result of UVA exposure. The lack of visible erythema can be deceptive because many of UVB's deleterious effects are shared by UVA.

What are the major differences between UVA and UVB rays?

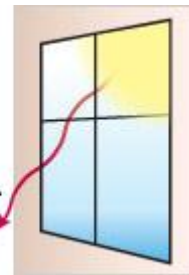
Unlike UVB rays, UVA radiation levels have small fluctuations during the day, and are present from sunrise to sunset every day, all year round, even in the winter and on cloudy days, and over time can lead to skin cancer.



UVA rays persist all year round, even in the winter—unlike UVB rays.

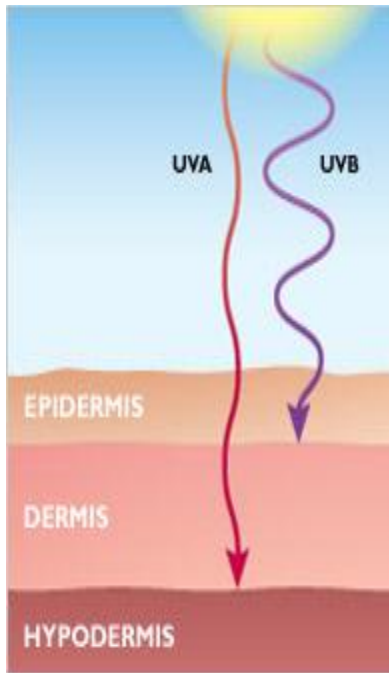


UVA rays exist from sunrise to sunset, even on cloudy days – unlike UVB rays.



UVA rays pass through windows and glass - unlike UVB rays.

How do UVA & UVB Rays affect Skin?



UVA rays penetrate deeper into the dermis than UVB rays While UVB rays remain primarily at the epidermal level and are partially blocked by the stratum corneum, UVA rays penetrate deeper into the dermis or base layer of the skin.

- **UVA** activates the melanin stored in the epidermis, and produces a pigmentation effect visible within one hour but usually fades in 24 hours.
- **UVA** penetrates the epidermis where connective tissue and blood vessels exist. The result is a loss of elasticity that causes the skin to sag, wrinkle, and age prematurely.
- **UVB** penetration primarily remains at the epidermis level.
- A large dose of **UVB** radiation will cause acute sunburn, redness, burning sensation, and blistering.
- **UVB** rays stimulate the formulation of melanin, causing a significant pigmentation of the skin. This darkening effect will be evident after approximately 24 hours and is relatively long-lasting.

Skin's Natural Defenses

Human skin has inherent defense mechanisms to protect itself from UV damage:-

1. Thickened Stratum Corneum
2. Melanin Synthesis by Melanocytes

DAMAGING EFFECTS OF UVA & UVB

1. Sun burn
2. Tanning
3. Hyperplasia
4. Immunological changes
5. Collagen breakdown
6. Cell death
7. Photo aging
8. Skin cancer etc.

Current Recommendations for Sunscreen grading by AADA

- UVA protection is equally important.
- AADA recommends:
 - SPF as the main criteria for detecting sunscreen efficacy.
 - SPF (Sun Protection Factor) to change to UVB Sunburn protection factor
 - Persistent Pigment Darkening method (skin type III to V)
 - Critical wavelength of at least 370 nm.

- Proportionate increase in UVA screening capacity with increasing SPF. (UVA / UVB ratio)

AADA – American Association of Dermatology Association

COLIPA - European Cosmetic, Toiletry and Perfumery Association

MEASUREMENTS OF SUNSCREEN PROTECTION

SUN PROTECTION FACTOR (SPF)

The SPF of a sunscreen is a laboratory measure of the effectiveness of sunscreen — the higher the SPF, the more protection a sunscreen offers against UV-B (the ultraviolet radiation that causes sunburn).

The SPF indicates the time a person with sunscreen applied can be exposed to sunlight before getting sunburn relative to the time a person without sunscreen can be exposed.

$$\text{SPF} = \frac{\text{MED Protected Skin}}{\text{MED Unprotected Skin}}$$

MED: Minimal Erythematous Dose

The minimum dose of UV radiation required to generate the first perceptible erythematous reaction on human skin

SPF → >50 ⇒ extreme protection

SPF → 30-50 ⇒ very high protection

SPF → 20-30 ⇒ high protection

For example, someone who would burn after 12 minutes in the sun would expect to burn after 120 minutes if protected by a sunscreen with SPF 10. In practice, the protection from a particular sunscreen depends on factors such as:

- The skin type of the user.
- The amount applied and frequency of re-application.
- Activities in which one engages (for example, swimming leads to a loss of sunscreen from the skin).
- Amount of sunscreen the skin has absorbed.

<u>SPF</u>	<u>UVB absorption</u>
15	93.3
20	95
30	96.7
45	97.8
50	98

Limitations of SPF-

The SPF is an imperfect measure of skin damage because invisible damage and skin aging is also caused by the very common ultraviolet type A, which does not cause reddening or pain.

Conventional sunscreen does not block UVA as effectively as it does UVB, and an SPF rating of 30+ may translate to significantly lower levels of UVA protection.

According to a 2004 study, UVA also causes DNA damage to cells deep within the skin, increasing the risk of malignant melanomas.

Even some products labeled "broad-spectrum UVA/UVB protection" do not provide good protection against UVA rays. The best UVA protection is provided by products that contain zinc oxide, avobenzone, and ecamsule. Titanium dioxide probably gives good protection, but does not completely cover the entire UV-A spectrum.

In the EU sunscreens are limited to SPF 50+, indicating a SPF of 60 or higher, and Australia's upper limit is 30. The United States does not have mandatory, comprehensive sunscreen standards, although a draft rule has been under development since 1978.

MEASUREMENTS OF UVA PROTECTION

Different methods to test UVA protection of a sunscreen:

In vivo methods:

- 1) IPD method** (Immediate Pigment darkening)
- 2) PPD method** (Persistent Pigment darkening) (PA factor)
- 3) Erythema Factor** (PFA)
- 4) Phototoxic Method**

In vitro methods:

- 1) Critical wavelength**
- 2) UVA / UVB ratio**

In vivo methods :

I] IPD method (Immediate Pigment Darkening):

Immediate pigment darkening (IPD) is a transitory darkening of the skin observed after UVA exposure. The melanocytic system is implicated in its development. Indeed, it involves structural changes in melanocytes and keratinocytes and a chemical modification of pre-existing melanin. Darkening intensity is maximum immediately after exposure and decreases rapidly. The maximum efficiency wavelength for induction of IPD is around 340 nm. The phenomenon is inhibited by oxygen deprivation. Minimum dose for induction of IPD (MIPDD) varies with the subject according to phototype, melanotype and skin color.

However, the pigmentation is very short lived & hence not a reliable method.

II] Persistent Pigment Darkening (PPD)

The Persistent Pigment Darkening (PPD) method is a method of measuring UVA protection, similar to the SPF method of measuring UVB light protection. Originally developed in Japan

Instead of measuring erythema or reddening of the skin, the PPD method uses UVA radiation to cause a permanent darkening or tanning of the skin. More applicable to skin types III, IV & V as they tan more.

Theoretically, a sunscreen with a PPD rating of 10 should allow you to endure 10 times as much UVA as you would without protection. The PPD method is an *in vivo* test like SPF.

$$\text{PA Factor} = \frac{\text{PPD protected skin}}{\text{PPD unprotected skin}}$$

In addition, COLIPA has introduced a method which is claimed can measure this *in vitro* and provide parity with the PPD method.

As part of revised guidelines for sunscreens in the EU, there is a requirement to provide the consumer with a minimum level of UVA protection in relation to the SPF. This should be a UVA PF of at least 1/3 of the SPF to carry the UVA seal.

PPD METHOD: PA FACTOR

The PPD method grades the sunscreen product into 3 categories depending upon the amount of UVA Protection it offers which is denoted by PA factor

PA + : Protection for Sensitive skin from low grade UVA

PA ++ : Protection for normal skin from moderate UVA

PA +++ : Protection for normal skin against strong UVA exposure.

III] Erythema Factor (PFA)

Measures the redness induced by UVA. Applicable only to skin types I & II as erythema is more visible in these skin types.

IV) Phototoxic Method

Only used to measure UVA effect in photo allergic conditions

In vitro methods:

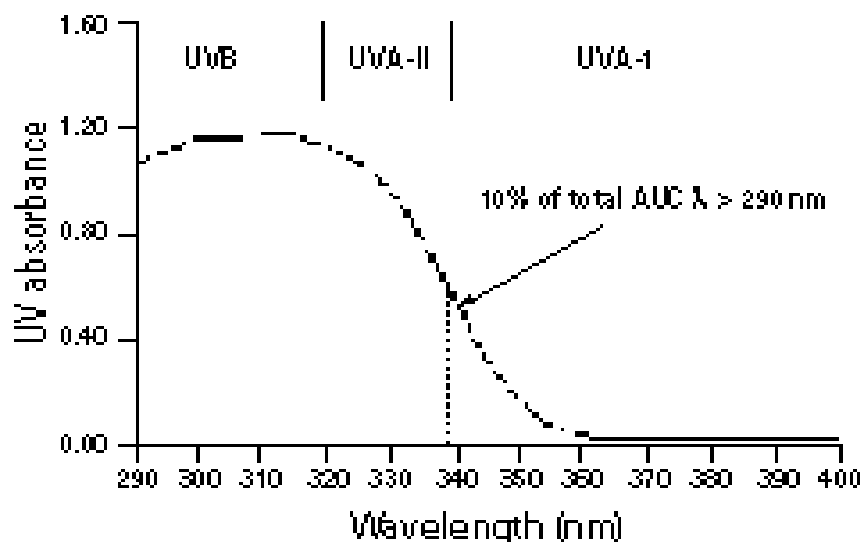
1. Critical Wavelength

The above method has been modified to yield a new measure of the 'breadth' of UVA protection using a test method called 'critical wavelength'. In this test proposal, the absorbance of the thin film of the sunscreen is integrated (summed) from 290 nm across the UV wavelengths until the sum reaches 90% of the total absorbance of the sunscreen in the ultraviolet region (290-400 nm). The wavelength at which the summed absorbance reaches 90% of total absorbance is defined as the 'critical wavelength' and is considered to be a measure of the breadth of sunscreen protection. Filters are then classified as 'broad spectrum', having a significant part of their absorbance in the UVA, when the critical wavelength is longer than 370 nm. The critical wavelength λ_c is defined according to equation 2:

$$\int_{290}^{\lambda_c} \lg[1/T(\lambda)] d\lambda = 0.9 \cdot \int_{290}^{400} \lg[1/T(\lambda)] d\lambda$$

eg:-

1. Sunscreen covers from 290 – 360 nm (UVB + UVA II + UVA I) 90% area under curve will be at 338 nm. Critical wavelength for this product is 338 nm.



Higher critical wavelength: better UVA protection

2. UVA / UVB ratio

This ratio compares the sunscreen's UVA filtering capacity to its UVB filtering capacity.

An ideal ratio would be 1. If the ratio is more than 1, it implies that the UVA protection is more while if the ratio is less than 1 then it implies that the UVB protection is more.

SUNSCREEN USAGE & APPLICATION

No matter how technologically advanced sunscreens become; they ultimately rely on proper use. Daily application of sunscreen is the ideal way to prevent UV damage. Frequency of use and compliance issues aside, the most important factor with regards to sunscreen efficacy is the quantity used

Studies assessing SPF of sunscreens use $2 \text{ mg/cm}^{[2]}$; however, patients usually apply only about $0.5 \text{ to } 1.5 \text{ mg/cm}^{[2]}$. An easy way to achieve this concentration of $2 \text{ mg/cm}^{[2]}$ is to use the teaspoon rule of application: greater than one-half teaspoon should be applied to each arm and also to the head and neck, and greater than one teaspoon should be applied to each leg, the chest, and the back (total amount used is approximately 5.5 to 6 teaspoons).

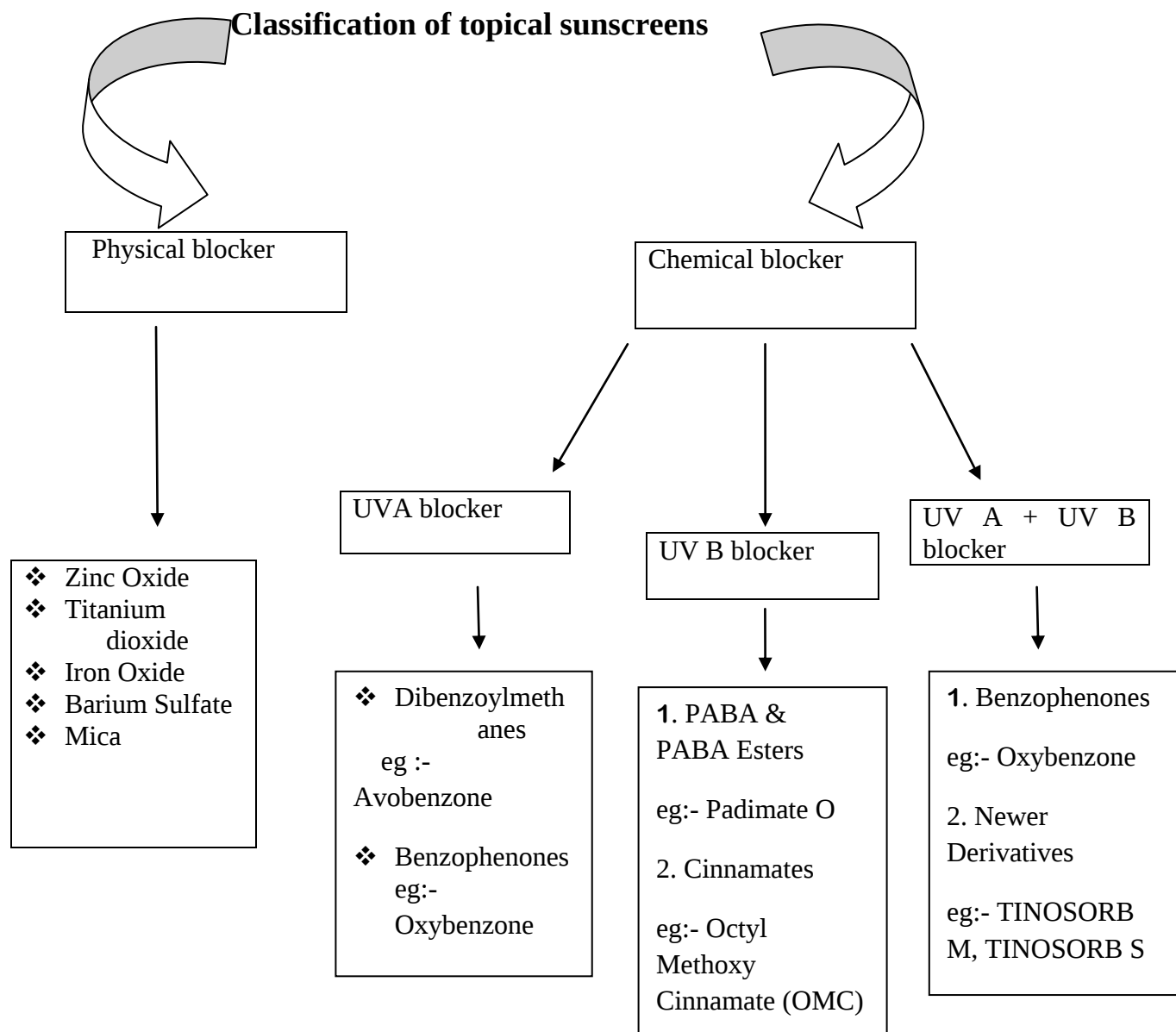
The relationship between the amount of sunscreen applied and SPF is not linear, so at small quantities sunscreens quickly lose their protective value. In fact, using only $1 \text{ mg/cm}^{[2]}$ of an SPF 25 sunscreen results in an SPF of 7.

Reapplication takes on added significance considering the common initial failure to use the recommended amount. Current guidelines indicate that individuals should apply sunscreen approximately 30 minutes prior to sun exposure and then every 2 to 3 hours thereafter.

Furthermore, reapplication is warranted after any vigorous activity that removes sunscreen (swimming, toweling, sweating, etc.). Using sunscreens that are waterproof, water resistant, or sweat resistant can help prevent this loss of protection.

Water Resistant	Maintains SPF for atleast 40 minutes of water exposure
Waterproof*	Maintains SPF for atleast 80 minutes of water exposure
Sweat Resistant	Maintains SPF for atleast 30 minutes of heavy sweating
* Includes Sunscreens labeled as " very water resistant"	

Topical sunscreens



INTRODUCTION TO PROJECT

The purpose of study to understand sunscreen market.

❖ Major -objectives:-

To know about sunscreen market in terms of doctor's perception towards prescribing sunscreens, its indications, SPF & PA factor requirement, recommendation for uses.

❖ Sub-objectives:-

To know about, in what indications doctors prescribe sunscreen?

To know about SPF requirement in a sunscreen.

To evaluate, what other attributes apart from sun protection are being considered before prescribing a sunscreen?

To know, doctor's opinion about PA factor in a sunscreen.

To evaluate preferred pack sizes of sunscreens.

To know, doctor's opinion about UltraGuard.

Research Methodology:-

The research involved is Primary research only.

Primary research: The approach followed for primary research data involved collecting information by interviewing the doctors through questionnaire.

❖ Survey :-

A survey is conducted among Dermatologist in Mumbai sub-urban, Thane and Navi-Mumbai.

- ❖ Method of Data collection – Data was collected on the basis of structured Questionnaire. Questions were both open ended and closed ended.

Sampling:

❖ Sample size –

Survey conducted among the doctors in Mumbai suburban, Thane and Navi-Mumbai.

City	Dermatologist covered
Mumbai	44
Thane	24
Navi-Mumbai	17

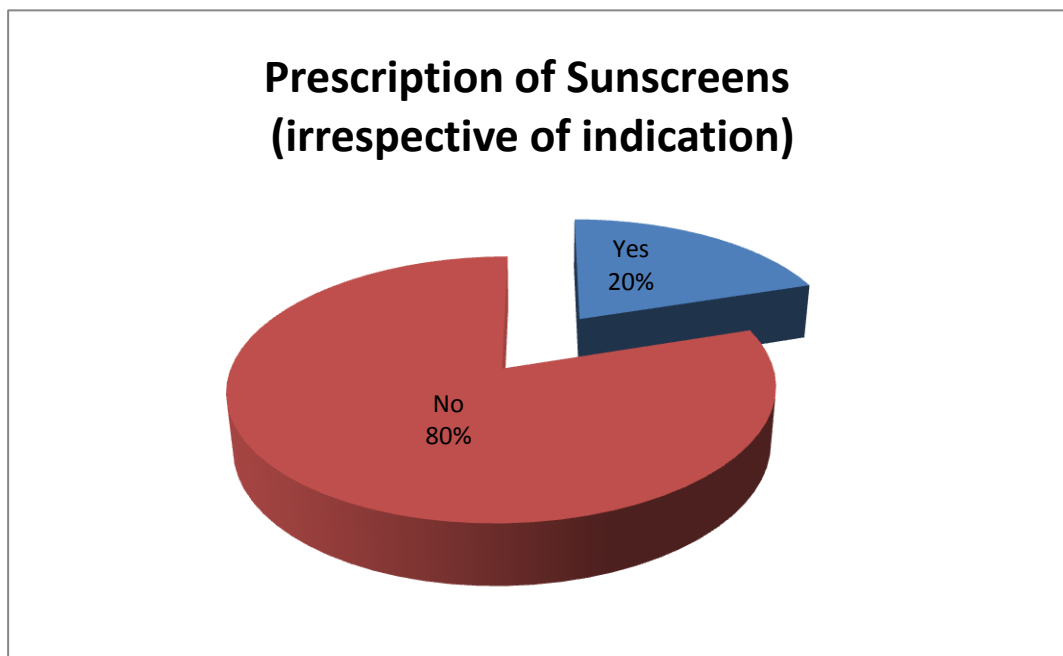
- ❖ Method of Data Analysis - Microsoft excel

Limitations-

- ❖ Since the study is conducted only in large cities for the validity of findings to other area need to be tested.
- ❖ The survey is restricted to only Dermatologist.

ANALYSIS AND FINDINGS

1. Do you prescribe sunscreens to all your patients (irrespective of indication)?



Observation:

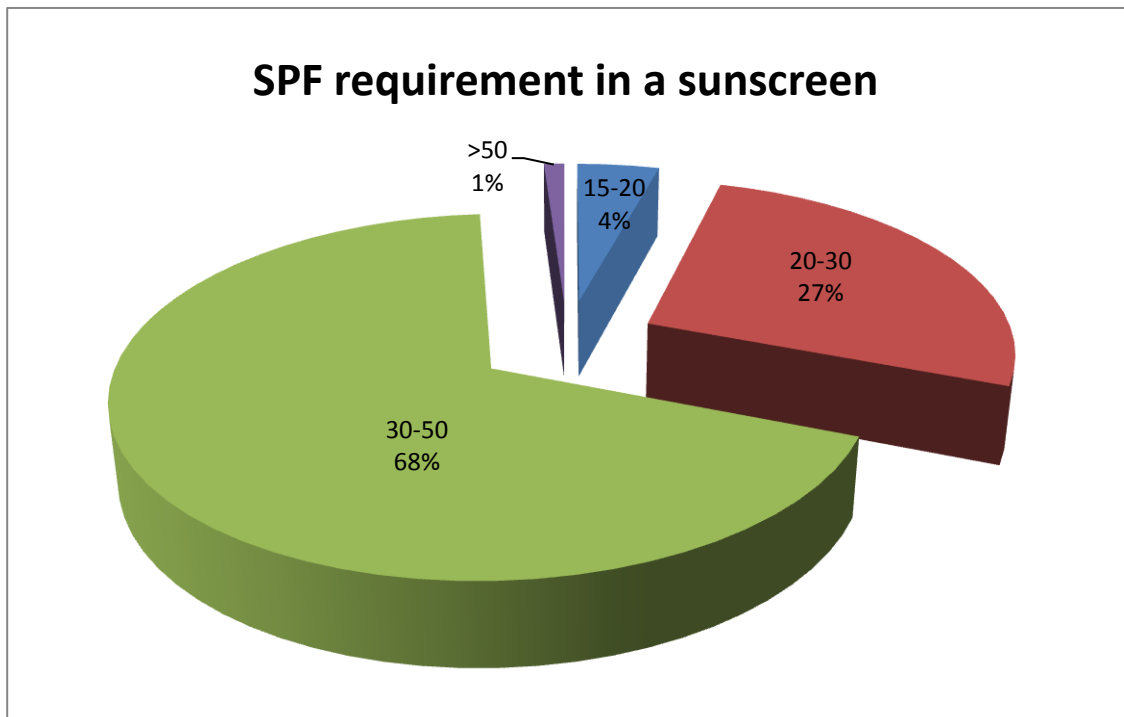
Most of doctors prefer to prescribe sunscreen only in indications considering other factors like affordability, willingness of patient to use life long etc.

2. In what indications do you recommend a sunscreen?

Observation:-

Generally in photo related skin diseases such as Tanning, Melasma, PLE, Photoaging, Photo dermatitis and in Post procedures.

3. The SPF requirement in sunscreen should be?



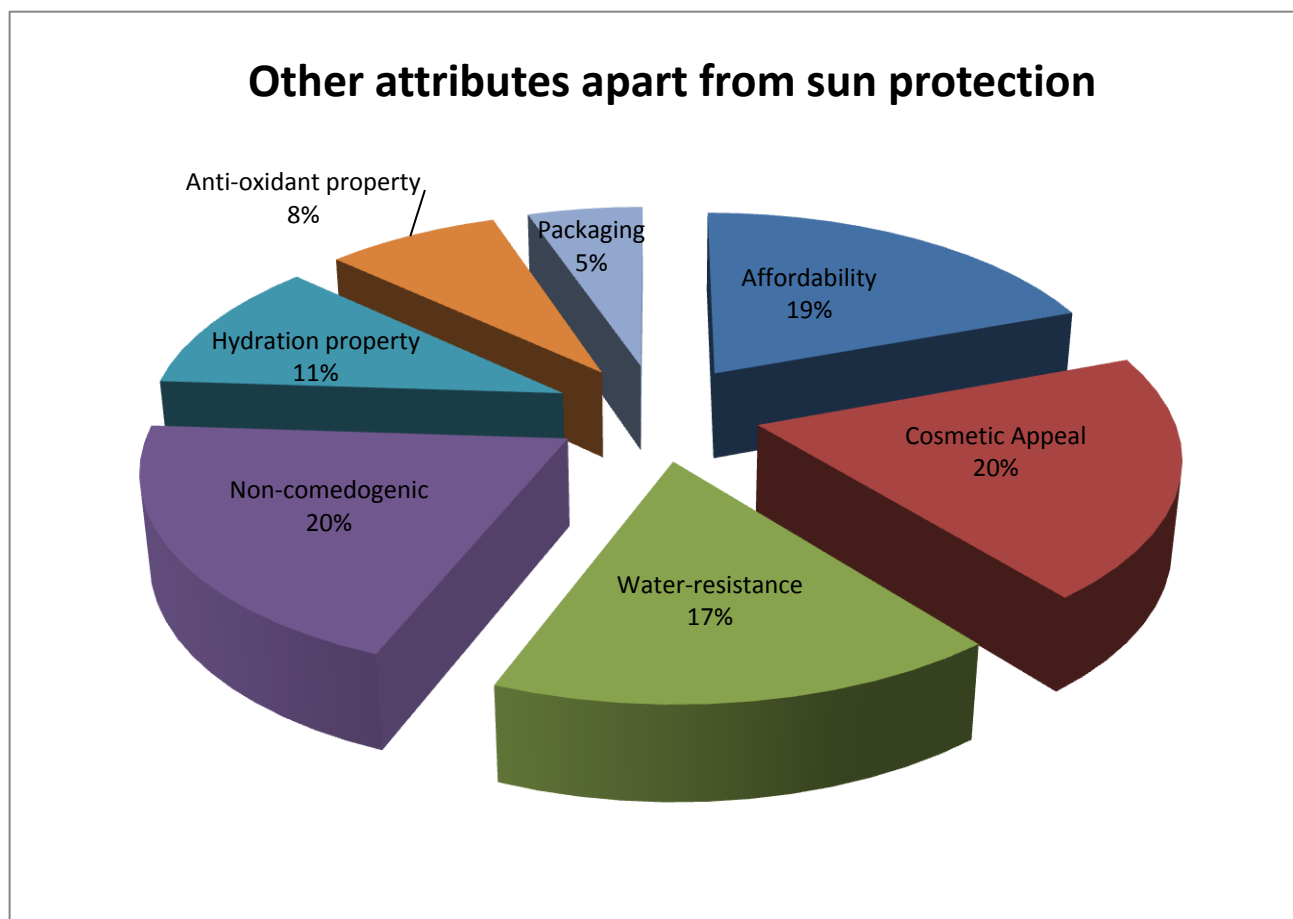
Observation: General requirement of SPF is between 30-50.

4. What kind of sunscreen do you prefer for post procedures? (Botox, Filler, Laser, Peels, Derma abrasion etc.) ?

Observation:

Generally sunscreen having combination of physical and chemical blocker with higher SPF & PA +++

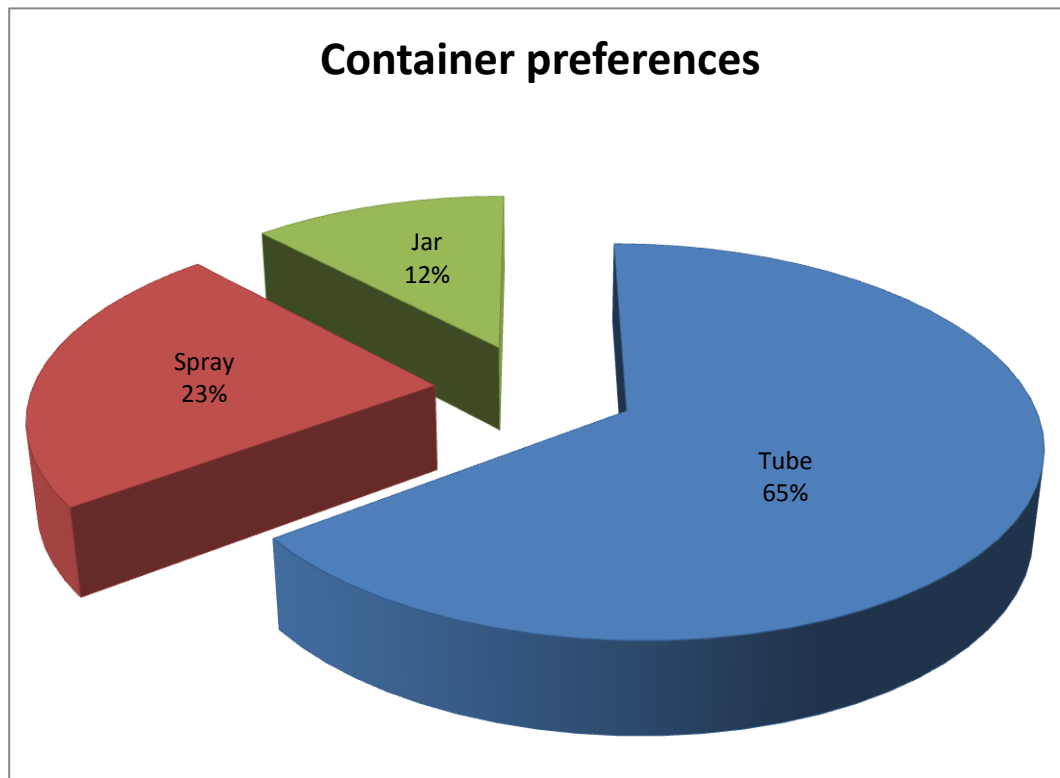
5. When choosing a sunscreen apart from sun protection what attributes do you consider?



Observation:-

The major attributes (apart from sun protection) being considered before prescribing are sunscreen's non-comedogenic effect, cosmetic appeal, affordability and water-resistance property

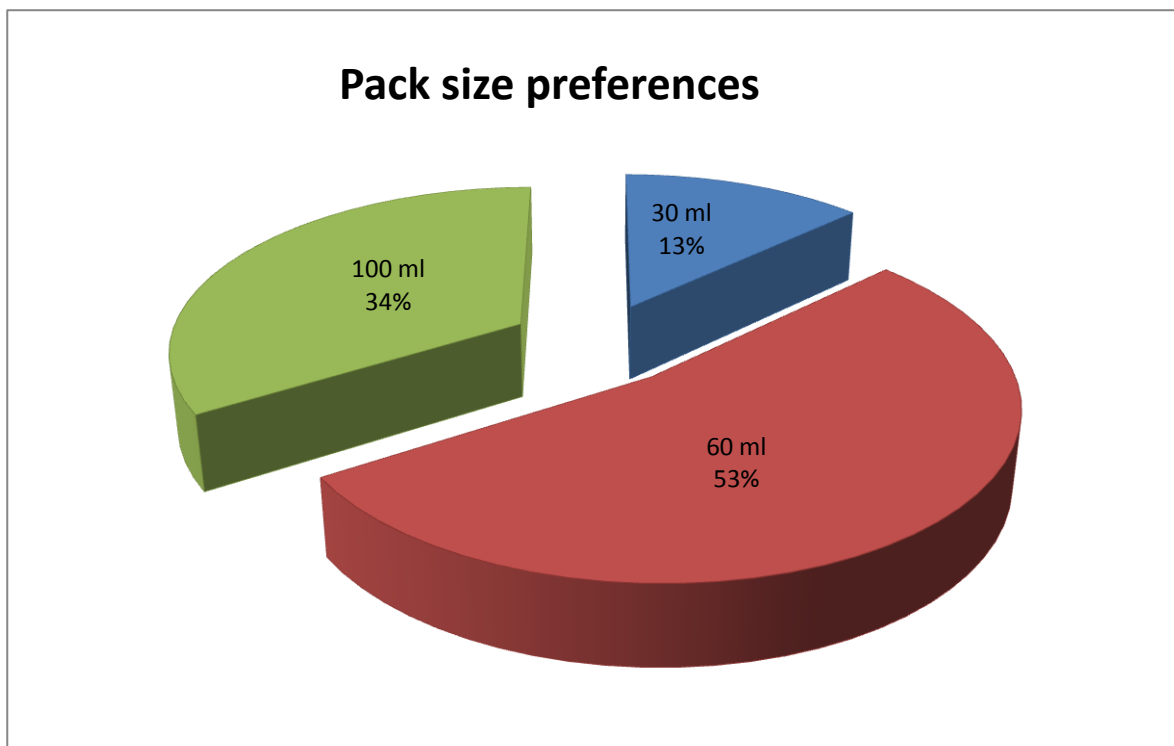
6. Do you prefer sunscreen in...



Observation:

Sunscreens are preferred more in Tube over Spray and Jar because of its convenience in use as well as to carry.

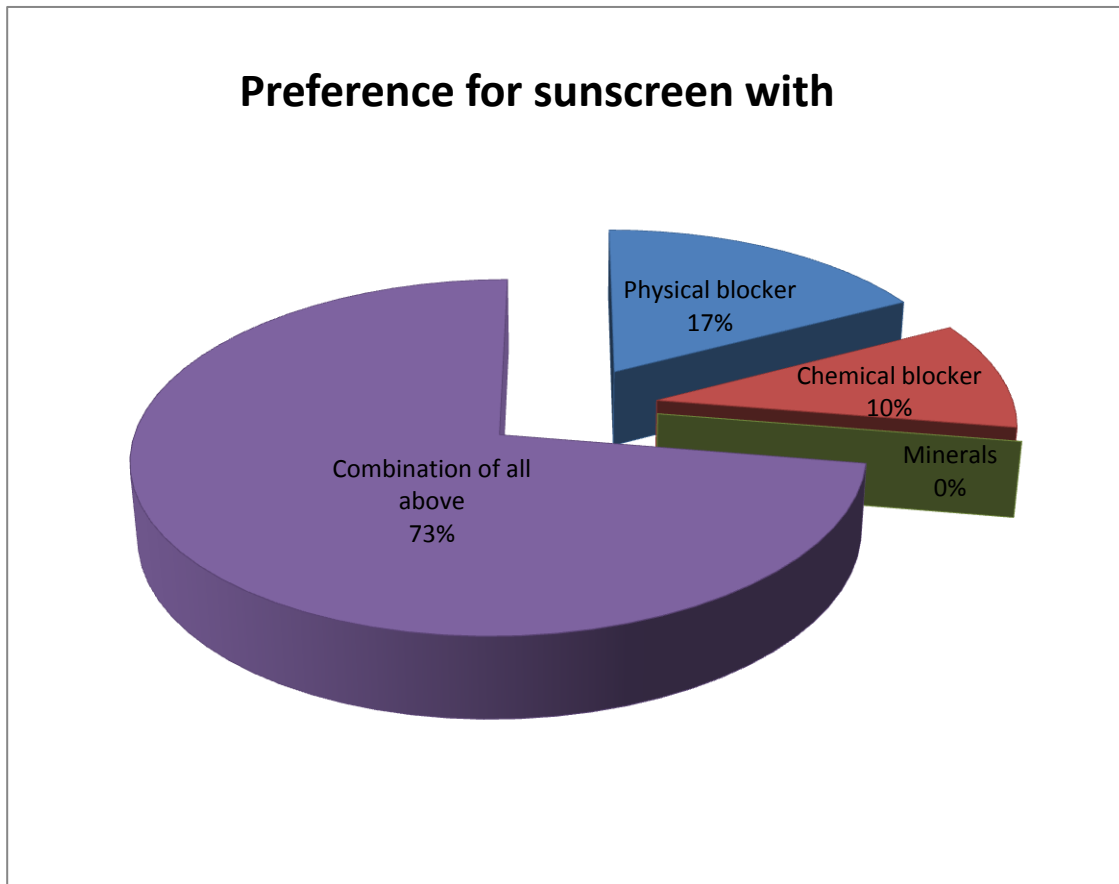
7. Which Pack size do you prefer?



Observation:-

60ml pack size is more preferred by doctors considering its convenient and patient's psychology of value for money.

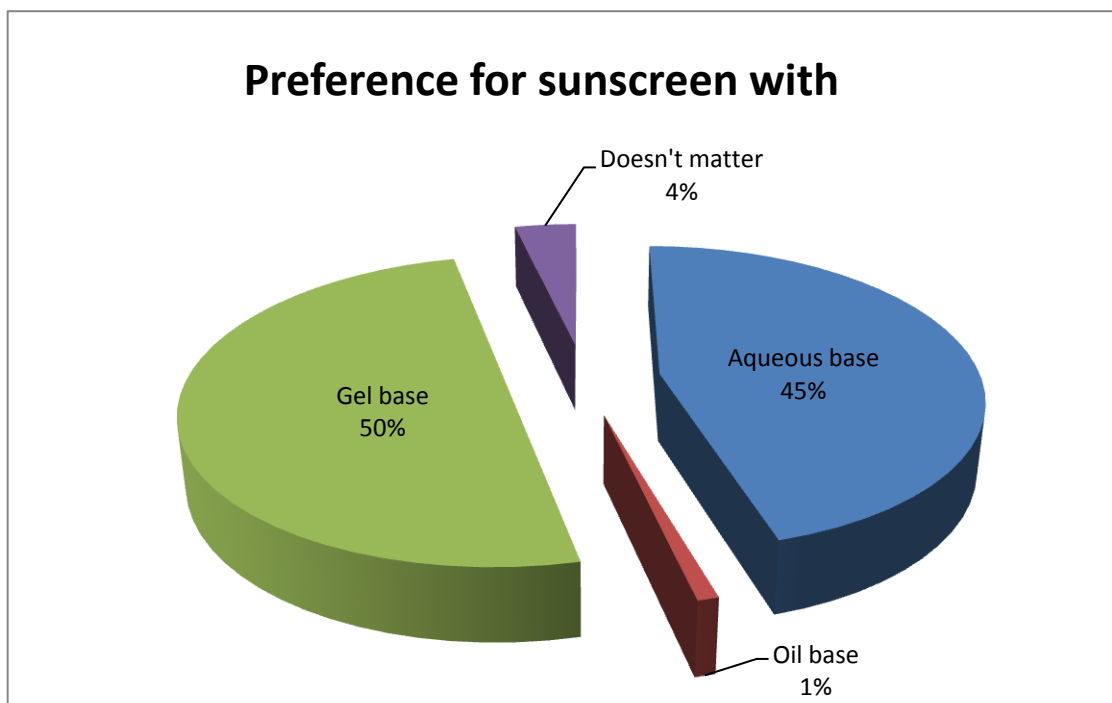
8. Do you prefer sunscreen with?



Observation:-

Combination of Physical blocker, Chemical blocker and minerals is mostly used over any single type sunscreen.

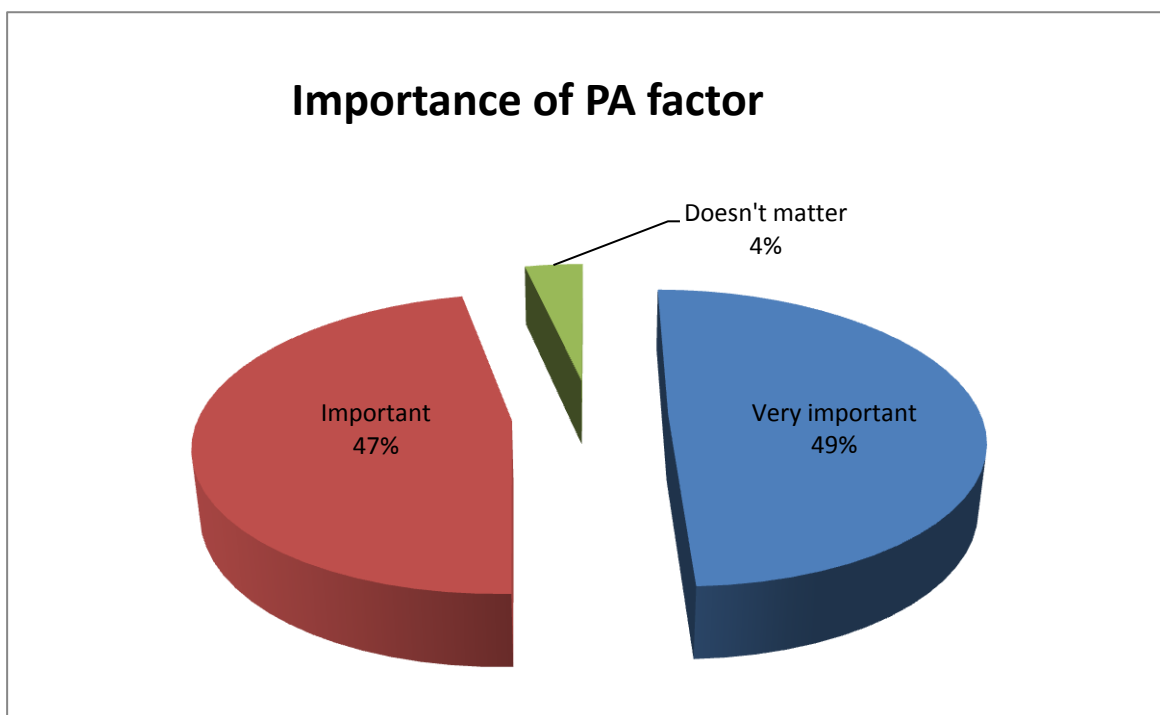
9. Do you prefer sunscreen with?



Observation:-

Sunscreens with aqueous base and gel base are nearly equally preferred, depending upon individual sunscreen's physical and other properties.

10. For measuring UV A protection how would you rate the importance of PA factor?



Observation:-

Considering long term effect of UV A rays, PA factor is important to very important for measuring UV A protection.

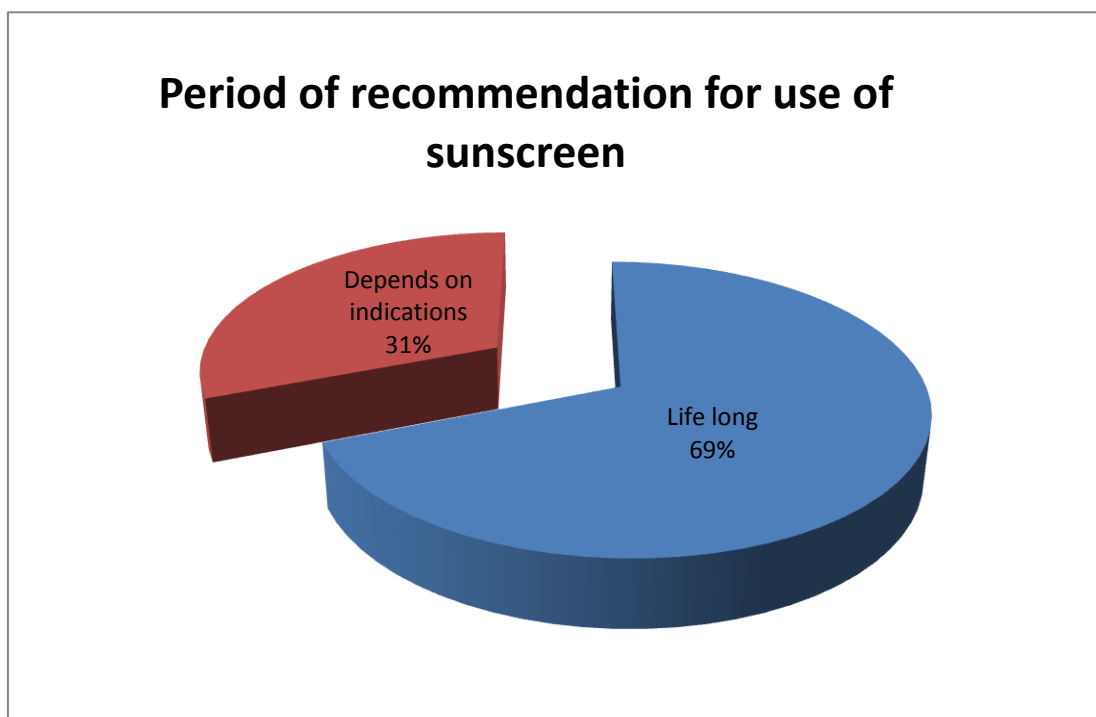
11. For which indication would you recommend mandatory usage of sunscreen?

- A. Melasma B. Photoaging C. Tanning
D. Post Derma procedures E. Acne treatment D. Sensitive skin

Observation:-

Mandatory use of sunscreen in Melasma, Photoaging, Tanning, Post Derma procedures and in photo sensitive skin.

12. For what period do you recommend the use of a sunscreen?



Observation:-

Generally sunscreens are recommended for life long use irrespective of season but sometimes other factors come in consideration before prescribing such as indications, affordability.

13. Any sunscreen brand which currently meets your requirement?

Observation:- Yes.

There are many brands prescribed by doctors some of them are UltraGuard, Suncross aquagel, Suncoat, Ansolar, Photoban, Cetaphil, Sunkroma, Sebamed etc.

Brand name	No. of response
SUNCROSS AQUAGEL	21
ANSOLAR	13
PHOTOBAN	10
SEBAMED	7
SUNKROMA	6
SUNCOAT	6
ULRTAGUARD	6
SUNGRACE	5
PHOTOBLOCK	5
SUNSTOP	4
NEUTROGENA	4
CETAPHIL	4
SUNBAN FORTE	3
SPECTRA BAN	3
SHADOWZ	2
PHOTOMAX	2
EKRUAN	2
ZORAY AQUAGEL	2
SUNBLOCK	1
AZORAN	1
SHADE	1
MELAGUARD	1

14. Do you prescribe UltraGuard? Your feedback on UltraGuard.

Observation:-

UltraGuard is prescribed in those areas only where promotion of brand is going on.

UltraGuard is welcomed by patients as well as doctors due to its results and matte finish property.

There are some complaints regarding its little more stickiness and comedogenic effect.

Major Players in sunscreen market

BRAND	COMPANY
SUNCROSS	RANBAXY
SUNBAN	H & H
MELAGUARD	ABBOT
SHADOWZ	DRL
PHOTOBAN	MICRO LABS
SUNGRACE	GLENMARK
SPER	WOCKHARDTH
ELOVERA-SPF	GLENMARK
SHADE	FULFORD
SCREENE	LIVA
ANSOLAR	GSK
ZORAY	CFL
ULTRAGUARD	ELDER HEALTH CARE

Conclusion

Key Findings as per Major Objectives :

- ❖ The sunscreen is preferably prescribed in indications like Tanning, Melasma, Polymorphous light eruption, Photoageing, Photodermatitis and Post Procedures.
- ❖ According to most of dermatologist, the SPF requirement in a sunscreen should be between 30-50.
- ❖ The attributes apart from sun protection are being considered before prescribing are generally sunscreen's noncomedogenic effect, cosmetic appeal, affordability and water-resistance property.
- ❖ Preferable Pack size of sunscreen is 60 ml.
- ❖ Apart from indications sunscreen should be used lifelong irrespective of season.

Recommendations

- ❖ Sunscreen market will potentially grow in coming year as more and more Dermatologist starts prescribing and recommending it for lifelong use.
- ❖ There is increasing demand for cosmetically appealing sunscreens both from doctors and patients side, company should grab this opportunity and promote UltraGuard using its matte finish property.
- ❖ Company can bring 60 ml pack size on competitive price which is prescribed by most of Dermatologist.
- ❖ Till now Doctors are not concern about sunscreens having anti-oxidant property. There is need of Awareness among doctors and promotion of UltraGuard in terms of anti-oxidant property as USP.
- ❖ The last but not least, there is need of immediate concern regarding promotion of UltraGuard considering its falling no of prescriptions even after warmly welcomed by market.

❖ **Questionnaire for Doctors**

RESEARCH QUESTIONNAIRE

Name : Dr.

Place:

Q1. Do you prescribe sunscreens to all your patients (irrespective of indication)?

A. Yes B. No

Q2. In what indications do you recommend a sunscreen?

Ans-

Q3. The SPF requirement in a sunscreen should be?

A. 15-20 B.20-30 C.30-50 D. >50

Q4. What kind of sunscreen do you prefer for post procedures? (Botox, Filler, Laser, Peels, Derma abrasion etc.) ?

Ans-

Q5. When choosing a sunscreen apart from sun protection what attributes do you consider?

(Please, give ranking)

A. Affordability of sunscreen

B. Cosmetic Appeal

C. Water-resistance

D. Non-comedogenic

E. Hydration property

F. Anti-oxidant property

G. Packaging

Q6. Do you prefer sunscreen in...

- A. Tube B. Spray C. Jar

Q7. What pack size do you prefer?

- A. 30 ml B. 60 ml C. 100 ml

Q8. Do you prefer sunscreen with?

- A. Physical Blocker B. Chemical Blocker
C. Minerals D. Combination of above

Q9. Do you prefer sunscreen with?

- A. Aqueous base B. Oil base C. Gel base D. Doesn't matter

Q10. For measuring UV A protection how would you rate the importance of PA factor?

- A. Very important B. Important C. Doesn't matter

Q11. For which indication do you recommend mandatory use of sunscreen?

- A. Melasma B. Photoageing
C. Tanning D. Post Derma procedures
E. Acne treatment F. Sensitive skin

Q12. For what period do you recommend the use of sunscreen ?

Ans-

Q13. Any sunscreen brand which currently meets your requirement?

Ans-

Q14. Do you prescribe UltraGuard? Your feed on UltraGuard.

Ans-

LIST OF VISITED DOCTORS

Dr. Name	Area/Patch	City
RAGHUNANDAN TORSEKAR	MULUND EAST	Mumbai
PRANALI PATIL	MULUND EAST	Mumbai
MANJUSHA KURWA	BHANDUP	Mumbai
PRAKASH BORA	BHANDUP	Mumbai
RATNAPRABHA POSA	BHANDUP	Mumbai
PARUL KOLHE	BHANDUP	Mumbai
K K AGRAWAL	BHANDUP	Mumbai
DILIP THAKKAR	MULUND	Mumbai
VEENA	MULUND	Mumbai
PURTI KOLAGE	MULUND	Mumbai
PHALGUNI THAKKAR	TAMBE NAGAR MULUND WEST	Mumbai
JOLLY KAPADIA	TAMBE NAGAR MULUND WEST	Mumbai
KIRIT MANEK	NAHUR WEST	Mumbai
SUDHA HEGDE	MULUND	Mumbai
VIJAYALAXMI L	MULUND	Mumbai
DILIP THAKKAR	MULUND	Mumbai

SIDDHI CHIKHALKAR	MULUND	Mumbai
GEETANJALI DANGE	TEMBIPADA BHANDUP WEST	Mumbai
MAMATA CHEDA	TAMBE NAGAR MULUND WEST	Mumbai
CHIRAG SAWALA	MULUND	MUMBAI
GAYATRI BHARADWAJ	MULUND	MUMBAI
VIJAY L ASWANI	MULUND	MUMBAI
RAJESH JADHAV	VARTAK NAGAR	THANE
ABHIJEET		
RAGHUWANSHI	VARTAK NAGAR	THANE
MANJIRI JAGTAP	VARTAK NAGAR	THANE
BEENA VYAS	KHOPAT AND NAUPADA	THANE
JAY GUPTA	KHOPAT AND NAUPADA	THANE
VINAY GOPLANI	KHOPAT AND NAUPADA	THANE
RUPALI PAWASKAR	KHOPAT AND NAUPADA	THANE
ARCHANA VAIDYA	CHARAI AND NAUPADA	THANE
RAJ HARJANI	CHARAI AND NAUPADA	THANE
SHAZIA KHAN	KOPRI AND ANAND NAGAR	THANE
VIKAS PAWNARKAR	KOPRI AND ANAND NAGAR	THANE
VEENA FALE	VASANT VIHAR	THANE
SANDHYA PRADHAN	VASANT VIHAR	THANE
AMIT KARKHANIS	NAUPADA	THANE
AARTI THAKKAR	NAUPADA	THANE
KABERI SOM	NAUPADA	THANE
SHARMILA PATIL	NAUPADA	THANE
S D PUROHIT	NAUPADA	THANE
SANDEEP DAY	KALWA WEST	THANE

RASHID SHAIKH	KALWA WEST	THANE
GEETA SHINDE	KALWA HOSPITAL AND KALWA	THANE
ZUBIN BHARDA	KALWA HOSPITAL AND KALWA	THANE
SUMIT VANE	KALWA HOSPITAL AND KALWA	THANE
VISHLAKSHI VISHWANATHAN	KALWA HOSPITAL AND KALWA	THANE

Doctors name	Area/ Patch	City
M R L SUJATA	CHEMBUR	MUMBAI
ASHOK B SHAH	GHATKOPER	MUMBAI
PRAKASH BORA	GHATKOPER	MUMBAI
SUNIL GHATE	GHATKOPER	MUMBAI
ANUJ GUPTA	GHATKOPER	MUMBAI
DIVYAL GALA	RAJAWADI HOSP	MUMBAI
NEHA MATTAK	RAJAWADI HOSP	MUMBAI
C K JAGAOKE	GHATKOPER	MUMBAI
P H MAIYAR	GHATKOPER	MUMBAI
R P MAIYAR	GHATKOPER	MUMBAI
MANJIRI JAIN	GHATKOPER	MUMBAI
DEEPTI DESAI	GHATKOPER	MUMBAI
SNEHAL HADWALE	GHATKOPER	MUMBAI
JITENDRA PARIKH	GHATKOPER	MUMBAI
K HARIHARAN	CHEMBUR	MUMBAI
APARNA SANTHANAM	CHEMBUR	MUMBAI
NITIN NADKARNI	CHEMBUR	MUMBAI

SANDHYA RAO	CHEMBUR	MUMBAI
VISHAKA KAMAT	CHEMBUR	MUMBAI
NIRANGAN NAGPUR	CHEMBUR	MUMBAI
SURESH ANAND	CHEMBUR	MUMBAI
CHETAN OBERAI	CHEMBUR	MUMBAI
ARCHANA PARAB	CHEMBUR	MUMBAI
PRITI TRIVEDI	GHATKOPER	MUMBAI
SUSHANT SHETTY	CHEMBUR	MUMBAI
SHRUTI CHAVAN	RAJAWADI HOSP	MUMBAI
JENIFER DAVID	RAJAWADI HOSP	MUMBAI
INDRAPREET MAHINDRA	RAJAWADI HOSP	MUMBAI
PRATIK OSWAL	CHEMBUR	MUMBAI

R K BACHWAL	AIROLI	NAVI MUMBAI
SATISH UDARE	VASHI	NAVI MUMBAI
MEENU MENAN	VASHI	NAVI MUMBAI
BINDU GAUTAM	AIROLI	NAVI MUMBAI
VIJAY ADHE	VASHI	NAVI MUMBAI
SHUBHANGI MESTRY	VASHI	NAVI MUMBAI
KIRAN GODASE	VASHI	NAVI MUMBAI
JAYSHREE SHARAD	VASHI	NAVI MUMBAI
PRANIT FARANDE	AIROLI	NAVI MUMBAI
SUNIL PETKAR	VASHI	NAVI MUMBAI
VIPRA SHAH	KOPAR KHAIRNE	NAVI MUMBAI
MANJYOT GAUTAM	VASHI	NAVI MUMBAI
KAMLESH BHAGAT	VASHI	NAVI MUMBAI

MANISH GAUTAM	VASHI	NAVI MUMBAI
PREETI ATRE	KOPAR KHIRNE	NAVI MUMBAI
MANOJ SETHI	KOPAR KHIRNE	NAVI MUMBAI
JOSTNA DEV	VASHI	NAVI MUMBAI

Time plan for project

Work done	Period of work
Discussion of objective, Determine research project, Questionnaire design	First week
Field visit	2 nd week to 6 th week
Data compilation, Analysis and findings	3 days
Report writing	3 days