



Research Article

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# Common Skin Diseases and Technology Application Trends in The Mekong Delta: A 2024 Descriptive Study

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## Abstract

**Question:** The Mekong Delta region has had significant socio-economic development over the years, urbanization is increasing, however, the environment and the impacts of climate change are challenges in skin care and protection. The popularity of the media has contributed significantly to raising awareness about healthcare in general and skin care of people in particular. That has driven the increase in the system of skin disease treatment and health care facilities.

**Objectives:** Preliminary identification of common skin diseases in 2024 and the increase and decrease in the number of diseases compared to 2023, the current investment and development of resources of dermatology at treatment and health care facilities, reflected through the actual application of technology, the level of human resources and training needs.

**Materials and Methods:** The study described 128 doctors who are directly treating, caring for and managing in the field of dermatology and skin cosmetology in 11/13 localities in the Mekong Delta.

**Results:** the 10 most common skin diseases in treatment and care facilities in 2024 accounted for 84.1% of the structure of skin diseases in the following order: acne, atopic dermatitis, contact dermatitis, dermatitis, urticaria, seborrheic dermatitis, psoriasis, scabies, folliculitis, and itchy papules. Up to 82.0% of doctors believe that skin diseases in 2024 will increase compared to 2023. Dermatology hospitals have the highest average number of applied technologies (10.5 types/facility), second is general hospitals (7.7 types/facility), third is high-tech spas (6.4 types/facility). Lasers are the most popular technology group and also the technology group with the highest demand. Products to treat acne and fish skin dermatitis are in higher demand than other groups of treatment products.

**Conclusion:** Skin diseases are on the rise, tropical diseases are still accounting for a high proportion of the structure, laser technology and acne and dermatitis treatment products are the most prioritized in the current skin health care system in the Mekong Delta.

**Keywords:** Tropical skin diseases, Climate change, Laser technology, Mekong Delta

**Abbreviations:** CDC: Centers for Disease Control; CME: Continuing Medical Education; IPL: Intense Pulsed Light; PRP: Platelet Rich Plasma

## Introduction

The Mekong Delta region has had significant socio-economic development and increasing urbanization over the years, however, the environment and impacts from climate change are challenges in skin care and protection, especially skin diseases typical of the tropics. have a hot and humid climate. The popularity of the media has contributed significantly to raising awareness about healthcare in general and skin care of people in particular. That has promoted the increase in the system of skin disease treatment and health care facilities, making dermatology one of the fastest-growing fields in recent years and is forecast to continue to develop in the near future.

To learn about the current state of development of dermatology in the Mekong Delta, we conducted the study “Current status of common skin diseases, the application of technology in skin treatment and care, the need for technology, products and training – A descriptive study in the Mekong Delta in 2024”. The goal is to through the opinions of doctors, the study will preliminarily identify common skin diseases in 2024 and the increase and decrease in the number of diseases compared to 2023, the current investment and development of resources of the dermatology specialty at treatment and health care facilities, reflected through the actual application of

technology, human resource qualifications and training needs, as a basis for orientations to develop a network of health care services for skin diseases and cosmetic skin in accordance with the actual needs in the Mekong Delta region.

## Materials and Methods

### Study Design, Objects and Samples

A descriptive survey was conducted on 128 doctors in 11/13 provinces between October and November 2024 using convenient sampling. Participants required at least a doctor's qualification and 1 year of experience.

### Data Collection

Data was collected using structured questionnaires covering four parts: respondent info, disease trends, technology status, and training needs. Analysis was performed using Excel and SPSS.

### Data Analysis

The data is cleaned before it is put into use. The main methods used in data analysis include frequency analysis and mean value calculation. The software used includes Excel and SPSS.

## Results and Discussion

### Overview of the Mekong Delta



**Figure 1:** Mekong Delta Province Map (Source: Wikipedia).

The Mekong Delta is the region in southwestern Vietnam where the Mekong River approaches and empties into the sea through a network of distributaries. The Mekong delta region encompasses a large portion of south-western Vietnam of over 40,922 km<sup>2</sup> (15,800 sq mi) and population in 2022 about 17,4 million people. The size of the area covered by water depends on the season. Its wet

coastal geography makes it an important source of agriculture and aquaculture for the country. The region comprises 12 provinces: Long An, Dong Thap, Tien Giang, An Giang, Ben Tre, Vinh Long, Tra Vinh, Hau Giang, Kien Giang, Soc Trang, Bac Lieu, and Ca Mau, along with the province-level municipality of Can Tho (Wikipedia, 2024) (Figure 1).

**Table 1:** Overview of the doctor participating in the interview.

Character		Frequency n=128	Percent (%)
Specialties	Dermatology	92	71.9
	Other specialties	36	28.1
Degree	Doctor, bachelor	45	35.2
	Residency	16	12.5
	Preliminary Specialties	20	15.6
	Master, Specialty I	42	32.8
	Ph.D., Specialty II	5	3.9
Workplace	General Hospital	38	29.7
	Dermatology Hospital	30	23.4
	Dermatology Specialty Clinic	27	21.1
	Medical Center	11	8.6
	High-tech spa	8	6.3
	Medical Universities and Colleges	8	6.3
	Centers for Disease Control (CDC)	3	2.3
	Medical management unit	3	2.3
Provinces and cities - places of work	An Giang	4	3.1
	Bac Lieu	5	3.9
	Ben Tre	4	3.1
	Ca Mau	4	3.1
	Dong Thap	12	9.4
	Hau Giang	6	4.7
	Kien Giang	3	2.3
	Soc Trang	5	3.9
	Can Tho City	75	58.6
	Tra Vinh	6	4.7
	Vinh Long	4	3.1

## Overview of the Research Object

Of the 128 doctors participating in the survey, dermatologists accounted for 71.9% and other specialties accounted for 28.1%. Doctors work in many different health care fields, most of them work in provincial hospitals (53.1%), of which 29.7% work in general hospitals and 23.4% work in dermatology hospitals; working in dermatology clinics accounted for 21.1%; working in health centers accounted for 8.6%; working at medical universities/

colleges accounted for 6.3%; working at high-tech spas accounted for 6.3%; working at the Centers for Disease Control accounted for 2.3% and working at the state management agency in charge of health accounted for 2.3%. Distribution of doctors' work in 11/13 provinces and cities in the Mekong Delta. In which, Can Tho city has the highest number of doctors, 58.6% (Table 1).

Doctors participating in the interview had doctoral and bachelor's degrees accounting for 35.2%; master's degree and

specialty I accounted for 32.8%; preliminary specialties accounted for 15.6%; resident doctors accounted for 12.5% and doctorates, Ph.D., Specialty II accounted for 3.9%. Doctors participate in interviews in terms of the number of years of experience. From 1

to 5 years, accounting for 54.7%; from 6 to 10 years, accounting for 14.1%; from over 10 to 20 years accounted for 14.8%; over 20 years accounted for 13.3% and less than 1 year accounted for 3.1% (Table 2).

**Table 2:** Number of years of experience of the doctor participating in the interview.

Years of Experience	Frequency n=128	Percent (%)
Less than 1 year	4	3.1
From 1 to 5 years	70	54.7
From 6 to 10 years	18	14.1
From 11 to 20 years	19	14.8
Over 20 years	17	13.3

### Common Skin Diseases In 2024 And the Increase/Decrease in Skin Diseases Compared To 2023

**Table 3:** Common skin diseases in 2024 according to doctors.

Rank	Skin disease	Frequency n=128	Percent (%)
1	Acne	74	57.8
2	Atopic dermatitis	64	50.0
3	Contact dermatitis	63	49.2
4	Dermatoderma	46	35.9
5	Urticaria	35	27.3
6	Seborrheic dermatitis	34	26.6
7	Psoriasis	30	23.4
8	Scabies	29	22.7
9	Folliculitis	22	17.2
10	Itchy Papules	20	15.6
11	Eczema	19	14.8
12	Vasodilation	15	11.7
13	Keratosis	14	10.9
14	Melasma	14	10.9
15	Stretch marks	13	10.2
16	Post inflammatory Hyperpigmentation	4	3.1

The most prevalent diseases in 2024 are acne (57.8%), atopic dermatitis (50.0%), and contact dermatitis (49.2%). 82.0% of respondents noted an increase in disease frequency over the past year (Table 3).

In addition to the above common skin diseases, doctors note that some skin diseases that need attention include vitiligo, herpes,

drug allergies, lupus erythematosus, pemphigus and chickenpox. According to doctors, the situation of skin diseases in 2024 increased compared to 2023, accounting for 82.0% (of which a slight increase accounted for 52.3% and a sharp increase accounted for 29.7%), unchanged compared to 2023, accounting for 10.9% and decreasing compared to 2023, accounting for 7.0% (Table 4).

**Table 4:** The situation of increase and decrease in skin diseases in 2024 compared to 2023.

Character	Frequency n=128	Percent (%)
Strong increase	38	29.7
Slight increase	67	52.3
Constant	14	10.9
Mitigate	5	3.9
Plummeting	3	2.4
Total	128	100

### Current status and demand for technology and products in cosmetic skin treatment and care in 2024

On average, there are 6.8 types of technology used in a treatment and skin care facility. The most are 22 types and some establishments do not apply technology. In which, dermatology hospitals have the highest average number of technologies applied in the treatment and care of skin diseases (10.47 types/facility),

ranked second is general hospitals (7.66 types/facility), third is high-tech spas (6.38 types/facility), and fourth is dermatology specialty clinics (5.93 types/facility). Provincial Health Centers and Centers for Disease Control (CDC) have fewer technologies in the treatment and care of skin diseases (2.82 and 2.33 types/facility), at least universities, medical colleges and health management units (Table 5).

**Table 5:** The average number of technologies applied at skin disease treatment and care facilities by 11/2024.

Treatment and care facilities	Frequency	Statistic	
		Mean	Std. Deviation
Dermatology Hospital	30	10.5	7.6
General Hospital	38	7.7	7.1
High-tech spa	8	6.4	6.1
Dermatology Specialty Clinic	27	5.9	6.1
Medical Center	11	2.8	2.1
Centers for Disease Control	3	2.3	2.3
Medical Universities and Colleges	8	2.1	1.6
Health Regulatory Agencies	3	1.7	1.2

Up to the time of the survey, 71.9% of respondents said that their workplace is applying Co 2 Laser technology, accounting for the highest percentage compared to other types of technology. Technologies accounting for over 30% include: Laser Pigmentation,

needle rolling, Light (IPL), Electrocautery, mesotherapy, Light (LED), keloid scar/hypertrophic scar injection, scar bottom dissection and nutrient supply metastasis (Table 6).

**Table 6:** The current status of technologies being applied at skin disease treatment and care facilities until 11/2024.

Rank	Technology Name	Frequency n=128	Percent (%)
1	Laser Co2	92	71.9
2	Laser Pigment	64	50
3	Light (IPL)	54	42.2
4	Derma roller	54	42.2
5	Mesotherapy	50	39.1
6	Cauterization	50	39.1

7	Light (LED)	48	37.5
8	Keloid scar/hypertrophic scar injection	46	35.9
9	Subcision	45	35.2
10	Electroporation	40	31.3
11	Filler	38	29.7
12	Botulinum Toxin A	37	28.9
13	Chemical Peel	37	28.9
14	Low-level laser therapy	32	25
15	Radio Frequency	32	25
16	Skin Surgery	28	21.9
17	Hifu Ultherapy	26	20.3
18	UV	24	18.8
19	Platelet Rich Plasma	23	18
20	Thread Lifting	22	17.2
21	Micro Focus Ultrasound	16	12.5
22	Others	24	18.8

Regarding the demand for technology application in the coming time, the results of doctor interviews have shown that Laser technology continues to lead the demand in the future even if this technology is currently widely applied. The same trend with Lasers is light technologies (IPL). Technologies that currently have

low application but are in increasing demand in the future include: fillers, Botulinum Toxin A, stem cells, facial thread lifts, etc. On the contrary, technologies with reduced demand in the future include: Needle Rolling, Chemical Peel, Electric Incineration, etc. (Table 7).

**Table 7:** The need for technology application in the coming time.

Rank	Technology Name	Frequency n=128	Percent (%)
1	Laser CO <sub>2</sub>	67	52.3
2	Laser Pigment	55	43
3	Light (IPL)	41	32.0
4	Filler	38	29.7
5	Thread Lifting	36	28.1
6	Botulinum Toxin A	33	25.8
7	Platelet Rich Plasma	33	25.8
8	Micro Focus Ultrasound	31	24.2
9	Hifu Ultherapy	31	24.2
10	Low-level laser therapy	30	23.4
11	Light (LED)	30	23.4
12	Radio Frequency	29	22.7
13	Mesotherapy	27	21.1
14	Subcision	27	21.1
15	Cauterization	25	19.5
16	Dermaroller	24	18.8
17	Electroporation	24	18.8
18	Chemical Peel	23	18.0

19	Keloid scar/hypertrophic scar injection	23	18.0
20	Skin Surgery	23	18.0
21	UV	21	16.4
22	Others	9	7

The demand for acne treatment products (76.56%) and dermatitis treatment products (58.59%) accounted for the highest proportion and was quite far away from the rest of the product

groups. The third place is products used for hair care and restoration of facial skin damage (45.31%). Other care and treatment products have a lower demand rate (Table 8).

**Table 8:** Demand for skin disease treatment and care products.

Rank	Product Name	Frequency n=128	Percent (%)
1	Products for the treatment of acne	98	76.6
2	Products for the treatment of dermatitis	75	58.6
3	Products for cares and restores facial skin lesions	58	45.3
4	Products for the treatment of hair	46	35.9
5	Products for the treatment of psoriasis	44	34.4
6	Products for cares and restores body skin damage	44	34.4
7	Products for the treatment of scabies	43	33.6
8	Products for Skin Care for Pregnant Women	43	33.6
9	Products for care of scar	42	32.8
10	Products for care of nails	32	25
11	Others	6	4.7

### Training Needs in 2024

According to the survey results, the demand for training doctors specialist II accounted for the highest rate, 32.0%; the second highest rate is the need for continuing medical training (CME), 25.0%; the third highest rate is the demand for doctoral

and master's training, 18.8%; the fourth highest rate is the demand for specialized training I, 17.2%; the fifth highest rate is the need to train skin care technicians, 16.41%. Training needs such as preliminary specialists, resident doctors, and nursing have a low rate (Table 9).

**Table 9:** Demand for training according to qualifications.

Rank	Degree	Frequency n=128	Percent (%)
1	Specialty 2	41	32.0
2	Continuing Medical Education (CME) <sup>1</sup>	32	25.0
3	Doctor	24	18.8
4	Master	24	18.8
5	Specialty 1	22	17.2
6	Skin Care Technician	21	16.4
7	Preliminary Specialties	9	7.0
8	Residency	7	5.5
9	Nursing	6	4.7



The areas of continuous training that are of the most interest are the advanced application of laser technology in skin treatment and care, 55.5%. Other technologies such as IPL, Mesotherapy, stem

cells, Botox, Filler, RF, biotechnology, electrophoresis, etc. have similar demand, ranging from 25 to 36% (Table 10).

**Table 10:** Demand for continuous training.

Rank	CME Training Fields	Frequency n=128	Percent (%)
1	Advances in Laser Technology	71	55.5
2	Advances in IPL technology	46	35.9
3	Advances in Mesotherapy Technology	45	35.2
4	Advances in Stem Cell Technology	43	33.6
5	Advances in RF technology	42	32.8
6	Advances in Filler Technology	42	32.8
7	Advances in Botox technology	42	32.8
8	Application of biotechnology	37	28.9
9	Advances in Electrophoresis Technology	33	25.8
10	Others	10	7.8

\*Note: CME: Continuing medical knowledge update (Article 3 of Circular No. 22/2013/TT-BYT dated August 9, 2013 of the Ministry of Health of Vietnam on guidelines for continuing education for medical staff)

The training time according to the needs of doctors in 01 day accounted for 55.8%; in 02 days, accounting for 25.9% and over 02 days, accounting for 18.3%. Over 50% of doctors choose the right days for training during the week are Saturday and Sunday.

## Discussion

Skin diseases with a high proportion in the skin disease structure of the study have similar results to the study by *Dinh, et al.* [1] in a survey of 10 provinces/cities across the country. According to this study, atopic dermatitis accounts for 34% of the skin disease structure; fungal diseases and scabies account for a high proportion (13.5% and 13.0%). According to *Huynh, et al.* [2] epidemiological survey in Vinh Phu commune, Giang Thanh district, Kien Giang province (2024), the 3 skin diseases with the highest proportion are atopic dermatitis (24.4%), contact dermatitis (16.8%), and dermatomycosis (12.2%). In the above 2 studies, acne has a low rate in the community due to age restrictions. However, patients treated for acne at medical examination and treatment facilities according to doctors' assessments are high, this result is similar to some reports of the Center for Disease Control (CDC), for example, the report of the Department of Dermatology of Kien Giang General Hospital in 2023, the number of acne cases is 522 cases, the second highest after atopic dermatitis (898 cases).

At the World Summit on Dermatology and the 3rd Indochina Dermatology Conference in 2017, experts discussed many topics of interest such as dermatopathogenesis, biochemotherapy, non-invasive aesthetics, regenerative aesthetics and the application of stem cells in beauty... have considered technology to play an

important role in skin care today. There are many studies showings that Laser technology is quite commonly applied in many treatment fields such as dentistry, soft tissue surgery, ophthalmology, cosmetology, etc. Specifically, the research of *Nguyen, et al.* [3] evaluated the results of the application of CO<sub>2</sub> laser in the treatment of maxillofacial soft diseases at the Center for Oral and Maxillofacial Diseases – Hue Central Hospital. In the treatment of acne, a study by *Pham, et al.* [4] on the treatment results and satisfaction of acne patients with a combination of Laser CO<sub>2</sub> and FOB 10 Lotion has shown significant effectiveness, with an overall clinical improvement after 12 weeks of treatment: good (69.4%), good (26.4%), moderate (7.6%) and medium (4.2%), average change in GAGS score according to the time before treatment (31.65); after 12 weeks of treatment (17.76). 91.7% of patients were satisfied with the treatment results. The majority of patients were satisfied with the time (91.7%), efficiency (90.3%) and overall (90.3%) of the Co 2 Laser coordination procedure; 88.9% of patients decided to reuse the method.

Another application of Laser in the treatment of melasma is proven to be effective in the research of *Luu, et al.* [5]. When combined with Q-Switched ND: Yag Laser in combination with Melatonin cream, Tri-White Serum applied with a successful result accounting for 95.1% (78% disease cure, 17.1% disease reduction), 4.9% unsuccessful. The patient's perception after treatment showed that very satisfied accounted for 56.1%, satisfaction accounted for 26.8%, normal accounted for 17.1%. The results of treatment according to the classification of cheek tanning according to MASI were statistically significant  $p < 0.001$ .



Another study by *Ahmed, et al.* [6] in the treatment of dark circles around the eyes compared Carboxy therapy with Chemical Peel and Mesotherapy, the results showed that no statistically significant differences were found in improving pigmentation or patient satisfaction between any group. However, the mesotherapy group reported more burning sensations after treatment than the other two groups but also showed significant improvements in pigmentation and patient satisfaction compared to the Carboxy group.

Another solution is highly effective by *Roohaninasab, et al.* [7], when considering the degree of reduction in the intensity of dark circles under the eyes. The treatment method that combines nano fat injection along with SVF, PRP and Nd: YAG laser has a much greater therapeutic effect than nano fat injection alone. In all three combination treatment groups, patients were 100% satisfied.

There are many other studies on the effectiveness of the application of technology in the care of skin diseases and cosmetic skin, showing that the application of technology has greatly supported doctors in treating and caring for patients. On the other hand, technology is being developed at a very fast pace, every year, there are many new versions, new features are launched, requiring doctors to constantly update information, and the application of new technology also requires simultaneous updating of knowledge and corresponding human resources.

The new point discovered in the study is that the average number of applied technologies at high-tech spas (6.4 types/facility) is higher than that of dermatology specialty clinics (5.9 types/facility). While health centers and disease control centers, this number only fluctuates at less than 3 types/facility. Based on the bridge between technology and human resources, this result shows that high-tech spas are currently strongly attracting a team of doctors and experts in the field of dermatology. According to many experts, high-tech spa is an industry with a higher growth rate than the rest of the groups in both number and scale. This group of services has been and will contribute to the official health system in "primary health care" for dermatology, through early detection and treatment advice for customers of professional teams at high-tech spas, reducing the burden of resources on the official health system. and at the same time strengthen the role and participation of organizations in the community [8,9].

## Conclusion

The 10 most common skin diseases in treatment and care facilities in 2024 account for 84.1% of the structure of skin diseases in the order: acne, atopic dermatitis, contact dermatitis, dermatitis, urticaria, seborrheic dermatitis, psoriasis, scabies, folliculitis, and

itchy papules. Up to 82.0% of doctors believe that skin diseases in 2024 will increase compared to 2023.

Dermatology hospitals have the highest average number of applied technologies (10.5 types/facility), second is general hospitals (7.7 types/facility), third is high-tech spas (6.4 types/facility). Lasers are the most popular technology group and also the technology group with the highest demand. Products to treat acne and fish skin dermatitis are in higher demand than other groups of treatment products.

## Conflict of Interest

The authors declare no financial or personal conflicts of interest regarding this study.

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