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TERMINOLOGICAL UNITS IN THE MEDICAL SPANISH: AN OVERVIEW OF THE SPANISH-ENGLISH LEXICON IN THE FIELD OF ASSISTED REPRODUCTION

UNIDADES TERMINOLÓGICAS EN EL ESPAÑOL DE LA MEDICINA: UNA PANORÁMICA DEL LÉXICO ESPAÑOL-INGLÉS EN EL CAMPO DE LA REPRODUCCIÓN ASISTIDA

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Abstract

As medical knowledge advances, so does information about diseases, treatments and technologies, leading to the creation of new medical terms. On this basis and at the core of the Neotermed project's research, this paper thoroughly examines the terminology of assisted reproduction (AR). This study aims to identify and compare some Spanish and English terminological units extracted from the *Vocabulario de Reproducción Asistida*. The analysis focuses on syntagmatic relations and how complexity of the derived terms affects their frequency of use in a specialised corpus, as well as their representation in dictionaries or online lexicographic resources. The study results confirm that the more complex and specialised terms become - i.e. when adjectives or nouns are added to the base term - the less frequent they are used. This means that more specialised terms tend to appear less frequently in the corpus analysed and the lexicographic resources of both languages, reflecting their lower representation in these contexts.

Keywords: medical terminology, lexicographical resources, corpus, frequency of use, assisted reproduction, Neotermed project.

Resumen

A medida que avanza el conocimiento médico, también lo hace la información sobre enfermedades, tratamientos y tecnologías, lo que da lugar a la creación de nuevos términos médicos. Partiendo de esta base y en el centro de la investigación del proyecto Neotermed, este artículo examina a fondo la terminología del campo de la reproducción asistida (RA). El objetivo de este estudio es identificar y comparar las unidades terminológicas en español e inglés extraídas del *Vocabulario de Reproducción Asistida*. El análisis se centra en las relaciones sintagmáticas y en cómo la complejidad de los términos derivados afecta su frecuencia de uso en un corpus especializado, así como su representación en diccionarios o recursos lexicográficos en línea. Los resultados del estudio confirman que, a medida que los términos se vuelven más complejos y especializados —es decir, cuando se les añaden adjetivos o sustantivos al término base—, su uso se vuelve menos frecuente. Esto significa que los términos más especializados tienden a aparecer menos en el corpus analizado y en los recursos lexicográficos de ambas lenguas, lo que refleja su menor representación en estos contextos.

Palabras clave: terminología médica, recursos lexicográficos, corpus, frecuencia de uso, reproducción asistida, proyecto Neotermed.

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1. INTRODUCTION: BACKGROUND AND THEORETICAL FRAMEWORK

1.1. BACKGROUND: THE NEOTERMED PROJECT

Theoretical and practical research into specialised terminology in Spanish has grown exponentially in recent years. This growth is particularly evident in the scientific field, where new knowledge is constantly being generated. In this dynamic environment, it is often necessary to coin new terms to describe emerging realities or concepts in word formation (Fernández Silva, 2010). As it is stated by Martínez Sánchez and Santamaría-Pérez "La terminología de una nueva especialidad participa de los términos de la ciencia de la que emerge y, necesariamente, comprende nuevas unidades léxicas o neologismos que conforman con otras una red propia de la especialidad" (2023, p. 198).

As medicine progresses, terminology evolves to cover newly identified diseases, treatments and technologies that previously had no names due to their absence or limited knowledge (Sánchez Manzanares & Santamaría-Pérez, 2021). Hence, the ongoing creation of new online glossaries, resources, and terminology databases on medical language (Cortés Gabaudan, 2009; Cosnautas, 2013; Ramos Ruiz & Bolívar Pérez, 2015; Santamaría-Pérez, Congost-Maestre, Gómez-Torres, Mura, Pérez Contreras, Lillo-Crespo & Sáez Espinosa, 2022; Neotermed, 2024), to name but a few.

The medical field of assisted reproduction (AR) serves as a prime example of this phenomenon. It is defined as "reproduction achieved through ovulation induction, controlled ovarian stimulation, evolution triggering, assisted reproductive techniques, intrauterine, intracervical or intravaginal insemination, with sperm from the husband/partner or a donor" (Zegers-Hochschild, Adamson, Mouzon, Ishihara, Mansour, Nygren, Sullivan & Vanderpoel, 2010, p. 22). The rapid advancements in assisted reproduction over recent decades have led to the creation of numerous new terms, reflecting the dynamic and ever-evolving nature of this field. As the science and technology behind assisted reproduction continue to progress, the terminology must also evolve,

ensuring that medical professionals can accurately and effectively communicate about the latest developments. In the field of AR, the linguistic planning of a standardised international terminology leads to predominance of secondary neology in Spanish, which means that there is terminological dependence on English (Sánchez Manzanares & Santamaría-Pérez, 2021).

The Neotermed[1] project arises from the enormous social interest in the field of health sciences, specifically the biomedical discourse of the specialty of Assisted Reproduction (AR). Thus, the population wants to participate in these medical advances and, consequently, must understand the specialised lexicon that allows them to access this knowledge. The main objective of Neotermed is to study how the main targets comprehend specialised terms, the connection between their understanding of these terms, and the degree of neologicity of terminology they encounter when seeking specialised knowledge.

The project's primary targets are university students in biomedicine who are new to this vocabulary. For them, terminology plays an essential cognitive and discursive role in transmitting specialised content and constructing a cohesive text. After several previous studies (Santamaría-Pérez & Congost-Maestre, 2022; Santamaría-Pérez, Congost-Maestre, Gómez-Torres, Mura, Pérez Contreras, Lillo-Crespo & Sáez Espinosa, 2022; Domènech Bagaria, Estopà Bagot & Santamaría-Pérez, 2022; Domènech Bagaria & Santamaría-Pérez, 2023), there is a perceived need for research into terminology resources for students to assist them in the development of cognitive and communicative skills specific to their discipline, such as, for example, the comprehension and production of specialised texts. On the other hand, patients start a lengthy treatment process and techniques with lexical units, which they also access for the first time. The goal is to measure the degree of readability of the information accessed

[1] www.neotermed.org

by these recipients through the websites of associations and clinics to educate and teach health literacy to achieve the empowerment, inclusion, and equality of this group, who live in a situation of emotional and personal stress, often accompanied by social pressure and a significant economic effort.

The study of how both groups of users perceive and access terminology knowledge will not only enable the development of guidelines and deployment of evidence-based communication best practices but also lead to the implementation of interventions to mitigate impacts and boost the well-being of each group. The project's practical applications are two-fold, with a focus on creating accessible resources for both university students and patients:

a) The *Vocabulario de Reproducción Asistida*[2] for biomedicine students, which will be presented hereafter.
b) A set of online infographics in Spanish, English, French, Italian, German and Valencian to facilitate patient access to knowledge of assisted reproduction terms.

1.2. The vocabulario de reproducción asistida

The *Vocabulario de Reproducción Asistida* is an online, freely accessible terminology application that offers more than 600 Spanish entries of assisted reproduction terms and their English translations. The tool was opened at the beginning of 2023. It is not just a collection of words but a practical and helpful tool designed specifically for undergraduate and graduate students in biomedicine and other related areas.

The resource is the result of a collaborative effort by an interdisciplinary team of research project members, including linguists, terminologists, and health professionals. Every decision, from the selection of terms to the detailed information in the entries, has been guided by relevance to the student's group. Nevertheless, it is also a valuable resource for translators and language mediators.

[2] https://vocabulario.neotermed.org/

The frequency criterion has been used to select terms from the specialised corpus[3] of Neotermed, which includes scientific and academic texts such as scientific articles, master's theses, and manuals. The starting point was the *Glosario de Fertilidad Humana*[4], complemented by semi-automatic terminology extraction with the help of the Sketch Engine tool. Fertility specialists validated all the Spanish terms to accept them as entries in the *Vocabulario*, terminologists and linguists prepared every terminology record, and the group of translators provided the English terms and their translations.

The entries are shown alphabetically or thematically, and in each entry, we can find the following information: language (English or Spanish), grammatical category, level of specialisation (high-middle-low), thematic field, source of the definition, definition, variants, associated concepts, English translation, examples and combinatorics. The thematic fields in which the terms are organised are: *Anatomía, fisiología y embriología, Biología celular, Enfermedad, Genética, Problemas de fertilidad, Pruebas diagnósticas, Signo/Síntoma and Técnicas de Reproducción Asistida*.

1.3. Theoretical framework

This section aims to present a brief overview of the theoretical framework which is the basis for the research that has been carried out.

1.3.1. The Communicative Theory of Terminology

The changes in society as well as the new communicative needs that characterised the second half of the 20th century led to a reconsideration of the universal character of Wüster's theory of terminology (TGT). During the last decade of the 20th century, new views regarding Terminology emerged from different scientific fields, which led to a change in the way people saw and studied this topic.

[3] For a detailed description of the corpus's design and compilation, see Martínez Sánchez and Santamaría-Pérez (2023).
[4] https://terms.iulma.ua.es/es/glosario-de-fertilidad-humana

In 1999, Cabré Castellví proposed a set of considerations regarding Terminology that will found the Communicative Theory of Terminology (CTT). In it, she mentions that it is an interdisciplinary field whose object of study are the Terminological Units (TU), units from natural language which have to be approached from different perspectives. They have to be studied functionally, formally and semantically.

TU are modules of language related to Lexical Units and described as polyhedral denominative-conceptual, they are interdisciplinary units that have the capacity of reference and that can be defined with the composition of three components (Cabré Castellví, 2009):

a) A cognitive component: they represent the categorisation of reality.
b) A linguistic component: they are linguistic signs that belong to the natural language.
c) A social component: they are used for communication between experts, to train new experts and to disseminate specialised knowledge.

In addition, each one of these components must have an independent theory, interlinked, as they have to share the same object of study (Terminological Units), and necessarily coherent with the other theories.

Therefore, since 1996 Cabré Castellví has been developing CTT, which aims to be broad enough to focus not only on language, but also on knowledge and communication. Moreover, Terminology joins aspects from the Theory of Knowledge, the Theory of Communication and the Theory of Language.

1.3.2. The Language of Medicine

As Gutiérrez Rodilla (1998) stated, the scientific-technical language is composed of many fields of specialisation, among which we find the language of Medicine and Health Sciences.

According to Cabré Castellví (1993, p. 480), the Language of Medicine is "a subcode of the General Language dealing with topics related to the field of health sciences". Moreover, it is characterised by having a topic, different

users, a specialised field, a specific channel and interactions between interlocutors. Therefore, it modifies the General Language system to adapt to the communicative and terminological needs of this domain.

In addition, Linguistics and Medicine are two disciplines closely related due to the scientific advance; because the development of a field in Medicine implies the creation of different concepts to name new realities (Domènech Bagaria, Estopà Bagot, Santamaría-Pérez, 2023, p. 137).

In Medicine, we see that the production of specialised texts are filled with TU, which are units that assemble the specialised knowledge and can belong to different fields depending on the context they are used in (Cabré Castellví, 1999). Apart from the use of TU, specialised texts possess features that differentiate them from texts that belong to the natural language. Therefore, these texts need to be precise and avoid ambiguity, specific and concise (Cabré Castellví, Estopà Bagot, Montané March, Porras-Garzón, 2022, p. 62).

Aguirre Beltrán (2012, p. 56) mentions that Medicine and Health Sciences includes many specialties such as Paediatrics, Pharmacy, Dentistry, among many others. However, in this particular study we will focus exclusively in the biomedical speciality of Assisted Reproduction (AR).

1.3.3. The Language of Assisted Reproduction

Fertility and reproduction are issues that have accompanied human beings since ancient times and this concern has reached the present day in what we know as Assisted Reproduction Techniques and Treatments.

RA is a recent and constantly evolving field with a great socio-economic impact. Although we find texts from the 15th century with the first attempts of artificial insemination (AI) (Massé García, 2016), it is not until the middle of the 20th century that we experience the greatest advances in this discipline. It is important to highlight that in 1978, the world's first *in vitro* fertilisation (IVF) baby was born, marking the beginning of countless births through AR techniques and treatments.

The scientific progress brought about by the development of this discipline implied the creation of numerous Terminological Units to name the new realities.

When a new field is born, the first thing to do is to establish its basic terms, which are usually monolexic at the beginning of the field. However, its development favours the creation of more complex Terminological Units. These TU are no longer simple monolexical units, but polylexical TU created by linguistic processes such as derivation, compositions and neology (Gutiérrez Rodilla, 1998). According to Sager (1993) and Estopà Bagot (2001), these polylexic units are frequent in specialised texts and, in some cases, represent up to 80% of the terminology used. Quiroz Herrera (2008) mentions that some studies have found units with more than 3/4 components.

As Cabré Castellví, Estopà Bagot, Montané March and Porras-Garzón (2022, p. 62) stated that the monolexic terms fixed at the start of the creation of a discipline are called monolexic *base units*. The polylexic terms that appear as the field progresses are called *satellite terms*, which are the result of adding different components to the *base units* in order to create new terms that are able to describe the new realities of a particular discipline.

For instance, in the field of Assisted Reproduction, '*embryo*' is a base unit that was fixed as a basic term at the beginning of this field. With its development, this term has experienced changes by adding new components to create satellite terms that derive from it, such as the polylexic TU '*euploid embryo*' or '*aneuploid embryo*'.

2. OBJECTIVES, HYPOTHESIS AND METHODOLOGY

2.1. OBJECTIVES AND HYPOTHESES

2.1.1. Objectives

The primary objective of this article is to conduct a comparative analysis of Spanish and English syntagmatic terminological units within the field of assisted reproduction. By examining the structures, usage patterns, frequency of use in corpus and lexicographical presence of these terms, the study seeks

to uncover linguistic nuances in this rapidly evolving medical specialty. Specifically, the research aims to:

- Identify and compare critical terminological units related to assisted reproduction in Spanish and English, focusing on their syntagmatic relationships and the complexity of their structures.
- Evaluate the frequency and presence of the Spanish terms in the Neotermed specialised corpus.
- Evaluate the frequency and presence of the terms in lexicographical resources.
- Assess the correlation between the specialisation level of terms (i.e., the complexity or number of additional elements or «satellites» surrounding a core term).

2.1.2. Hypothesis

This study is grounded in the hypothesis that the more specialised a terminological unit is, or the more additional elements (satellites) it incorporates, the less likely it is to appear frequently in corpora and specialised dictionaries or glossaries. The reasoning behind this hypothesis is twofold:

a) As a term incorporates additional adjectives, nouns, or adverbs, it becomes more specialised and complex. This complexity may result in less frequent usage, as such terms are typically employed only in particular contexts within the medical field.

b) Medical terms with more satellites may be underrepresented in specialised dictionaries and glossaries. As a result, highly specialised terminology might be less visible or absent from these resources, leading to terminological challenges and translation.

The study aims to test these hypotheses by analysing the selected terms, their usage in a corpus, and their inclusion in various lexicographical resources. Thus, it will clarify how specialised terminology is developed, used, and documented in Spanish and English.

2.2. Methodology

In order to carry out this study, a terminological extraction of the terms present in the Assisted Reproduction vocabulary created within the Neotermed project was carried out.

For this purpose, the idea was to review all terms that make up each of the thematic fields of the vocabulary, namely: *Problemas de fertilidad, Biología celular, Signo/Síntoma, Técnicas de reproducción asistida, Anatomía, fisiología y embriología, Pruebas Diagnósticas, Enfermedad and Genética*.

The first step, therefore, was to perform a manual revision of all the monolexical Terminological Units and see if they had polylexical or satellite terms. These satellite terms are formed by adding other structures such as adjectives, nouns, adverbs, among others, to the nucleus or monolexical TU.

Once all the satellite terms we collected from the vocabulary, the next step was to check their frequency of use in the corpus stored in *Skecth Engine* created for the project. This criterion was established in order to reduce the amount of polylexical terms we were going to work with. Since the number of polylexical terms that are in the vocabulary is very large, it was considered appropriate to limit the terms for this study and focus only on the ones that are more frequent in the corpus.

Table 1 contains two columns: one with the thematic field and one with the number of Terminological Units selected for the purpose of the study.

Thematic field	Nº of Terminological Units
Problemas de fertilidad	8
Biología celular	8
Signo/Síntoma	9
Técnicas de reproducción asistida	32
Anatomía, fisiología, embriología	5
Pruebas diagnósticas	8
Enfermedad	21
Genética	10

Table 1: *Number of terminological units in each semantic field*

If we observe Table 1, we can clearly see a difference in the number of TU selected from each thematic field. We could explain the phenomenon at some point because, for instance, the Assisted Reproduction Techniques (Técnicas de reproducción asistida) are continuously developing as science advances whereas other thematic fields such as Anatomy, Physiology, Embryology (Anatomía, fisiología, embriología) and Genetics (Genética) were studied many years ago and experience less changes nowadays. Moreover, the texts that compose the corpus are about and related to Assisted Reproduction.

Table 2 lists all 100 terms that were selected from the vocabulary, alongside their corresponding thematic field and base units. The base units represent the core or root terms from which more specific terminological units are derived.

Thematic field	Base Units	Terminological Units
Problemas de fertilidad	*aborto*	*aborto clínico, aborto de repetición, aborto espontáneo, aborto inducido*
	amenorrea	*amenorrea primaria, amenorrea secundaria*
	fallo ovárico	*fallo ovárico precoz*
	menopausia	*menopausia precoz*
Biología celular	*célula*	*célula de la granulosa, célula de la granulosa mural, célula de Sertoli. célula del cúmulo, célula germinal, célula somática, célula de Leydig*
Signo/Síntoma	*anomalía*	*anomalía mülleriana, anomalía pélvica*
	aplasia	*aplasia testicular, aplasia uterina*
	muerte	*muerte fetal, muerte neonatal temprana*
	parto	*parto prematuro, parto pretérmino*
Técnicas de reproducción asistida	*ciclo*	*ciclo de DGP, ciclo de IAD, ciclo de ICSI, ciclo de IIUU, ciclo de inseminación artificial, ciclo de recepción de ovocitos, ciclo de reproducción asistida, ciclo espontáneo, ciclo natural*
	coito	*coito dirigido, coito programado*
	estimulación	*estimulación folicular, estimulación ovárica, estimulación ovárica controlada*
	fallo de implantación	*fallo de implantación recurrente*
	fecundación	*fecundación heteróloga, fecundación homóloga*

(Continued)

Thematic field	Base Units	Terminological Units
	inseminación	*inseminación artificial, inseminación artificial conyugal, inseminación artificial de donante, inseminación heteróloga, inseminación homóloga, inseminación intrauterina*
	punción	*punción folicular, punción ovárica*
	respuesta	*respuesta ovárica, respuesta sub-óptima ovárica*
	transferencia	*transferencia de blastocistos, transferencia de embriones, transferencia embrionaria ecoguiada, transferencia intratubárica de cigotos, transferencia intratubárica de gametos*
Anatomía, fisiología, embriología	*embarazo*	*embarazo bioquímico, embarazo clínico, embarazo ectópico, embarazo gemelar*
	embrión	*embrión euploide*
Pruebas diagnósticas	*biopsia*	*biopsia corial, biopsia embrionaria, biopsia endometrial, biopsia testicular*
	diagnóstico	*diagnóstico prenatal, diagnóstico prenatal no invasivo*
	seminograma	*seminograma con recuento de espermatozoides, seminograma REM*
Enfermedad	*disfunción*	*disfunción ovulatoria, disfunción reproductiva, disfunción sexual, disfunción testicular*
	mioma	*mioma intramural, mioma submucoso, mioma subseroso, mioma uterino*
	síndrome	*síndrome antifosfolípido, síndrome de Asherman, síndrome de hiperestimulación ovárica, síndrome de Klinefelter, síndrome de Martin-Bell, síndrome de Swyer*
	útero	*útero arcuato, útero bicorne, útero didelfo, útero retroverso, útero septo, útero unicorne*
Genética	*ADN*	*ADN circulante*
	dominancia	*dominancia completa, dominancia incompleta*
	malformación	*malformación congénita*
	mutación	*mutación genética, mutación somática*

Table 2: *Terminological units used in the study and thematic field*

Once all the terms are selected and classified, the next step is to carry out a lexicographical documentation in specialised resources in the field of Medicine and Health Sciences. To do so, five specialised terminology resources were selected for each of the working languages: Spanish and English.

Table 3 contains the resources consulted to see if the Terminological Units appear in them or not. As it can be seen, three resources were consulted for

the two working languages (*The International Glossary on Infertility and Fertility Care* (Zegers-Hochschild et al., 2017), *Clasificación internacional de enfermedades* (World Health Organization [WHO], 2019), and the *SNOMED CT Browser* (SNOMED International, 2024).

Spanish	English
Diccionario de Términos Médicos (DTM)	*Libro Rojo. Diccionario de dudas y dificultades de traducción del inglés médico (LR)*
Diccionario Panhispánico de Términos Médicos (DPTM)	*The United Nations Terminology Database (UNTERM)*
SNOMED CT browser from the National Health System (Snomed CT)	*SNOMED CT browser from the National Health System* (Snomed CT)
Clasificación internacional de enfermedades, 11ª. Edición (CIE-11)	*Clasificación internacional de enfermedades, 11ª. Edición* (CIE-11)
The International Glossary on Infertility and Fertility Care (2017) (Spanish version) (IGFC)	*The International Glossary on Infertility and Fertility Care (2017)* (IGFC)

Table 3: *Terminological specialised resources*

For the Spanish language the other two resources are two specialised dictionaries in the field of medicine, namely the *Diccionario de Términos Médicos* (Real Academia Nacional de Medicina, 2012) and the *Diccionario Panhispánico de Términos Médicos* (Real Academia Nacional de Medicina, 2023). For the English language, *The United Nations Terminology Database* (UNTERM, 2024) and the *Diccionario de dudas y dificultades de traducción del inglés médico* written by Navarro (2024) were consulted.

The last step was to classify the satellite polylexical terms paying attention to the components added to the monolexical nucleus as well as to the number of components that form the satellite term.

3. ANALYSIS

In this section, we present the analysis. It is meticulously organised into different parts: one for the corpus frequency, lexicographical, another for the documentation of both Spanish and English terms, and finally, another for

comparative analysis of English and Spanish terminology. The analysis aims to uncover patterns in term usage and representation across different lexicographical resources and languages.

3.1. FREQUENCY IN CORPUS

The initial step in our analysis is to evaluate the frequency of the Spanish terms within the specialised Neotermed corpus. Figure 1 vividly illustrates the distribution of term frequency across a diverse range of thematic fields, such as genetics, anatomy, and fertility issues.

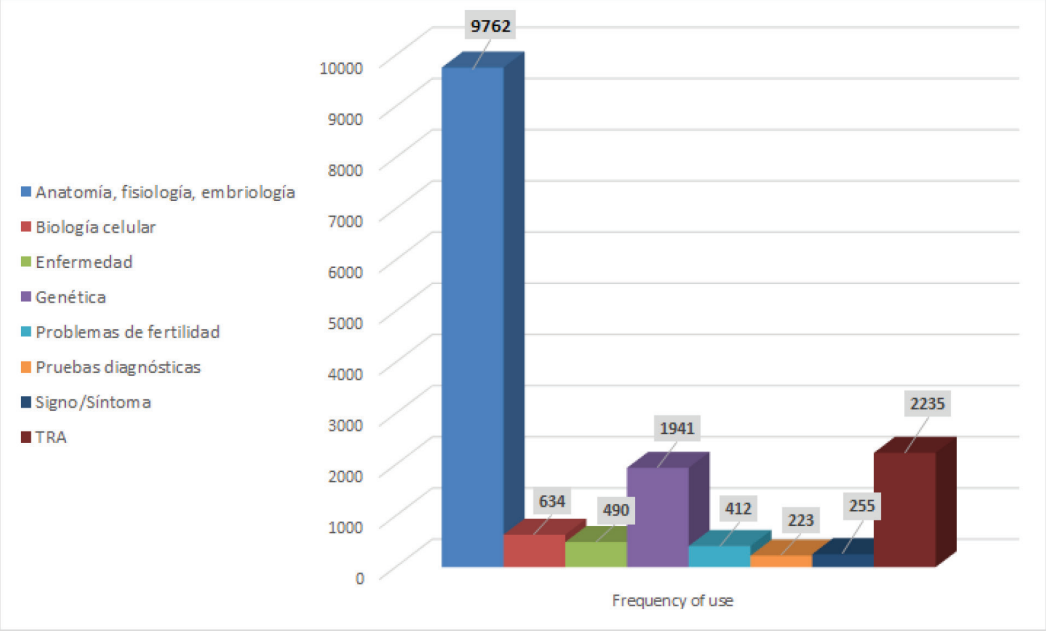

FIGURE 1: *Frequency of terms by thematic field in Neotermed corpus*

If we observe Figure 1, terms related to *Anatomía, fisiología y embriología* are the most frequent in the corpus, with a total of 9,762 occurrences. Conversely, *Pruebas diagnósticas* and *Signo/Síntoma* are the thematic fields with the lowest representativity, recording 255 and 223 occurrences in total, respectively. Moving to the frequency of terms in the corpus, we have Table 4. This table contains three columns: one with the thematic field, the one in the middle with the terms more or less frequent in that thematic field and the third one with the number of occurrences in the corpus.

Thematic field	Most/Less frequent term	Nº of occurrences
Problemas de fertilidad	*fallo ovárico precoz*	160
	aborto inducido	1
Biología celular	*biopsia testicular*	72
	seminograma REM	1
Signo/Síntoma	*parto prematuro*	115
	muerte neonatal temprana	1
Técnicas de reproducción asistida	*estimulación ovárica*	625
	ciclo de IIU	1
Anatomía, fisiología, embriología	*embrión*	4644
	embarazo gemelar	17
Biología celular	*célula germinal*	185
	célula somática	3
Enfermedad	*síndrome de hiperestimulación ovárica*	107
	útero retroverso	1
Genética	*AND*	1073
	dominancia completa	1

Table 4: *Number of occurrences of the most and less frequent terms*

According to this table, the term *embrión* is the most representative in this field, with 4,644 occurrences, while 'embarazo gemelar' is the least frequent, with 17 occurrences. Within the field of *Técnicas de reproducción asistida (TRA)*, 'estimulación ovárica' is the most frequent term, with 625 occurrences, while 'ciclo de IIU' is the least frequent, with only one occurrence. The specialised literature often focuses on broader or more widely applicable processes, which contrasts with the specific nature of the term 'ciclo de IIU' (ciclo de inseminación intrauterina). This is one reason for its low frequency in the corpus. For example, techniques like 'inyección intracitoplasmática de espermatozoides' (ICSI) or 'inseminación artificial de donante' (IAD) are more frequently discussed and, therefore, appear more often in the corpus, with 54 and 38 occurrences, respectively. This suggests that these more advanced or complex procedures are of greater interest in the context covered by the corpus. Additionally, regional or institutional variations in terminology could

play a role; different sources might use alternative terms or focus on different aspects of reproductive techniques, which could lead to the underrepresentation of specific terms like 'ciclo de IIU'.

In *Genética*, the term 'ADN' stands out with 1,073 occurrences, while 'dominancia completa' is registered only once. In *Problemas de fertilidad*, 'fallo ovárico precoz' is the most common term, with 160 occurrences, and aborto inducido is the least frequent, with only one occurrence.

In *Biología celular*, 'célula germinal' appears 185 times, being the most frequent term, while 'célula somática' is mentioned only 3 times. The significant difference in the frequency of terms within the field of *Biología celular* in the corpus, where 'célula germinal' appears 185 times compared to just 3 mentions of 'célula somática', likely reflects the corpus's focus on reproductive biology. 'Células germinales' are directly involved in reproduction, making them highly relevant to studies of fertility and embryogenesis, which explains their frequent mention. In contrast, 'células somáticas', which are not directly involved in reproduction, are less central to the specialised focus of this corpus, resulting in their much lower occurrence. In *Enfermedad*, 'síndrome de hiperestimulación ovárica' is the dominant term with 107 occurrences, while *útero retroverso* is the least frequent with a single mention.

In *Pruebas diagnósticas*, 'biopsia testicular' stands out with 72 occurrences, while terms like 'seminograma REM' have very low frequency (1 occurrence). In *Signo/Síntoma*, 'parto prematuro' is the most frequent term with 115 occurrences, contrasting with 'muerte neonatal temprana', which appears only once.

Overall, the distribution of topics in the corpus primarily focuses on the biological and clinical aspects of reproduction, particularly in areas like embryology, assisted reproductive techniques, and genetics. This fact suggests a strong emphasis on the foundational and treatment-related aspects of reproductive health.

3.2. Lexicographical documentation

This section evaluates the representation of both Spanish and English medical terms across the specialised lexicographical resources mentioned in the methodology section. The analysis examines the presence of these terms and assesses how additional satellite elements, such as adjectives and nouns, influence their documentation.

3.2.1. Spanish terms

The analysis of Spanish terms across different lexicographical resources reveals significant patterns in term documentation, particularly when comparing basic terms with their more specialised counterparts. Figure 2 offers the lexicographical documentation coverage for Spanish terms:

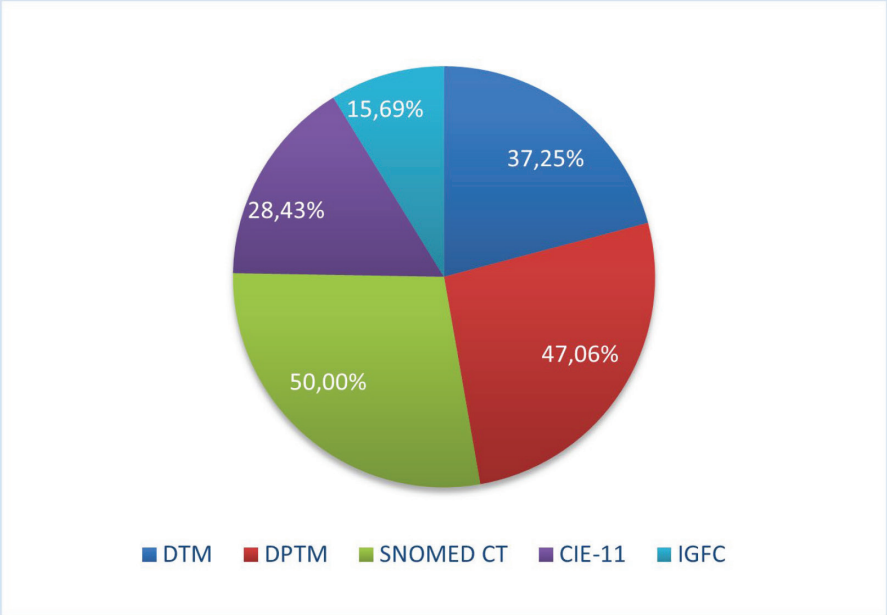

Figure 2: *Lexicographical documentation coverage for Spanish terms*

The documentation coverage of Spanish terms across different lexicographical resources varies significantly. The *DTM* includes approximately 37.25% of the analysed terms, providing a substantial but not comprehensive representation of the terminology. The *DPTM* offers slightly broader coverage,

encompassing about 47.06% of the terms. Among the resources, *SNOMED CT* stands out with the highest coverage, documenting 50% of the terms, reflecting its extensive scope in medical terminology. In contrast, the *CIE-11* covers 28.43% of the terms, indicating more selective inclusion. The *IGFC* has the most limited coverage, documenting only 15.69% of the terms, which suggests focusing on a narrower set of highly specialised concepts.

The analysis of Spanish terms across various lexicographical resources reveals a consistent trend: basic and widely recognized terms are far more likely to be documented across multiple resources than their more specialised counterparts. A prime example of this is the term 'embrión', which appears frequently in the corpus and is well-represented in all the consulted lexicographical resources. In contrast, 'embrión euploide', a more specific term, has a much lower frequency in the corpus and is notably absent from any of the lexicographical resources.

A similar pattern is observed with the term 'ADN'. This term is well-documented in almost all resources, with the only exception being the IGFC. However, when looking at the more specialised variant, 'ADN circulante', we find that it is not documented in any of the resources.

This trend continues with terms related to foetal and neonatal death. For instance, 'muerte fetal' is comprehensively documented across all resources, reflecting its significance in medical discussions. On the other hand, 'muerte neonatal', while still documented in some resources like *SNOMED CT*, *CIE-11*, and *IGFC*, is absent from others, such as *DTM* and *DPTM*. The term 'muerte neonatal temprana', which is even more specific, shows an even more limited presence, documented only in *SNOMED CT* and *CIE-11*. This analysis underscores the disparity in documentation between basic terms and their more specialised forms across different lexicographical resources.

The comparison between the terms 'transferencia de embriones' and 'transferencia de blastocistos' further illustrates the pattern of core versus

specialised terminology in lexicographical documentation. 'Transferencia de embriones', which refers to the transfer of embryos during assisted reproductive procedures, is a term that appears with relative frequency in the corpus. Its prevalence is reflected in its comprehensive representation across several essential lexicographical resources, including the *DTM*, the *DPTM*, and the *IGFC*. This widespread documentation highlights the term's importance and frequent use in clinical practice and medical literature. In contrast, 'transferencia de blastocistos', a term that refers explicitly to the transfer of blastocysts rather than earlier-stage embryos, is not documented in any of the consulted lexicographical resources despite its relevance in specific specialised contexts. The absence of 'transferencia de blastocistos' from these resources, coupled with its lower frequency in the corpus, underscores a broader trend: specialised terms, especially those involving more complex processes or additional satellite elements, are less likely to be uniformly documented across lexicographical resources.

This pattern is consistent with the documentation of other core medical terms, such as 'embrión' and 'útero'. These terms are fundamental to the field of reproductive medicine and, as such, are consistently and thoroughly documented across most lexicographical resources. Their frequent appearance in the corpus and comprehensive coverage in resources like *DTM*, *DPTM*, and *SNOMED CT* reflect their centrality to the discourse in reproductive health.

On the other hand, more specialised terms, or those with additional satellite elements, tend to be less frequently documented. Terms like 'útero didelfo' (a congenital uterine anomaly) or 'embarazo gemelar' (twin pregnancy) are less commonly mentioned in the corpus and are also underrepresented in lexicographical resources. This discrepancy highlights a significant challenge in the field: the more specialised or complex a term becomes, the less likely it is to be consistently included across all resources.

In addition to this analysis, we have compared the frequency of some of the terms in the corpus and their coverage in lexicographical resources. Therefore, Figure 3, provides this comparison:

The X-axis (frequency in the corpus) represents how often each term appears in the corpus; the Y-axis (terms) lists the terms being analysed, and the colour legend (lexicographical coverage) indicates the level of coverage each term has across lexicographical resources, with darker colours representing higher coverage.

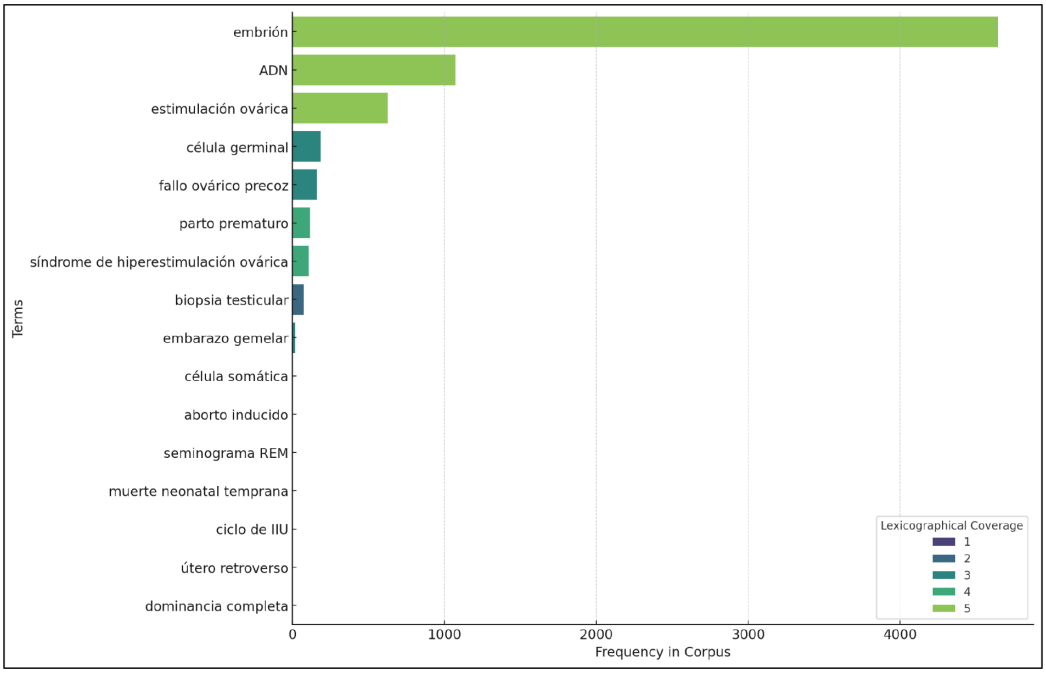

Figure 3: *Term frequency and lexicographical coverage*

This bar chart illustrates the relationship between the frequency of specific medical terms in the corpus and their coverage across lexicographical resources. Terms with high frequency, such as 'embrión' and 'ADN', are generally well-documented, indicated by the longer bars and darker colours. Conversely, less frequent terms like 'seminograma REM' and 'dominancia completa' show minimal documentation, reflected by shorter bars and lighter colours. The chart highlights a pattern where commonly used terms are more

likely to be thoroughly covered in lexicographical resources, while specialised or less frequent terms often have limited representation.

Table 5 provides a detailed comparison of nucleus terms and their satellite variants from Figure 3. Notably, the majority of the satellites are adjectives, such as 'euploide' for 'embrión' and 'circulante' for 'ADN', which serve to describe or qualify the nucleus term directly.

Nucleus term	Satellite	Type of satellite
embrión	*embrión euploide*	Adjective
ADN	*ADN circulante*	Adjective
estimulación	*estimulación ovárica*	Adjective
célula	*célula germinal / célula somática*	Adjective
fallo ovárico	*fallo ovárico precoz*	Adjective
parto	*parto prematuro*	Adjective
síndrome	*síndrome de hiperestimulación ovárica*	Noun phrase
biopsia	*biopsia testicular*	Adjective
embarazo	*embarazo gemelar*	Adjective
aborto	*aborto inducido*	Adjective
seminograma	*seminograma REM*	Noun (acronym)
muerte neonatal	*muerte neonatal temprana*	Adjective
ciclo	*ciclo de IIU*	Noun phrase
útero	*útero retroverso*	Adjective
dominancia	*dominancia completa*	Adjective

Table 5: *Comparison of Spanish terms and their satellite variants*

In addition to adjectives, the table includes noun phrases and an acronym that enhance the base terms by indicating specific subtypes within a broader category. For instance, 'seminograma REM', where 'REM' stands for 'recuento de espermatozoides móviles', is a specific form of semen analysis that provides additional details beyond the seminogram.

The terms in Figure 4 were selected randomly from the list of syntagmatic terms to complement Figure 3 and to explore whether there is a correlation between their frequency in the corpus and their coverage rate in lexicographical resources. The results show that while some terms like 'célula del cúmulo' and 'parto prematuro' have high frequencies in the corpus and high

lexicographical coverage, this pattern is inconsistent across all terms. For example, 'diagnóstico prenatal no invasivo' infrequently appears in the corpus and has correspondingly low lexicographical coverage, whereas terms like 'amenorrea secundaria', despite having relatively lower frequencies, still maintain moderate lexicographical coverage.

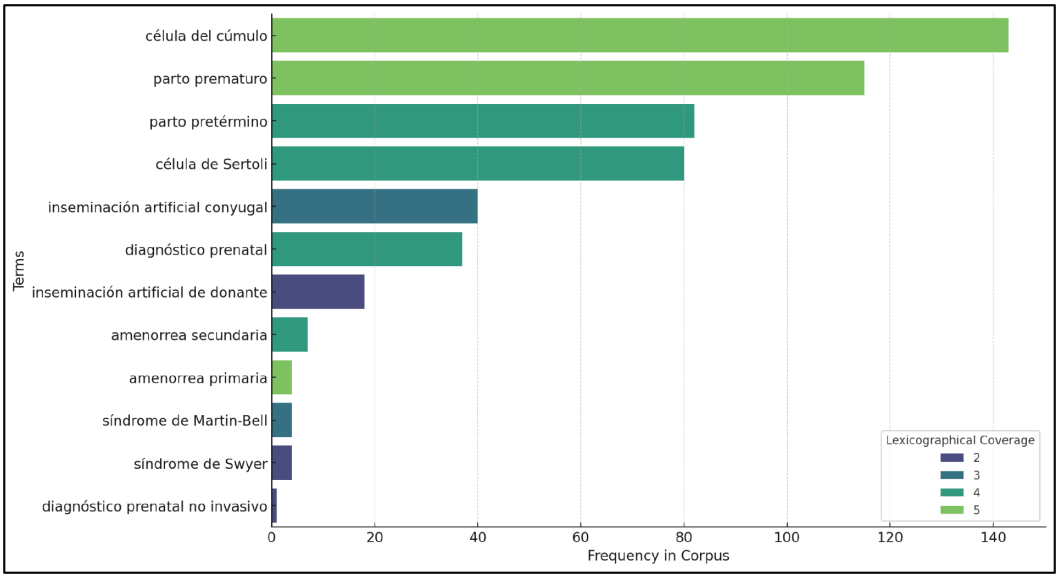

FIGURE 4: *Frequency vs. lexicographical coverage of selected terms*

These findings demonstrate a clear correlation between a term's level of specialisation and its likelihood of being uniformly documented. Core terms, due to their broad application in medical practice, are more likely to be included across multiple resources. In contrast, core terms with satellites, which often require a deeper understanding of specific contexts, are less uniformly represented, leading to potential challenges in both health communication and the broader dissemination of specialised medical knowledge.

3.2.2. English terms

For English terms, as we have presented in the methodology section, the English lexicographical resources differ from the Spanish ones since some of them do not allow any search in English. Figure 5 presents the

percentages of the English terms that have been found in the online resources as follows:

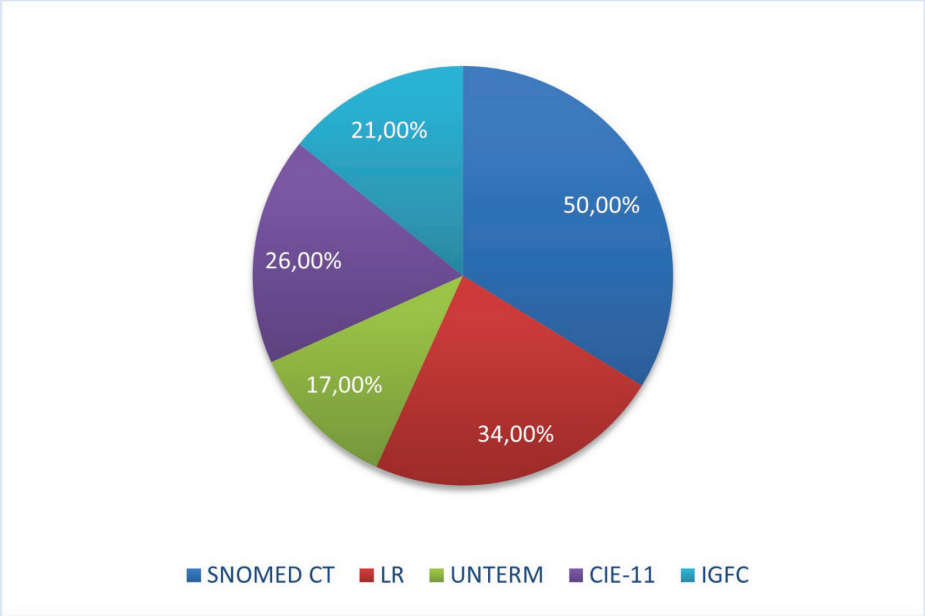

FIGURE 5: *Lexicographical documentation coverage for English terms*

As observed in Figure 3, *SNOMED CT* provides the most extensive coverage, with 50% of the terms analysed. The *LR* documents for 34% coverage, while *CIE-11* includes 26% of the terms. *IGFC* also contributes by covering 21% of the terms. Although *UNTERM* offers the least coverage, it still includes 17% of the terms. This distribution highlights the varying extent to which these resources address the terms analysed.

Moreover, some resources not specialised in medical terms offer the least coverage, such as *UNTERM*. Others, such as *SNOMED CT* or *LR*, associated with medical language queries, are practical for these searches. In contrast, *IGFC*, despite its focus on fertility language issues, has a low coverage rate, primarily providing core terms on techniques and treatments for assisted reproduction.

The analysis of English terms across various lexicographical resources reveals a consistent trend: some recognised terms in assisted reproduction are far more likely to be documented across multiple resources than their more specialised

counterparts. For instance, the term 'miscarriage' is well-represented in all the consulted resources, while 'recurrent miscarriage' shows a more limited presence, documented only in a subset of these resources.

Similarly, the term 'induced abortion' is comprehensively documented across most resources, while 'clinical abortion' is documented less frequently, being absent from several resources. This pattern is further exemplified by terms like 'primary amenorrhea', which, while still documented in some resources such as *SNOMED-CT* and *CIE-11*, is absent from others, including *LR* and *UNTERM*. The inconsistent documentation of these terms suggests a gap in the representation of more specialised or complex medical conditions.

This trend extends to other specialised terms as well. For example, 'endometrial biopsy', which refers to a procedure involving the removal of a small sample of the uterine lining for examination, is documented in *SNOMED-CT* but absent from other resources like *LR*, *UNTERM*, *IGFC*, and *CIE-11*. In contrast, 'chorionic biopsy', another important diagnostic procedure in prenatal care, is not documented in any of the consulted resources despite its relevance.

The disparity between core terms and core terms with satellites is further exemplified by comparing 'embryo' and 'euploid embryo'. The term 'embryo' is thoroughly documented across all resources, reflecting its fundamental role in medicine. On the other hand, the term 'euploid embryo' is notably absent from all consulted lexicographical resources. This absence underscores the difficulty in achieving uniform documentation for specialised terms critical in specific medical contexts, such as genetics and assisted reproduction.

Similarly, 'testicular biopsy', a procedure involving removing tissue from the testicle for examination, is not documented in any of the consulted resources. Moreover, while 'prenatal diagnosis' is documented in *UNTERM*, it is missing from other resources like *SNOMED-CT*, *LR*, *IGFC*, and *CIE-11*. The term 'non-invasive prenatal diagnosis', which refers to prenatal testing methods that do not involve invasive procedures, is absent from all resources despite its growing importance in modern prenatal care.

In summary, these findings demonstrate a clear correlation between a term's level of specialisation and its likelihood of being uniformly documented. Due to their broad application in medical practice, core terms are more likely to be included across multiple resources. In contrast, specialised terms, particularly those involving complex medical procedures or conditions, are less consistently represented.

Finally, Table 6 provides a detailed categorisation of nucleus terms and their corresponding satellite terms in English. This table is a counterpart to Table 5, which lists Spanish terms. Similar to the Spanish terms, most satellites are adjectives, such as 'euploid' for 'embryo' or 'circulating' for 'DNA', which serve to specify characteristics or states directly linked to the nucleus term. There are also instances where the satellites are nouns, like 'germ cell' or 'somatic cell', which help in distinguishing subtypes within the broader category of 'cell'. Additionally, some entries use noun phrases or acronyms, like 'ovarian hyperstimulation syndrome' or 'IUI cycle', to describe more complex concepts or procedures related to the base term. For example, 'IIU' stands for intrauterine insemination.

Nucleus term	Satellite	Type of satellite
embryo	*euploid embryo*	Adjective
DNA	*circulating DNA*	Adjective
stimulation	*ovarian stimulation*	Adjective
cell	*germ cell / somatic cell*	Noun / Adjective
ovarian failure	*premature ovarian failure*	Adjective
birth	*preterm birth*	Adjective
syndrome	*ovarian hyperstimulation syndrome*	Noun phrase
biopsy	*testicular biopsy*	Adjective
pregnancy	*multiple pregnancy*	Adjective
abortion	*induced abortion*	Adjective
semen analysis	*REM semen analysis*	Noun (acronym)
neonatal death	*early neonatal death*	Adjective
cycle	*IUI cycle*	Noun (acronym)
uterus	*retroverted uterus*	Adjective
dominance	*complete dominance*	Adjective

Table 6: *Comparison of English terms and their satellite variants*

3.3. Comparative Analysis of English/Spanish Terminology

This section compares the results of the lexicographical documentation conducted previously. Specifically, the aim is to study thoroughly and compare specific terms of both of the working languages in order to see any difference in the documentation of the terminology. To do so, four satellite terms were selected in the Spanish language as well as their equivalents in English in order to compare their appearance in each of the sources.

3.3.1. Analysis of specific terms

First of all, Table 7 and Table 8 gather the satellite terms analysed as well as their presence or not in the lexicographical sources we have worked. Concretely, Table 7 presents the four terms in Spanish ('menopausia precoz', 'amenorrea primaria', 'célula de Sertoli' and 'transferencia intratubárica de gametos') and Table 8 its equivalents in English ('early menopause', 'primary amenorrhea', 'Sertoli cell' and 'gamete intrafallopian transfer'). Apart from the terms, the lexicographical sources appear at the top of the table. If a term appears in a specific source, the capital letter X appears underneath to reflect it.

Satellite term	***DTM***	***DPTM***	***SNOMED-CT***	***CIE-11***	***IGFC***
menopausia precoz	X	X		X	
amenorrea primaria	X	X	X	X	
célula de Sertoli	X	X	X		
transferencia intratubárica de gametos					X

Table 7: *Documentation of Spanish terms in the lexicographical sources*

Satellite term	***SNOMED-CT***	***LR***	***UNTERM***	***IGFC***	***CIE-11***
early menopause					
primary amenorrhea	X				X
Sertoli cell	X			X	
gamete intrafallopian transfer	X			X	

Table 8: *Documentation of English terms in the lexicographical sources*

As it can be seen, the first term 'menopausia precoz' appears in three of the sources consulted, namely *DTM*, *DPTM* and *CIE-11*, but not in *SNOMED-CT* nor the specialised glossary in fertility *IGFC*. Even though the Spanish term is present in most of the lexicographic sources, the presence of the English equivalent differs significantly. In this case, there is no documentation of 'early menopause' in any of the resources addressed for the English language. Notwithstanding that, there is indeed a result of a synonym: 'premature menopause'. This synonym appears only in *SNOMED-CT*, so the frequency of appearance in English sources is still noticeably lower than its appearance in the Spanish ones. In spite of the fact that 'early menopause' is a fertility problem that hinders getting pregnant, there is no documentation of the term in *IGFC*, even though it covers fertility and infertility care.

Secondly, the satellite term 'amenorrea primaria' is documented in every source except for the IGFC, whereas the English satellite term, 'primary amenorrhea' only appears in *SNOMED-CT* and *CIE-11*. In this example, it can be seen that documentation is lineal in both languages, as the term appears in *SNOMED-CT* and *CIE-11*.

In the thematic field of *Biología celular,* the term 'célula de Sertoli' appears in *DTM*, *DPTM* and *SNOMED-CT* as an independent entry. The English equivalent 'Sertoli cell' also appears in *SNOMED-CT* and, contrary to the Spanish term, it is included in the *IGFC*. It is relevant to mention that it was decided not to include this term in the Spanish version of the glossary, despite its frequency of use. In particular, there are 89 occurrences of 'célula de Sertoli' in total, so at some point there is a correlation between its frequency of use in the corpus and its coverage in lexicographical resources.

Finally, the satellite term 'transferencia intratubárica de gametos' or 'gamete intrafallopian transfer' belongs to the thematic field *Técnicas de Reproducción Asistida*. Due to its level of specialisation, its documentation in the lexicographical sources is lower than other terms that have already been analysed. In this case, the term in Spanish only appears in the *IGFC* as well as the term in

English, which appears in the *IGFC* and *SNOMED-CT*. Its absence in the rest of the sources may be due to its linguistic complexity as well as its specification.

The polylexic term 'transferencia intratubárica de gametos' has 'transferencia' as its nucleus and to transform it into a satellite term, it needed to be added some components such as the adjective intratubárica, de proposition de and the plural noun 'gametos'. Therefore, its linguistic complexity can be perfectly seen when the term is itemised. This complexity also relies on its specificity, which makes it more difficult to document in the lexicographical sources we have worked with.

This comparison between languages demonstrates that the documentation of a particular term is not linear in both languages. That is to say, each source selects the terms that need to be included and, in some cases such as *SNOMED-CT*, *CIE-11* and *IGFC*, the inclusion of a specific word may vary depending on the language.

4. DISCUSSION AND CONCLUSIONS

In this study we have presented the analysis of English and Spanish syntagmatic terminological units of Assisted Reproduction. For this purpose, we have sourced the terms in the *Vocabulario de Reproducción Asistida*, a resource created within the Neotermed project, as well as several lexicographical sources to perform the terminological documentation of the terms in both of the working languages.

Therefore, we have evaluated the frequency of use of the Spanish terms in the vocabulary in order to select the most common satellite words and their equivalents in English. Once the terms were extracted and selected, the lexicographical documentation in the sources was performed.

This study has proven that the two hypotheses set out at the outset are true.

First of all, the more components a term incorporates, the more specialised and complex the satellite term becomes. This difficulty is also represented in the decrease of its frequency of use in the corpus, as they are technical terms that may be only used in a specific field. Satellite terms such as 'seminograma

con recuento de espermatozoides', 'transferencia embrionaria ecoguiada' and 'transferencia intratubárica de cigotos' are satellite terms with two or more components added to the nucleus, which make them more difficult to understand and less frequent in usage.

The second hypothesis stated that the more components a satellite term has, the less it is represented in dictionaries and glossaries. Once again, this hypothesis has been proved by studying the presence of the selected terms in the lexicographical sources selected for both languages. In Spanish, terms that have more than 2 components, for instance 'seminograma con recuento de espermatozoides', 'ciclo de inseminación artificial', 'ciclo de reproducción asistida' and 'transferencia intratubárica de cigotos' do not appear in any of the sources consulted for the Spanish documentation. The same happens in the English language with terms such as *REM* 'semen analysis', 'artificial insemination cycle' or 'conjugal artificial insemination', terms that do not appear either in the English documentation. In addition, some of these terms are under-represented in the corpus created within the Neotermed project, which may algo demonstrate their absence in the lexicographical sources.

Overall, this study confirms the hypothesis stated at the beginning of the investigation, and demonstrates that the more specialised and complex a satellite term is, the less it will appear in the corpus we have worked with and in the dictionaries and glossaries we have consulted.

For future research, it would be valuable to examine how the under-representation of complex and specialised satellite terms in both corpora and lexicographic resources affects the accessibility and dissemination of knowledge in specialised fields such as assisted reproduction. As these terms are crucial for accurate communication in such contexts, their absence from current resources suggests a need for systematic updating of lexicographic databases and glossaries. Future studies could focus on methodologies for incorporating these specialised terms into existing resources, ensuring that they are adequately documented and represented.

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