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Healthcare Professionals' Knowledge of the Relative Energy Deficiency in Sport (REDs): A Cross-Sectional Survey Study

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BACKGROUND: The Female/Male Athlete Triad and Relative Energy Deficiency in Sport (REDs) arise from low energy availability and affect health and performance. Despite their prevalence, little is known about healthcare professionals' knowledge in Spain. The aim of this research is to assess the level of knowledge among healthcare professionals in Spain regarding the Female/Male Athlete Triad and Relative Energy Deficiency in Sport (REDs).
METHODS: A cross-sectional electronic survey was distributed through Spanish national professional associations in medicine, nursing, and physiotherapy. The questionnaire included sociodemographic variables, prior general information, and 16 knowledge-based items. It was validated by an expert panel and pilot tested. Descriptive and inferential statistics were applied (ANOVA; $p < 0.05$).
RESULTS: 308 professionals participated (82.14% nurses/physiotherapists; 17.86% physicians). Half (50.3%) had heard of the Triad and 25% of REDs. Physicians demonstrated greater knowledge (72.3% and 45.5%) compared to nurses/physiotherapists (45.5% and 17.4%). Mean scores were 11.53 (SD = 2.7) and 9.86 (SD = 3.2), respectively. Notable gaps existed in menstrual health and nutritional causes of low energy availability.
CONCLUSION: There is a notable lack of knowledge about REDs and the Triad, particularly among nurses and physiotherapists. Targeted educational strategies are necessary for early detection, prevention, and treatment.

INTRODUCTION

Physical activity is a fundamental component in health promotion; however, its practice is not without risks. Among the associated clinical conditions are the Female/Male Athlete Triad (Triad) and Relative Energy Deficiency in Sport (REDs). In 2014, the Triad was defined as a syndrome characterized by low energy availability—with or without eating disorders—menstrual health disorders, and impaired bone health, which may occur in isolation or simultaneously [1]. That same year, the International Olympic Committee introduced the concept of REDs, expanding on the Triad through an international consensus [2].

This new paradigm was based on the premise that sustained low energy availability could lead to a broader spectrum of physiological dysfunctions, with consequences for musculoskeletal, immune, metabolic, cardiovascular, and mental health [2]. In physically active individuals, this could translate into increased injury risk and diminished athletic performance [2]. In 2023, an updated consensus reinforced this definition, emphasizing its impact on both health and performance, and expanding its influence on areas such as energy metabolism, neurocognitive function, and physiological development [3].

Conceptually, REDs is structured around two interrelated models. The health model addresses the syndrome's implications for reproductive, bone,

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haematological, neurological, and cardiovascular function [3], while the performance model focuses on its effects on strength, endurance, recovery, and athlete motivation [3]. In both cases, low energy availability remains the central axis of the syndrome, and its impact depends on the duration and severity of this condition [3].

The prevalence of the Triad and REDs in athletic populations has been estimated to range from 22% to 61%, although these figures vary depending on the methodology used and the type of sport analysed [4–6]. According to the meta-analysis by Gallant et al.(2025), among the 6,118 athletes from various disciplines analysed, the prevalence of low energy availability—a clinical state preceding the development of the Triad and REDs—was approximately 45%. Detection of these conditions is typically supported by clinical tools such as the Low Energy Availability in Females Questionnaire (LEAF-Q) [8], the Low Energy Availability in Males Questionnaire (LEAM-Q) [9], and the RED-S Clinical Assessment Tool 2 (RED-S CAT2) [10].

Given its high prevalence and negative impact on health and athletic performance, preventing REDs is a public health priority. Health consequences for athletes include amenorrhea, stress fractures, depression, lipid and glucose metabolism alterations, musculoskeletal issues, immune system dysfunction, and sleep disturbances. Performance-related consequences may include decreased physical and/or cognitive abilities, training responsiveness, recovery, muscular strength, endurance, or power [3]. Preventive strategies are structured into three levels: primary (risk reduction), secondary (early detection), and tertiary (treatment optimization in affected individuals) [11]. In this regard, educating athletes, coaches, strength and conditioning staff, and healthcare professionals is essential to raise awareness about the risks associated with low energy availability and to promote effective preventive practices [3,11–13].

Nevertheless, significant challenges remain regarding the validation of diagnostic tools and the evaluation of professional knowledge on REDs, particularly within the healthcare setting. Currently, the questionnaire developed by Pai et al.(2022) is the only validated tool available for this purpose. Effective prevention of the Triad and REDs thus requires a solid understanding of these conditions and early identification. Previous studies have shown that the level of knowledge among physicians, physiotherapists, and nurses is limited [15–22]. Most of these studies have been conducted in English-speaking countries and, in Europe, mainly in the Netherlands; however, no studies have been identified in Spain or Spanish-speaking contexts.

Within this framework, the present study aims to analyse the level of knowledge regarding the Female/Male Athlete Triad and REDs among healthcare professionals in Spain.

METHODS

Ethical Approval

This study was approved by the Ethics Committee of the University of the Basque Country (CEISH-UPV/EHU: M10_2024_104) and conducted in accordance with the Declaration of Helsinki. All participants gave electronic informed consent prior to beginning the survey.

Study Design

A cross-sectional study was conducted through the distribution of an electronic questionnaire. The research protocol was reviewed and approved by the Ethics Committee for research involving human beings, their samples, and data in accordance with the ethical principles established in the Declaration of Helsinki.

Participants

The target population consisted of active healthcare professionals in Spain, including physicians, nurses, and physiotherapists. In the Spanish context, practicing as a healthcare professional requires registration with the corresponding Official College of the profession, as well as in the province or autonomous community where the individual practices. For the recruitment phase, an exhaustive search was carried out to identify all Official Colleges of Physicians, Nursing, and Physiotherapy in the country, as well as professional associations and scientific societies that, in the investigators' judgment, might have an interest in the subject matter.

A formal invitation to participate in the study was sent to the identified organizations. Those that agreed to collaborate were provided with detailed information about the study objectives and instructions for disseminating the questionnaire through their preferred channels. The most commonly used methods of dissemination were mass email, publication on their websites, and distribution via social media.

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Questionnaire Design

The questionnaire was developed based on previous instruments and the clinical experience of the researchers [14,16,19,21–23]. Two differentiated versions were created: one for physicians and another for nurses and physiotherapists. The questionnaire was divided into two sections. The first section collected sociodemographic and general information related to the topic, including how professionals detect and address the conditions (16 items for physicians and 13 for nurses/physiotherapists) (see Annex 1).

The second section assessed knowledge of the Triad and REDs, with 16 items common to all professional groups (see Annex 2). The 16 knowledge items were organized into four thematic subgroups, conceptual definition of the Triad and REDs (questions 1 and 3); low energy availability (questions 2, 4, 5, 10, 14, 15, and 16); menstrual health (questions 6, 9, 11, and 13) and bone health (questions 7, 8, and 12). It was assumed that the level of knowledge required was homogeneous across all professional profiles, with differences expected in the clinical approach and management of the evaluated conditions. Each correct answer was awarded one point, and incorrect answers were awarded zero points; the maximum possible score for this block of questions was 16.

The questionnaire was reviewed by a multidisciplinary panel of 12 experts (physicians, nurses, dietitians, and physiotherapists), who evaluated the relevance, clarity, and pertinence of each item using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Qualitative suggestions for improvement were also collected. After incorporating the corresponding adjustments, a pilot test was conducted with six professionals (two physicians, two nurses, and two physiotherapists) to evaluate the clarity and estimated completion time. Once validated, the final questionnaire (see Annexes 1 and 2) was distributed via Microsoft Forms (Microsoft, USA), ensuring participant anonymity. Before starting the survey, professionals were required to provide electronic informed consent. Data collection took place between May and October 2024, and responses were exported to Microsoft Excel (Microsoft, USA) for further analysis.

Statistical Analysis

Sociodemographic characteristics of participants, as well as response frequencies to knowledge questions, were analysed using descriptive statistics, employing SPSS Statistics (IBM, USA) and Microsoft Excel (Microsoft, USA). ANOVA was performed to examine the association between total knowledge score (maximum = 16) and various sociodemographic variables, with a significance level set at 0.05.

RESULTS

A total of 308 healthcare professionals responded to the questionnaire, of whom 82.14% (n = 253) were nurses or physiotherapists, and 17.86% (n = 55) were physicians. The sociodemographic characteristics of the sample are presented in Table 1.

Overall, 50.3% of participants reported having heard of the Triad, while only one in four had heard of REDs. This proportion was significantly higher among physicians, with 72.3% and 45.5% reporting prior knowledge of the Triad and REDs, respectively, compared to 45.5% and 17.4% reported by the nursing/physiotherapy group. When asked whether they had received any training or information on these entities, only 15.9% (n = 49) responded affirmatively.

Notably, half of those (n = 25) were physicians, representing 50% of the medical subgroup, whereas only 24 of the nursing/physiotherapy professionals had received training, corresponding to 9.5% of that group. Regarding clinical detection capacity, only 15.8% (40 nurses/physiotherapists and 27 physicians) reported knowing how to identify an individual with symptoms compatible with the Triad or REDs. Variables significantly associated with higher knowledge scores included sex (male), profession (physician), and prior awareness of both the Triad and REDs (see Table 2). Neither years of professional experience nor age showed statistically significant associations with the scores obtained.

Among physicians, the clinical tools used to detect the Triad and REDs were explored (see Figure 1). A total of 83.6% cited the clinical history as their main tool, followed by the sport's medical examination (74.5%) and the RED-S Screening Tool (63.6%). Additionally, 60% accepted weight or anthropometric control as valid detection methods. After identifying a case of Triad or REDs, 26 physicians (47.3%) would refer the case to another specialist, while 40% (n = 22) would manage it themselves with assistance from other professionals. In the event of referral, 78.2% would refer the case to a sports medicine specialist, 58.3% to a nutritionist, 41.8% to a psychologist, and 38.2% to a gynaecologist (see Figure 2). The

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nursing/physiotherapy group was asked about their level of comfort when addressing various clinical topics with athletes, including menstrual health, nutritional guidelines, stress fractures, sleep quality, athletic performance, injuries, and male sexual health. Detailed results are shown in Table 3.

Table 1. Sociodemographic characteristics of the participants

	Physicians		*Nurses/Physiotherapists*	
	N	**%**	**N**	**%**
Sex				
Male	28	50.91	52	20.55
Female	27	49.09	201	79.45
Age				
18 to 35 years	6	10.91	98	38.74
36 to 50 years	19	34.55	109	43.08
51 to 65 years	28	50.91	43	17.00
66 or older	2	3.64	3	1.19
Years in profession				
0–5 years	5	9.09	43	17.00
6–10 years	2	3.64	48	18.97
11–20 years	14	25.45	70	27.67
21–30 years	12	21.82	66	26.09
>31 years	22	40.00	26	10.28
Specialty				
Community	11	20.00	95	37.55
Sports	20	36.36	39	15.42
Occupational	4	7.27	7	2.77
Traumatology	12	21.82	--	--
Hospital-based	--	--	98	38.74
Private practice	--	--	11	4.35
Other	8	14.55	3	1.19

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Table 2. Linear regression analysis of factors associated with knowledge score

Variable	*B (Unstandardized)*	*Standard Error*	*Beta (Standardized)*	*t*	*p*
(Constant)	8.519	0.712		11.971	<0.001
Profession (Physician vs Nurse/PT)	1.295	0.514	0.155	2.516	<0.05
Sex (Male)	-1.079	0.416	-0.147	-2.590	<0.05
Years in practice: 0–5 years	0.593	0.712	0.067	0.833	<0.05
Years in practice: 6–10 years	0.701	0.662	0.081	1.059	0.291
Years in practice: 21–30 years	-0.139	0.492	-0.019	-0.283	0.777
Years in practice: ≥31 years	-0.314	0.806	-0.036	-0.389	0.697
Age: 18–35 years	0.563	0.863	0.083	0.653	0.514
Age: 36–50 years	0.260	0.639	0.040	0.406	0.685
Age: ≥66 years	1.894	1.350	0.075	1.403	0.162
Has heard of the Female/Male Athlete Triad	1.787	0.408	0.279	4.377	<0.001
Has heard of Relative Energy Deficiency in Sport (REDs)	1.326	0.480	0.180	2.764	<0.01

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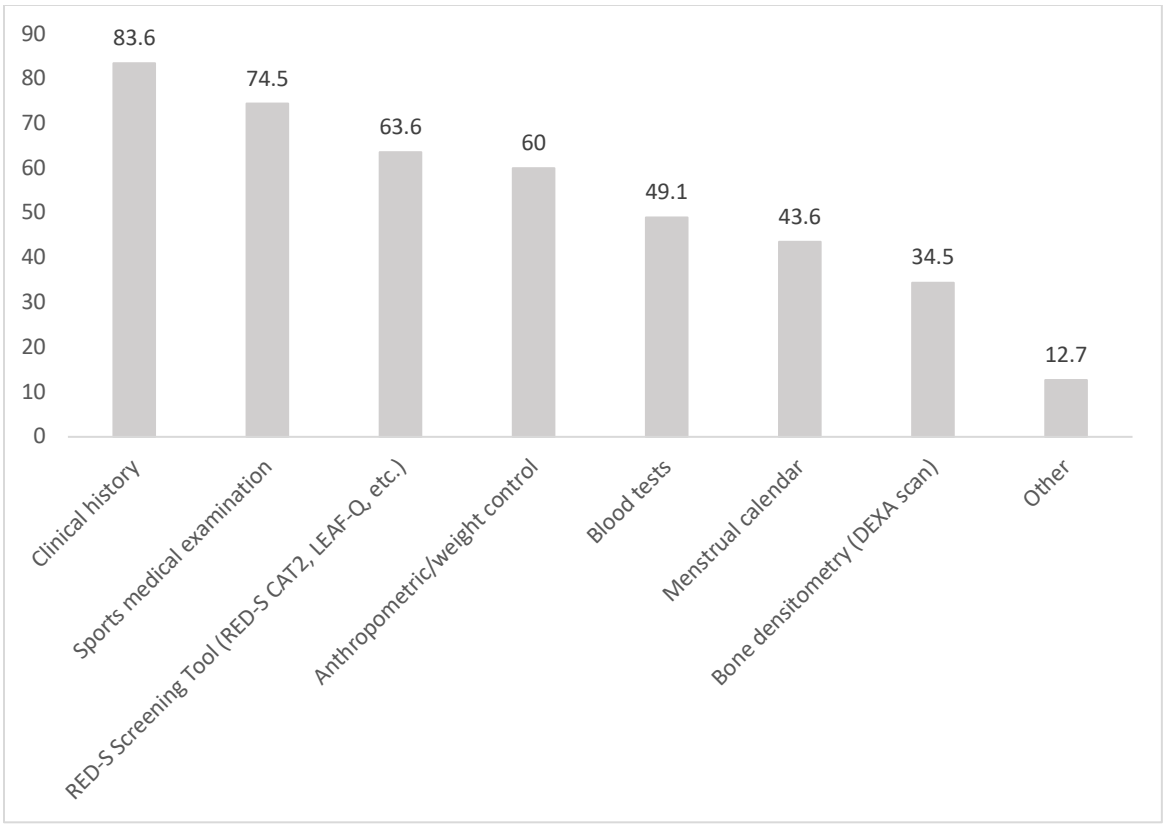

Figure 1. Tools used by physicians to detect the triad or REDs

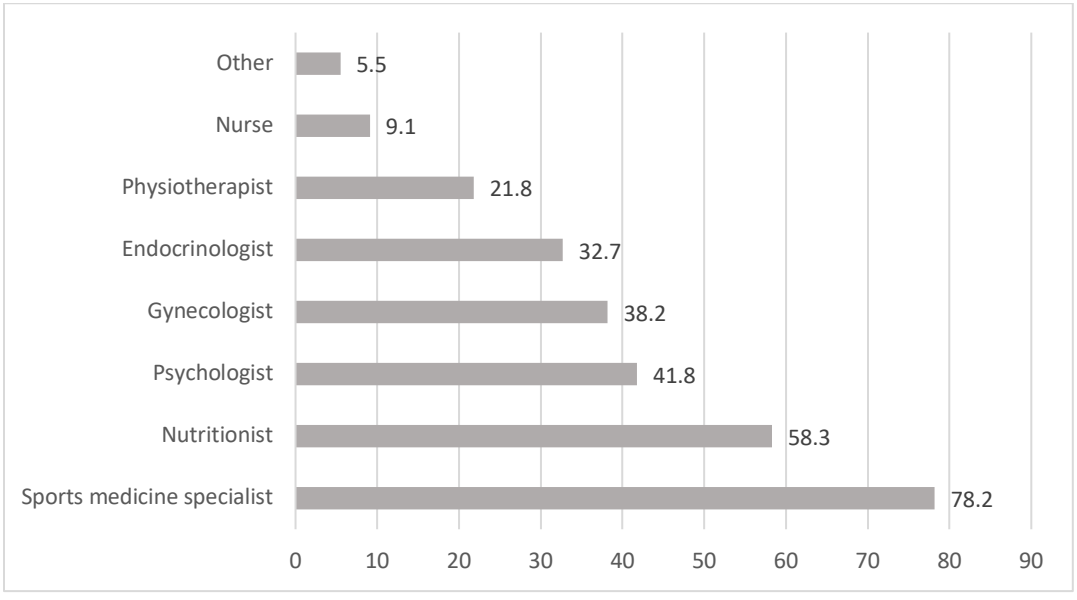

Figure 2. Specialists to whom physicians would refer a suspected case of the triad or REDs

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Table 3. Comfort level of nurses and physiotherapists in addressing specific clinical topics with physically active individuals

Topic	*Totally Comfortable*	*Very Comfortable*	*Somewhat Comfortable*	*Slightly Comfortable*	*Not Comfortable at All*
Menstrual cycles	118 (46.64%)	55 (21.74%)	60 (23.72%)	19 (7.51%)	1 (0.40%)
Nutritional guidelines	80 (31.62%)	82 (32.41%)	78 (30.83%)	11 (4.35%)	2 (0.79%)
Stress fractures	72 (28.46%)	68 (26.88%)	64 (25.30%)	36 (14.23%)	13 (5.14%)
Restorative sleep	98 (38.74%)	81 (32.02%)	64 (25.30%)	8 (3.16%)	2 (0.79%)
Sports performance	76 (30.04%)	60 (23.72%)	75 (29.64%)	28 (11.07%)	14 (5.53%)
Sports injuries	74 (29.25%)	61 (24.11%)	68 (26.88%)	36 (14.23%)	14 (5.53%)
Vigor or erectile dysfunction	34 (13.44%)	38 (15.02%)	87 (34.39%)	65 (25.69%)	29 (11.46%)

Table 4. Correct responses to knowledge questionnaire items by professional group

Question	*Group*	*0 points (N, %)*	*1 point (N, %)*
1. What are the three components of the female athlete triad?	Physicians	26 (47.3%)	29 (52.7%)
	Nurses/Physiotherapists	151 (59.7%)	102 (40.3%)
	Total	177 (57.5%)	131 (42.5%)
2. Low energy availability occurs when there is insufficient energy to maintain health and optimal performance.	Physicians	3 (5.5%)	52 (94.5%)
	Nurses/Physiotherapists	40 (15.8%)	213 (84.2%)
	Total	43 (14%)	265 (86%)
3. What is the main factor causing REDs?	Physicians	17 (30.9%)	38 (69.1%)
	Nurses/Physiotherapists	76 (30%)	177 (70%)
	Total	93 (30.2%)	215 (69.8%)
4. Low energy availability may be associated with reduced carbohydrate intake.	Physicians	16 (39%)	39 (70.9%)
	Nurses/Physiotherapists	98 (38.7%)	155 (61.3%)
	Total	114 (37%)	194 (63%)
5. Low energy availability can occur without changes in weight or bmi.	Physicians	10 (18.2%)	45 (81.8%)
	Nurses/Physiotherapists	85 (33.6%)	168 (66.4%)
	Total	95 (30.8%)	213 (69.2%)

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6. Menarche after age 15 is normal in intensely active girls.	Physicians	29 (52.7%)	26 (47.3%)
	Nurses/Physiotherapists	169 (66.8%)	84 (33.2%)
	Total	198 (64.3%)	110 (35.7%)
7. At what age does peak bone mass occur in women?	Physicians	8 (14.5%)	47 (85.5%)
	Nurses/Physiotherapists	55 (21.7%)	198 (78.3%)
	Total	63 (20.5%)	245 (79.5%)
8. Osteopenia in young women can be reversed by reducing training volume or intensity.	Physicians	26 (47.3%)	29 (52.7%)
	Nurses/Physiotherapists	137 (54.2%)	116 (45.8%)
	Total	163 (52.9%)	145 (47.1%)
9. Secondary amenorrhea is normal in active women.	Physicians	21 (38.2%)	34 (61.8%)
	Nurses/Physiotherapists	142 (56.1%)	111 (43.9%)
	Total	163 (52.9%)	145 (47.1%)
10. Low energy availability can cause secondary amenorrhea.	Physicians	7 (12.7%)	48 (87.3%)
	Nurses/Physiotherapists	58 (22.9%)	195 (77.1%)
	Total	65 (21.1%)	243 (78.9%)
11. Menstrual irregularities are a risk factor for low bone mineral density.	Physicians	10 (18.2%)	45 (81.8%)
	Nurses/Physiotherapists	79 (31.2%)	174 (68.8%)
	Total	89 (28.9%)	219 (71.1%)
12. Stress fractures are more likely in amenorrhoeic women.	Physicians	8 (14.5%)	47 (85.5%)
	Nurses/Physiotherapists	78 (30.8%)	175 (69.2%)
	Total	86 (27.9%)	222 (72.1%)
13. Menstrual cycle disturbances are just indicators of intense training.	Physicians	40 (72.7%)	15 (27.3%)
	Nurses/Physiotherapists	186 (73.5%)	67 (26.5%)
	Total	226 (73.4%)	82 (26.6%)
14. Low energy availability can affect athletic recovery.	Physicians	3 (5.5%)	52 (94.5%)
	Nurses/Physiotherapists	20 (7.9%)	233 (92.1%)
	Total	23 (7.5%)	285 (92.5%)
15. Low energy availability can improve athletic performance (strength, speed, power).	Physicians	8 (14.5%)	47 (85.5%)
	Nurses/Physiotherapists	62 (24.5%)	191 (75.5%)
	Total	70 (22.7%)	238 (77.3%)
16. After intense training, caloric intake should be based on...	Physicians	14 (25.5%)	41 (74.5%)
	Nurses/Physiotherapists	118 (46.6%)	135 (53.4%)
	Total	132 (42.9%)	176 (57.1%)

The knowledge questionnaire consisted of 16 items (see Table 4). Among nurses/physiotherapists (n = 253), only 5 participants (2%) achieved the maximum score, while nearly 55% scored 10 or less. About one in five scored below 8 points (equivalent to a failing grade of <5/10), and only one participant answered all questions incorrectly. In the physician group (n =

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55), 4 participants (7.3%) achieved the maximum score, 80% scored 10 or more points, and only 10.9% scored below 8. No physician failed all questions. The mean score was 11.53 (SD = 2.7) for physicians and 9.86 (SD = 3.2) for the other professionals. A total of 131 participants correctly identified all three components of the Triad, including 27 physicians (49.1%) and 104 nurses/physiotherapists (41.1%), which represents 42.53% of the total sample.

Although 86% of respondents correctly recognized the definition of low energy availability, one-third (n = 114) failed to associate it with reduced carbohydrate intake.

Regarding menstrual health, 64.28% (n = 194) did not know that menarche after age 15 is not considered normal in physically active individuals. Additionally, 52.9% (n = 163) considered it normal for a woman to experience secondary amenorrhea if she engages in intense physical activity. With regard to bone health, 52.9% of participants incorrectly stated that osteopenia could be reversed by reducing the volume or intensity of physical activity. Conversely, 72.1% correctly acknowledged that stress fractures are more frequent in women with prolonged amenorrhea.

DISCUSSION

This study evaluated the level of knowledge regarding the Triad and REDs among healthcare professionals in Spain, using an online questionnaire. The results reveal significant differences in knowledge based on professional category. While physicians showed a higher level of knowledge—with approximately half correctly identifying the three components of the Triad—nursing and physiotherapy professionals reported considerably lower awareness, particularly regarding REDs, which only 17.4% had previously heard of.

This gap persists even though 90.5% of nurses and physiotherapists and more than half of the physicians (n = 25) indicated they had not received any formal training on these clinical entities. Furthermore, only 15.8% reported knowing how to identify an individual presenting symptom compatible with the Triad or REDs. These findings are similar to the 19% reported by Kroshus et al.(2015) regarding the Triad, or the 13% by Tenforde et al. (2020) regarding REDs. In contrast, these results differ from those of Tenforde et al. (2020), where 33% of professionals knew how to detect the Triad, and Verhoef et al. (2024), where 57.6% of physicians felt competent in identifying REDs. Similarly, in Parkinson's study (2023), 27% of physiotherapists reported sufficient knowledge to detect REDs.

These findings contrast with previous research in European and U.S. contexts. Studies such as those by Curry et al.(2015), Tenforde et al.(2020), and Verhoef et al.(2024) report higher knowledge levels among physicians, while knowledge among physiotherapists and nurses remains limited [16,18,19,21,23,25,26]. These differences reinforce the need to implement targeted educational programs for all healthcare professionals, with particular emphasis on nurses and physiotherapists.

Among surveyed physicians, 83.6% identified the clinical history as the main tool for recognizing signs and symptoms associated with the Triad and REDs—a finding consistent with Verhoef et al.(2024), where 74.4% also emphasized the importance of this approach. There was also widespread agreement on the need for multidisciplinary treatment: 78.8% of physicians believed that a sports medicine specialist should lead the approach, followed by nutritionists (58.3%), psychologists (41.8%), and gynaecologists (38.2%). These figures are in line with Verhoef et al.(2024), who also emphasized the roles of sports medicine physicians (68.8%), nutritionists (63.9%), psychologists (49.6%), and physiotherapists (29.3%) in multidisciplinary management.

In this context, the roles of nurses and physiotherapists become especially relevant, as they are often the professionals with the most direct contact with athletes. Approximately two-thirds of these professionals reported feeling comfortable addressing topics such as menstrual disturbances, sleep, stress fractures, or nutritional guidance. However, the lack of clear association between these clinical signs and the diagnosis of REDs or the Triad may hinder early detection.

Regarding the knowledge questionnaire, physicians obtained a mean score of 7.2 (on a scale of 0 to 10), similar to Verhoef et al.(2024), who reported a score of 7.7. Physiotherapists scored an average of 6.16—slightly higher than the 5.9 reported in the same study and higher than the 4.7 reported by Hou et al.(2025). This study also represents the first specific evaluation of nursing professionals' knowledge of both the Triad and REDs, as previous research focused only on knowledge of the Triad [18]. The results also highlight the persistence of misconceptions. While one in four participants attributed REDs to intense physical exercise, 37% believed that reduced carbohydrate

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intake could be linked to low energy availability. Additionally, there were clear gaps in menstrual health knowledge: 64.2% considered menarche after age 15 to be "normal," and nearly 50% (n = 163) viewed secondary amenorrhea as a physiological consequence of intense exercise. These outcomes are less favourable than those reported by Pantano (2017), where 84% rejected such a claim, but are similar to findings by Troy et al. (2006).

Despite international IOC consensus statements regarding REDs and its impact on health and performance, this study found that although 92.1% of participants recognized the negative effect of low energy availability on athlete recovery, 24.5% mistakenly believed it could improve performance. O'Donnell et al. (2023), who noted that approximately 30% of coaches and athletes still consider caloric restriction a valid strategy to enhance performance, reported similar findings. Likewise, Pantano (2009) reported that the Triad affects both bone health and cardiovascular function, with 55% of athletes experiencing reduced recovery capacity after intense training.

Regardless of the limitations identified, it is worth noting that most physicians reported appropriate approaches in terms of diagnosis, clinical history taking, and multidisciplinary treatment [3]. However, the fact that 87.4% of participants had not received specific training on the Triad or REDs reinforces the urgent need for educational strategies. In this regard, several studies have demonstrated the effectiveness of educational interventions: Pai et al.(2022) reported a 40% increase in knowledge after a training program, and Brown et al. (2020) observed a 45% improvement among collegiate dancers. Similarly, Tenforde et al. (2020) found that only 35% of healthcare providers felt comfortable addressing cases of the Triad and REDs, further justifying the need for ongoing training.

CONCLUSION

Despite the methodological limitations of this study—such as the relatively small sample size and potential biases due to the use of an online questionnaire—the results reveal a significant lack of knowledge about the Triad and REDs among healthcare professionals in Spain. This lack of knowledge may hinder timely detection of these clinical conditions and, consequently, compromise the health and performance of physically active individuals. The findings are consistent with the existing scientific literature and support the need for specific training programs for healthcare professionals. These programs should be aimed at optimizing early identification, multidisciplinary management, and prevention of both conditions in clinical practice.

To this end, greater integration of these concepts into health sciences curricula and the implementation of more effective clinical screening strategies are essential.

The adoption of evidence-based educational interventions and the dissemination of updated clinical guidelines could substantially improve professional competence in the management of these conditions. Future research should include larger sample sizes and design evaluation tools tailored to the various healthcare professions, to obtain a more precise analysis of knowledge levels and specific educational needs.

Conflict of Interest Statement

The authors declare no conflicts of interest with the contents of this study.

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Appendix 1. Questionnaire on sociodemographic information and general knowledge

Gender of the participant

Years of professional experience

Age

Professional specialty

Years practicing the specialty

Have you heard of the Female/Male Athlete Triad?

Have you heard of Relative Energy Deficiency in Sport (REDs)?

Have you received information/training on REDs or the Female/Male Athlete Triad?

What type of information/training?

What tools would you use to detect whether a physically active person presents with REDs or the Athlete Triad? (Physicians only)

What strategy would you follow to address the issue? (Physicians only)

If you were to refer them to another professional, to whom would you refer? (Physicians only)

In general, what strategy would you follow to address a suspected case of the Triad or REDs? (Nurses and physiotherapists only)

Rate how comfortable you feel discussing the following topics with physically active women/men: menstrual cycles, nutritional guidelines, stress fractures, sleep quality, athletic performance, sports injuries, and male sexual health or erectile dysfunction. (Nurses and physiotherapists only)

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Appendix 2. Knowledge questionnaire

1. What do you consider to be the 3 components of the Female Athlete Triad?

2. Low energy availability occurs when the energy required to maintain bodily functions for health and optimal performance is insufficient.

3. What is the main factor causing REDs?

4. Low energy availability may be associated with reduced carbohydrate intake.

5. Low energy availability can occur without changes in body weight or body mass index.

6. Menarche after age 15 is normal if the adolescent engages in intense physical activity.

7. At what age does peak bone mineral density occur in women?

8. Osteopenia in adolescent or young adult women can be reversed if physical activity intensity or volume is reduced in adulthood.

9. In a physically active woman, secondary amenorrhea may be considered normal if she trains intensely.

10. Low energy availability may cause secondary amenorrhea in physically active women.

11. Menstrual disturbances in physically active women are a risk factor for low bone mineral density.

12. Stress fractures are more common in women with prolonged amenorrhea than in eumenorrheic women.

13. Menstrual cycle disruptions or amenorrhea in physically active women are indicators of intense training.

14. Low energy availability can negatively affect athlete recovery.

15. Low energy availability may increase athletic performance (strength, speed, power).

16. After intense exercise, the dietary intake should be based on...

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