



Analysis of Gender Usage Characteristics of Korean Medical Nail Care

Ae Jin Park¹, Ki Han Kwon^{2*}

¹Division of Beauty Arts Care, Department of Beauty Arts Care, Graduate School, Dongguk University, Seoul, Korea

²College of General Education, Kookmin University, Seoul, Korea

*Corresponding author: Ki Han Kwon

College of General Education, Kookmin University, 77 Jeongneung-ro, Seongbuk-gu, Seoul 02707, Korea
Tel.: +82 2 910 5923
Fax: +82 2 910 5923
Email: kihan.kwon@kookmin.ac.kr

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Abstract

Purpose: This study aims to analyze the treatment usage characteristics of consumers in Korea who use medical nail care, which is a noninvasive combined treatment. **Methods:** The study examined three symptoms, namely, onychomycosis, ingrown toenails, and pincer toenails in a group of 500 people in December 2022. A survey was conducted, and data were analyzed by gender. **Results:** In terms of the type of problem toenails, onychomycosis was higher in men, and women displayed high rates of pincer toenail. Current toenail conditions exhibited slightly negative response rates for men and women. Moreover, men tend to prefer hospitals, and women perform self-care to manage these issues. The usage rate of general nail salons was higher for women than that for men. The reasons for opting to use medical nail care demonstrated high response rates of improvement in problem for men and women. For procedures, the usage rate of laser or medication for treating onychomycosis was higher for men, whereas that of the resin gel procedure for ingrown and pincer toenail was higher for women. The monthly expenditure cost was less than 100,000 won for men and women, and the period of effect did not significantly differ across two and three months for both groups. **Conclusion:** The findings of this study have implications for understanding consumers with problematic toenails and rethinking the medical nail care system.

Keywords: Medical nail care, Treatment characteristics, Onychomycosis, Ingrown toenail, Pincer toenails

Introduction

Since the beginning of mankind, the instinctive desire for beauty has evolved in various ways, which has culminated in today's beauty culture. Humans spare no expense or time in enhancing their physical appearance, and the importance of the outward image has surpassed that of inner beauty and attitude, which were previously considered crucial. As a result, one's perception of success and social standing has shifted. In particular, taking care of one's appearance has become a form of stress reduction and a means of expressing individuality. Beauty care is also viewed as an external means of displaying confidence and making a good impression in interpersonal

relationships (Jung & Moon, 2018). With the acceleration of industrialization and economic growth, the social activities of women have increased, which has led to improved income levels and social status. Consequently, the desire and interest in beauty have been increasing. Specialized care has included not only the hair and face but also the hand and foot (Kim *et al.*, 2010). The beauty industry is diversifying to improve and supplement physical health by expanding its concepts to health and beauty management with a focus on overall well-being that exceeds simple aesthetics (Kwak *et al.*, 2012).

In many developed countries, the prevalence of toenail problems is high due to urbanization and increased social activities. The underlying reasons are related to various activities

such as sports and tourism (Nowicka & Nawrot, 2021). The management of problematic toenail among men is also becoming increasingly prevalent. Women's progress in society, increased emphasis placed on physical appearance, and men's increased interest in beauty contribute to a cultural climate that values personal health, youthfulness, and overall well-being. This trend is not only influencing personal lives but also medical trends. As such, hospitals also offer nail care services apart from the extensive care provided by beauty nail care services due to this phenomenon. The expansion of professional procedures performed in hospitals is driving the growth of the healthcare market (Lee *et al.*, 2015). Medical nail care refers to a combination of medical treatment and corrective care provided by a specialist after diagnosis. If treatment or care alone is unsatisfactory, then the achievement of rapid treatment effects for problematic nails can be considered professional management (Pyo *et al.*, 2007).

Recently, as interest in nail diseases that lead to continued problems in the Republic of Korea has increased, the need for nail care using auxiliary methods for treatment has emerged, and medical nail care systems that combine treatment and cosmetic procedures have been increasing.

Medical nail care is conducted using medical devices, such as lasers and corrective care, in dermatology clinics or hospitals. It can be defined as a scientific approach for analyzing and treating nail problems and conditions (Jung, 2009). The difference between medical nail care and nail salon care is that medical nail care is part of a hospital treatment process. In dermatology hospitals, these cosmetic procedures are performed in various forms (Lee, 2021). Treatment in relation to beauty and care includes drill care, noninvasive wire brace, acrylate, resin gel, and Fraser, among others. Currently, many hospitals complementary therapies before and after treatment for onychomycosis, ingrown nail, and pincer nail. Currently, the market for medical nail care requires various strategies for identifying the needs of consumers, establishing long-term relationships, and developing sustainable services to support treatment. This scenario will soon become a crucial factor in the competitiveness of medical care (Yang & Jeong, 2013; Eyuboglu & Buja, 2007).

Previous studies on problematic toenails were only conducted to examine the efficacy of cosmetic (Márquez-Reina *et al.*, 2020; Liu & Huang, 2018) or medical (Ma *et al.*, 2019) treatment. However, studies that analyze and document differences in the usage characteristics of consumers of medical nail care that combines the two treatments are lacking. To address this

research gap, the current study analyzed such characteristics on the basis of a system that includes medical treatment with noninvasive cosmetic correction, which is a feature of the Korean medical nail care system. As an initial study on medical nail care, this study is significant in that it identifies usage characteristics by gender and provides a basis for understanding consumers and rethinking the merged management system of medical and beauty.

Methods

1. Participants and data collection

As a study on the usage characteristics of consumers with problematic nail diseases experiencing medical nail care, this study produced and distributed a self-questionnaire using Naver from December 15 to December 21, 2022. The questionnaire was distributed to hospitals that introduced a problematic nail care system. Data from a total of 500 respondents were collected. Among them, 31 were excluded due to missing data, such that 469 were included in the final analysis.

2. Usage characteristics

To analyze the utilization characteristics, 8 questions were reconstructed and measured for this study based on the study of medical utilization characteristics in the study (Kim, 2015), referring to the treatment target, subjective health level, and duration of treatment use. The survey was conducted by presenting pictures along with the names of the treatments to enable the participants to could accurately distinguish the type of care they received. Noninvasive treatment procedures that have been performed in the existing hospitals, which include medication, high-frequency, Fraser, Onycho Clip and stiring. Noninvasive correction and care options that have been added to medical nail care include drill care, noninvasive wire brace, resin gel, and acrylic.

3. Data analysis

Statistical data were analyzed using SPSSWIN ver. 28.0 (SPSS Inc., USA), and frequency analysis was conducted to elucidate general and treatment use characteristics. Moreover, the chi-square test (χ^2 test) was performed to verify that the characteristics of treatment use displayed significant differences according to the general characteristics of consumers

and procedures received for onychomycosis treatment and the improvement of ingrown and pincer toenails. However, treatments may overlap during the treatment process, which were measured as multiple responses.

Results

1. General characteristics of the participants

Table 1 presents the results of frequency analysis of the general characteristics of the participants. In terms of gender, men and women comprise 34.1% and 65.9% of the sample

aged in their 20s (20.5%), 30s (33.5%), 40s (26.0%), and 50s or older (20.0%). The highest level of education noted is bachelor's degree (72.5%) followed by high school (14.9%), and master's degree (12.6%). According to vocation, 4.7%, 14.3%, 39.4%, 14.9%, 15.8%, 8.3%, and 2.6% are students, professionals, office workers, service workers, home makers, business owners, and other, respectively. The study classified marital status as unmarried (39.0%), married (59.1%), and other (1.9%). Monthly average income reached less than 2 million won (4.3%), 200–2.99 million (16.6%), 300–3.99 million (34.1%), 400–4.99 million (20.3%), and more than 5 million won (24.7%). The residential areas of the respondents included Seoul (28.6%), Gyeonggi-do

Table 1. General characteristics of the participants

N=469

Variable	Sortation	Frequency (N)	Percentage (%)
Gender	Man	160	34.1
	Woman	309	65.9
Age	20s	96	20.5
	30s	157	33.5
	40s	122	26.0
	Over 50s	94	20.0
Highest level of education	Less than high school diploma	70	14.9
	University	340	72.5
	Graduate school	59	12.6
Vocation	Students	22	4.7
	Professionals	67	14.3
	Office workers	185	39.4
	Service employees	70	14.9
	Homemakers	74	15.8
	Self-employed	39	8.3
	Other	12	2.6
Marital status	Unmarried	183	39.0
	Married	277	59.1
	Other	9	1.9
Income	Less than 2 million won	20	4.3
	2.00–2.99 million won	78	16.6
	3.00–3.99 million won	160	34.1
	4.00–4.99 million won	95	20.3
	More than 5 million won	116	24.7
Residential area	Seoul	134	28.6
	Gyeonggi-do	131	27.9
	Gyeongsang-do	128	27.3
	Chungcheong Province	31	6.6
	Jeollado	30	6.4
	Jeju. Gangwon	15	3.2

Analysis of Gender Usage Characteristics of Korean Medical Nail Care

(27.9%), Gyeongsang Province (27.3%), Chungcheong Province (6.6%), Jeolla-do (6.4%), and Jeju and Gangwon (3.2%).

2. Types of problematic toenail and status differences

Table 2 presents the results of the analysis of differences in usage characteristics according to the types of problematic toenail. The study found a significant difference in the ratios corresponding to onychomycosis ($\chi^2=15.437$, $p<0.001$) and pincer toenail ($\chi^2=4.004$, $p<0.05$). The frequency of onychomycosis was 56.9% for men, and the frequencies of ingrown and pincer toenails were 44.3% for women, which is considered high. In terms of current toenail conditions, 51.3% and 46.0% of the men and women, respectively, demonstrated the rate of 'slightly bad' without a significant difference.

3. Differences in facilities that provide medical nail care

Table 3 depicts the differences in facilities that provide medical

nail care. The study noted a significant difference in previous management facilities ($\chi^2=18.573$, $p<0.01$) in which demonstrated high rates of visiting hospitals (43.1%), whereas the women tended to opt for home management (32.4%). The ratio of nail salon care was higher for women (17.5%) than that for men (5.6%), which is a significant difference ($p<0.01$).

The reasons for using medical nail care led to high rates of improvement in nail problems for men (40.6%) and women (39.2%) without a significant difference.

4. Analysis of differences in treatment of problematic toenails

Table 4 lists the differences in the treatment of problematic toenails. In terms of proportion, 51.3% and 37.5% of the men and women underwent procedures received to treat onychomycosis but displayed a significant difference in medication ($\chi^2=8.122$, $p<0.01$). Along with medication, the men

Table 2. Types of problematic toenail and status differences

Variable	Sortation	Man	Woman	χ^2 (p)
Type of problematic toenail (multiple responses)	Onychomycosis	91 (56.9)	117 (37.9)	15.437 (0.000)
	Ingrown toenail	74 (46.3)	137 (44.3)	0.156 (0.693)
	Pincer toenail	22 (13.8)	66 (21.4)	4.004 (0.045)
	Other	3 (1.9)	16 (5.2)	2.959 (0.085)
Current toenail condition	Very good	2 (1.3)	11 (3.6)	8.887 (0.064)
	Relative good	10 (6.3)	38 (12.3)	
	Normal	55 (34.4)	107 (34.6)	
	Slightly bad	82 (51.3)	142 (46.0)	
	Very bad	11 (6.9)	11 (3.6)	

Table 3. Differences in facilities that provide medical nail care

Variable	Sortation	Man	Woman	χ^2 (p)
Past management place	Nail salon	9 (5.6)	54 (17.5)	
	Hospital	69 (43.1)	87 (28.2)	
	Problem-oriented management shop	34 (21.3)	65 (21.0)	18.573** (0.001)
	Self-care	47 (29.4)	100 (32.4)	
	Other	1 (0.6)	3 (1.0)	
Reasons for using medical nail care	Improvement in problem	65 (40.6)	121 (39.2)	
	Service	14 (8.8)	26 (8.4)	
	Appropriate management costs	35 (21.9)	59 (19.1)	
	Facilities	20 (12.5)	23 (7.4)	8.834 (0.183)
	Transportation	10 (6.3)	28 (9.1)	
	Recommend	12 (7.5)	31 (10.0)	
	Other	4 (2.5)	21 (6.8)	

and women exhibited high ratios of laser use ($\chi^2=9.635, p<0.01$) and other procedures ($\chi^2=6.640, p<0.05$), respectively, which demonstrated a significant difference. In terms of procedure, 44.4% of the men received ingrown nail treatment to improve pincer toenail, and 38.2% of the women mainly used drill care. The rate of use of the resin gel procedure ($\chi^2=12.171, p<0.001$) was relatively higher for women (20.7%) than that for the men (8.1%), which indicates a significant difference.

5. Expenditure and effectiveness

Table 5 presents differences in expenditure and effectiveness in which 43.1% of the men and 51.8% of the women reported monthly expenses of less than 100,000 won without a significant difference ($p>0.05$). For the duration of the effect, 35.6% of the

men and 30.4% of the women produced ratios of less than 2–3 months, which indicates no significant difference.

Discussion

This study examined the usage characteristics of customers with problematic toenail diseases by conducting a survey on 469 customers who received or are currently receiving medical nail care.

Table 2 presents the result of the comparison of the percentages of variables that displayed significant differences according to gender.

Onychomycosis ($\chi^2=15.437, p<0.001$) displayed a significant

Table 4. Analysis of differences in treatments for problematic toenails

Variable	Sortation	Man	Woman	χ^2 (p)
Procedures for onychomycosis (multiple responses)	Drill care	66 (41.3)	113 (36.6)	0.979 (0.323)
	Laser	46 (28.8)	51 (16.5)	9.635 (0.002)
	Medication	82 (51.3)	116 (37.5)	8.122 (0.004)
	High-frequency	27 (16.9)	47 (15.2)	0.220 (0.639)
	Other	6 (3.8)	33 (10.7)	6.640 (0.010)
Procedures for ingrown and pincer toenails (multiple responses)	Non-invasive wire brace	33 (20.6)	64 (20.7)	0.000 (0.982)
	Drill care	71 (44.4)	118 (38.2)	1.677 (0.195)
	Onychoclip	13 (8.1)	31 (10.0)	0.451 (0.502)
	Medication	19 (11.9)	25 (8.1)	1.776 (0.183)
	Acrylate	17 (10.6)	40 (12.9)	0.531 (0.466)
	Resin gel	13 (8.1)	64 (20.7)	12.171 (0.000)
	Fraser	6 (3.8)	16 (5.2)	0.481 (0.488)
	Stiring	8 (5.0)	19 (6.1)	0.256 (0.613)

Table 5. Difference in expenditures and effectiveness

Variable	Sortation	Man	Woman	χ^2 (p)
Monthly expenses	Less than 100,000 won	69 (43.1)	160 (51.8)	4.269 (0.511)
	Less than 200,000 won	38 (23.8)	69 (22.3)	
	Less than 300,000 won	32 (20.0)	44 (14.2)	
	Less than 400,000 won	12 (7.5)	22 (7.1)	
	Less than 500,000 won	7 (4.4)	10 (3.2)	
	More than 500,000 won	2 (1.3)	4 (1.3)	
Duration of effect	Less than 1 month	24 (15.0)	48 (15.5)	1.527 (0.822)
	Less than 2 months	38 (23.8)	80 (25.9)	
	Less than 3 months	57 (35.6)	94 (30.4)	
	Less than 4 months	21 (13.1)	41 (13.3)	
	More than 4 months	20 (12.5)	46 (14.9)	

difference for a high proportion of men (56.9%). Pincer nails ($\chi^2=4.004$, $p<0.05$) received a high percentage for women (21.4%). Scholars demonstrate that infection in men is related to various activities such as sports. In particular, it is very common in athletes, marathons, swimmers, and a few groups of professionals. Moreover, it can be contacted in public places such as swimming pools, gyms, and shower rooms, which play an important role in spreading infections. Enclosed shoes worn while exercising also promote the growth of fungus and the subsequent development of ringworm (Seebacher *et al.*, 2008; Havlickova *et al.*, 2008). On this basis, the study assumed that these factors trigger the development of athlete's foot in men. Lee *et al.* (2011) conducted a study on pincer nails and found that women exhibited higher symptom rates, which support the current study. The reasons for the more frequent symptoms of women include obesity, inappropriate cutting of the nail plate, and tight shoes (Baran, 2001). Moreover, another consideration is the unique features of women's shoes (high heels), which can also be considered a triggering factor.

The study observed a significant difference in previous management facility ($\chi^2=18.573$, $p<0.01$), as the rate of men opting for management in facilities was high, whereas the rate of home management was high for the women. This result is considered to support the results of this study. Specifically, the men disclosed that they were not embarrassed to face a foot specialist, while women responded that they were embarrassed (Ratajczak *et al.*, 2022). Beuscher & Kelechi (2019) mentioned that many patients delay treatment until the symptoms of the infection worsen, because they misunderstand that if they consider their condition as simply a cosmetic problem, then it will be solved without treatment (Beuscher & Kelechi, 2019). Therefore, we believe that this study supports our findings.

The proportion of men who underwent laser or drug treatment to address toenail fungus was higher. This study found that the symptoms of toenail fungus are high in men, which confirms the abovementioned results. The typical treatment for toenail fungus is oral medication. However, side effects, such as liver or kidney damage, may occur due to medication. Alternatively, laser is a treatment method with less reported side effects and is easy to apply compared with drug treatment (Ortiz *et al.*, 2014; Galvan Garcia, 2014). Therefore, the study infers that laser treatment was combined with medication to increase treatment efficacy (Daye & Durmaz, 2021). The use of resin gel treatment

($\chi^2=12.171$, $p<0.001$) to improve ingrown and pincer toenails was relatively higher for women (20.7%) compared with men (8.1%). The study infers that women consider aesthetic satisfaction more important in terms of problematic toenail procedures. Moreover, women acquire more information about beauty care than men do. The study by Lee also demonstrated that gel care is a quick procedure, poses no side effects, and is aesthetically pleasing. Therefore, the results are supported (Lee & Kwon, 2022).

In summary, in terms of the type of problematic toenail, men exhibited high rates of onychomycosis (56.9%), and women achieved a high rate of pincer toenail (21.4%). A total of 43.1% of the men used hospitals or were later prescribed laser procedures (28.8%) and medication (51.3%) when problems such as onychomycosis were observed. Women frequently opted for home management (32.4%). However, combining the ratio if the use of nail shops (17.5%) and problem-oriented management facilities (21.0%), the study proposes that the usage characteristics of consumers are derived not only from the perspective of treatment but also care. In terms of the care aspect, the study found that women used highly wearable care procedures such as resin gel (20.7%), noninvasive wire brace (20.7%), and acrylic (12.9%), which are widely used in cosmetic procedures for ingrown nail care to eliminate heterogeneity and increase aesthetics.

Conclusion

1. Consumer considerations

The men and women responded that the rate of improvement of problematic nail diseases was high due to their use of the current medical nail care. In other words, the treatment was activeness. Moreover, given that the use of drill care was commonly high in terms of drug treatment and noninvasive correction in terms of treatment, the result reflects the advantages of combined treatment. Moreover, drill care was recognized as an effective form of basic care in the treatment process. Men are less hesitant to visit hospitals due to reluctance or shame compared with women, such that men should be encouraged to actively use the treatment system in hospitals to increase the effectiveness of the treatment. In the case of women, treatment, basic care, and noninvasive corrective treatment can be used to increase the aesthetics aspect to encourage consumers to continue the treatment process.

2. Potential of medical nail care and limitations of the research

The medical nail care system addresses problematic nails using medical and noninvasive corrective treatments. Nevertheless, many hospitals continue to reject this system. Thus, patients are burdened with invasive treatment due to cosmetic problems, and satisfaction with treatments may decrease if they do not feel an intuitive effect (Daye & Durmaz, 2021). The need for this system can increase profits for hospitals if they practice various treatment options. From the point of view of patients, selecting from various treatment options according to their lifestyle is easy. Examining the trend of research on problematic nails, the study found a few articles on the efficacy of noninvasive preservation care (Márquez-Reina et al., 2020; Liu & Huang, 2018) or medical treatment (Ma et al., 2019). Although other studies depict the effects of treatment and correction, those that document the analysis of consumer usage characteristics of medical nail care systems that combine hospital treatment and noninvasive correction care are lacking. Thus, to the best of our knowledge, the current study is the first to conduct a survey on consumers and their use of noninvasive combination therapy, which differs from previous studies and is considered to pose an academic value. The results that if a combined treatment system of cosmetic correction and medical treatment can be considered, then patients may select options that they deem best. In addition, we provided basic data for analysis according to gender and for broadening the base in connection with medical as proof of the need for cosmetic correction.

The medical nail care system in the Republic of Korea is in its infancy, such that the study the number of respondents is limited, and all treatment options in hospitals cannot be generalized. Therefore, future studies are required to classify and analyze treatment usage characteristics and evaluate consumer satisfaction.

Author's contribution

AJP and KHK designed all experimental investigations, collected data. AJP and KHK contributed equally to this work.

Author details

Ae Jin Park (PhD Program), Department of Beauty Arts Care, Dongguk University, Pildong-ro 1-gil, Jung-gu, Seoul, 04620, Korea; Ki Han Kwon (Professor), Department

of General Education, Kookmin University, Jeongneung-ro, Seongbuk-gu, Seoul 02707, Korea.

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Analysis of Gender Usage Characteristics of Korean Medical Nail Care

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국문초록

한국 메디컬 네일 케어 성별 이용 특성 분석

박애진¹, 권기한^{2*}¹동국대학교 일반대학원 뷰티아트케어학과, 서울, 한국²국민대학교 교양대학, 서울, 한국

목적: 본 논문의 목적은 비침습 복합치료인 의료용 네일케어를 사용하는 국내 소비자들의 치료 이용 특성을 분석하는 것입니다. **방법:** 2022년 12월에 500명의 그룹을 대상으로 발톱 진균증, 내성 발톱, 집게 발톱의 증상을 연구했습니다. 설문조사를 실시하고 성별로 분석했습니다. **결과:** 문제 발톱 유형에서는 남성이 발톱 진균증 증상이 높았고, 여성은 집게발톱 비율이 높았습니다. 현재 발톱 상태는 남성과 여성 모두에서 약간 나쁘다는 반응을 보였습니다. 과거 관리 장소에서는 남성은 병원에, 여성은 셀프케어에 대한 경향이 높았습니다. 일반 네일샵 이용률은 남성보다 여성이 더 높았습니다. 의료용 네일 케어를 이용한 이유는 남녀 모두 문제성 개선에 대한 응답이 높았습니다. 발톱 진균증을 치료하기 위해 받은 시술에서 레이저 및 약물 치료 비율은 남성이 더 높았고, 내성 발톱 및 집게발 발톱을 치료하기 위해 받은 시술에서 레진 젤 시술은 남성보다 여성이 더 높았습니다. 월 지출 비용은 남녀 모두 10만 원 미만이었으며, 효과가 나타난 기간은 남녀 모두 2-3개월로 큰 차이가 없었습니다. **결론:** 문제성 발톱 관리에 대한 소비자 행동을 이해하고 의료용 손톱 관리 시스템을 재고할 수 있는 근거를 제공한다.

핵심어: 메디컬 네일 케어, 치료이용특성, 발톱 진균증, 내성 발톱, 집게 발톱

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中文摘要

韩国医学美甲护理的性别使用特征分析

朴皚珍¹, 權起漢^{2*}

¹东国大学一般大学院美容艺术护理学科, 首尔, 韩国

²国民大学教养大学, 首尔, 韩国

目的: 本研究旨在分析韩国消费者使用医疗指甲护理（一种非侵入性综合治疗）的治疗使用特征。**方法:** 该研究于2022年12月对500人进行了调查，检查了甲癣、内生脚趾甲和钳状脚趾甲三种症状，并按性别对数据进行了分析。**结果:** 就脚趾甲的问题类型而言，甲真菌病在男性中较高，而女性则有较高的钳状趾甲发生率。目前的脚趾甲状况对男性和女性的反应率略有负面。此外，男性往往更喜欢去医院，而女性则通过自我护理来解决这些问题。一般美甲店的使用率女性高于男性。选择使用医疗指甲护理的原因表明，男性和女性的问题改善反应率很高。在手术方面，男性使用激光或药物治疗甲癣的比例较高，而女性使用树脂凝胶治疗内嵌趾甲和钳形趾甲的比例较高。男性和女性每月的支出费用均低于1万韩元，两组的效果持续时间在两个月和三个月内没有显著差异。**结论:** 这项研究的结果对于了解有问题脚趾甲的消费者和重新思考医疗指甲护理系统具有重要意义。

关键词: 医疗指甲护理, 治疗特点, 甲真菌病, 内嵌脚趾甲, 钳状脚趾甲