

Characteristics of Nonoperative Ankle Sprain Patients in Makassar: A Retrospective Descriptive Study

Avriani Putri Palimbong¹, Yery Mustari², Immanuel Maulang³, Melda Putri⁴

¹⁻⁴Undergraduate Physiotherapy Study Program, Faculty of Nursing, Hasanuddin University, Makassar, South Sulawesi, Indonesia

Corresponding author:

Name: Avriani Putri Palimbong

E-mail: avrianiputri26@gmail.com

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Abstract

Background: Ankle sprain is one of the most common musculoskeletal injuries and may result in persistent pain, functional limitation, recurrent injury, and chronic ankle instability. Local data describing the characteristics of patients receiving nonoperative physiotherapy care in Makassar remain limited.

Objective: To describe the characteristics of nonoperative ankle sprain patients treated at physiotherapy clinics in Makassar, Indonesia, during 2023 to 2024.

Methods: This retrospective descriptive study used secondary data from medical records of 238 nonoperative ankle sprain patients treated at five physiotherapy clinics in Makassar between January 2023 and December 2024. Total sampling was used. Data were summarized using frequencies and percentages with IBM SPSS Statistics version 24.

Results: Early adulthood, defined as 26 to 35 years, was the most represented age group (31.5%). Most patients were male (61.8%) and self-employed (26.1%). Lateral ankle sprain accounted for 92.0% of cases, and noncontact mechanisms accounted for 71.8%. Right sided injuries were most common (63.9%), and 74.4% represented a first episode. Pain and functional limitation were recorded in all patients, while swelling was present in 89.5%. Most patients had no documented complication (91.2%) and were classified as adherent to therapy (94.5%).

Conclusion: Nonoperative ankle sprain patients receiving physiotherapy care in Makassar were predominantly young adults, male, and self-employed, with lateral ankle sprain and noncontact mechanisms being the most common characteristics. These findings provide a local descriptive basis for prevention and rehabilitation planning, although they should not be generalized to all individuals with ankle sprain in Makassar.

Keywords

Ankle Injuries; Musculoskeletal Diseases; Conservative Treatment; Retrospective Studies

Introduction

Ankle sprain is among the most common musculoskeletal injuries, particularly in physically active populations, and has been reported to account for a substantial proportion of sports injuries. The injury involves stretching or tearing of ankle ligaments, including the lateral ligament complex, deltoid ligament, and distal tibiofibular syndesmosis.^{1,2} Approximately 85% of ankle sprains are associated with inversion and adduction while the ankle is plantarflexed, placing considerable stress on the lateral ligament complex.^{1,2}

Although ankle sprain is often regarded as a relatively minor acute injury, its consequences may persist beyond the initial episode. Persistent pain, restricted mobility, recurrent sprain, chronic ankle instability, and posttraumatic osteoarthritis have all been described after ankle ligament injury.³ Recent national epidemiological data from the United States estimated 7.4 million ankle sprains presenting to emergency departments between 2010 and 2024, corresponding to an incidence of 1.53 per 1,000 person years.⁴ Ankle sprain is also an important health problem in Indonesia. The 2018 National Basic Health Research report documented a prevalence of sprain injuries of 32.8%, with injuries of the lower extremities accounting for 67.9% of reported injury locations.⁵ Previous Indonesian data from athletes have also identified ankle sprain as an important component of lower extremity sports injuries.⁶

Management is determined by injury severity and clinical stability. Grade I and II injuries are generally managed conservatively, whereas selected grade III injuries with substantial instability may require surgical consideration.⁷ Nonoperative management is clinically relevant because many patients can be managed through rehabilitation and because treatment pathways may reduce health care use compared with operative management in selected populations.⁸

Despite the clinical importance of ankle sprain, recent Indonesian publications describing the characteristics of patients receiving physiotherapy care in the general population remain limited.⁹ Existing studies have often focused on athletes, specific sports, or particular clinical outcomes rather than the broader profile of patients attending physiotherapy clinics. This gap is particularly evident in Makassar, where local descriptive data were not identified in the authors' available literature base.

Characterizing the patient population is useful for physiotherapy services because demographic and injury characteristics can inform prevention priorities, early assessment, patient education, and rehabilitation planning.¹⁰ Descriptive information may also provide a basis for future analytic studies examining predictors of recurrence, chronic ankle instability, delayed recovery, or treatment adherence.

Therefore, this study aimed to describe the characteristics of nonoperative ankle sprain patients treated at five physiotherapy clinics in Makassar during 2023 to 2024 according to age, sex, occupation, injury type, injury mechanism, injured side, injury history, clinical symptoms, complications, and adherence to physiotherapy treatment.

Methods

This study used a quantitative retrospective descriptive design based on medical records. Historical clinical information was extracted from records of patients who had received physiotherapy for nonoperative ankle sprain during January 2023 through December 2024. Data extraction was performed from 8 January to 8 February 2025. No intervention or prospective follow up was conducted.

The study was conducted at five physiotherapy clinics in Makassar: Klinik EMPhysio, Klinik Prima Physio, Klinik Orthophysio, Klinik Physiocenter, and Klinik Physio Sakti. The analysis covered records from January 2023 through December 2024.

The target population comprised all patients with nonoperative ankle sprain documented in the medical records of the five participating clinics during the study period. Total sampling was used, meaning that all records meeting the eligibility criteria were included. A formal sample size calculation was not performed because the study sought to describe the entire accessible population during the specified period rather than select a sample from that population.

Inclusion criteria were: a documented diagnosis of ankle sprain in the medical record, receipt of nonoperative physiotherapy management, and a visit occurring between January 2023 and December 2024. Records were excluded when the patient had undergone previous ankle surgery before the relevant visit or when more than three study variables were missing.

The study included ten descriptive characteristics: age, sex, occupation, injury type, injury mechanism, injured side, injury history, clinical symptoms, complications, and treatment adherence. Because the study was descriptive and did not test associations or causal relationships, these variables were treated as descriptive study variables rather than dependent and independent variables.

Table 1. Operational Definitions of Study Variables

No.	Variable	Operational definition	Categories	Scale
1	Age	Age in years at the first recorded visit	0 to 5; 6 to 11; 12 to 16; 17 to 25; 26 to 35; 36 to 45; 46 to 55; 56 to 65; >65	Ordinal
2	Sex	Sex recorded in the medical record	Male; Female	Nominal
3	Occupation	Main occupation recorded in the medical record	Employee; civil servant/teacher/state enterprise; military/police; health worker; self-employed/farmer/homemaker; athlete; student; pensioner	Nominal
4	Injury type	Ankle sprain classified according to involved ligament group	Lateral; medial; syndesmotic	Nominal
5	Mechanism	Whether external physical interaction was recorded	Contact; noncontact	Nominal
6	Injured side	Anatomical side of the ankle involved	Right; left; bilateral	Nominal
7	Injury history	Previous ankle sprain on the same side	First episode; recurrent	Nominal
8	Clinical symptoms	Inflammatory or functional signs recorded at first visit	Pain; functional limitation; swelling; redness; heat	Nominal
9	Complications	Pathological conditions documented as complications	Chronic ankle instability; osteoarthritis; peroneal tendon injury; osteochondral defect; none documented	Nominal
10	Treatment adherence	Attendance according to the treatment plan	Adherent: ≥2 sessions; nonadherent: 1 session	Nominal

Before data collection, the researchers coordinated with the five clinics to obtain permission and standardize the extraction process. The same inclusion and exclusion criteria and operational definitions were applied at all sites. Information was extracted and categorized using the predefined variables. Records with insufficient information according to the exclusion criteria were not included in the analysis. When information was unclear or required verification, the researchers confirmed the relevant information with the treating physiotherapist. The same verification approach was applied across participating clinics.

Data were processed using IBM SPSS Statistics version 24. Analysis was limited to univariate descriptive statistics, presented as frequencies and percentages for each study variable. Inferential testing was not performed because the objective was to describe the distribution of patient characteristics rather than assess associations, group differences, or causal relationships.

The study was granted an ethical exemption by the Health Research Ethics Committee of Hasanuddin University under Ethical Approval No. 034/UN4.18.3/TP.01.02/2025. The source manuscript states that written informed consent was obtained from all participants before data collection and that confidentiality was maintained. Because this was a retrospective medical record study, the relationship between the stated informed consent procedure and the ethical exemption should be confirmed against the approved protocol before journal submission.

Results

A total of 238 eligible nonoperative ankle sprain patient records from five physiotherapy clinics were included. The records comprised 8 patients from Physiocenter, 15 from Orthophysio, 30 from EMPhysio, 30 from Physio Sakti, and 155 from Prima Physio. The distribution of the ten descriptive characteristics is presented in Table 2.

Table 2. Distribution of Characteristics of Nonoperative Ankle Sprain Patients

Characteristic	n	%
Age		
0 to 5 years	0	0.0
6 to 11 years	5	2.1
12 to 16 years	14	5.9
17 to 25 years	53	22.3
26 to 35 years	75	31.5
36 to 45 years	50	21.0
46 to 55 years	28	11.8
56 to 65 years	11	4.6
>65 years	2	0.8
Sex		
Male	147	61.8
Female	91	38.2
Occupation		
Athlete	10	4.2
State enterprise employee	11	4.6
Coach	2	0.8
Lecturer	4	1.7
Teacher	1	0.4
Homemaker	10	4.2
Private employee	33	13.9
University student	26	10.9
School student	34	14.3
Pensioner	3	1.3
Pilot	1	0.4
Civil servant	16	6.7
Police	6	2.5
Health worker	16	6.7
Military	3	1.3
Self employed	62	26.1
Injury type		
Lateral ankle sprain	219	92.0
Medial ankle sprain	16	6.7
Syndesmotoc ankle sprain	3	1.3
Mechanism		
Contact	67	28.2
Noncontact	171	71.8
Injured side		
Bilateral	6	2.5
Right	152	63.9
Left	80	33.6
Injury history		
Recurrent	61	25.6
First episode	177	74.4
Clinical symptoms		
Redness	152	63.9
Heat	152	63.9
Swelling	213	89.5
Pain	238	100.0
Functional limitation	238	100.0
Complications		
Chronic ankle instability	20	8.4
Osteoarthritis	1	0.4
None documented	217	91.2
Treatment adherence		
Adherent	225	94.5
Nonadherent	13	5.5

The largest age group was 26 to 35 years, comprising 75 patients (31.5%), followed by 17 to 25 years with 53 patients (22.3%) and 36 to 45 years with 50 patients (21.0%). No patient was recorded in the 0 to 5 year category. Overall, the distribution was concentrated in working age groups.

Male patients accounted for 147 cases (61.8%), compared with 91 female patients (38.2%). Self employment was the most frequently recorded occupational category, with 62 patients (26.1%), followed by school students (14.3%), private employees (13.9%), and university students (10.9%). The remaining occupational categories each represented less than 7% of the study population.

Lateral ankle sprain predominated, accounting for 219 cases (92.0%), whereas medial ankle sprain and syndesmotic ankle sprain accounted for 16 (6.7%) and 3 (1.3%) cases, respectively. Noncontact injury mechanisms were recorded in 171 patients (71.8%), while contact mechanisms were recorded in 67 patients (28.2%).

Right sided injury was the most common anatomical distribution, occurring in 152 patients (63.9%), followed by left sided injury in 80 patients (33.6%) and bilateral injury in 6 patients (2.5%). Most records represented a first ankle sprain episode (177 patients, 74.4%), whereas 61 patients (25.6%) had a history of recurrent injury.

Pain and functional limitation were recorded in all 238 patients. Swelling was present in 213 patients (89.5%), while redness and heat were each documented in 152 patients (63.9%). Chronic ankle instability was recorded in 20 patients (8.4%) and osteoarthritis in 1 patient (0.4%); no complication was documented in 217 patients (91.2%). Based on the study's attendance definition, 225 patients (94.5%) were classified as adherent and 13 (5.5%) as nonadherent.

Discussion

This retrospective descriptive study identified a patient profile dominated by early adulthood, male sex, self employment, lateral ankle sprain, noncontact injury mechanisms, right sided injury, first episode injury, pain and functional limitation, absence of documented complications, and high recorded treatment adherence. The findings describe the population accessing five physiotherapy clinics in Makassar and should therefore be interpreted as a clinical service profile rather than an estimate of the prevalence of ankle sprain in the wider community.

The predominance of patients aged 26 to 35 years is consistent with the concentration of ankle sprain cases in young and middle adult populations reported in previous clinical and epidemiological studies. Rhon et al. described a substantial burden among adults aged 25 to 39 years in the US Military Health System.¹¹

A plausible clinical explanation for the concentration in early adulthood is the combination of relatively high exposure to occupational and recreational physical activity.¹² However, the present dataset did not directly measure physical activity level, exposure time, neuromuscular performance, or specific occupational demands. These factors therefore remain potential explanations rather than demonstrated determinants in this study.

Male patients represented 61.8% of the records. This distribution is compatible with some studies reporting a higher proportion of male patients in particular clinical or athletic populations, although sex differences in ankle sprain risk are context dependent. A systematic review and meta-analysis has shown that intrinsic risk factors differ between male and female athletes.¹³ Other epidemiological evidence has reported higher incidence rates among women in some populations, indicating that the observed male predominance may reflect the composition of the population seeking care rather than a universally higher risk among men.¹²

Self-employment was the most common occupational category. Because the study did not quantify occupational exposure, working hours, physical demands, or recreational activity, the occupational distribution should be interpreted descriptively. It does, however, identify a potentially important group for future prevention studies. Such work should examine specific occupational tasks, footwear, environmental conditions, prior injury, and physical activity exposure rather than treating occupation alone as a causal factor.

Lateral ankle sprain accounted for 92.0% of cases. This marked predominance is consistent with the established anatomical and biomechanical susceptibility of the lateral ligament complex. The lateral ligaments are commonly exposed to inversion related loading, particularly when the ankle is plantarflexed.¹ Recent reviews similarly describe lateral ankle sprain as the dominant clinical pattern, with the anterior talofibular ligament and calcaneofibular ligament frequently involved.¹⁴

The predominance of noncontact mechanisms is clinically relevant because noncontact events may occur during running, landing, cutting, or changes in direction without a direct external collision. However, the medical records did not provide sufficient detail to distinguish all movement patterns or indirect contact events. The finding should therefore be regarded as the recorded classification used in the participating clinics.

The right ankle was involved in 63.9% of cases. Previous research has reported substantial side differences in selected athletic populations, but laterality is not consistently established as a universal risk factor.¹⁵ Most patients were classified as experiencing a first episode. This finding differs from the common clinical concern that previous ankle sprain is an important risk factor for recurrence and chronic ankle instability. Previous injury is widely recognized as clinically relevant to recurrent sprain and chronic ankle instability. The lower proportion of recurrent cases in this sample may reflect the referral pattern, inclusion of patients at their first documented physiotherapy episode, or differences in case mix across the participating clinics.¹⁶ chronic

Clinical symptoms were dominated by pain and functional limitation, which were present in all patients, while swelling was present in 89.5%. Redness and heat were recorded in 63.9%. These findings are compatible with the inflammatory response following acute tissue injury, although the retrospective design did not permit precise classification of injury stage or severity.¹⁷ Clinical manifestations of ankle sprain commonly include pain, swelling, and functional impairment, with presentation varying according to injury severity and time since injury.¹⁸

The absence of a consistently documented injury grade is an important limitation when interpreting the symptom distribution. A patient presenting later after injury may have less prominent inflammatory signs despite ongoing pain or functional limitation. Consequently, the current frequencies should not be interpreted as estimates of the prevalence of inflammatory signs at a standardized time point after injury.

Most patients had no documented complication, while chronic ankle instability was recorded in 8.4% and osteoarthritis in 0.4%. These proportions should be interpreted cautiously because complications were identified from existing records rather than assessed using standardized diagnostic criteria. Chronic ankle instability is a clinically important consequence of recurrent ankle sprain and is associated with proprioceptive and functional deficits. Previous evidence has also shown a higher prevalence of perceived instability among individuals with previous ankle injury.^{19,20}

The study has several strengths. It included all eligible records across five physiotherapy clinics during a defined two-year period, thereby reducing selection within the accessible clinic population. The use of standardized operational definitions and a common extraction approach across sites also supported consistency. The study additionally included a broad set of demographics, injury, clinical, complication, and attendance characteristics, providing a useful local clinical profile.

Several limitations should be considered. First, injury severity was not consistently documented, preventing analysis by grade. Second, retrospective medical record data are vulnerable to information bias because completeness and accuracy depend

on clinical documentation. Verification with treating physiotherapists may have reduced uncertainty but cannot eliminate recording bias. Third, the sample came from five selected clinics and excluded individuals who did not seek physiotherapy, received care elsewhere, or underwent operative management. The findings therefore cannot be generalized to all ankle sprain patients in Makassar. Fourth, the descriptive design precludes causal or associative inference. Finally, the operational definition of adherence was based solely on the number of clinic sessions and may overestimate meaningful rehabilitation adherence.

From a clinical perspective, the findings support continued attention to early assessment, patient education, and structured rehabilitation for patients presenting with ankle sprain.²¹ However, specific preventive programs cannot be prioritized solely from these descriptive data. Future studies should evaluate neuromuscular and proprioceptive interventions prospectively, while collecting injury severity, limb dominance, physical activity exposure, footwear, rehabilitation dose, and validated functional outcomes. Multicenter prospective research would also help determine predictors of recurrence and chronic ankle instability in Indonesian physiotherapy populations.

Conclusion

Among 238 nonoperative ankle sprain patients treated at five physiotherapy clinics in Makassar during 2023 to 2024, the largest group was aged 26 to 35 years, and most patients were male and self-employed. Lateral ankle sprain and noncontact mechanisms predominated, with right sided injury and first episode injury being more common than their respective alternatives. Pain and functional limitation were recorded in all patients, while most patients had no documented complication and were classified as adherent according to the study's attendance-based definition.

These findings provide a descriptive profile of patients who accessed physiotherapy services at the participating clinics. They may assist local clinicians in understanding the case mix and in planning patient education and rehabilitation services. Because the study was retrospective and clinic based, the findings should not be interpreted as population prevalence estimates or evidence of causal relationships. Future multicenter prospective studies should incorporate standardized injury grading, validated functional outcomes, detailed exposure measures, rehabilitation dose, and longer follow up to identify predictors of recurrence and chronic ankle instability.

Author Contribution

Avriani Putri Palimbong: Conceptualization; Data curation; Formal analysis; Writing, original draft.

Yery Mustari: Supervision; Writing, review and editing.

Immanuel Maulang: Supervision; Writing, review and editing. Melda Putri: Supervision; Writing, review and editing.

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Conflict of Interest Statement

The authors declare no conflict of interest.

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Ethics Statement

This study was approved by the Health Research Ethics Committee of Hasanuddin University under Ethical Approval No. 034/UN4.18.3/TP.01.02/2025. The source manuscript states that written informed consent was obtained from all participants and that confidentiality was maintained. The authors should verify that the consent statement is consistent with the approved retrospective record-based protocol before submission.

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