*Journal of Athletic Training* 2025;60(2):134–142
doi: 10.4085/1062-6050-0575.23

www.natajournals.org



# Ankle Scientific Knowledge and Physiotherapy Practice: A Thematic Analysis of Clinical Behaviors of French-Speaking Physiotherapists

**Romain Tourillon, PT, MSc, CMP*†; Eamonn Delahunt, PT, PhD‡§; François Fourchet, PT, PhD*‖; Brice Picot, PT, PhD‖¶; Massamba M'Baye, PT, S&C#**

*Physiotherapy Department and Motion Analysis Lab, Swiss Olympic Medical Center, La Tour Hospital, Meyrin, Switzerland; †University Lyon, UJM-Saint-Etienne, Inter-University Laboratory of Human Movement Biology, Saint-Etienne, France; ‡School of Public Health, Physiotherapy and Sports Science and §Institute for Sport and Health, University College Dublin, Ireland; ‖French Society of Sports Physical Therapist (SFMKS Lab), Pierrefitte-sur-Seine, France; ¶Inter-University Laboratory of Human Movement Biology (LIBM), Savoie Mont-Blanc University, Chambéry, France; #Kin'Aixpert, Viviers du Lac, France

***Context:*** Chronic ankle instability (CAI) is prevalent among individuals who sustain a lateral ankle sprain (LAS) injury. The persistence of the characteristic long-standing clinical symptoms of CAI may be attributable to the lack of adoption by physiotherapists of evidence-informed clinical guidelines.

***Objective:*** To investigate the extent to which French-speaking physiotherapists implement the International Ankle Consortium rehabilitation-oriented assessment (ROAST) framework when providing clinical care for individuals with an acute LAS injury.

***Design:*** Cross-sectional study.

***Setting:*** Online survey informed by a Delphi process of foot-ankle experts.

***Patients or Other Participants:*** A total of 426 French-speaking physiotherapists completed the online survey.

***Main Outcome Measure(s):*** The survey was disseminated to French-speaking physiotherapists in France; Switzerland; Quebec, Canada; Luxembourg; and Belgium. It comprised closed and open-ended questions organized in 5 sections: (1) participant demographics, (2) participant self-assessment of expertise, (3) clinical diagnostic assessment of the ankle (bones and ligaments), (4) clinical evaluation after an acute LAS injury (ROAST framework), and (5) CAI. The qualitative data from the open-ended questions were analyzed using best-practice thematic-analysis guidelines.

***Results:*** Only 6.3% ($n = 27$) of the respondents could name all Ottawa Ankle Rules criteria. Only 25.6% ($n = 109$) of the respondents cited or described criterion standard tests from the literature to assess the integrity of the lateral ankle ligaments. Less than 25% ($n = 71$) of the respondents reported using clinical evaluation outcome metrics (ROAST) recommended by the International Ankle Consortium to inform their clinical care for individuals with an acute LAS injury. In general, the respondents had a greater knowledge of the functional than the mechanical insufficiencies associated with CAI.

***Conclusion:*** A minority of French-speaking physiotherapist survey respondents use the International Ankle Consortium ROAST to inform their clinical care for individuals with an acute LAS injury. This highlights the responsibility of the scientific community to better disseminate evidence-informed research to clinicians.

***Key Words:*** ankle sprain, chronic ankle instability, evidence-based practice, knowledge translation, practice change

**Key Points**

- A minority of French-speaking physiotherapist survey respondents use the clinical evaluation outcome metrics recommended by the International Ankle Consortium rehabilitation-oriented assessments to inform their clinical care for individuals with an acute lateral ankle sprain injury.
- Non-English speakers are at a substantial disadvantage regarding their ability to understand and correctly implement evidence-informed clinical research that is published in English-language scientific journals.
- The foot-ankle research community should endeavor to better disseminate evidence-informed research to clinicians in ways that can overcome constraints imposed by language and geographical location.

Acute lateral ankle sprain (LAS) injuries are the most common musculoskeletal injury incurred by individuals who partake in sport or recreational physical activities.[1,2] The incidence of LAS injuries among the general population has been reported to be as high as 2.15 per 1000 person-years.[2] LAS injuries account for as many as 3% to 5% of all emergency department visits per year in the United Kingdom.[3] However, this is likely an

underestimation considering that 50% to 64% of individuals who sustain an acute LAS injury do not seek medical attention for their injury.[4,5] Therefore, it is unsurprising that the risk of LAS injury recurrence is high.[6,7] As many as 40% of individuals who incur a first acute LAS injury develop chronic ankle instability (CAI), which is characterized by self-reported episodes of "giving-way" of the ankle joint, self-reported perceptions of ankle instability, and recurrent injuries.[8,9] CAI has been reported to be associated with the development of post-traumatic osteoarthritis.[10] The combination of this catastrophic cascade (LAS injury, recurrent injury, CAI, and development of post-traumatic osteoarthritis) and the associated economic costs makes the burden of LAS injury indisputable.[1,6]

To reduce the effect of LAS and CAI on society and health care systems, the need for continued research and dissemination of research-informed knowledge has been promoted by the International Ankle Consortium (IAC).[11] This community has published consensus statements to provide best-practice and evidence-informed recommendations related to the definition of CAI as well as the prevalence, effect, and long-term consequences of LAS injury.[1,11] Furthermore, this community has developed the rehabilitation-oriented assessment (ROAST) framework for acute LAS injury.[12] The ROAST framework presents recommendations on a minimum standard pragmatic clinical assessment as well as a 10-point guideline by which clinicians can sharpen the focus of their rehabilitation planning to specifically address insufficiencies known to be associated with CAI. Despite growing research related to LAS injury and CAI, research findings (evidence) will not change health outcomes unless health care organizations, systems, and professionals implement them in clinical practice.[13] *Knowledge translation* is defined as the process of moving from what has been learned through research to its application in different decision-making contexts, and it is considered an important process to provide more effective health services.[13] However, the translation of research findings into clinical practice remains challenging, with multiple barriers coming from both researchers or practitioners.[14] This has been shown in ankle research, whereby researchers have reported that Irish clinicians had a limited understanding of the full spectrum of insufficiencies that are associated with CAI.[15] One possible barrier to knowledge translation could be the lack of time that clinicians have to read journal articles, and researchers have reported that changes in day-to-day clinical practices are most commonly informed by knowledge acquired by attending courses.[16] Another possible barrier more related to international populations could be the difficulty of reading and understanding English, which has become the dominant language in the global scientific community.[17] As a consequence, non-English speakers are at a disadvantage when trying to understand and implement published research, which is typically written in English for higher impact.[18,19]

In this context, the purposes of our study were to (1) investigate the extent to which French-speaking (FR) physiotherapists implement the IAC ROAST framework when providing clinical care for individuals with an acute LAS injury and (2) investigate the knowledge of FR physiotherapists regarding the mechanical and functional insufficiencies that are associated with CAI. Based on the previous potential barriers mentioned earlier, we hypothesized that a large proportion of FR physiotherapists would not routinely implement the IAC ROAST framework when providing clinical care for individuals with an acute LAS injury. We also hypothesized that they would have a limited understanding of the mechanical and functional insufficiencies that are associated with CAI.

## METHODS

### Study Design

We conducted a cross-sectional study by administering an online survey to FR physiotherapists working in several FR countries. Ethical exemption was received from the Commission Cantonale d'Ethique de la Recherche sur l'Être Humain of Geneva due to the anonymous nature of the questionnaire, and the study was approved by La Tour Hospital, Swiss Olympic Medical Center. All responses were anonymous, and no personal data were collected. By completing the survey, all participants consented to the use of their answers for research purposes.

### Participants

The eligible population comprised FR physiotherapists practicing in France; Switzerland; Quebec, Canada; Luxembourg; and Belgium with the following inclusion criteria: age of $\geq$18 years, registered in their respective national professional society, and legally able to provide consent to participate in the study.

### Survey Validation: Modified Delphi Process

The survey was developed by 2 researchers (R.T. and E.D.) who, at the time, were members of the executive committee of the IAC, 2 researchers experienced in sports science (F.F. and B.P.), and 1 physiotherapist (M.M.). Based on previous methodology, our survey validation was informed by a Delphi process among FR foot-ankle experts.[20] We sent an email to all the experts from our network seeking their participation in the Delphi process. They were required to complete the first round of the Delphi process within 6 weeks of receiving the email invitation. A reminder email was sent to all individuals 3 weeks after the initial email invitation. Twenty-two experts based in France ($n = 12$); Switzerland ($n = 5$); Belgium ($n = 3$); and Quebec, Canada ($n = 2$), participated in the Delphi process. The panel comprised physiotherapists ($n = 13$), surgeons ($n = 3$), physicians ($n = 4$), a podiatrist ($n = 1$), and a scientist ($n = 1$). The experts were asked to express their agreement with each survey question on a Likert scale ranging from 1 to 5 (1 = *strongly disagree*, 2 = *disagree*, 3 = *no opinion*, 4 = *agree*, and 5 = *strongly agree*). They also had the opportunity to suggest a modification to the question when agreement was not reached. To establish the level of agreement, the total percentage of *strongly agree* and *agree* responses was calculated for each question. A cutoff score of 75% was required for consensus agreement. After 2 rounds, all experts agreed with the final survey, which was then pilot tested.

### Survey Data Collection and Diffusion

The final version of the survey was hosted via SurveyMonkey (http://www.surveymonkey.com) and comprised 5 sections: (1) participant demographics (age, sex, country, employment status, qualification, etc); (2) participant self-

assessment of expertise in the clinical assessment, diagnosis, and treatment of patients with acute LAS injury and CAI; (3) clinical diagnostic assessment of the ankle (bones and ligaments); (4) clinical evaluation after an acute LAS injury (IAC ROAST framework); and (5) CAI (definition and mechanical and functional insufficiencies). The English translation of the survey is presented in Supplemental Material 1 (available online at https://dx.doi.org/10.4085/1062-6050-0575.23.S1).

In the self-assessment section, participants were asked to rate their expertise on a 10-point Likert scale, with 10 indicating the *highest level of expertise*. The definitions of clinical assessment, medical diagnosis, and treatment/rehabilitation were provided to the participants in the online survey (see Supplemental Material 1). The third section concerning clinical diagnostic assessment of the ankle (ie, bones and ligaments) included both closed and open-ended questions.[12,21–23] Clinical evaluation after an acute LAS injury (fourth section) included closed and open-ended questions related to the IAC ROAST framework.[12] In this section, participants were asked about their use of each framework item during the rehabilitation process/period (acute, subacute, functional, and return-to-sport phase) for patients with acute LAS injury. Finally, the fifth section included open-ended questions about participants' definitions of CAI and their knowledge of the mechanical and functional insufficiencies associated with CAI.[11,24,25]

The invitation to complete the questionnaire via SurveyMonkey was distributed separately in each country between October 12, 2020, and September 28, 2021. This data-collection period was considered reasonable because no requests to complete the survey were made after this time. In each country, the survey was distributed via either newsletter diffusion of national or regional authorities or mailing list diffusion of scientific or continuing education organizations. This strategy permitted an email to be sent to approximately 13 053 FR physiotherapists throughout the 5 countries.

### Statistical Analyses

Descriptive statistics were generated by SurveyMonkey software and subsequently imported into Microsoft Excel 2016 (Microsoft Corp) to facilitate development of figures and tables. Closed questions were appraised with descriptive analysis and summarized as narrative text. Qualitative data generated from the open-ended questions were translated verbatim and compiled in Excel. The analysis of qualitative data from the open-ended questions followed thematic-analysis guidelines and was separated into the following 5 steps: (1) compiling, (2) disassembling, (3) reassembling, (4) interpreting, and (5) concluding.[26,27] During the process, 2 researchers (R.T. and M.M.) independently created a set of codes (categories and subcategories) from participant answers for each open-ended question. When agreement was not reached, a third researcher (F.F.) was consulted to reach a consensus. Similarly, descriptive analysis of the participant response rate in each category and subcategory was summarized as narrative text.

## RESULTS

From a potential list of 13 053 FR physiotherapists, a total of 763 (5.8%) FR physiotherapists accessed the survey between October 12, 2020, and September 28, 2021. Of the 763 FR physiotherapists, 426 (55.8%) individuals completed all questions of sections 1, 2, and 3 fully, with most respondents (range, 390–424 respondents) completing most or all questions in sections 4 and 5. Descriptive statistics of the 426 survey respondents for sections 1 and 2 are detailed in Table 1. Most (77.5%) respondents had a postgraduate qualification. The overall mean level of participant self-assessment regarding their expertise in the clinical assessment, diagnosis, and treatment of patients with acute LAS injury or CAI was 6.6 of 10.

The principal results of section 3 of the online questionnaire are detailed in Table 2. Concerning the clinical assessment of the skeletal tissues of the ankle joint, 48.1% ($n = 205$) of respondents cited the Ottawa Ankle Rules (OAR), but only 6.3% ($n = 27$) were able to correctly list all criteria. In total, 36.6% ($n = 156$) of respondents were unable to cite any of the OAR criteria. In addition, only 24.6% ($n = 105$) of respondents had an accurate knowledge of the sensitivity and specificity of the OAR. Instead of using the OAR to assess the skeletal tissues of the ankle joint, a substantial proportion (40.4%; $n = 172$) of respondents proposed their own assessments, which included visual observation, percussion, and subjective quantification of gait. Regarding the clinical assessment of the ligaments of the ankle joint, only 25.6% ($n = 109$) of respondents mentioned the anterior drawer test or the talar tilt test. A similarly small number of respondents mentioned the squeeze test (17.1%; $n = 73$) or the external rotation test (15.3%; n = 65) for the clinical assessment of the syndesmosis ligaments. Instead of these tests, a large proportion (46.9%–56.8%; $n = 200$–$242$) of respondents proposed their own tests, which included general observation, mobilization of the ankle joint, and ligament stress tests in nonspecific positions (see Supplemental Material 2, available online at https://dx.doi.org/10.4085/1062-6050-0575.23.S2).

Section 4 of the questionnaire included questions related to the clinical evaluation of acute LAS injury and specifically the ROAST framework. The results of this section revealed that, except for patient-reported outcome measure (PROM) questionnaires, a large proportion of respondents (>70%) displayed knowledge of each ROAST framework item (Figures 1 and 2); only 18.2% ($n = 71$) of respondents reported that they regularly used a PROM questionnaire, and only 47.9% ($n = 34$) of this group of respondents were able to name a specific ankle PROM questionnaire. However, the results indicated that the clinical assessment methods used by respondents to evaluate each ROAST item are heterogeneous and in most instances do not align with the recommendations proposed by the IAC in their ankle clinical evaluation framework.[12] For example, only 28.1% ($n = 111$) of respondents reported using the figure-of-8 test to evaluate ankle-joint swelling, only 37.0% ($n = 142$) of respondents reported using the weightbearing lunge test to evaluate ankle-joint dorsiflexion range of motion, and only 23.7% ($n = 77$) of respondents reported using the Y-Balance Test or Star Excursion Balance Test to evaluate dynamic postural balance (Figures 1 and 2).

Section 5 of the questionnaire sought participants' definitions of CAI and their knowledge of the mechanical and functional insufficiencies that are associated with CAI. Regarding the definition of CAI, 62.4% ($n = 266$) of respondents included reference to recurrent sprain, 37.1% ($n = 158$) of respondents defined CAI as

**Table 1. Physiotherapist characteristics and self-assessment (*N* = 426)**

| Characteristic | Mean ± SD |
|---|---|
| Age, y | 37.1 ± 10.96 |
| Level of expertise self-assessment, 10-point Likert scale | |
| Clinical assessment | 6.4 ± 1.6 |
| Diagnosis | 6.3 ± 1.7 |
| Treatment | 7.0 ± 1.4 |
| Clinical experience, y | 13.2 ± 10.8 |
| | No. (%)[a] |
| Sex | |
| Female | 202 (47.4) |
| Male | 224 (52.6) |
| Country | |
| Belgium | 26 (6.1) |
| France | 230 (54.0) |
| Luxembourg | 45 (10.6) |
| Quebec, Canada | 61 (14.3) |
| Switzerland | 64 (15.0) |
| Employment status[b] | |
| Private practice | 377 (88.5) |
| Public hospital | 20 (4.7) |
| Private clinic | 16 (3.8) |
| Rehabilitation center | 24 (5.6) |
| Sports structures | 29 (6.8) |
| Others | 19 (4.5) |
| Research activity | 17 (4.0) |
| Senior research fellow | 1 (0.2) |
| Postdoctoral researcher | 2 (0.5) |
| PhD candidate researcher | 6 (1.4) |
| Research assistant | 4 (0.9) |
| Others | 4 (0.9) |
| Postgraduate qualification[b] | 330 (77.5) |
| Sport physiotherapy | 149 (35.0) |
| Musculoskeletal physiotherapy | 200 (46.9) |
| Foot-ankle joint complex | 92 (21.6) |
| Manipulative therapy | 62 (14.6) |
| Patients with lateral ankle sprain/chronic ankle instability treated | |
| 1/mo | 146 (34.3) |
| 1/wk | 131 (30.8) |
| 2–6/wk | 142 (33.3) |
| >6/wk | 7 (1.6) |

[a] Percentages are calculated from a denominator of 426.
[b] Participants could choose >1.

**Table 2. Results of Thematic Analysis for Bone and Ligamentous Integrity (*N* = 426)**

| | No. (%) |
|---|---|
| Part 1: bone integrity | |
| Ottawa Ankle Rules | 205 (48.1) |
| Bernese Ankle Rules | 18 (4.2) |
| Tuning fork test | 66 (15.5) |
| General observations excluding Ottawa Ankle Rules | 172 (40.4) |
| Walking or weightbearing status excluding Ottawa Ankle Rules | 134 (31.5) |
| Manual bone percussions | 71 (16.7) |
| Declared "do not know" | 15 (3.5) |
| Part 2: ligamentous integrity | |
| Anterior talofibular ligament | |
| Name or describe anterior drawer test | 109 (25.6) |
| Name or describe ligament palpation | 82 (19.2) |
| Other | 242 (56.8) |
| Declared "do not know" | 75 (17.6) |
| Cluster: anterior drawer test and ligament palpation | 13 (3.1) |
| Calcaneofibular ligament | |
| Name or describe talar tilt test | 109 (25.6) |
| Name or describe ligament palpation | 70 (16.4) |
| Other | 200 (46.9) |
| Declared "do not know" | 97 (22.8) |
| Cluster: talar tilt test and ligament palpation | 18 (4.2) |
| Syndesmosis ligaments | |
| Name or describe squeeze test | 73 (17.1) |
| Name or describe external rotation test | 65 (15.3) |
| Name or describe weightbearing dorsiflexion test | 18 (4.2) |
| Name or describe ligament palpation | 55 (12.9) |
| Other | 208 (48.8) |
| Declared "do not know" | 105 (24.6) |
| Cluster: squeeze test + external rotation test + weightbearing dorsiflexion test + ligament palpation | 3 (0.7) |

the presence of sensorimotor deficits after LAS injury, 25.1% ($n = 107$) of respondents defined CAI as the presence of ankle hyperlaxity after LAS injury, and 29.8% ($n = 127$) of respondents defined CAI as the presence of a perception of instability after LAS injury. For the functional insufficiencies that are associated with CAI, 55.6% ($n = 237$) of respondents mentioned the generic term sensorimotor deficits (Figure 3A). The 3 most-identified sensorimotor deficits included the following: balance deficits (52.3%; $n = 124$), strength deficits (44.3%; $n = 105$), and proprioception deficits (36.3%; $n = 86$). Regarding mechanical insufficiencies that are associated with CAI, 41.7% ($n = 166$) of respondents mentioned the generic term sensorimotor deficits (Figure 3B). Parallel to that, the 2 most-identified mechanical insufficiencies included the following: ankle hyperlaxity (32.2%; $n = 128$) and ankle dorsiflexion range-of-motion deficits (28.6%; $n = 114$).

## DISCUSSION

The main findings of this study were that less than one-fourth of the survey respondents (1) use the IAC ROAST framework when providing clinical care for individuals with an acute LAS injury and (2) have a clear understanding of the full spectrum of mechanical and functional insufficiencies associated with CAI development. These results were surprising considering that a large proportion of the respondents have a postgraduate qualification in sports physiotherapy, musculoskeletal physiotherapy, foot-ankle joint complex, manipulative therapy, or a combination. We also noted a remarkable discrepancy between the low level of evidence-based answers provided by the respondents and their high self-assessed expertise in clinical assessment, diagnosis, and treatment (≈7/10), which is close to the level of the expert panel members of the IAC (≈8/10).[12] These findings highlight the gap in knowledge between the best available scientific evidence and self-reported clinical practice in FR countries regarding management of acute LAS injury and CAI.

### Section 3: Clinical Diagnostic Assessment of the Ankle

The OAR are the most commonly used clinical prediction rules because they are simple and quick to implement in practice.[21] Even though the OAR were published almost 30 years ago and have been taught for years in physiotherapy programs at FR schools and universities, a

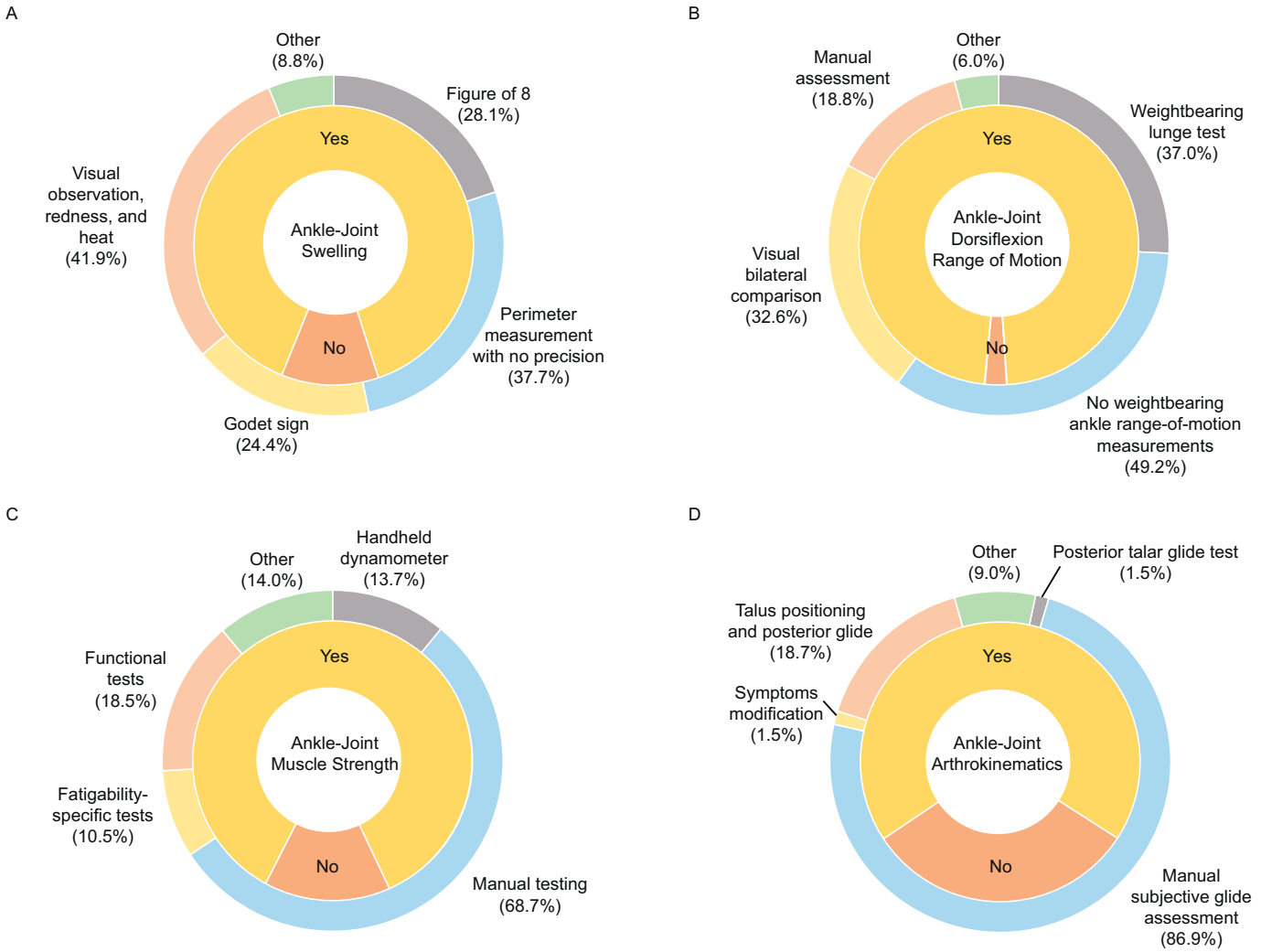


**Figure 1. Thematic analysis of clinical evaluation after an acute lateral ankle sprain (rehabilitation-oriented assessment framework items). A, Ankle-joint swelling themes. B, Ankle-joint dorsiflexion range-of-motion themes. C, Ankle-joint muscle-strength themes. D, Ankle-joint arthrokinematics themes.**

small proportion of survey respondents (24.6%) know how to implement the OAR in clinical practice.[22] In the respondents' medical systems, the health care providers who have first contact with most patients after an LAS and provide clinical diagnostic assessment are medical doctors in emergency departments or private practice. Therefore, for the past decade, implementing the OAR in daily practice has not been a priority for our respondents, which could explain our results. However, even if FR physiotherapists are rarely included on the primary care team, they should know how to implement the OAR because, from our experience, they may need to use these rules in certain cases in their daily practices (eg, live game and no rapid medical care available). Regarding lateral ligament integrity assessment, half of the respondents (≈51.9%) specified that they used their own modified version of reference tests. This could be problematic, as modified versions of reference tests lack psychometric validity and could lead to misdiagnosis of ligament integrity in practice. In addition, very few respondents (≈3.7%) reported using a cluster of tests (eg, palpation + stress test), which is known to increase the efficacy of ankle diagnostic tests.[23] For the assessment of the integrity of the syndesmosis ligaments, a similar response pattern was observed, with 48.8% of respondents reporting use of a modified test and only 2.3% of respondents reporting use of a cluster of at least 2 reference tests.[12,28] Given that imaging or arthroscopy is indicated when a cluster of diagnostic tests are positive, the practice of not using these tests could result in underdiagnosis of syndesmosis ligament injury, leading to potential long-term residual deficits (eg, prolonged pain, disability, and premature ankle arthritis) associated with these high ankle sprains.[29]

## Section 4: Clinical Evaluation After an LAS Injury

In consensus statements, the IAC has proposed that LAS recurrence might be due to inadequate rehabilitation.[1,12] The IAC has suggested that clinicians should implement the ROAST guidelines when managing acute ankle-sprain injuries because a rehabilitation program based on objectively identified injury-associated impairments could help reduce the risk of recurrent injuries (a key feature of CAI).[12] Our results indicated that a large proportion of

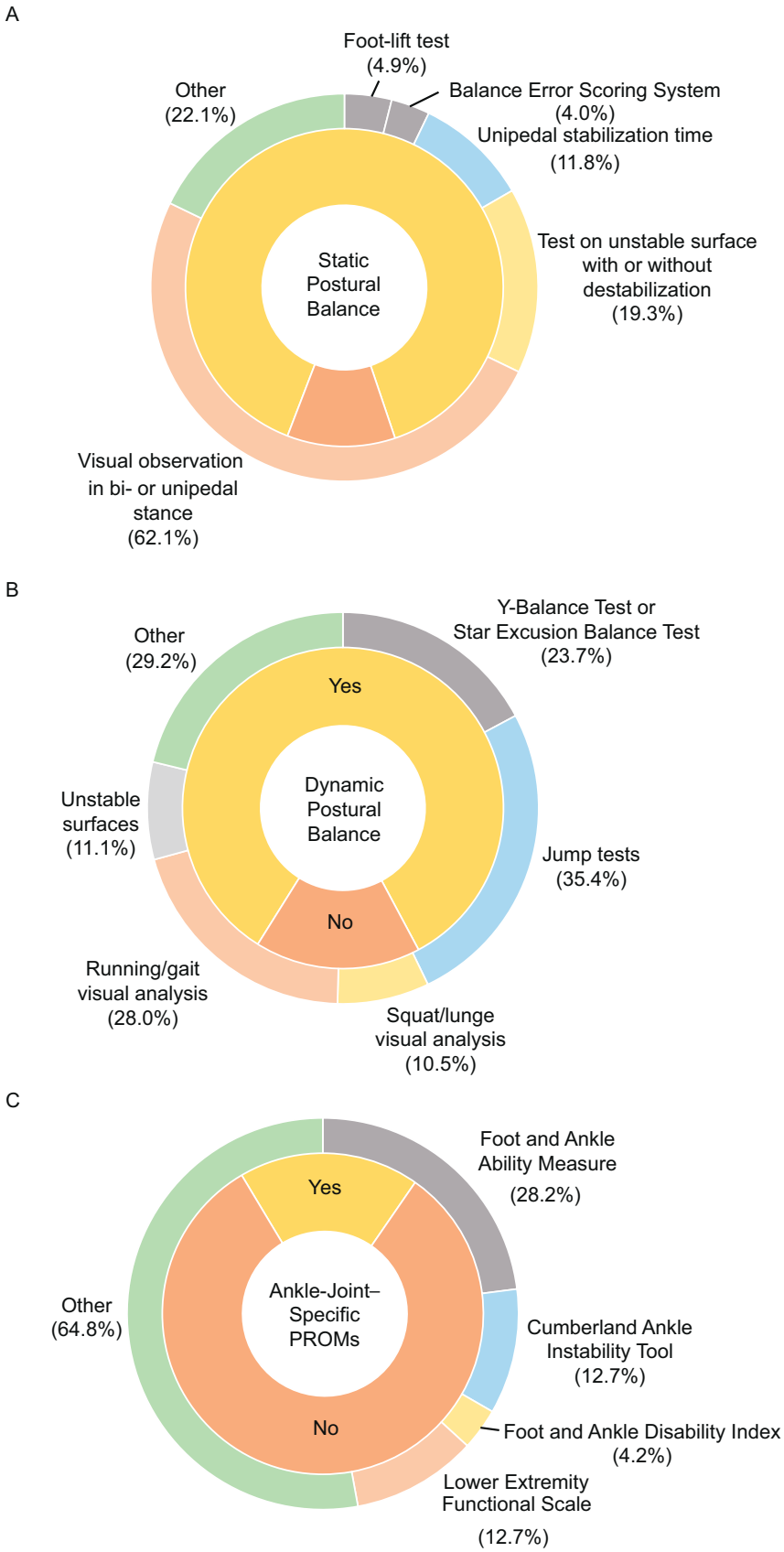


**Figure 2. Thematic analysis of clinical evaluation after an acute lateral ankle sprain (rehabilitation-oriented assessment framework items). A, Static postural balance set of themes. B, Dynamic postural balance themes. C, Ankle-joint–specific patient-reported outcome measures (PROMs) themes.**

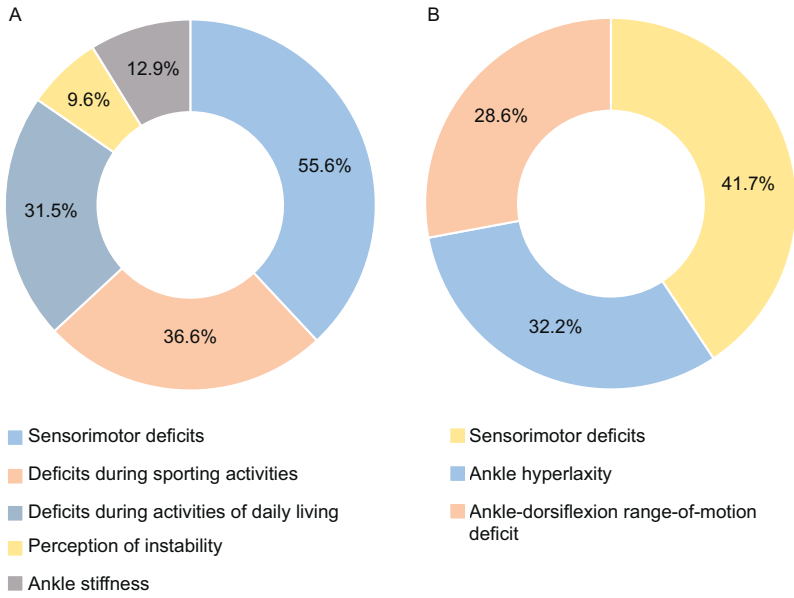


**Figure 3. Top-described themes concerning functional and mechanical insufficiencies that contribute to chronic ankle instability. A, The 5 most-described themes regarding functional insufficiencies. B, The 3 most-described themes regarding mechanical insufficiencies.**

respondents likely overestimated their self-perceived expertise related to the clinical assessment of acute ankle-sprain injuries. A minority of respondents reported performing evidence-informed objective impairment-based clinical assessments during the rehabilitation process after acute LAS injury, as evidenced by 68.7% of respondents using subjective manual muscle tests to determine the presence or absence of shank muscle-strength impairments. The use of subjective manual muscle tests is questionable, and the results obtained from such clinical assessments are likely to lead to unreliable findings. Our results reinforce the need to teach and claim the importance of using objective impairment-based clinical assessments in the curricula and continuing education courses for FR physiotherapists. Finally, in this section, a large majority of respondents (81.8%) reported that they do not use important PROMs questionnaires, such as the Foot and Ankle Ability Measure or the Cumberland Ankle Instability Tool.[30,31] Although these PROMs are now available and validated in French, their underutilization reduces the ability of survey respondents to properly detect patient self-reported functional deficits, functional ankle instability, and severity of the instability.[30–33]

## Section 5: CAI

The accepted definition of CAI endorsed by the IAC is the presence of residual symptoms such as self-reported episodes of "giving way" of the ankle joint and/or self-reported perception of ankle-joint instability and/or self-reported recurrent sprains after the occurrence of at least 1 significant ankle-sprain injury.[11] Our results suggested that a thorough understanding of the concept of CAI is lacking among our survey respondents. Giving way was only identified by 14.3% of respondents, perception of ankle-joint instability was only identified by 29.8% of respondents, and recurrent sprains were identified by 62.4% of respondents. In addition, our results showed that survey respondents do not have a thorough comprehension of the difference between functional and mechanical insufficiencies, as sensorimotor deficits was the most frequently cited theme for each. In 2002, Hertel[24] published the first model of CAI in which it was proposed that CAI results from the interaction between *mechanical instability*, defined as pathological laxity after ankle-ligament injury, and *functional instability*, defined as the occurrence of recurrent ankle instability and the sensation of joint instability due to the contribution of proprioceptive and neuromuscular deficits. Therefore, including sensorimotor deficits as a key theme for both mechanical and functional instability illustrates that survey respondents are likely unaware of the range of different mechanical insufficiencies that can contribute to the development of CAI (eg, degenerative changes and tissue adaptations).[24,25] Such a misunderstanding could result in the implementation of suboptimal treatment such that important mechanical insufficiencies are never addressed as part of the rehabilitation process, thus perpetuating the cascade of chronic symptoms and prolonged long-term deficits.[1,12]

## Implications

The survey respondents' gap in knowledge between the best available scientific evidence and their actual clinical practice has implications for researchers, practitioners, and journal editors. First, it highlights the potential problem of a language barrier and the disadvantage of survey respondents not understanding English-language articles.[18] To overcome this barrier, a well-known international continuing education website (Physio Network) that includes infographics, research reviews, and podcasts has been translated into French for several years. However, our results showed that translation of the OAR, the ROAST framework, and the first model of CAI into French is not enough to fill the knowledge gap, so other options must be considered.[12,24,34] As proposed by Fung, providing translations of abstracts into languages other than English and using a wiki-open translation or an international board of translator editors could be valuable options for journal editors.[18] Second, our

results underscore the responsibility of researchers to disseminate the clinical applications of their findings to clinicians who may have little time to read journal articles. Therefore, one possible strategy of dissemination could be the better use of easy-to-understand and viewer-friendly media, such as infographics, article synthesis, and website blogs that are now more frequently translated into French. Outside conventional journal publications, continuing education courses are the biggest source of practice-changing information for practitioners, as highlighted by Whiteley et al.[16] We do not know if our respondents prefer gathering their information from courses, but we think that social media and courses are options for enhanced knowledge translation to bridge the gap between research and practice.[35] Whereas individuals who teach continuing professional development courses need to ensure that the material they deliver to practitioners is contemporaneous and evidence informed, practitioners must integrate this new scientific evidence into their practice and learn continually and sustainably.

### Limitations

Our investigation had several limitations. First, we disseminated our survey via official, scientific, or education authorities of each country and not via social media. This method was decided a priori to avoid inclusion bias, but the total number of respondents could be considered low compared with the number of physiotherapists in the included countries. Second, the FR physiotherapists who participated in this survey were likely more interested in LAS and therefore more educated and more aware of recent clinical guidelines. Third, although attending to the psychosocial aspects of injury is essential when managing LAS injuries, as highlighted in the updated model of CAI, we focused solely on the biological aspect of the "biopsychosocial" model during clinical assessment.[25] We limited our focus in part to ensure the time to complete the questionnaire would not exceed 25 minutes and, thus, ensure the highest response rate.[36] Last, we only recruited from the 5 FR countries with the largest numbers of physiotherapists, with most respondents being from France and working in private practice, so our results are not generalizable to other FR physiotherapy populations. However, the educational systems (based on internships) and modes of professional practice (employment in institutions or independent self-employment) were sufficiently analogous in the 5 chosen countries, allowing the derivation of overarching conclusions from our study.

## CONCLUSIONS

Our results suggest that a minority of the FR physiotherapists who responded to our survey use evidence-informed clinical assessment approaches for patients with acute LAS injuries and CAI. Their lack of knowledge of the insufficiencies that are associated with CAI is concerning and suggests that several important insufficiencies are likely never addressed as part of the rehabilitation process. This, in turn, could perpetuate the cascade of chronic symptoms. More efforts are needed from both researchers and clinicians to improve knowledge translation from science to clinical practice. Without such efforts, the prevalence of CAI will likely remain high among their patients.

## ACKNOWLEDGMENTS

We thank all the physiotherapists who selflessly participated in the study.

## REFERENCES

1. Gribble PA, Bleakley CM, Caulfield BM, 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):1496–1505. doi:10.1136/bjsports-2016-096189
2. Waterman BR, Owens BD, Davey S, Zacchilli MA, Belmont PJ II. The epidemiology of ankle sprains in the United States. *J Bone Joint Surg Am*. 2010;92(13):2279–2284. doi:10.2106/JBJS.I.01537
3. Cooke MW, Lamb SE, Marsh J, Dale J. A survey of current consultant practice of treatment of severe ankle sprains in emergency departments in the United Kingdom. *Emerg Med J*. 2003;20(6):505–507. doi:10.1136/emj.20.6.505
4. McKay GD, Goldie PA, Payne WR, Oakes BW. Ankle injuries in basketball: injury rate and risk factors. *Br J Sports Med*. 2001;35(2):103–108. doi:10.1136/bjsm.35.2.103
5. Hiller CE, Nightingale EJ, Raymond J, et al. Prevalence and impact of chronic musculoskeletal ankle disorders in the community. *Arch Phys Med Rehabil*. 2012;93(10):1801–1807. doi:10.1016/j.apmr.2012.04.023
6. Verhagen EA, van Tulder M, van der Beek AJ, Bouter LM, van Mechelen W. An economic evaluation of a proprioceptive balance board training programme for the prevention of ankle sprains in volleyball. *Br J Sports Med*. 2005;39(2):111–115. doi:10.1136/bjsm.2003.011031
7. Hubbard-Turner T. Lack of medical treatment from a medical professional after an ankle sprain. *J Athl Train*. 2019;54(6):671–675. doi:10.4085/1062-6050-428-17
8. Doherty C, Bleakley C, Hertel J, Caulfield B, Ryan J, Delahunt E. Recovery from a first-time lateral ankle sprain and the predictors of chronic ankle instability: a prospective cohort analysis. *Am J Sports Med*. 2016;44(4):995–1003. doi:10.1177/0363546516628870
9. Delahunt E, Coughlan GF, Caulfield B, Nightingale EJ, Lin CW, Hiller CE. Inclusion criteria when investigating insufficiencies in chronic ankle instability. *Med Sci Sports Exerc*. 2010;42(11):2106–2121. doi:10.1249/MSS.0b013e3181de7a8a
10. Hirose K, Murakami G, Minowa T, Kura H, Yamashita T. Lateral ligament injury of the ankle and associated articular cartilage degeneration in the talocrural joint: anatomic study using elderly cadavers. *J Orthop Sci*. 2004;9(1):37–43. doi:10.1007/s00776-003-0732-9
11. Gribble PA, Delahunt E, Bleakley C, et al. Selection criteria for patients with chronic ankle instability in controlled research: a position statement of the International Ankle Consortium. *Br J Sports Med*. 2014;48(13):1014–1018. doi:10.1136/bjsports-2013-093175
12. Delahunt E, Bleakley CM, Bossard DS, 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):1304–1310. doi:10.1136/bjsports-2017-098885
13. Curran JA, Grimshaw JM, Hayden JA, Campbell B. Knowledge translation research: the science of moving research into policy and practice. *J Contin Educ Health Prof*. 2011;31(3):174–180. doi:10.1002/chp.20124
14. Sussman S, Valente TW, Rohrbach LA, Skara S, Pentz MA. Translation in the health professions: converting science into action. *Eval Health Prof*. 2006;29(1):7–32. doi:10.1177/0163278705284441
15. Kerin F, Delahunt E. Physiotherapists' understanding of functional and mechanical insufficiencies contributing to chronic ankle instability. *Athl Train Sports Health Care*. 2011;3(3):125–130. doi:10.3928/19425864-20101029-03

16. Whiteley R, Napier C, van Dyk N, et al. Clinicians use courses and conversations to change practice, not journal articles: is it time for journals to peer-review courses to stay relevant? *Br J Sports Med*. 2021;55(12):651–652. doi:10.1136/bjsports-2020-102736
17. Ofori-Adjei D, Antes G, Tharyan P, Slade E, Tamber PS. Have online international medical journals made local journals obsolete? *PLoS Med*. 2006;3(8):e359. doi:10.1371/journal.pmed.0030359
18. Fung IC. Open access for the non-English-speaking world: overcoming the language barrier. *Emerg Themes Epidemiol*. 2008;5:1. doi:10.1186/1742-7622-5-1
19. Garfield E, Welljams-Dorof A. The microbiology literature: languages of publication and their relative citation impact. *FEMS Microbiol Lett*. 1992;100(1–3):33–37. doi:10.1111/j.1574-6968.1992.tb05678.x
20. Bossard DS, Remus A, Doherty C, Gribble PA, Delahunt E. Developing consensus on clinical assessment of acute lateral ankle sprain injuries: protocol for an international and multidisciplinary modified Delphi process. *Br J Sports Med*. 2018;52(23):1539. doi:10.1136/bjsports-2017-099007
21. Barelds I, Krijnen WP, van de Leur JP, van der Schans CP, Goddard RJ. Diagnostic accuracy of clinical decision rules to exclude fractures in acute ankle injuries: systematic review and meta-analysis. *J Emerg Med*. 2017;53(3):353–368. doi:10.1016/j.jemermed.2017.04.035
22. Stiell IG, Greenberg GH, McKnight RD, et al. Decision rules for the use of radiography in acute ankle injuries. Refinement and prospective validation. *JAMA*. 1993;269(9):1127–1132. doi:10.1001/jama.269.9.1127
23. Gribble PA. Evaluating and differentiating ankle instability. *J Athl Train*. 2019;54(6):617–627. doi:10.4085/1062-6050-484-17
24. Hertel J. Functional anatomy, pathomechanics, and pathophysiology of lateral ankle instability. *J Athl Train*. 2002;37(4):364–375.
25. Hertel J, Corbett RO. An updated model of chronic ankle instability. *J Athl Train*. 2019;54(6):572–588. doi:10.4085/1062-6050-344-18
26. Castleberry A, Nolen A. Thematic analysis of qualitative research data: is it as easy as it sounds? *Curr Pharm Teach Learn*. 2018;10(6):807–815. doi:10.1016/j.cptl.2018.03.019
27. Elo S, Kyngäs H. The qualitative content analysis process. *J Adv Nurs*. 2008;62(1):107–115. doi:10.1111/j.1365-2648.2007.04569.x
28. Netterström-Wedin F, Bleakley C. Diagnostic accuracy of clinical tests assessing ligamentous injury of the ankle syndesmosis: a systematic review with meta-analysis. *Phys Ther Sport*. 2021;49:214–226. doi:10.1016/j.ptsp.2021.03.005
29. Lin CF, Gross MT, Weinhold P. Ankle syndesmosis injuries: anatomy, biomechanics, mechanism of injury, and clinical guidelines for diagnosis and intervention. *J Orthop Sports Phys Ther*. 2006;36(6):372–384. doi:10.2519/jospt.2006.2195
30. Carcia CR, Martin RL, Drouin JM. Validity of the Foot and Ankle Ability Measure in athletes with chronic ankle instability. *J Athl Train*. 2008;43(2):179–183. doi:10.4085/1062-6050-43.2.179
31. Hiller CE, Refshauge KM, Bundy AC, Herbert RD, Kilbreath SL. The Cumberland Ankle Instability Tool: a report of validity and reliability testing. *Arch Phys Med Rehabil*. 2006;87(9):1235–1241. doi:10.1016/j.apmr.2006.05.022
32. Geerinck A, Beaudart C, Salvan Q, et al. French translation and validation of the Cumberland Ankle Instability Tool, an instrument for measuring functional ankle instability. *Foot Ankle Surg*. 2020;26(4):391–397. doi:10.1016/j.fas.2019.05.002
33. Borloz S, Crevoisier X, Deriaz O, Ballabeni P, Martin RL, Luthi F. Evidence for validity and reliability of a French version of the FAAM. *BMC Musculoskelet Disord*. 2011;12:40. doi:10.1186/1471-2474-12-40
34. Banihachemi JJ. Cheville instable: démarche diagnostique et thérapeutique. In: Bendahou M, Saidi K, Besch S, Khiami F, eds. *Traumatisme de la Cheville. Références en Médecine d'Urgence. Collection de la SFMU*. Springer; 2013:241–256. doi:10.1007/978-2-8178-0352-4_21
35. Maloney S, Tunnecliff J, Morgan P, et al. Translating evidence into practice via social media: a mixed-methods study. *J Med Internet Res*. 2015;17(10):e242. doi:10.2196/jmir.4763
36. Revilla M, Ochoa C. Ideal and maximum length for a web survey. *Int J Mark Res*. 2017;59(5):557–565. doi:10.2501/IJMR-2017-039

## SUPPLEMENTAL MATERIAL

**Supplemental Material 1.** English translation of the online survey.

Found at DOI: https://dx.doi.org/10.4085/1062-6050-0575.23.S1

**Supplemental Material 2.** Thematic analysis of the online survey for each open-ended question.

Found at DOI: https://dx.doi.org/10.4085/1062-6050-0575.23.S2

*Address correspondence to Romain Tourillon, PT, MSc, CMP, Physiotherapy Department and Motion Analysis Lab, Swiss Olympic Medical Center, La Tour Hospital, 1217 Meyrin, Switzerland. Address email to romain.tourillon@latour.ch.*