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ASSESSMENT OF CLINICAL CHARACTERISTICS OF DEEP PLANTAR WARTS

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ABSTRACT

Objective: *To evaluate the clinical characteristics of patients with deep plantar warts.*

Subjects and methods: *This was a prospective, descriptive cross-sectional study on 80 patients with deep plantar warts examined and treated at the Outpatient Department and Dermatovenereology Department of Military Hospital 103 (June 2025 - February 2026).*

Results: *The median age was 22 (21-31,5) years. Most patients were male (88.8%). The majority were military personnel (85%). The most common location of lesions was the left foot (46.3%), followed by the right foot (37.5%). The size of the lesions was mainly 2-5 mm in diameter (83.8%, p < 0.001). Most patients had 1-2 papular lesions (63.7%, p < 0.001). Most patients experienced mild pain (82%, p < 0.001).*

Conclusion: *The majority of patients examined were military personnel, male, young, with a small number of lesions (1-2 lesions), 2-5 mm in diameter, and mild pain.*

Keywords: Deep plantar warts, clinical characteristics.

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1. INTRODUCTION

Deep plantar warts are caused by human papillomavirus (HPV), which includes approximately 350 identified genotypes. Among these, HPV types 1, 2, 4, 5, 10, 14, 19, 20, 27, and 57 have been associated with plantar lesions [1], [2], [3]. HPV infection occurs through microabrasions and disruptions of the epidermal barrier [4]. The prevalence of HPV infection has been estimated to affect up to 40% of the global population, with plantar warts accounting for approximately 14% of cases annually [5].

Deep plantar warts (Myrmecia) commonly occur on the toes and weight-bearing areas of the sole. Lesions often begin as a solitary wart and subsequently increase in number, with potential spread to the contralateral foot. Clinically, the lesions present as raised papules measuring 2–5 mm in diameter, frequently containing black punctate dots and associated with significant pain, in contrast to superficial plantar warts, which are typically painless [6].

Deep plantar warts generally follow a benign course, are more commonly observed in children, and may resolve spontaneously within two years. However, in adults, the disease tends to persist for longer durations and demonstrates poorer therapeutic responsiveness; in certain cases, progression to cutaneous malignancy has been reported [5], [7]. Factors associated with deep plantar warts, as well as their clinical characteristics, play an important role in treatment selection and disease prevention. Nevertheless, available research data on these aspects remain limited.

This study was conducted to evaluate the common clinical characteristics of deep plantar warts, thereby contributing to improvements in the diagnosis and treatment of the disease.

2. SUBJECTS AND METHODS

2.1. Subjects

The study included 80 patients diagnosed with deep plantar warts who underwent examination and treatment at the Department of Outpatient Services and the Department of Dermatology, Military Hospital 103, between June 2025 and February 2026.

Inclusion criteria: patients aged ≥ 18 years, with adequate cognitive and behavioral capacity, who voluntarily agreed to participate in the study.

Exclusion criteria: patients with concomitant diseases that could affect the treatment process, and pregnant or breastfeeding women.

2.2. Methods

- Study design: a prospective and retrospective cross-sectional descriptive study.

- Sampling method: convenience sampling, including all patients who met the eligibility criteria.

- Study procedures:

+ Screening, clinical examination, and enrollment of eligible patients into the study.

+ Collection of data using a standardized study record form.

+ Follow-up, outcome assessment, and data analysis.

- Study variables:

+ General patient characteristics: age, sex, and occupation.

+ Clinical characteristics: lesion location, number and size of lesions, and pain severity caused by the lesions, assessed using the Visual Analogue Scale (VAS) [8].

- Ethical considerations: the study protocol was approved by the Biomedical Research Ethics Committee of Military Hospital 103 (Decision No. 3469/HĐĐĐ, dated July 18, 2025). All participants were fully informed about the study objectives, voluntarily agreed to participate, and had their personal information kept confidential.

Statistical analysis: data were analyzed using IBM SPSS Statistics version 27.0. Statistical significance was defined as $p < 0.05$.

3. RESULTS

Table 1. General Characteristics of the study participants

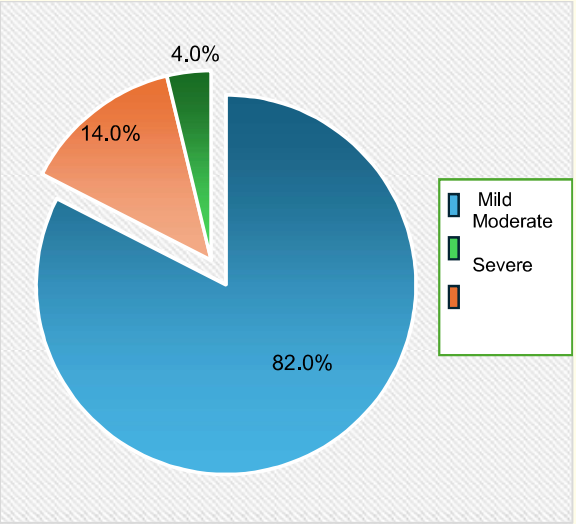
Characteristics (n = 80)		Result
Age (n, %)	18-19	9 (11.3)
	20-29	50 (62.5)
	30-39	8 (10.0)
	40-49	10 (12.5)
	50-59	3 (3.7)
	Median (Q1-Q3)*	22 (21-31.5)
Sex (n, %)	Male	71 (88.8)
	Female	9 (11.2)
Occupation (n, %)	Military personnel	68 (85.0)
	Others	12 (15.0)
Data are presented as median and interquartile range (IQR).		

The patients ranged in age from 18 to 59 years, with a median age of 22 years (IQR: 21-31.5 years). The 20-29 year age group accounted for the highest proportion of patients (62.5%). Most patients were male (88.8%) and belonged to the military personnel (85.0%).

Table 2. Clinical characteristics of the patients

Clinical characteristics (n = 80)		Results	p*
Direction of lesion (n, %)	Left	37 (46.3)	< 0.01
	Right	30 (37.5)	
	Both	13 (16.2)	
Lesion Size (n, %)	< 2 mm	3 (3.8)	< 0.001
	2-5 mm	67 (83.8)	
	> 5 mm	10 (12.4)	
Number of warts (n, %)	< 3	51 (63.7)	< 0.001
	3-5	9 (11.3)	
	> 5	20 (25.0)	
**: Chi-square goodness-of-fit.*			

Deep plantar wart lesions were more frequently observed on the left foot (46.3%) than on the right foot (37.5%) or on both feet (16.2%), with a statistically significant difference ($p < 0.01$). Lesion sizes ranging from 2-5 mm accounted for the highest proportion of cases (83.8%, $p < 0.001$), and most patients presented with 1-2 papular lesions (63.7%, $p < 0.001$).



VAS Pain Severity in Patients.

Pain symptoms in the study participants were predominantly mild, with VAS scores ranging from 1 to 3 accounting for 82.0% of cases.

4. DISCUSSION

Deep plantar warts may occur at any age; however, they are more commonly observed in younger individuals [9], [10]. In the present study of 80 patients with deep plantar warts, the median age was 22 years (IQR: 21-31.5 years), with the majority of patients belonging to the 20-29 year age group (62.5%). These findings are relatively consistent with the study by Hoon Choi et al. in 2024, which reported a mean age of 22.0 ± 12.0 years, with 73.3% of patients aged between 10 and 29 years [10].

In our study, male patients (88.8%) were more frequently affected than female patients. Most previous studies have also demonstrated a higher prevalence of the disease among adult males compared with females [5]. A study by Ayesha Anwar (2016) reported that 69.1% of patients were male, whereas 30.9% were female [2]. Similarly, the study conducted by Hoon Choi et al. (2024) also showed a markedly higher proportion of male patients (75.0%) [10].

Regarding occupation, most patients in the present study were military personnel (85.0%). This finding is consistent with the study conducted by Ngo Van Hoa et al. at Military Hospital 103 in 2022, in which 49.1% of patients were military personnel [11]. This may be attributable to the military environment, which involves activities that can easily cause microtrauma to the plantar surface and includes several high-risk factors for HPV transmission, such as marching, communal living quarters, and shared public bathrooms and toilets [5]. In addition, as this is a military hospital, a large proportion of the patient population consists of male military personnel.

Among the 80 patients included in the study, lesions were predominantly observed on either the left foot (46.3%) or the right foot (37.5%), whereas bilateral involvement accounted for a lower proportion (16.2%), with a statistically significant difference ($p < 0.01$). The study by Hoon Choi et al. (2024) reported comparable proportions of lesions on the right foot (34.7%), left foot (31.8%), and both feet (33.5%) [10]. Several previous studies have shown that deep plantar warts commonly occur unilaterally. However, differences in the proportion of bilateral involvement among studies may be attributable to variations in epidemiological characteristics and geographical settings.

Most published studies have provided limited information regarding lesion size [5], [7]. A study by María José Chiva Miralles (2025) reported lesion sizes ranging from 1 to 9 mm, of which 38% of papules measured > 3.9 mm and were selected for surgical treatment, whereas 62% measured < 4.0 mm and were managed conservatively [1]. In our study, most lesions ranged from 2 to 5 mm in size (83.8%, $p < 0.001$). This finding is consistent with the study by Ngô Văn Hòa in 2022, in which 24 out of 35 patients had lesions measuring <5 mm [11].

In the present study, most patients presented with 1-2 papular lesions (63.7%, $p < 0.001$), which differs from the findings reported by Hoon Choi in 2024, where 59.1% of patients had 1-4 papular lesions [10]. In adults, these lesions often respond poorly to treatment and are associated with pain that adversely affects daily activities and occupational performance. This is commonly the reason why patients seek medical intervention even when the number of lesions is relatively small [5].

Most previous studies have only mentioned pain symptoms without quantitatively assessing pain severity in patients [1], [5]. In the present study, we found that the majority of patients experienced only mild pain (82.0%) according to the Visual Analogue Scale (VAS). However, although the pain intensity was generally mild, it could still cause discomfort during walking and daily activities, thereby necessitating definitive treatment.

5. CONCLUSION

Patients with deep plantar warts who underwent examination and treatment at Military Hospital 103 had a median age of 22 years (IQR: 21-31.5 years). The disease was most commonly observed in individuals aged 20-29 years (62.5%), in males (88.8%), and among military personnel (85.0%). Deep plantar wart lesions were identified on the left foot (46,3%), right foot (37.5%), or both feet (16.2%). Most patients presented with 1-2 papular lesions (63.7%), lesion sizes ranging from 2-5 mm (83.8%), and mild pain symptoms (82.0%).

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