UNIVERSITÀ DEGLI STUDI
DI GENOVA

campus savona

Università degli Studi di Genova

Scuola di Scienze Mediche e Farmaceutiche

Dipartimento di Neuroscienze, Riabilitazione, Oftalmologia, Genetica e Scienze Materno-Infantili

Master in Riabilitazione dei Disordini Muscoloscheletrici

A.A. 2019/2020

Campus Universitario di Savona

Knowledge of and Adherence to Evidence-Based Practice Guidelines and Recommendations for Ankle Sprains Management: a Survey among Italian Physiotherapists

Candidato:

Dott.ssa Fisioterapista Giulia Caffini

Relatore:

Dott. Fisioterapista OMPT Andrea Raschi

Correlatore:

Dott. Fisioterapista OMPT Simone Battista

Ai miei nonni Paolo e Giovanna

Abstract

Background

Even though a large percentage of patients with lateral ankle sprain (LAS) develops chronic ankle instability that contributes to decreased physical activity and quality of life [1], LAS is often considered an innocuous injury that will heal expediently and with minimal treatment. [2] The physiotherapists, as health care professionals, should work following an evidence-based practice (EBP) [3], in this case the Clinical Practice Guidelines 2013 [4] updated with a Consensus Statement in 2018 [5] and recently updated in 2021 from the American Physical Therapy Association. [6] However, it seems that physical therapy treatment choices for musculoskeletal conditions in general are often not based on research evidence [7] . At the moment, there are not any other studies investigating the level of knowledge and adherence to CPGs and evidence-based recommendations for ankle sprain injury management among Italian Physical Therapist.

Objectives

According to what stated before, the authors of this research want to investigate the Italian physiotherapists' level of knowledge of CPGs and recommendation for ankle sprain management and the actual adherence to them in the clinical practice.

Methods

The study had a cross-sectional design, the data were collected with an electronic survey in Italian language through Microsoft 365 Forms and structured in 3 sections: (I) demographic characteristics, (II) investigation of adherence to EBP recommendations through two clinical vignettes, (III) investigation of knowledges of CPGs and recommendations measuring the level of agreement and disagreement with a 5-points Likert scale in eleven statements.

Results

Through the AIFI and the University of Genova newsletter, and through social media and private contact with the colleagues, 483 physiotherapists answered the survey. Among them, 408 (85%) completed the section I and the section II about adherence, and 369 (76%) had completed the survey in all its sections. In a case of acute LAS with negative Ottawa ankle rules, 4,17% of the participants (N=17) "followed" high level recommended treatment choices, 73,77% (N=301) chosen "partially following" combinations of therapies, 15.93% (N=65) were "partially not following" and 6.13% (N=25) were considered "not following". In a case of acute LAS with positive Ottawa ankle rules, 37.01% (N=151) were considered "following" the EBP recommendations, 35.29% (N=144) were "partially following", 25% (N=102) were "partially not following" and 2.70% (N=11) were "not following". Considering that 369 participants completed the section III, the consensus was achieved for 8 (73%) statements (2, 3, 4, 5, 6, 9, 10, 11) out of 11.

Conclusion

This study showed that although there is a good knowledge about assessments and treatments modalities among the Italian Physiotherapists that participated at this survey, it exists some incoherence with the adherence in clinical practice. The data analysis and the discussion and conclusions about this study will be revised a second time from the authors in order to respect all

the parameters of reported outcomes and findings for the possible submission of the research to an international journal.

Key words
ankle sprain; clinical practice guidelines; physical therapy; physiotherapist

Study design
Cross-sectional study

Indice

1. Introduction

Lateral ankle sprains (LASs) are the most common lower limb musculoskeletal injury incurred by individuals who practice sports and recreational physical activities. [8] Not only do LASs have a high prevalence in the active population but also in the general population, posing a substantial healthcare burden. [1] A large percentage of patients with LASs develops chronic ankle instability (CAI) and this contributes to ongoing disability and sensorimotor control deficits, which are associated with decreased levels of physical activity and health-related quality of life (HrQOL). [1] Nonetheless, LASs are often considered an innocuous injury that will heal expediently and with minimal treatment. [2]

Physiotherapists are one of the main health-care professionals who should take care of patients with rheumatic and musculoskeletal diseases, including LASs, following the gold standard principle of evidence-based practice (EBP). The term EBP stands for: “the conscientious, explicit, and judicious use of current best evidence integrated with the individual clinical expertise in making decision about the individual patient care.” [9] To facilitate the use of EBP, researchers have published clinical practice guidelines (CPGs), which are systematically developed statements aimed at helping people make clinical, policy-related and system-related decisions. [3] Specifically for the management of patients with LAS, researchers have published several CPGs and Consensus Statements with EBP recommendations [4] [5] [10], including the most recent CPGs from 2021 from the Academy of Orthopaedic Physical Therapy of the American Physical Therapy Association. [6]

These CPGs and recommendations provide the clinicians with a guide for the LAS management in the different areas including assessment of predisposing and prognostic factors, diagnostics, treatment, prevention and return to work/sport. Focusing on the assessment and treatments, the recommendations can be summarised as it follows.

As far the assessment is concerned, the LAS management should start with the clinicians taking notice of risk factors for a LAS (e.g., an history of a previous ankle sprain [4] [6], type and level of sport practised by the patient, workload and level of participation, deficiencies in proprioception and ROM [5]) as well as the risk factors for developing ankle instability (e.g., the absence of balance or proprioception exercises following an acute lateral ankle sprain). [4]

Clinicians may incorporate a discriminative instrument, such as the Cumberland Ankle Instability Tool [11], to assist them in identifying the presence and severity of ankle instability and they should incorporate validated functional outcome measures, such as the Foot and Ankle Ability Measure [12] and the Lower Extremity Functional Scale [13], as part of a standard clinical examination [4] [6].

The ligament damages assessments are optimised if clinical assessment is delayed for between 4 and 5 days post injury [5] and the Ottawa ankle rules [14] should be used to determine whether a radiograph is required to rule out a fracture of the ankle and/or foot [4] [5] [6] . During the post-acute period following a recent or recurring LAS, activity limitation, participation restriction and symptom reproduction should be measured objectively.

For what concerns the interventions, in the acute and protected motion phase, clinicians should advise patients to use external supports and to progressively bear more and more weight on the affected limb throw exercise therapy. The type of external support and gait assistive device recommended should be based on factors like the severity of the injury [4] [6], and the use of external support for 4-6 weeks provides better outcomes compared with immobilisation [5]. The combination of more treatments as a recommendation is something new that has been mentioned in the latest CPGs [6]. The authors says that clinicians may use multiple interventions to supplement balance training over an episode of care for individuals with CAI, to include a combination of exercise and manual therapy procedures as guided by the patient's values and goals, the clinician's judgment, and evidence-based clinical recommendations. [6]

Moreover, manual therapy procedures, such as lymphatic drainage, active and passive soft tissue and joint mobilisation, and anterior-to-posterior talar mobilisation procedures, within pain-free movement are recommended together with a rehabilitation programme of therapeutic exercises [5] [5] . A programme of exercise should be implemented also in patients with several LASs. [4]

The use of repeated intermittent applications of ice is recommended to reduce pain [4], on the contrary is recommended not to use rest, compression, and elevation alone [5]. Non-steroidal anti-inflammatory drugs may be used only when it is necessary to reduce pain and swelling. [5]

There is weak and conflicting evidence on the diathermy, electrotherapy, and low-laser therapy, but it is certain that ultrasounds should not be adopted [4] [6] .

Finally, in the progressive loading and sensorimotor training phase clinicians should include manual therapy both non-weight bearing and weight-bearing, and therapeutic exercises and activities to improve mobility, strength, coordination, and postural control, and to reduce the risk of recurring ankle sprain, even if the therapeutic exercises present in the literature are based on weak evidence [4] and it's unclear if it has to be supervised or not [5].

Even though physiotherapists should follow the gold standard principle of EBP, it seems that their treatment choices for musculoskeletal conditions in general are often not based on research evidence [7].

This study is similar to other studies that investigated the knowledge of and/or the adherence to evidence-based practice guidelines for Low Back Pain management among US physical therapists [15], for Osteoarthritis among Italian PTs [16], for knee Osteoarthritis among Australian PTs [17] and Belgian PTs [18], for Arthritis among Swedish PTs [19], for Postoperative total hip and knee arthroplasty among Dutch PTs [20], but none of these researches has been conducted on the LAS topic.

It can also be said that the use of recommended and non-recommended treatments among physiotherapists has remained largely unchanged since 1990s, and the use of non-evidence treatments appears to be increasing. [21] In line with these findings, the main purpose of the current investigation was to describe and compare the knowledge of and the adherence to EBP CPGs and recommendations for LAS among Italian physiotherapists through a cross-sectional study design. The analysis of the knowledge of and adherence to CPGs in the same sample would allow for a better understanding of the gap between what treatments healthcare professionals should provide the patient with and the practice that is recommended, addressing the so-called evidence-practice gap. [16][22] By analysing this gap in Italy, this study gathered information that might be more easily transferred to other Mediterranean countries which seem to have higher educational needs compared to the Northern-European ones. [23]

2. Methods

Study design

The present study had a quantitative cross-sectional design. It was based on an online survey investigating Italian physiotherapists' knowledge of and adherence to ankle sprain CPGs and recommendations. The survey was completely developed in Italian. The study was conducted following the Declaration of Helsinki and ethical approval was obtained from the Research Ethics Committee of the University of Genoa (CERA: Comitato Etico per la Ricerca di Ateneo, approval date: 05/04/2021; n. 2021.40). This work is reported following the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) recommendations for reporting observational studies. [24]

Survey development

The questionnaire was divided in three parts: (1) collection of demographic characteristics of the participants (e.g. sex, age, working times, education level. Etc.), (2) two clinical vignettes for

investigating the adherence to CPGs and recommendations, (3) eleven statements for investigating the knowledge of CPGs and recommendations.

The data for the investigation were collected throughout an electronic survey created with Microsoft 365 Forms, a secure web application to build and manage online surveys and databases, respecting the European General Data Protection [25]. Data were collected from May 2021 to August 2021. Before answering the survey, the participants were provided with an informed consent and had access both to the "Information about the study" in Italian language (APPENDIX B - bit.ly/2QEBCbv) and to the "Information about privacy data use" in Italian language (APPENDIX C - ex artt. 9 e 10 del Reg. UE n. 2016/679 - bit.ly/2RXmSEX).

In the first section demographic data were collected, such as the provenience (Nord, Centre or South of Italy), age, gender (male, female, other to be specify), the monthly most frequent working modality (self-employed, employed, unemployed), working setting (own private centre, hospital, etc…), physiotherapy field (musculoskeletal and rheumatological, sport, neurological, etc.), year of graduation in Physiotherapy, years of work since the graduation, the highest academic degree and the participation at one ankle topic specific course, how many patients with ankle sprain they see monthly.

In the second section of the survey the participants were asked to make their management choices based on two hypothetical patients' vignettes. Clinical vignettes are valid and acceptable tools to measure clinical decision making and observance of EBP guidelines [15]. Two different vignettes were created (APPENDIX A section 2 – Italian and English): (1) first episode of acute LAS with negative signs and symptoms for suspecting a bone fracture according to the Ottawa ankle rules, (2) reinjury acute lateral ankle sprain with positive signs and symptoms for suspecting a bone fracture according to the Ottawa ankle sprain. Both represents a scenario in an acute and protected motion phase after an ankle injury. The participants were asked to carefully read the vignettes and to select which therapeutic strategies would have been chosen by selecting from a list of options for the management of the patient in the first week of physiotherapy in a 1st access scenario. The **table 1** represents which were the recommended options from the CPGs and recommendations.

In the third section (APPENDIX A section 3 – Italian and English), the participants were asked to choose their level of agreement through a 1 (completely disagree) to 5-point (completely agree) Likert scale [26] to a total of 11 statements: 5 of them were about the assessment of ankle sprains and 6 deal with the treatment and management of LAS answering. Participants who partially or completely agreed (scores 4–5) were considered to agree with the statements, on the contrary those participants who neither agree nor disagree, or partially or fully disagreed (score 1-3) were considered to disagree with the statements. Furthermore, to limit acquiescence bias, such as the tendency to agree with all the survey statements, 4 reversed statements were put into the questionnaire so that disagreement with those statements (scores 1–2) would indicate an agreement with the CPGs and recommendations. [16] [27] Each statement was acquired from the review of the CPGs [4][6] and Consensus Statement [5] and the expected answers are represented in **table 2**.
Both section 2) and 3) was based on the "Ankle Stability and Movement Coordination Impairments:

Ankle Ligament Sprains Clinical Practice Guidelines Linked to the International Classification of Functioning, Disability and Health From the Orthopaedic Section of the American Physical Therapy Association" [4] and on the "Diagnosis, treatment and prevention of ankle sprains: update of an evidence-based clinical guideline" [5]. The approval from the Research Ethics Committee of the University of Genoa arrived in the same days in which the most recent CPGs from the Orthopaedic Section of the American Physical Therapy Association were published [6], but the author of these research decided to include them in the study, even because not many recommendations changed from the previous ones.

Table 1 Section II: Clinical vignette – adherence investigation

Vignette 1: first episode of acute lateral ankle sprain with negative signs and symptoms for suspecting a bone fracture (negative Ottawa ankle rules).	
Proposed treatments	**EBP Recommendations and authors' comments**
Application of ice/cryotherapy alone	**CS 2018**: The individual aspects of RICE are not effective, apart from cryotherapy, if provided in combination with exercise therapy. There is no evidence that RICE alone, or cryotherapy, or compression therapy alone has any positive influence on pain, swelling or patient function. Therefore, there is no role for RICE alone in the treatment of acute LAS (level 2). **CPGs 2021**: Clinicians may use repeated intermittent applications of ice in association with a therapeutic exercise program to address symptoms and functioning following an acute LAS. (GRADE C) **Authors' comment**: considered NOT FOLLOWING if chosen alone or only with RICE components; considered PARTIALLY FOLLOWING if chosen with recommended choices.
Application of ice/cryotherapy in combination with tolerated active mobilization	**CPGs 2013**: Clinicians should use repeated intermittent applications of ice to reduce pain, decrease the need for pain medication, and improve weight bearing following an acute ankle sprain. (GRADE A) **CS 2018**: The individual aspects of RICE are not effective, apart from cryotherapy, if provided in combination with exercise therapy. […] (level 2). **CPGs 2021**: Clinicians may use repeated intermittent applications of ice in association with a therapeutic exercise program to address symptoms and functioning following an acute LAS. (GRADE C) **Authors' comment**: considered PARTIALLY NOT FOLLOWING if chosen alone or only with RICE components; considered

	FOLLOWING if chosen with recommended choices (e.g. active mobility exercises).
Compression	**CS 2018**: There is no evidence that RICE alone, or cryotherapy, or compression therapy alone has any positive influence on pain, swelling or patient function. Therefore, there is no role for RICE alone in the treatment of acute LAS (level 2). **Authors' comment**: considered NOT FOLLOWING if chosen alone or only with RICE components; considered PARTIALLY FOLLOWING if chosen with recommended choices.
Elevation	**CS 2018**: There is no evidence that RICE alone, or cryotherapy, or compression therapy alone has any positive influence on pain, swelling or patient function. Therefore, there is no role for RICE alone in the treatment of acute LAS (level 2). **Authors' comment:** considered NOT FOLLOWING if chosen alone or only with RICE components; considered PARTIALLY FOLLOWING if chosen with recommended choices.
Protection with a semi-rigid brace	**CPGs 2013**: Clinicians should advise patients with acute lateral ankle sprains to use external supports and to progressively bear weight on the affected limb. (Level I Grade A) **CS 2018**: Use of functional support for 4–6 weeks is preferred over immobilisation. The use of an ankle brace shows the greatest effects compared with other types of functional support (level 2). **CPGs 2021**: Clinicians should advise patients with an acute LAS to use external supports, such as braces or taping, and to progressively bear weight on the affected limb. The type of external support and gait assistive device recommended should be based on the severity of the injury, phase of tissue healing, level of protection indicated, extent of pain, and patient preference. (GRADE A) **Authors' comment:** considered FOLLOWING if chosen alone or with recommended choices.
Protection with a lace-up brace	CPGs 2013: Clinicians should advise patients with acute lateral ankle sprains to use external supports and to progressively bear weight on the affected limb. (Grade A) CS 2018: Use of functional support for 4–6 weeks is preferred over immobilisation. The use of an ankle brace shows the

	greatest effects compared with other types of functional support (level 2). **Authors' comment:** considered FOLLOWING if chosen alone or with recommended choices.
Protection with elastic tape (kinesiotape)	**CS 2018**: Based on a small systematic review (n=276), it can be concluded that kinesiotape is unlikely to provide sufficient mechanical support in unstable ankles (level 1). **Authors' comment:** considered NOT FOLLOWING if chosen alone or only with not recommended choices; considered PARTIALLY NOT FOLLOWING if chosen with partially recommended choices; considered PARTIALLY FOLLOWING if chosen with recommended choices.
Advice to the patient to contact the specialist or to go to the emergency room	**CPGs 2013**: The Ottawa and Bernese ankle rules should be used to determine whether a radiograph is required to rule out a fracture of the ankle and/or foot. **CPGs 2021**: Clinicians should conduct a thorough patient history and examine the multiple segments of the ankle-foot complex to rule in or out the pathologies that may be present when differentially diagnosing an acute sprain and utilize the OAR when determining whether a radiograph is necessary after an acute LAS. **Authors' comment:** considered PARTIALLY NOT FOLLOWING if chosen alone, and PARTIALLY FOLLOWING if chosen with recommended choices of treatments. According to the text where the authors explicated that the Ottawa ankle rules are negative, it's not an emergency context.
Advice to the patient to contact the specialist or to go to the emergency room, starting in the meantime the rehabilitation program	**CPGs 2013**: The Ottawa and Bernese ankle rules should be used to determine whether a radiograph is required to rule out a fracture of the ankle and/or foot. **CPGs 2021**: Clinicians should conduct a thorough patient history and examine the multiple segments of the ankle-foot complex to rule in or out the pathologies that may be present when differentially diagnosing an acute sprain and utilize the OAR when determining whether a radiograph is necessary after an acute LAS. **Authors' comment:** considered PARTIALLY FOLLOWING if chosen with recommended choices of treatments, and PARTIALLY NOT FOLLOWING if chosen alone or with partially

	recommended choices. According to the text where the authors explicated that the Ottawa ankle rules are negative, it's not an emergency context.
Referral of the patient to the doctor for a possible pharmacological treatment	**CS 2018**: NSAIDs may be used by patients who have incurred an acute LAS for the primary purpose of reducing pain and swelling. However, care should be taken in NSAID usage as it is associated with complications (level 2) and may suppress or delay the natural healing process. **CPGs 2021**: Clinicians may prescribe NSAIDs (as physical therapy practice acts allow) to reduce pain and swelling in those with an acute LAS. (GRADE C) **Authors' comment:** according to the Italian physiotherapists' practice acts, they are not allowed to prescribe medicines. The authors chosen to write this choice to investigate the recommendation for NSAIDs in Italy. Choice considered PARTIALLY FOLLOWING if chosen alone or with recommended choices.
Advice to rest and immobilization for 2 weeks	**CPGs 2013**: there was a significant benefit to weight bearing as tolerated compared to non–weight-bearing cast immobilization. (Level I) Clinicians should advise patients with acute lateral ankle sprains to use external supports and to progressively bear weight on the affected limb. (Grade A) **CS 2018**: Use of functional support and exercise therapy is preferred as it provides better outcomes compared with immobilisation. If immobilisation is applied to treat pain or oedema, it should be for a maximum of 10 days after which functional treatment should be commenced (level 2). **Authors' comment:** considered NOT FOLLOWING anytime.
Recommend for laser therapy	**CPGs 2013**: There is moderate evidence both for and against the use of low-level laser therapy for the management of acute ankle sprains. (GRADE D) **CS 2018**: As no strong evidence exists on the effectiveness of these treatment modalities, they are not advised in the treatment of acute LAS (level 2). **CPGs 2021**: Clinicians may use low-level laser therapy to reduce pain in the initial phase of an acute LAS. (GRADE C) **Authors' comment:** considered PARTIALLY FOLLOWING if

	chosen with recommended choices; considered PARTIALLY NOT FOLLOWING if chosen alone.
Recommend for diathermy endurance	**CPGs 2013**: Clinicians can utilize pulsating shortwave diathermy for reducing oedema and gait deviations associated with acute ankle sprains. (GRADE C) **CS 2018**: As no strong evidence exists on the effectiveness of these treatment modalities, they are not advised in the treatment of acute LAS (level 2). **CPGs 2021**: Not changed from 2013 **Authors' comment:** considered PARTIALLY FOLLOWING if chosen with recommended choices; considered PARTIALLY NOT FOLLOWING if chosen alone.
Recommend for antalgic electrotherapy	**CPGs 2013**: There is moderate evidence both for and against the use of electrotherapy for the management of acute ankle sprains. (GRADE D) **CS 2018**: As no strong evidence exists on the effectiveness of these treatment modalities, they are not advised in the treatment of acute LAS (level 2). **CPGs 2021**: Not changed from 2013 **Authors' comment:** considered PARTIALLY FOLLOWING if chosen with recommended choices; considered PARTIALLY NOT FOLLOWING if chosen alone.
Recommend for ultrasound therapy	**CPGs 2013**: Clinicians should not use ultrasound for the management of acute ankle sprains. (GRADE A) **CS 2018**: As no strong evidence exists on the effectiveness of these treatment modalities, they are not advised in the treatment of acute LAS (level 2). **CPGs 2021**: Not changed from 2013 **Authors' comment:** considered NOT FOLLOWING anytime.
Passive joint mobilization with manual therapy techniques alone	**CPGs 2013**: Clinicians should use manual therapy procedures, such as lymphatic drainage, active and passive soft tissue and joint mobilization, and anterior-to-posterior talar mobilization procedures, within pain-free movement to reduce swelling, improve pain-free ankle and foot mobility, and normalize gait

	parameters in individuals with an acute lateral ankle sprain. (GRADE B) **CPGs 2021**: Clinicians should use manual therapy procedures, such as lymphatic drainage, active and passive soft tissue and joint mobilization, and anterior-to-posterior talar mobilization procedures within pain-free movement, **alongside therapeutic exercise** to reduce swelling, improve pain-free ankle and foot mobility, and normalize gait parameters in individuals with a LAS. (GRADE A) **Authors' comment:** considered NOT FOLLOWING if chosen alone; considered PARTIALLY FOLLOWING if chosen with partially recommended choices; considered FOLLOWING if chosen with recommended choices (e.g. active mobility exercises).
Passive joint mobilization with manual therapy techniques in combination with other active treatments	**CPGs 2013**: Clinicians should include manual therapy procedures, such as graded joint mobilizations, manipulations, and non–weight-bearing and weight-bearing mobilization with movement, to improve ankle dorsiflexion, proprioception, and weight-bearing tolerance in patients recovering from a lateral ankle sprain. (GRADE A) **CS 2018**: A combination with other treatment modalities, such as exercise therapy, enhances the efficacy of manual joint mobilisation and is therefore advised (level 3). **CPGs 2021**: Clinicians should use manual therapy procedures, such as lymphatic drainage, active and passive soft tissue, and joint mobilization, and anterior-to-posterior talar mobilization procedures within pain-free movement, **alongside therapeutic exercise** to reduce swelling, improve pain-free ankle and foot mobility, and normalize gait parameters in individuals with a LAS. (GRADE A) **Authors' comment:** considered FOLLOWING if chosen alone; considered PARTIALLY FOLLOWING if chosen with partially recommended choices.
Active mobility exercises	**CS 2018**: Exercise therapy should be commenced after LAS to optimise recovery of joint functionality. (LEVEL 1) For this reason, it is advised to start exercise therapy, especially in athletes, as soon as possible after the initial sprain to prevent recurrent LAS. Exercise therapy should be included into regular

	training activities as much as possible as home-based exercise (level 1). **CPGs 2021**: Clinicians should implement rehabilitation programs with a structured therapeutic exercise program, which can include protected active ROM, stretching exercises, neuromuscular training, postural re-education and balance training, both in clinic and at home, as determined by injury severity, identified impairments, preferences, learning needs, and social barriers in those with a LAS. (GRADE A) **Authors' comment:** considered FOLLOWING if chosen alone; considered PARTIALLY FOLLOWING if chosen with partially recommended choices.
Exercises such as step up, squat, jumps and aerobic exercises	**CS 2018**: as above. **CS 2018**: Supervised exercises focusing on a variety of exercises such as proprioception, strength, coordination, and function will lead to a faster return to sport in patients after a LAS and are therefore recommended (level 1). **CPGs 2021**: Clinicians should implement rehabilitation programs with a structured therapeutic exercise program, which can include protected active ROM, stretching exercises, neuromuscular training, postural re-education and balance training, both in clinic and at home, as determined by injury severity, identified impairments, preferences, learning needs, and social barriers in those with a LAS. (GRADE A) **Authors' comment:** considered PARTIALLY FOLLOWING if chosen alone or with partially recommended choices. The guidelines and recommendations do not specify which exercises are the best for the acute phase after LAS. The authors considered this choice partially following the recommendation as long as the load is safely tolerated.
Vignette 2: reinjury acute lateral ankle sprain with positive signs and symptoms for suspecting a bone fracture (positive Ottawa ankle rules).	
Proposed treatments	**EBP Recommendations and authors' comments**
Application of ice/cryotherapy alone	
Application of ice/cryotherapy in combination with tolerated active mobilization	
Compression	

Elevation	
Protection with a semi-rigid brace	
Protection with a lace-up brace	
Protection with elastic tape (kinesiotape)	
Advice to the patient to contact the specialist or to go to the emergency room	**CPGs 2013**: the Ottawa and Bernese ankle rules should be used to determine whether a radiograph is required to rule out a fracture of the ankle and/or foot. (GRADE A) **CPGs 2021**: Clinicians should conduct a thorough patient history and examine the multiple segments of the ankle-foot complex to rule in or out the pathologies that may be present when differentially diagnosing an acute sprain and utilize the OAR when determining whether a radiograph is necessary after an acute LAS. **Authors' comment:** considered FOLLOWING if chosen alone; considered PARTIALLY FOLLOWING if chosen with RICE components or brace components; considered PARTIALLY NOT FOLLOWING if chosen with choices of treatments. According to the text where the authors explicated that the Ottawa ankle rules are positive (there is pain in the malleolar zone and there is tenderness along the tip of the posterior edge of the distal 6 cm of the lateral malleolus, and inability to bear weight for 4 steps), it's an emergency context, therefore the physiotherapists should rule out a bone fracture before providing any treatments. Anytime the choice of the participants was missing the referral to the doctor or to the emergency room, it was considered NOT FOLLOWING.
Advice to the patient to contact the specialist or to go to the emergency room, starting in the meantime the rehabilitation program	As above. **Authors' comment:** considered NOT FOLLOWING anytime. According to the text where the authors explicated that the Ottawa ankle rules are positive, it's an emergency context, therefore the physiotherapists should rule out a bone fracture before providing any treatments.
Referral of the patient to the doctor for a possible pharmacological treatment	
Advice to rest and immobilization for 2 weeks	

Recommend for laser therapy	
Recommend for diathermy endurance	
Recommend for antalgic electrotherapy	
Recommend for ultrasound therapy	
Passive joint mobilization with manual therapy techniques alone	
Passive joint mobilization with manual therapy techniques in combination with other active treatments	
Active mobility exercises	
Exercises such as step up, squat, jumps and aerobic exercises	
Legend: CPGs 2013= Clinical Practice Guidelines from Martin et al 2013; CS 2018 = Consensus Statement from Vuuberg G. et al 2018; CPGs 2021 = Clinical Practice Guidelines from Martin et al 2021.	

Table 2 Section III: Statements and review of EBP recommendations

Statements about assessment	**EBP recommendations**
1) The clinical assessment of damage to the ligaments after an ankle sprain should be performed within 24 hours from the trauma. (**Reversed statement**)	**CS 2018**: Regarding the clinical assessment of damage to the anterior talofibular ligament, the sensitivity (84%) and specificity (96%) of assessment using the anterior drawer are optimised if clinical assessment is delayed for between 4 and 5 days post injury. (level 2)
2) In case of suspected fracture of the ankle or the foot, it's not recommended to apply the Ottawa ankle rules. (**Reversed statement**)	**CS 2018**: In case of a suspected fracture, the OAR should be applied (level 2). **CPGs 2021**: Clinicians should conduct a thorough patient history and examine the multiple segments of the ankle-foot complex to rule in or out the pathologies that may be present when differentially diagnosing an acute sprain, and utilize the OAR when determining whether a radiograph is necessary after an acute LAS.
3) During the anamnesis it is important to assess previous events of ankle sprains.	**CPGs 2013**: Clinicians should recognize the increased risk of acute lateral ankle sprain in individuals who have a history of a previous

	ankle sprain. (GRADE B) **CPGs 2021**: Clinicians should include patient age, BMI, pain coping strategies, report of instability, history of previous sprain, ability to bear weight, pain with weight bearing, ankle dorsiflexion ROM, medial joint-line tenderness, balance, and ability to jump and land (as safely tolerated) in their initial assessment because of their role in influencing the clinical course and estimation of time to accomplish the goals of an individual with an acute LAS. (GRADE B)
4) In front of a second episode of lateral ankle sprain it is never necessary to apply the Ottawa ankle rules. (**Reversed statement**)	**CPGs 2013**: the Ottawa and Bernese ankle rules should be used to determine whether a radiograph is required to rule out a fracture of the ankle and/or foot. (GRADE A) **CS 2018**: In case of a suspected fracture, the OAR should be applied (level 2)
5) Physiotherapists should incorporate functional outcome measures such as the FAAM (Foot and Ankle Ability Measure), as part of the examination of patients with ankle sprain.	**CPGs 2013**: Clinicians may incorporate a discriminative instrument, such as the Cumberland Ankle Instability Tool, to assist in identifying the presence and severity of ankle instability. (GRADE B) **CPGs 2013**: Clinicians should incorporate validated functional outcome measures, such as the FAAM and the LEFS, as part of a standard clinical examination. (GRADE A) **CPGs 2021**: Clinicians should use validated patient-reported outcome measures, such as the PROMIS PF and PI scales, the FAAM, and the LEFS, as part of a standard clinical examination. (GRADE A)
Statements about treatment	**EBP recommendations**
6) In front of recurrent ankle sprains, the clinician should recommend to the patent to follow a therapeutic exercise program for coordination and balance for at least 1 year from the trauma.	**CPGs 2013**: 44% of subjects had persistent symptoms at 1-year follow-up, 5% to 33% of patients continued to have pain at 1-year or longer follow-up, with 5% to 25% still experiencing pain after 3 years.
7) Both tape and brace have a role in the prevention of recurrent lateral ankle sprains events.	**CPGs 2013**: Athletes who did not use a lace-up ankle brace when participating in high school football or basketball had a higher incidence of

	ankle injuries, irrespective of previous injury. (GRADE B - level I of evidence) **CS 2018**: Both tape and brace have a role in the prevention of recurrent LAS despite limited evidence on mechanisms that leads to these beneficial effects (level 1). The choice of usage should depend on personal preferences. **CPGs 2021**: Clinicians should recommend the use of prophylactic bracing to reduce the risk of a first-time LAS, particularly for those with risk factors for LAS.
8) At list one of the following treatment modalities is strongly recommended for the management of patients with ankle sprain during the acute phase: ultrasound, laser therapy, electrotherapy, diathermy. (**Reversed statement**)	**CPGs 2013**: *Low-level laser therapy*: there is moderate evidence both for and against the use of low-level laser therapy for the management of acute ankle sprains. (D) *Electrotherapy*: there is moderate evidence both for and against the use of electrotherapy for the management of acute ankle sprains. (GRADE D) *Diathermy*: clinicians can utilize pulsating shortwave diathermy for reducing oedema and gait deviations associated with acute ankle sprains. (GRADE C) *Ultrasound*: clinicians should not use ultrasound for the management of acute ankle sprains. (GRADE A) **CS 2018**: As no strong evidence exists on the effectiveness of these treatment modalities, they are not advised in the treatment of acute LAS (level 2). **CPGs 2021**: not changed.
9) In the treatment of patients with an ankle sprain, clinicians should use manual therapy procedures, such as lymphatic drainage, joint and soft tissue mobilization.	**CPGs 2013**: Clinicians should use manual therapy procedures, such as lymphatic drainage, active and passive soft tissue and joint mobilization, and anterior-to-posterior talar mobilization procedures, within pain-free movement to reduce swelling, improve pain-free ankle and foot mobility, and normalize gait parameters in individuals with an acute lateral ankle sprain. (GRADE B)

10) For patients with severe ankle sprains, physiotherapists should implement rehabilitation programs that include therapeutic exercises.	**CPGs 2013**: Clinicians should implement rehabilitation programs that include therapeutic exercises for patients with severe lateral ankle sprains. (GRADE A)
11) When evaluating the results of the rehabilitation program for an ankle sprain, physiotherapists should plan a follow-up until one year since the trauma.	**CPGs 2013**: 44% of subjects had persistent symptoms at 1-year follow-up, 5% to 33% of patients continued to have pain at 1-year or longer follow-up, with 5% to 25% still experiencing pain after 3 years.
Legend: CPGs 2013= Clinical Practice Guidelines from Martin et al 2013; CS 2018 = Consensus Statement from Vuuberg G. et al 2018; CPGs 2021 = Clinical Practice Guidelines from Martin et al 2021; reversed statement = the expected answer is 1-2 on a 5-point Likert scale	

Participants

The Italian physiotherapists participants were recruited through different ways. Firstly, by receiving the hyperlink to the questionnaire through the Italian Association of Italian Physiotherapists (AIFI: Associazione Italiana Fisioterapia) and the University of Genoa newsletter. Secondly, they were contacted directly by the authors or through social media outlets. The participants were not aware of the guidelines and recommendations that the authors used to design this study.

Those who did not read the "Information about the study" and did not provide their consent after reading the "Information about privacy data use" were not able to proceed with the questions. The first two questions of the first section were useful to determine if the participant respected or not the inclusion criteria: (1) having achieved a bachelor's degree in Physiotherapy in Italy and being currently working as a physiotherapist in Italy; (2) having treated at least a patient with ankle sprain during the previous two years. Those who gave a negative answered at these two questions, were sent at the end of the survey, and could not proceed with the questions.

Variables

The primary outcome of the current investigation was to describe the knowledge of and the adherence to the CPGs and recommendations in patients with acute LASs in a sample of Italian physiotherapists.

Data source/measurement and analysis

The measurement of the data has been conducted through the Excel document created and downloaded by Microsoft 365 Forms at the end of the survey period. The frequencies of the answers to the three different sections of the survey were reported.

Section I: participant's demographics

The data about the demographic section collected through multiple choice questions were reported as presented in the Excel file, the answers to open questions were divided into groups by the authors.

Section II: clinical vignette – adherence investigation

The answers about the section II were analysed one by one and divided by the authors in subcategories, then compared with the expected answers according to the EBP recommendations. The participants were classified as "following", "partially following", "partially not following" and "not following" the CPGs and recommendations depending on the intervention therapies chosen. In table 1 the authors' comments and choices have been specify in detail. Briefly, the participants were considered as "following" the recommendations if they chose only treatments that have a high level of recommendations, then that "should be used" from the physiotherapists in this acute phase (e.g. Grade A or Level 1). They were considered "partially following" the recommendations if they chose mostly treatments that that have a high level of recommendations (e.g. Grade A or Level 1), together with treatments that have a lower level of recommendations, than that "may be used" from the physiotherapists in this acute phase (from Grade B or from Level 2) or together with less not recommended treatments. They were considered "partially not following" the recommendations if they chose only or mostly treatments that are not recommended, without choosing any high level recommended treatments. They were considered "not following" the recommendations if they chose recommended not to be done treatments (e.g. ultrasound), alone or with other choices.

Section III: statements consensus – knowledge investigation

The answers about the section III were analysed in two categories: answers to normal statements and answers to reversed statements. About normal statements: answers 1 and 2 on a 5-point Likert scale were considered in agreement with the EBP recommendations, and answers 3, 4 and 5 on a 5-point Likert scale were considered in disagreement with the EBP recommendations. About reversed statements: answers 4 and 5 on a 5-point Likert scale were considered in agreement with the EBP recommendations, and answers 1, 2 and 3 on a 5-point Likert scale were considered in disagreement with the EBP recommendations. In the absence of a standard threshold, we defined a $\geq$ 70% agreement with a statement as consensus [16].

Study size

To determine the sample size for this online survey, the formula reported by Taherdoost et al. [28] and used by Battista et al. [29] was applied. Specifically, the sample size was the number of completed responses expected to be received. The calculated sample size necessary for this study was of 370, taking into consideration the number of Italian physiotherapists enrolled in the Italian professional register, following the formula, setting a 5% margin of error (how accurately the results of the survey would reflect the views of the general population) and a sampling confidence level of 95% (how confident we could be that the population would select an answer within a certain range).

3. Results

Participants

Through the AIFI and the University of Genova newsletter, and through social media and private contact with the colleagues, the authors were able to collect a total of 483 responses in a period from May 2021 to August 2021.

Among them, 11 (2%) had not accept the terms and privacy of the survey, 26 (5%) had not graduated in Italy or are not currently working as Physiotherapist in Italy, and 38 (8%) had not treated any patient with ankle sprain in the previous two years. Those that had completed the demographic section and the section II about adherence are 408 (85%), and 369 (76%) had completed the survey in all its sections. (**Figure 1**)

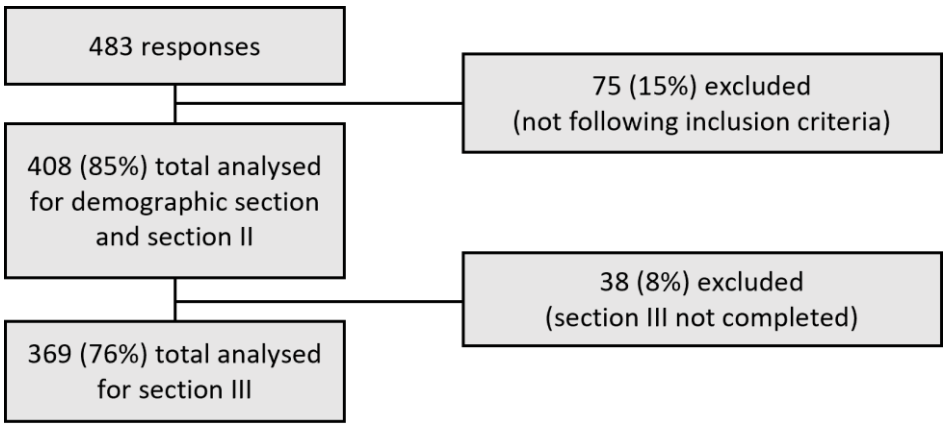

Figure 1 Participants' flowchart

Section I: participant's demographics

The demographics of the participants are displayed in **Table 3**.

Table 3 Demographics of the participants

Total responses to the survey			483
1. The participant declare to have read and understood the "Nota informativa sullo studio" at the link bit.ly/2QEBCbv :			
477	Yes		
6	No	out of the study	
2. The participant declare to have read and understood the "Informativa per il trattamento dei dati personali (ex artt. 9 e 10 del Reg. UE n. 2016/679)" at the link bit.ly/2RXmSEX and declare to give his/her consent to the University of Genoa to use his/her personal data for the purposes and with the modalities described in the document:			
472	Yes		
5	No	out of the study	
3. Have you graduated in Physiotherapy in Italy and are you currently working as a Physiotherapist in Italy?			
446	Yes		
26	No	out of the study	
4. Have you treated at least a patient with an ankle sprain in the last two years?			
408	Yes		
38	No	out of the study	

Total of participants included in the study			408
5. Choose where in Italy you're working as a Physiotherapist for most of the time:			
252	North		
120	Center		
36	South / Islands		
6. Age in number (e.g. 38):			
175	20-29		
139	30-39		
54	40-49		
40	50+		
7. Gender of identification:			
252	Male		
155	Female		
1	Other	8. Specify the identification gender:	neutral
9. Work employment conducted for the most hours of the month:			
283	Freelancer		
122	Employee		
3	Unemployed		
10. Work setting (where you work the most hours of the month):			
113	your private studio		
104	private studio of third parties		
86	national health service centre		
47	Hospital		
18	residences for the elderly		
40	other		
12. Primary field of work (field in which you work the most hours of the month):			
297	Musculoskeletal and rheumatological		
37	Sports field		
34	Neurological		
30	Pediatric		
5	Geriatric		
5	Other (2 Lymphologic, 2 Respiratory, 1 Oncologic)		
14. Year of graduation (e.g. 2012):			
147	2016 – 2021		
142	2010 – 2015		
70	2000 – 2009		
49	Before 1999		
15. Years of work since graduation:			
22	Less than 1 year		
150	1 to 5 years		
100	6 to 10 years		
136	More than 10 years		
16. Choose the academical education pathway title that you have obtained so far (more choices available):			
408	Bachelor's degree in Physiotherapy (3 years)		
153	Master 1st level		
27	Master of Science		
4	Master 2nd level		
1	PhD		
10	Other		
18. Have you ever attended any specific course or seminary on the topic "rehabilitation of patients with ankle sprain"?			
129	Yes		

279	No		
19. Choose how many patients with an ankle sprain you see monthly:			
71	0		
269	1 or 2		
56	3 or 4		
12	5 or more		

Section II: clinical vignette – adherence investigation through clinical vignette

Considering that 408 participants completed the section II, the number of the selections of each item are reported in **Table 4**. The percentages of the selection of items combination and the classification of the participants in "following", "partially following", "partially not following" and "not following" the CPGs and recommendations are reported in **Table 5** and in **Figure 2**.

Table 4 Frequencies of answers to Clinical Vignette

Choices	**Vig. n° 1**	**Vig. n° 2**
Application of ice/cryotherapy alone	37	133
Application of ice/cryotherapy in combination with tolerated active mobilization	298	32
Compression	255	136
Elevation	267	172
Protection with a semi-rigid brace	67	124
Protection with a lace-up brace	42	17
Protection with elastic tape (kinesiotape)	98	18
Advice to the patient to contact the specialist or to go to the emergency room	17	328
Advice to the patient to contact the specialist or to go to the emergency room, starting in the meantime the rehabilitation program	28	67
Referral of the patient to the doctor for a possible pharmacological treatment	16	19
Recommend to rest and immobilization for 2 weeks	2	7
Recommend for laser therapy	24	9
Recommend for diathermy	29	13
Recommend for antalgic electrotherapy	2	5
Recommend for ultrasound therapy	14	6
Passive joint mobilization with manual therapy techniques alone	20	14
Passive joint mobilization with manual therapy techniques in combination with other active treatments	210	17
Active mobility exercises	178	11
Exercises such as step up, squat, jumps and aerobic exercises	29	5

About the vignette n°1 the "following" group (N=17; 4.17%) provided the patient only with high level recommended treatment choices. In the "partially following" group (N=301; 73.77%) the physiotherapists chosen high level recommended choices in combination with low level recommendations, such as the use of active mobility exercises with recommendation for laser therapy. The group "partially not following" (N=65; 15.93%) provided the patient with low level recommendations only or in combination with not recommended choices, for example the choice for the first two weeks to use diathermy and components of RICE. In the "not following" group (N=25;

6.13%) the physiotherapists chosen treatments that are highly recommended not to be provided, such as ultrasound therapy, or only not recommended treatments. Among the recommended treatments in the acute phase after LAS, passive joint mobilization with manual therapy techniques in combination with other active treatments was delivered by most of the physiotherapists, followed by the active mobility exercises.

The vignette n°2 represents an emergency context in which the Ottawa ankle rules are positive, therefore the "following" group in the vignette n°2 (N=151; 37.01%) provided the patient only with the choice to contact the specialist or to go to the emergency room. In the "partially following group" (N=144; 35.29%) the physiotherapists correctly chosen to do referral of the patient to the specialist or to the emergency room, but they chosen together other treatments measures that haven't been considered harmful from the authors such as recommending elevation or application of ice. The group "partially not following" (N=102; 25%) provided the patient the advice to go to the emergency room or to the specialist but decided also to start the treatment before ruling out the presence of a bone fracture. In the end, anytime the choice of the participants was missing the referral to the doctor or to the emergency room, it was considered in the "not following group" (N=11; 2.70%).

Table 5 Section II: choices of treatments in two clinical cases (tot N=408)	
Vignette n°1: results related to acute LAS with negative Ottawa ankle rules	
Following: only recommended treatments have been chosen	4.17% (N=17)
Partially following: recommended treatments have been chosen together with lower recommended treatments	73.77% (N=301)
Partially not following: mostly not recommended treatment and lower recommended treatments have been chosen	15.93% (N=65)
Not following: only not recommended treatments have been chosen or treatments recommended not to be chosen have been chosen	6.13% (N=25)
Vignette n°2: results related to acute LAS with positive Ottawa ankle rules	
Following: advice to the patient to contact the specialist or to go to the emergency room	37.01% (N=151)
Partially following:	35.29% (N=144)
0.49% (N=2) Advice to the patient to contact the specialist or to go to the emergency room Referral of the patient to the doctor for a possible pharmacological treatment	
3.19% (N=13) Advice to the patient to contact the specialist or to go to the emergency room Application of ice/cryotherapy only	
10.78% (N=44) Advice to the patient to contact the specialist or to go to the emergency room RICE components	
0.98% (N=4) Advice to the patient to contact the specialist or to go to the emergency room Referral of the patient to the doctor for a possible pharmacological treatment RICE components	
3.43% (N=14)	

Advice to the patient to contact the specialist or to go to the emergency room Protection with a semi-rigid or lace-up brace	
15.20% (N=62) Advice to the patient to contact the specialist or to go to the emergency room Protection with a semi-rigid or lace-up brace RICE components	
1.23% (N=5) Advice to the patient to contact the specialist or to go to the emergency room Protection with a semi-rigid or lace-up brace RICE components Referral of the patient to the doctor for a possible pharmacological treatment	
Partially not following: advice to the patient to contact the specialist or to go to the emergency room and start the rehabilitation therapy before excluding a bone fracture	25% (N=102)
Not following: other choices but not advice to the patient to contact the specialist or to go to the emergency room	2.70% (N=11)

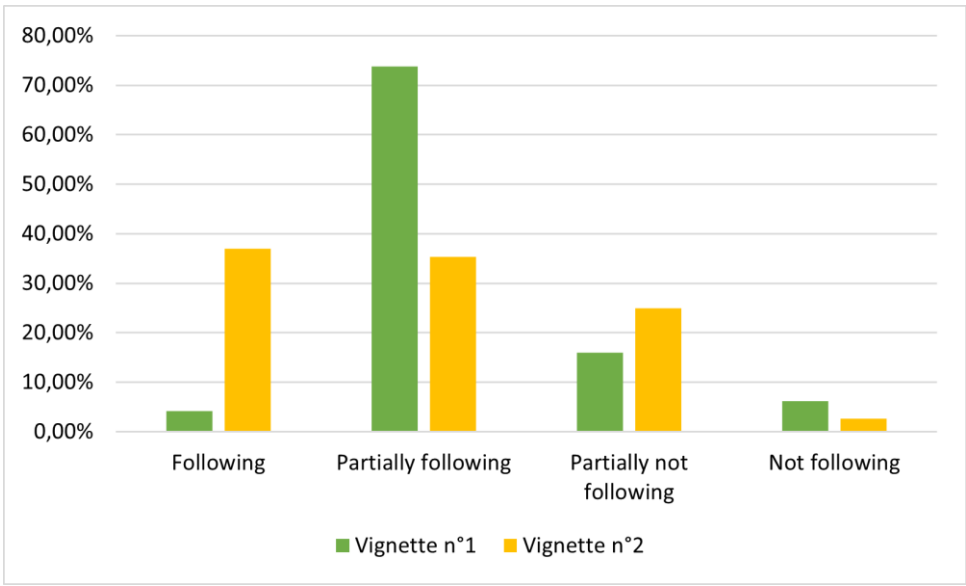

Figure 2 Reported answers to section II

Section III: statements consensus – knowledge investigation

Considering that 369 participants completed the section III, the percentages of agreement and disagreement in the answers on a 5-point Likert scale are reported in the **Table 6**. The **Figure 3** represent for which statements the consensus was reached at 70%.

Overall, consensus to the statements was achieved for 8 (73%) statements (2, 3, 4, 5, 6, 9, 10, 11) out of 11. Among the statements that found a consensus by the participants 4 investigated the

consensus about the assessment phase, including the rules to rule in or out a bone fracture, risk factors such as previous ankle injuries, the use of patient's reported outcomes; 4 investigated the treatments choices, including the use of manual therapy, the use of therapeutic exercise and the duration of the therapy program until the last follow-ups. On the contrary, the consensus was not achieved for 3 (27%) statements (1, 7, 8), those about the time within the clinical assessment should be performed, about the prevention potential of both brace and tape, about the level of recommendation for physical therapies such as laser therapy and ultrasound.

Table 6 Section III: level of agreement on a 5-point Likert scale (tot N=369)

Statements about assessment	**Agreement**	**Disagreement**
1) The clinical assessment of damage to the ligaments after an ankle sprain should be performed within 24 hours from the trauma. (**Reversed statement**)	(answer 1 or 2)	(answer 3, 4 or 5)
	55.83% (N= 206)	44.17% (N= 163)
2) In case of suspected fracture of the ankle or the foot, it's not recommended to apply the Ottawa ankle rules. (**Reversed statement**)	(answer 1 or 2)	(answer 3, 4 or 5)
	81.03% (N= 299)	18.97% (N= 70)
3) During the anamnesis it is important to assess previous events of ankle sprains.	(answer 4 or 5)	(answer 1, 2 or 3)
	98.64% (N= 364)	1.36% (N= 5)
4) In front of a second episode of lateral ankle sprain it is never necessary to apply the Ottawa ankle rules. (**Reversed statement**)	(answer 1 or 2)	(answer 3, 4 or 5)
	88.62% (N= 327)	11.38% (N= 42)
5) Physiotherapists should incorporate functional outcome measures such as the FAAM (Foot and Ankle Ability Measure), as part of the examination of patients with ankle sprain.	(answer 4 or 5)	(answer 1, 2 or 3)
	71.27% (N= 163)	28.73% (N= 106)
Statements about treatment	**Agreement**	**Disagreement**
6) In front of recurrent ankle sprains, the clinician should recommend to the patent to follow a therapeutic exercise program for coordination and balance for at least 1 year from the trauma.	(answer 4 or 5)	(answer 1, 2 or 3)
	85.09% (N= 314)	14.91% (N= 55)
7) Both tape and brace have a role in the prevention of recurrent lateral ankle sprains events.	(answer 4 or 5)	(answer 1, 2 or 3)
	48.51% (N= 179)	51.49% (N= 190)
8) At list one of the following treatment modalities is strongly recommended for the management of patients with ankle sprain during the acute phase: ultrasound, laser therapy, electrotherapy, diathermy. (**Reversed statement**)	(answer 1 or 2)	(answer 3, 4 or 5)
	69.11% (N= 225)	30.89% (N= 114)
9) In the treatment of patients with an ankle sprain, clinicians should use manual therapy procedures, such as lymphatic drainage, joint and soft tissue mobilization.	(answer 4 or 5)	(answer 1, 2 or 3)
	80.76% (N= 298)	19.24% (N= 71)
10) For patients with severe ankle sprains, physiotherapists should implement rehabilitation programs that include therapeutic exercises.	(answer 4 or 5)	(answer 1, 2 or 3)
	94.58% (N= 349)	5.42% (N= 20)

11) When evaluating the results of the rehabilitation program for an ankle sprain, physiotherapists should plan a follow-up until one year since the trauma.	(answer 4 or 5)	(answer 1, 2 or 3)
	84.82% (N= 313)	15.18% (N= 56)
Legend: for the statements the answers of agreement are 4 or 5 on a 5-point Likert scale; **reversed statement** = the answers of agreement are 1 or 2 on a 5-point Likert scale.		

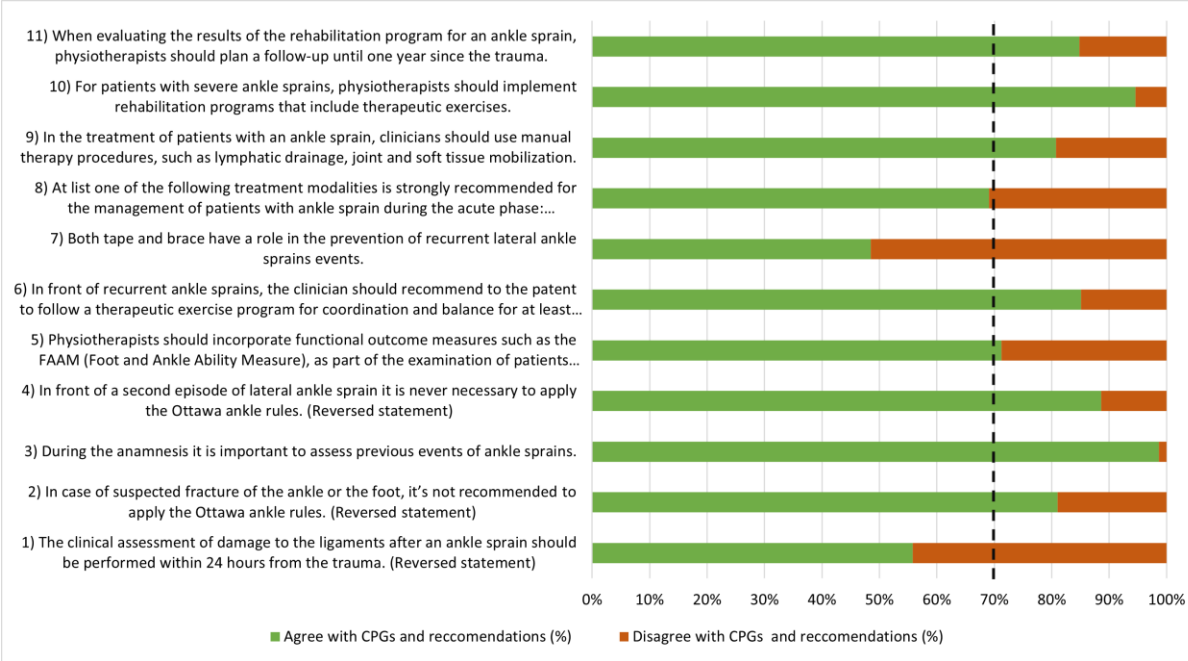

Figure 3 Reported answers to section III and consensus at 70%

4. DISCUSSION

Even if the Italian health care system doesn't include at the moment a primary access to the physiotherapists, more and more Italian physiotherapists working in a private rehabilitation centre are seeing patients as first access. In the section II the authors hypothesized two clinical cases in which the patients arrived in first access to the physiotherapists.

This study showed that in a case of acute ankle sprain with positive signs and symptoms for suspecting a bone fracture most of the Italian physiotherapists participating to the survey would have been adherent to the clinical practice recommendations to send the patient to the emergency room or to the specialist (choice selected 328 times) to do X-rays and rule in or out the presence of a

musculoskeletal condition that wouldn't be immediately physiotherapy competence. Indeed the CPGs and recommendations states that the in case of a suspected fracture, the Ottawa ankle rules should be applied [5] and should be used to determine whether a radiograph is required to rule out a fracture of the ankle and/or foot [4] [6]. Among these 328 physiotherapists, 144 (35.09%) recommended also to apply components of the RICE protocol (rest, ice, compression, and elevation) or suggested the use of a protective brace and to ask the doctor for FANs. These choices have been considered from the authors partially following the recommendations because they are protective and not harmful suggestions that can be done, if prioritizing the rule in or out of the fracture, and only the 2.70% (N=11) did not recognised an emergency context, but also the 25% (N=102) gave an incoherent answer, sending the patient to the specialist but at the same starting a rehabilitation management without having before ruled out the presence of a possible bone fracture.

These findings shows that the most of the physiotherapists participating to this survey was able to recognise the emergency context of the vignette, therefore to identify the positive Ottawa ankle rules [14]. This is in line with what it shows the section III of the study, where both the statements (2 and 4) about the knowledge of these screening tool found the consent from the participants.

In a case of acute ankle sprain with negative signs and symptoms for suspecting a bone fracture, only 4.17% of the physiotherapist have chosen high level recommendations alone, and most of the participants 73.77% have chosen both high level recommendations together with lower-level choices. The study shows that the knowledge of the Italian physiotherapists about the use of manual therapy and therapeutic exercise and the therapeutic choice in a clinical case match, there is a consensus in the section III about these statements.

Although there is no evidence and no role for ice, compression and elevation alone in the treatment of acute LAS [5], the use of RICE components alone has been suggested, but in the most of the cases the use of ice, compression and elevation has been done together with manual therapy and therapeutic exercise and/or with the use of a protective brace as recommended.

This study shows also that although the use of ultrasound therapy should not be used by clinicians for the management of acute ankle sprains [4–6], this treatment modality has been chosen for 14 times. The literature says also that the use of external supports with progressively bear weight [4] and exercise therapy is preferred as it provides better outcomes compared with immobilisation, that if applied should be for a maximum of 10 days [5], and only 2 on 408 participants chosen this management.

5. CONCLUSION

This study showed that although there is a good knowledge about assessments and treatments modalities among the Italian Physiotherapists that participated at this survey, it exists some incoherence with the adherence in clinical practice. This occurs mostly when the physiotherapists

are recognizing the presence of an emergency condition, with positive Ottawa ankle rules, and are referring the patient to the specialist or ER but are anyway applying some treatments before rule the bone fracture out.

The data analysis and the discussion and conclusions about this study will be revised a second time from the authors in order to respect all the parameters of reported outcomes and findings for the possible submission of the research to an international journal.

APPENDIX A – Level of evidence

GRADES OF RECOMMENDATION BASED ON		STRENGTH OF EVIDENCE	LEVEL OF OBLIGATION*
A	Strong evidence	A preponderance of level I and/or level II studies support the recommendation. This must include at least 1 level I study	Must or should
B	Moderate evidence	A single high-quality randomized controlled trial or a preponderance of level II studies support the recommendation	Should
C	Weak evidence	A single level II study or a preponderance of level III and IV studies, including statements of consensus by content experts, support the recommendation	May
D	Conflicting evidence	Higher-quality studies conducted on this topic disagree with respect to their conclusions. The recommendation is based on these conflicting studies	
E	Theoretical/ foundational evidence	A preponderance of evidence from animal or cadaver studies, from conceptual models/principles, or from basic science/bench research supports this conclusion	May
F	Expert opinion	Best practice based on the clinical experience of the guidelines development team	May
The strength of the evidence supporting the recommendations used by Martin et al. 2013 [4] *new from Martin et al. 2021 [6]			

EVIDENCE LEVEL	CONCLUSIONS BASED ON
1	Research of level A1 or at least two examinations of level A2 performed independently of each other with consistent results
2	One examination of level A2 or at least two examinations of level B, performed independently of each other
3	One examination of level B or C
4	Opinion of experts
The level of evidence conclusions used by Vuurberg et al. [5]	

APPENDIX B - SURVEY

Original survey in Italian language

SECTION I: INFORMATIONS AND SURVEY PARTICIPANT DEMOGRAPHICS

Gentile Partecipante, Le è stato chiesto di prendere parte ad uno studio dal titolo "Knowledge of and Adherence to Evidence-Based Practice Guidelines and Recommendations for Ankle Sprains Management: a Survey among Italian Physiotherapists".

Prima che Lei prenda una decisione in merito, è importante che comprenda il motivo dello studio e cosa Le sarà chiesto di fare, qualora decidesse di prendervi parte. Lo sperimentatore e i suoi collaboratori sono a Sua completa disposizione per qualsiasi chiarimento. Le prime due sezioni di questo questionario hanno lo scopo di fornirLe un'informazione corretta e completa affinché Lei possa esprimere una scelta libera e consapevole. Il responsabile dello studio è Marco Testa, Professore Aggregato presso il Dipartimento di Neuroscienze, Riabilitazione, Oftalmologia, Genetica e Scienze Materno-Infantili dell'Università di Genova. I ricercatori coinvolti sono il Prof. Marco Testa, la Dott.ssa Giulia Caffini, il Dott. Andrea Raschi e il Dott. Simone Battista.

La ringraziamo per il Suo prezioso contributo, per qualsiasi domanda può contattarci per e-mail all'indirizzo giuliacaffini95@gmail.com

A. Nota informativa e consenso informato

1. Il/la sottoscritto/a dichiara di avere preso visione della "Nota informativa sullo studio" al seguente link bit.ly/2QEBCbv :

- Accetto
- NON accetto

2. Il/la sottoscritto/a ha preso visione dell' "Informativa per il trattamento dei dati personali (ex artt. 9 e 10 del Reg. UE n. 2016/679)" al link bit.ly/2RXmSEX e dichiara di PRESTARE IL CONSENSO affinché l'Università degli Studi di Genova tratti i Suoi dati per le finalità e secondo le modalità ivi descritte:

- Accetto
- NON accetto

B. Raccolta dati demografici dei partecipanti

La preghiamo di rispondere alle seguenti domande:

3. Ha conseguito la Laurea in Fisioterapia in Italia ed esercita attualmente la professione di Fisioterapista in Italia?

- Sì
- No

4. Le è capitato di aver trattato almeno un paziente con distorsione di caviglia nei precedenti due anni?

- Sì
- No

5. Selezioni in quale parte d'Italia esercita per la maggior parte del tempo la professione di Fisioterapista

- Nord (Valle D'Aosta, Piemonte, Liguria, Lombardia, Veneto, Trentino-Alto Adige, Friuli-Venezia Giulia, Emilia-Romagna)
- Centro (Toscana, Marche, Lazio, Umbria, Abruzzo)
- Sud / Isole (Molise, Campania, Basilicata, Calabria, Puglia, Sicilia, Sardegna)

6. Età in numero (es. 38): _____

7. Genere con il quale si identifica:

- maschile
- femminile
- altro*

*8: Specifichi con quale genere si identifica: _____

9. Modalità di lavoro svolta per la maggior parte delle ore durante il mese:

- Libero professionista
- Dipendente
- Disoccupato

10. Setting di lavoro (dove svolge la maggior parte delle ore di lavoro durante il mese):

- Nel proprio studio privato
- In uno studio privato di terzi
- In un centro convenzionato
- In ospedale
- Residenze per anziani
- Altro*

*11. Specifichi di seguito il setting di lavoro in cui svolge la maggior parte delle ore lavorative durante il mese: _____

12. Ambito di lavoro prevalente (dove svolge la maggior parte delle ore di lavoro durante il mese):

- Muscoloscheletrico e reumatologico

- Sportivo
- Neurologico
- Età evolutiva
- Geriatrico
- Altro*

*13. Specifichi di seguito l'ambito di lavoro in cui svolge la maggior parte delle ore lavorative durante il mese: _____

14. Anno di conseguimento della laurea in Fisioterapia (es. 2012):_____

15. Anni di lavoro dalla laurea:

- Da meno di 1 anno
- Da 1 a 5 anni
- Da 6 a 10 anni

16. Contrassegni il titolo del percorso accademico che ha conseguito fino ad oggi (più opzioni disponibili):

- Laurea triennale in Fisioterapia
- Master di 1 livello
- Laurea Magistrale
- Master di 2 livello
- PhD
- Altro (specificare di seguito)*

*17. Se ha svolto uno più percorsi post lauream lo specifichi di seguito (es. "Master di 1° livello in Fisioterapia Sportiva"): _____

18. Ha frequentato corsi di formazione specifici sull'argomento di "Riabilitazione di pazienti con distorsioni di caviglia"?

- Sì
- No

19. Quanti pazienti in media vede al mese con distorsione di caviglia:

- 0
- 1-2
- 3-4
- 5 o più

SECTION II: SURVEY PATIENT VIGNETTES AND INTERVENTIONAL OPTIONS

Di seguito trova due casi clinici. La preghiamo di leggerli attentamente e di scegliere quali sono le procedure che metterebbe in atto per la gestione del paziente in prima settimana.

20.

Clinical scenario 1: first episode of acute lateral ankle sprain with negative signs and symptoms for suspecting a bone fracture, acute phase.

Anamnesi: A.R. è una signora di 40 anni, impiegata in ufficio postale, con la passione per il giardinaggio. Ieri ha subito un primo episodio di distorsione laterale di caviglia appoggiando il piede in flessione plantare ed inversione mentre era in giardino. È riuscita a rientrare in casa zoppicando. Il giorno successivo al trauma si presenta presso il Fisioterapista camminando con l'aiuto di due canadesi e tenendo il piede sollevato dal suolo.
Esame obiettivo: alla richiesta di appoggiare il piede per terra per provare a camminare per 4 passi la paziente dichiara di avere paura di sentire dolore, riesce comunque a camminare per tutto lo studio senza zoppicare, ma con un dolore nel compartimento laterale di 4 su 10 sulla scala del dolore VAS (Visual Analogue Scale).
Non presenta dolore alla palpazione dei 6 cm posteriori dei malleoli, né alla zona laterale e mediale del mesopiede. Presenta edema lieve ed ematoma nel compartimento antero-laterale della caviglia.

Scelga nel seguente elenco quali sono le procedure che metterebbe in atto per la gestione del paziente di questo scenario in prima settimana (più opzioni disponibili)

- Applicazione solamente di Ghiaccio/Crioterapia
- Applicazione di Ghiaccio/Crioterapia associata a mobilizzazione attiva tollerata
- Compressione
- Elevazione
- Protezione con tutore semi-rigido
- Protezione con tutore per caviglia con lacci (lace-up brace)
- Protezione con bendaggio elastico (kinesiotape)
- Consiglio al paziente di rivolgersi allo specialista di riferimento o di andare in Pronto Soccorso
- Consiglio al paziente di rivolgersi allo specialista di riferimento o di andare in Pronto Soccorso, iniziando nel frattempo il percorso riabilitativo
- Rinvio il paziente al medico per eventuale cura farmacologica
- Consiglio riposo a letto ed immobilizzazione per 2 settimane
- Consiglio utilizzo della laserterapia
- Consiglio utilizzo della diatermia
- Consiglio utilizzo della elettroterapia antalgica
- Consiglio utilizzo della ultrasuonoterapia
- Tecniche manuali di mobilizzazione articolare passiva da sole
- Tecniche manuali di mobilizzazione articolare passiva associate ad altro trattamento attivo

- Esercizi di mobilità attivi
- Esercizi come: step up, squat, salti, resistenza aerobica

21.

Clinical scenario 2: reinjury acute phase lateral ankle sprain with positive signs and symptoms for suspecting a bone fracture.

Anamnesi: G.C. è una giocatrice di basket di 20 anni che studia all'Università. Due giorni fa, durante la partita, ha subito un episodio di distorsione di caviglia appoggiando il piede in flessione plantare ed inversione nel momento dell'atterraggio da un salto. Si tratta del secondo episodio di distorsione di caviglia, il primo era avvenuto 3 anni fa, dopo il quale aveva seguito un percorso di riabilitazione fino a tornare a giocare.

Questa volta ha dovuto interrompere il gioco, è uscita saltellando sul piede opposto, ha applicato immediatamente il ghiaccio e la caviglia si è gonfiata velocemente. Ha provato ad appoggiare il piede per camminare fino allo spogliatoio ma il dolore era troppo forte (VAS 8/10).
Fino ad oggi ha tenuto il piede elevato con ghiaccio e non lo ha appoggiato per camminare, la notte però la caviglia le fa male (VAS 8/10). Si presenta due giorni dopo il trauma presso il Fisioterapista per la prima visita camminando con due canadesi senza appoggiare il piede.

Esame obiettivo: alla richiesta di appoggiare il piede per terra per provare a camminare per 4 passi la paziente riferisce di provare un dolore 8 su 10 sulla scala del dolore VAS (Visual Analogue Scale), alla palpazione dei 6 cm posteriori al malleolo peroneale riferisce un dolore VAS 7/10.

Scelga nel seguente elenco quali sono le procedure che metterebbe in atto per la gestione del paziente di questo scenario in prima settimana (più opzioni disponibili)

- Applicazione solamente di Ghiaccio/Crioterapia
- Applicazione di Ghiaccio/Crioterapia associata a mobilizzazione attiva tollerata
- Compressione
- Elevazione
- Protezione con tutore semi-rigido
- Protezione con tutore per caviglia con lacci (lace-up brace)
- Protezione con bendaggio elastico (kinesiotape)
- Consiglio al paziente di rivolgersi allo specialista di riferimento o di andare in Pronto Soccorso
- Consiglio al paziente di rivolgersi allo specialista di riferimento o di andare in Pronto Soccorso, iniziando nel frattempo il percorso riabilitativo
- Rinvio il paziente al medico per eventuale cura farmacologica
- Consiglio riposo a letto ed immobilizzazione per 2 settimane
- Consiglio utilizzo della laserterapia

- Consiglio utilizzo della diatermia
- Consiglio utilizzo della elettroterapia antalgica
- Consiglio utilizzo della ultrasuonoterapia
- Tecniche manuali di mobilizzazione articolare passiva da sole
- Tecniche manuali di mobilizzazione articolare passiva associate ad altro trattamento attivo
- Esercizi di mobilità attivi
- Esercizi come: step up, squat, salti, resistenza aerobica

SECTION III: STATEMENTS

Le chiediamo di leggere attentamente le seguenti affermazioni e di indicare quanto si trova in accordo con esse scegliendo un valore da 1 (completamente in disaccordo) a 5 (completamente d'accordo).

22. Quanto si trova in accordo con le seguenti affermazioni nell'ambito della valutazione?

	1 Completamente in disaccordo	2 Parzialmente in disaccordo	3 Né d'accordo né in disaccordo	4 Parzialmente d'accordo	5 Completamente d'accordo
La valutazione clinica del danno legamentoso a seguito di una distorsione di caviglia dovrebbe essere eseguita nell'arco delle 48 ore dall'evento traumatico.					
Se è presente il sospetto di una frattura della caviglia o del piede, non è raccomandato applicare le Ottawa Ankle Rule.					
In anamnesi è importante identificare la presenza di precedenti eventi di distorsione di caviglia.					
In presenza di un secondo episodio di distorsione laterale di caviglia non è mai necessario applicare le Ottawa Ankle Rule.					
Nel momento della valutazione dei pazienti con distorsione di caviglia, i fisioterapisti dovrebbero utilizzare					

misure di outcome funzionali come la FAAM (Foot and Ankle Ability Measure).					

23. Quanto si trova in accordo con le seguenti affermazioni nell'ambito del trattamento?

	1 Completamente in disaccordo	2 Parzialmente in disaccordo	3 Né d'accordo né in disaccordo	4 Parzialmente d'accordo	5 Completamente d'accordo
In presenza di distorsioni di caviglia ricorrenti si dovrebbe consigliare al paziente di eseguire un programma di esercizio terapeutico per la coordinazione e l'equilibrio per almeno 1 anno dal trauma.					
Sia il bendaggio che il tutore hanno il ruolo di prevenire eventi recidivanti di distorsioni di caviglia laterale.					
Almeno una delle seguenti modalità di trattamento è fortemente raccomandata nella gestione del paziente con distorsione di caviglia in fase acuta: ultrasuonoterapia, laserterapia, elettroterapia antalgica, diatermia.					
In individui con distorsione di caviglia, il Fisioterapista dovrebbe usare tecniche di terapia manuale come linfodrenaggio, mobilizzazione articolare e dei tessuti molli.					
In presenza di una distorsione di caviglia severa, il fisioterapista dovrebbe sviluppare un programma di riabilitazione che includa l'esercizio terapeutico.					
Nel valutare l'efficacia del programma di riabilitazione a seguito di una distorsione di caviglia, il fisioterapista dovrebbe programmare un follow-up fino ad un anno dall'evento traumatico.					

Translated survey in English language

SECTION I: INFORMATIONS AND SURVEY PARTICIPANT DEMOGRAPHICS

A. Informations about the research and informed consent

1. The participant declare to have read and understood the "Nota informativa sullo studio" at the link bit.ly/2QEBCbv :

- Yes
- No

2. The participant declare to have read and understood the "Informativa per il trattamento dei dati personali (ex artt. 9 e 10 del Reg. UE n. 2016/679)" at the link bit.ly/2RXmSEX and declare to give his/her consent to the University of Genoa to use his/her personal data for the purposes and with the modalities described in the document:

- Yes
- No

B. Participants' demographics

The participant is kindly requested to answer the following questions:

3. Have you graduated in Physiotherapy in Italy and are you currently working as a Physiotherapist in Italy?

- Yes
- No

4. Have you treated at least a patient with an ankle sprain in the last two years?

- Yes
- No

5. Choose where in Italy you're working as a Physiotherapist for most of the time:

- North (Valle D'Aosta, Piemonte, Liguria, Lombardia, Veneto, Trentino-Alto Adige, Friuli-Venezia Giulia, Emilia-Romagna)
- Center (Toscana, Marche, Lazio, Umbria, Abruzzo)
- South / Islands (Molise, Campania, Basilicata, Calabria, Puglia, Sicilia, Sardegna)

6. Age in number (e.g. 38): _____

7. Gender of identification:

- male

- female
- other*

*8: Specify the identification gender: _____

9. Work employment conducted for the most hours of the month:

- Freelancer
- Employee
- Unemployed

10. Work setting (where you work the most hours of the month):

- your private studio
- private studio of third parties
- national health service centre
- hospital
- residences for the elderly
- other*

*11. Specify next the work setting where you work the most hours of the month:
_____

12. Primary field of work (field in which you work the most hours of the month):

- Musculoskeletal and rheumatological
- Sports field
- Neurological
- Paediatric
- Geriatric
- Other*

*13. Specify your primary field of work (field in which you work the most hours of the month):

_____

14. Year of graduation (e.g. 2012):_____

15. Years of work since graduation:

- Less than 1 year
- 1 to 5 years
- 6 to 10 years

- More than 10 years

16. Choose the academical education pathway title that you have obtained so far (more choices available):

- Bachelor's degree in Physiotherapy (3 years)
- Master 1st level
- Master of Science
- Master 2nd level
- PhD
- other (to be specify)*

*17. Specify next if you obtained more than one level of graduation (e.g. "Master 1st level in Sport Physiotherapy"): _____

18. Have you ever attended any specific course or seminary on the topic "rehabilitation of patients with ankle sprain"?

- Yes
- No

19. Choose how many patients with an ankle sprain you see monthly:

- 0
- 1-2
- 3-4
- 5 or more

SECTION II: SURVEY PATIENT VIGNETTES AND INTERVENTIONAL OPTIONS

Di seguito trova due casi clinici. La preghiamo di leggerli attentamente e di scegliere quali sono le procedure che metterebbe in atto per la gestione del paziente in prima settimana.

20.

Clinical scenario 1: first episode of acute lateral ankle sprain with negative signs and symptoms for suspecting a bone fracture, acute phase.

History: A.R. is a 40-year-old woman, working as a post office employee with a passion for gardening. Yesterday she suffered a first episode of lateral ankle sprain when she put her foot in plantar flexion and inversion while in the garden. She managed to limp home. The day after the injury she went to the physiotherapist, walking with the help of two crutches and keeping her foot off the ground.

Physical examination: When asked to put her foot on the ground to try to walk 4 steps, the patient stated that she was afraid of feeling pain, however she was able to walk throughout the room without limping, but with a pain in the lateral compartment of 4 out of 10 on the VAS (Visual Analogue Scale) pain scale. She has no pain on palpation of the posterior 6 cm of the malleoli, nor the lateral and medial midfoot area. There is mild oedema and haematoma in the anterolateral compartment of the ankle.

Please choose from the following list which procedures you would implement to manage the patient in this scenario in week 1 (more options available)

- Application of ice/cryotherapy alone
- Application of ice/cryotherapy in combination with tolerated active mobilization
- Compression
- Elevation
- Protection with a semi-rigid brace
- Protection with a lace-up brace
- Protection with elastic tape (kinesiotape)
- Advice to the patient to contact the specialist or to go to the emergency room
- Advice to the patient to contact the specialist or to go to the emergency room, starting in the meantime the rehabilitation program
- Referral of the patient to the doctor for a possible pharmacological treatment
- Recommend to rest and immobilization for 2 weeks
- Recommend for laser therapy
- Recommend for diathermy
- Recommend for antalgic electrotherapy
- Recommend for ultrasound therapy
- Passive joint mobilization with manual therapy techniques alone
- Passive joint mobilization with manual therapy techniques in combination with other active treatments
- Active mobility exercises
- Exercises such as step up, squat, jumps and aerobic endurance

21.

Clinical scenario 2: reinjury acute phase lateral ankle sprain with positive signs and symptoms for suspecting a bone fracture.

History: G.C. is a 20-year-old female basketball player studying at university. Two days ago, during a game, she suffered an episode of ankle sprain while placing her foot in plantar flexion and inversion when landing from a jump. This is the second episode of a sprained ankle injury, the first having occurred three years ago, after which she underwent rehabilitation until she could play again.

This time she had to stop the game, came out hopping on the opposite foot, applied ice immediately and the ankle got quickly swollen. She tried to put her foot on the floor and bare weight to walk to the changing room, but the pain was too high (VAS 8/10).
Until now she has kept her foot elevated with ice and she has not put it down on the floor to walk, but at night her ankle hurts (VAS 8/10). She presented two days after the injury to the physiotherapist for the first visit, walking with two crutches without weight bearing.

Physical examination: when asked to place her foot on the floor to try to walk 4 steps the patient reported 8 out of 10 pain on the VAS (Visual Analogue Scale) pain scale, by palpating the 6 cm posterior to the peroneal malleolus she reported a pain level of 7/10 VAS.

Please choose from the following list which procedures you would implement to manage the patient in this scenario in week 1 (more options available)

- Application of ice/cryotherapy alone
- Application of ice/cryotherapy in combination with tolerated active mobilization
- Compression
- Elevation
- Protection with a semi-rigid brace
- Protection with a lace-up brace
- Protection with elastic tape (kinesiotape)
- Advice to the patient to contact the specialist or to go to the emergency room
- Advice to the patient to contact the specialist or to go to the emergency room, starting in the meantime the rehabilitation program
- Referral of the patient to the doctor for a possible pharmacological treatment
- Recommend to rest and immobilization for 2 weeks
- Recommend for laser therapy
- Recommend for diathermy
- Recommend for antalgic electrotherapy
- Recommend for ultrasound therapy
- Passive joint mobilization with manual therapy techniques alone
- Passive joint mobilization with manual therapy techniques in combination with other active treatments
- Active mobility exercises
- Exercises such as step up, squat, jumps and aerobic endurance

SECTION III: STATEMENTS

Please read the next statements carefully and choose how much you agree with them, choosing a number from 1 (completely disagree) to 5 (completely agree).

22. How much do you agree with the following statements about assessment?

	1 Completely disagree	2 Partially disagree	3 Neither agree nor disagree	4 Partially agree	5 Completely agree
The clinical assessment of damage to the ligaments after an ankle sprain should be performed within 24 hours from the trauma.					
In case of suspected fracture of the ankle or the foot, it's not recommended to apply the Ottawa ankle rules.					
During the anamnesis it is important to assess previous events of ankle sprains.					
In front of a second episode of lateral ankle sprain it is never necessary to apply the Ottawa ankle rules.					
Physiotherapists should incorporate functional outcome measures such as the FAAM (Foot and Ankle Ability Measure), as part of the examination of patients with ankle sprain.					

23. How much do you agree with the following statements about treatment?

	1 Completely disagree	2 Partially disagree	3 Neither agree nor disagree	4 Partially agree	5 Completely agree
In front of recurrent ankle sprains, the clinician should recommend to the patent to follow a therapeutic exercise program for coordination and balance for at least 1 year from the trauma.					

Both tape and brace have a role in the prevention of recurrent lateral ankle sprains events.					
At list one of the following treatment modalities is strongly recommended for the management of patients with ankle sprain during the acute phase: ultrasound, laser therapy, electrotherapy, diathermy.					
In the treatment of patients with an ankle sprain, clinicians should use manual therapy procedures, such as lymphatic drainage, joint and soft tissue mobilization.					
For patients with severe ankle sprains, physiotherapists should implement rehabilitation programs that include therapeutic exercises.					
When evaluating the results of the rehabilitation program for an ankle sprain, physiotherapists should plan a follow-up until one year since the trauma.					

6. BIBLIOGRAPHY

1. Gribble PA, Bleakley CM, Caulfield BM, Docherty CL, Fourchet F, Fong DTP, et al. Evidence review for the 2016 International Ankle Consortium consensus statement on the prevalence, impact and long-term consequences of lateral ankle sprains. Br J Sports Med. 2016;50(24):1496–505.

2. Gribble PA, Bleakley CM, Caulfield BM, Docherty CL, Fourchet F, Fong DTP, et al. 2016 consensus statement of the International Ankle Consortium: Prevalence, impact and long-term consequences of lateral ankle sprains. Br J Sports Med. 2016;50(24):1493–5.

3. Brouwers MC, Kho ME, Browman GP, Burgers JS, Cluzeau F, Feder G, et al. AGREE II: Advancing guideline development, reporting and evaluation in health care. Cmaj. 2010;182(18):839–42.

4. Martin RL, Davenport TE, Paulseth S, Wukich DK, Godges JJ. Ankle stability and movement coordination impairments: Ankle ligament sprains. J Orthop Sports Phys Ther. 2013;43(9).

5. Vuurberg G, Hoorntje A, Wink LM, Van Der Doelen BFW, Van Den Bekerom MP, Dekker R, et al. Diagnosis, treatment and prevention of ankle sprains: Update of an evidence-based clinical

guideline. Br J Sports Med. 2018;52(15):956.

6. Martin RRL, Davenport TE, Fraser JJ, Sawdon-Bea J, Carcia CR, Carroll LA, et al. Ankle stability and movement coordination impairments: Lateral ankle ligament sprains revision 2021. J Orthop Sports Phys Ther. 2021;51(4):CPG1–80.

7. Zadro J, O'Keeffe M, Maher C. Do physical therapists follow evidence-based guidelines when managing musculoskeletal conditions? Systematic review. BMJ Open. 2019;9(10).

8. Delahunt E, Bleakley CM, Bossard DS, Caulfield BM, Docherty CL, Doherty C, et al. Clinical assessment of acute lateral ankle sprain injuries (ROAST): 2019 consensus statement and recommendations of the International Ankle Consortium. Br J Sports Med. 2018;52(20):1304–10.

9. David L Sackett ; William Rosenberg ; JA Muir Gray ; R Brian Haynes ; W Scott Richardson. Evidence based medicine: what it is and what it isn't. BMJ. 1996;

10. Green T, Willson G, Martin D, Fallon K. What is the quality of clinical practice guidelines for the treatment of acute lateral ankle ligament sprains in adults? A systematic review. BMC Musculoskelet Disord. 2019;20(1):1–13.

11. Eechaute C, Vaes P, Duquet W. The chronic ankle instability scale: Clinimetric properties of a multidimensional, patient-assessed instrument. Phys Ther Sport. 2008;9(2):57–66.

12. Martin RRL, Irrgang JJ, Burdett RG, Conti SF, Van Swearingen JM. Evidence of validity for the Foot and Ankle Ability Measure (FAAM). Foot Ankle Int. 2005;26(11):968–83.

13. Binkley JM, Stratford PW, Lott SA, Riddle DL. The Lower Extremity Functional Scale (LEFS): Scale development, measurement properties, and clinical application. Phys Ther. 1999;79(4):371–83.

14. Bachmann LM, Kolb E, Koller MT, Steurer J, Riet G. Accuracy of Ottawa ankle rules to exclude fractures of the ankle and mid-foot: systematic review. 2003;1–7.

15. Ladeira CE, Cheng MS, Da Silva RA. Clinical specialization and adherence to evidence-based practice guidelines for low back pain management: A survey of US physical therapists. J Orthop Sports Phys Ther. 2017;47(5):347–58.

16. Battista S, Salvioli S, Millotti S, Testa M, Dell'Isola A. Italian physiotherapists' knowledge of and adherence to osteoarthritis clinical practice guidelines: a cross-sectional study. BMC Musculoskelet Disord. 2021;22(1):1–12.

17. Clarice Y. Tang; Rebecca Pile; Anna Croft; Narelle J. Watson. Exploring Physical Therapist Adherence to Clinical Guidelines When Treating Patients With Knee Osteoarthritis in Australia: A Mixed Methods Study. Phys Ther Vol. 2020;100(7):1084.

18. Spitaels D, Hermens R, Van Assche D, Verschueren S, Luyten F, Vankrunkelsven P. Are physiotherapists adhering to quality indicators for the management of knee osteoarthritis? An observational study. Musculoskelet Sci Pract. 2017;27:112–23.

19. Andersson SF, Bergman S, Henriksson EW, Bremander A. Arthritis management in primary care – A study of physiotherapists' current practice, educational needs and adherence to national guidelines. Musculoskeletal Care. 2017;15(4):333–40.

20. Peter WF, Nelissen RGHH, Vliet Vlieland TPM. Guideline recommendations for post-acute postoperative physiotherapy in total hip and knee arthroplasty: Are they used in daily clinical practice? Musculoskeletal Care. 2014;12(3):125–31.

21. Zadro JR, Ferreira G. Has physical therapists' management of musculoskeletal conditions improved over time? Brazilian J Phys Ther [Internet]. 2020;24(5):458–62. Available from: https://doi.org/10.1016/j.bjpt.2020.04.002

22. Kristensen N, Nymann C, Konradsen H. Implementing research results in clinical practice- the experiences of healthcare professionals. BMC Health Serv Res [Internet]. 2016;16(1):1–10. Available from: http://dx.doi.org/10.1186/s12913-016-1292-y

23. Vliet Vlieland TPM, Van Den Ende CHM, Alliot-Launois F, Beauvais C, Gobbo M, Iagnocco A, et al. Educational needs of health professionals working in rheumatology in Europe. RMD Open. 2016;2(2):1–9.

24. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. J Clin Epidemiol. 2008;61(4):344–9.

25. Blackmer WS. EU general data protection regulation. Am Fuel Petrochemical Manuf AFPM - Labor Relations/Human Resour Conf 2018. 2018;2014(October 1995):45–62.

26. Joshi A, Kale S, Chandel S, Pal D. Likert Scale: Explored and Explained. Br J Appl Sci Technol. 2015;7(4):396–403.

27. Suárez-Alvarez J, Pedrosa I, Lozano LM, García-Cueto E, Cuesta M, Muñiz J. Using reversed items in likert scales: A questionable practice. Psicothema. 2018;30(2):149–58.

28. Taherdoost H. Determining sample size; How to calculate survey sample size. Int J Econ Manag Syst [Internet]. 2017;2(2):237–9. Available from: http://www.iaras.org/iaras/journals/ijems

29. Cutolo R, Battista S, Testa M. Actual and perceived level of scientific english across italian physiotherapy courses: A cross-sectional study. Healthc. 2021;9(9):1–11.