



University
of Exeter

**A corpus-based study to establish high-frequency technical vocabulary word lists
in the Obstetrics and Gynecology (OB&GYN) field**

A dissertation submitted in partial fulfillment of the requirements for the degree of
Master in Education (M.Ed) in Teaching English to Speakers of Other Languages (TESOL)

Thi Thuy Dung Le

Student ID: 730069856

Submission Date: 16th September 2024

Word Count: 13.074

Table of content

Acknowledgments.....	iv
Abstract.....	v
List of Tables	vi
List of appendices	vii
List of abbreviations	viii
1. Introduction.....	1
2. Literature Review	3
2.1. Word Lists and Technical Vocabulary.....	3
2.2. How to Identify Technical Words?	4
2.3. Word Selection Criteria	5
2.4. Unit of Counting.....	6
2.5. Medical Word Lists	8
3. Methodology	13
3.1. Research Paradigm	13
3.2. Ethical considerations.....	14
3.3. Corpus Construction	14
3.4. Data Processing Procedure and Word Selection	16
3.4.1 <i>The Unit of Counting</i>	16
3.4.2. <i>Keyword Analysis</i>	17
3.4.3. <i>Semantic Rating Scale</i>	19
3.5. Thematic Groups within each Sublist	23
4. Results.....	24
4.1. Keyword analysis	26
4.2. Word lists	27
4.2.1. <i>General technical vocabulary word list</i>	27

4.2.2. <i>Specialised Technical Word List</i>	29
4.2.3. <i>Research-related Technical Vocabulary Word List</i>	32
4.2.4. <i>Fully OB&GYN Technical Vocabulary Word List</i>	33
4.2.5. <i>Acronyms Word List</i>	34
5. Discussion	36
5.1. Technical Word Lists	36
5.1.1 <i>Single Words and Multiword Units</i>	36
5.1.2. <i>Part of Speech and Unit of Counting</i>	37
5.1.3. <i>Specialised Technical Word List</i>	38
5.1.4 <i>The Importance of High-frequency Words in the List</i>	39
5.1.5. <i>Research-related Technical Vocabulary Word List</i>	39
5.2. Thematic Groupings within each Sublist	40
6. Conclusion	42
6.1. Summary of Key Findings	42
6.2. Implications.....	42
6.3. Limitations	43
6.4. Suggestions	44
References	45
Appendices	49

Acknowledgments

First and foremost, I would like to express my deep gratitude to my beloved Vietnamese students for their unwavering support and belief in me. This belief continuously inspires me to strive for self-improvement to provide the highest quality of education for my students. The ideas behind this dissertation stem from the practical needs of students, motivating me to conduct research that addresses their challenges.

I am deeply grateful to my supervisor, Professor Phillip Durrant, University of Exeter, for his invaluable feedback and constant encouragement. His guidance has greatly influenced my research approach, helping me grow into a more independent researcher in the future. I have seen myself grow intellectually with each round of his feedback. Without his step-by-step guidance, I could not complete this dissertation.

I would also like to extend my thanks to the lecturers and staff at the University of Exeter for their guidance and support. The university has provided me with access to extensive resources, including the latest research articles, and good facilities to help me concentrate on writing my work.

I am grateful to have my Vietnamese friends in Exeter, who have been with me through both joyful and challenging moments. Their support has been vital for maintaining my well-being throughout this journey.

My deepest thanks go to my family, who have always supported me with unwavering love and encouragement. Their health and happiness are my sources of strength, giving me the security and power to overcome difficult times in the UK.

Finally, I want to acknowledge myself for practicing self-care, discipline, resilience, and determination. I am proud of the hard work I have put in over the years, funding my studies at one of the leading universities in the UK. I am grateful for all that I have achieved.

Abstract

Technical vocabulary plays a critical role in teaching and learning English for Specific Purpose (ESP), particularly in medical fields. In the context of Vietnam, there is a growing need for Obstetrics and Gynecology (OB&GYN) healthcare practitioners to read research articles, stay updated on the latest knowledge in the field, and publish their research with the worldwide scientific community. This study aims to create high-frequency technical vocabulary word lists in the OB&GYN field and classify vocabulary items into semantic groups to facilitate learning and teaching vocabulary in ESP classes. In this research, the corpus-based study was to compile 350 research articles from five journals in the OB&GYN field to build the OB&GYN corpus. The researcher used keyword analysis to compare vocabulary items between the OB&GYN corpus and the *BNC2014 baby+* corpus to identify potential technical words. Then the semantic rating scale was used to classify words into different sublists. The findings of the study provide a total of 721 vocabulary items, with 254 being *general* technical vocabulary, 43 *specialised* technical vocabulary, 111 *research-related* technical vocabulary items, 284 fully OB&GYN technical vocabulary, and 29 technical acronyms. Within each sublist, the list was further examined and grouped in smaller sizes based on the shared topics to make word lists more manageable. The *general* technical vocabulary items were divided into 8 groups (i.e., anatomy, healthcare and hospital setting, signs and symptoms, diagnostic tests and medical procedures, pathologic conditions, treatment, disease prevention, and others). The *research-related* technical vocabulary sublist has three main groups (i.e., study design, criteria and outcomes analyses, and statistical measures), *fully OB&GYN* technical vocabulary word list includes 10 smaller groups (i.e., anatomy of the reproductive system, maternal outcomes, newborn outcomes, pregnancy, OB&GYN pathologic conditions, labor and delivery, hormonal and menstrual health, reproductive health, procedures and treatment, and others). For two sublists *Specialised* technical vocabulary word list and the *Acronyms* word list were not grouped because they are already in small sizes. The findings serve as valuable resources for teachers, learners, and material designers to teach and learn technical vocabulary.

Keywords: corpus, technical word lists, vocabulary, medicine, OB&GYN, ESP

List of Tables

Table 3.1: Description of journals in the OB&GYN corpus	15
Table 3.2: Adapted semantic rating scale.....	20
Table 3.3: Analysing semantic checklist.....	22
Table 4.1: Sublist description.....	24
Table 4.2: Themes of each group within sublists	25
Table 4.3: Top 20 lemma from keyword analysis	26
Table 4.4: Examples of 30 items in the general technical vocabulary word list.....	28
Table 4.5: Examples of 60 items from three groups of Sublist 1.....	28
Table 4.6: The specialised technical vocabulary.....	29
Table 4.7: Examples of specialised technical words with their meanings.....	30
Table 4.8: Research-related technical vocabulary word list.....	32
Table 4.9: Examples of 30 items of three groups of Sublist 3	32
Table 4.10: Examples of 30 items in the fully OB&GYN technical vocabulary word list.....	33
Table 4.11: Examples of 30 vocabulary items from three groups of Sublist 4.....	34
Table 4.12: Acronym word list.....	34

List of appendices

Appendix A: General Technical Vocabulary Word List (ungrouped)	49
Appendix B: Groups of general technical vocabulary items by themes	52
Appendix C: Specialised Technical Vocabulary Word List and Meaning Explanation	56
Appendix D: Research-related Technical Vocabulary Word List (ungrouped)	66
Appendix E: Groups of Research-related Technical Vocabulary Items by Themes	68
Appendix F: Fully OB&GYN Technical Vocabulary Word List (ungrouped)	70
Appendix G: Groups of Fully OB&GYN Technical Vocabulary Items by Themes	74
Appendix H: Acronyms word list	79

List of abbreviations

No.	Abbreviations	Full terms
1	OB&GYN	Obstetrics and Gynecology
2	ESP	English for Specific Purposes
3	GSL	General Service List
4	L2	Second language
5	EAP	English for Academic Purposes
6	BNC	British National Corpus
7	COCA	Corpus of Contemporary American English
8	AWL	Academic Word List
9	TCM	Traditional Chinese Medicine
10	NeuroWL	Neurology word lists
11	CEFR	Common European Framework of Reference for Languages
12	TESOL	Teaching English to Speakers of Other Languages

1. Introduction

Technical vocabulary plays a critical role in teaching and learning English for Specific Purpose (ESP), particularly in medical fields. Learning technical vocabulary is crucial for improving reading comprehension and writing development. In the context of Vietnam where English is a foreign language, the need for learning medical English has grown significantly in both medical universities and hospitals. The field of Obstetrics and Gynecology, a smaller branch of medicine, is paid greater attention in Vietnam due to advancements in reproductive-assisted techniques and the increasing demand for childbirth services.

Currently, there is a growing need for OB&GYN healthcare practitioners in both private and public hospitals to read research articles, stay updated on the latest knowledge in the field, and publish their research with the worldwide scientific community. As a result, tailored ESP courses in the OB&GYN are essential for equipping Vietnamese doctors with the necessary medical English skills, beginning with providing teachers and course designers a technical word list in the OB&GYN to help learners focus on high-frequency technical words, thus facilitating reading comprehension and writing development.

Several medical word lists exist in the literature for learners, such as Wang et al.'s (2008) medical word list compiling medical articles from various sub-disciplines, Yang's (2015) academic nursing wordlist, Lu's (2018) traditional Chinese medicine word lists, and Li et al.'s (2021) neurology wordlist. However, there is a notable lack of word lists specifically for the OB&GYN field. Addressing this gap, the present study aims to create high-frequency technical vocabulary word lists using corpus analysis. This will serve as a valuable resource to assist learners, teachers, and materials designers in learning and teaching medical English in the OB&GYN field.

The study will explore two main research questions:

1. What are the high-frequency technical vocabulary items in the OB&GYN corpus?
2. How can these high-frequency technical vocabulary items be grouped into different themes based on their meaning to support teaching and learning vocabulary?

The dissertation consists of six chapters. The introduction outlines the research context, rationale, and research questions. The literature review examines existing studies on building technical word lists using corpus, with a focus on technical vocabulary in medicine. Following this, the methodology details information on the research paradigm, ethical considerations, corpus construction, and methods to identify technical vocabulary and classify them into different sublists. The result chapter presents findings in relation to two main research questions, followed by the discussion section, which interprets findings and compares them to other medical wordlists. Finally, the conclusion chapter summarises key findings, discusses the limitations of research, and suggests further studies.

2. Literature Review

2.1. Word Lists and Technical Vocabulary

Word lists are collections of vocabulary items that serve various purposes in language learning and teaching. These lists prioritize useful vocabulary for specific learners, they might be general high-frequency word lists, academic word lists, or word lists for specific purposes such as in medicine, finance, and engineering. Two of the most widely used high-frequency vocabulary lists are the most frequent 2000-word families in the West's (1953) General Service List (GSL) and the first 3,000-word families of the British National Corpus (BNC) or Corpus of Contemporary American English (COCA) lists by Nation (2012). The two best-known lists for academic vocabulary are Academic Word List by Coxhead (2000) and New Academic Word List by Gardner and Davies (2014). By focusing on keywords that are highly frequent in specific contexts, learners can concentrate on useful vocabulary that they could encounter more frequently in specific domains. This will assist list users in better communication as well as reading and writing development. In ESP courses, technical word lists are valuable for materials design, vocabulary drilling tasks, and vocabulary assessment.

Technical vocabulary is very closely related to one specific subject area of the text but not another subject, and it can consist of high-, mid-, or low-frequency vocabulary (Nation, 2022). A significant percentage of technical words can be high-frequency. A study by Quero and Coxhead (2018) shows that 15% of the 1st 1,000-word families in the high-frequency word of West's (1953) list had a medical meaning (e.g., *cases, severe, levels*), and 10% of the 2nd 1,000 words of the GSL also presented medical meanings (e.g., *lung, virus, tumor*). Additionally, Lu's (2018) study also reveals that the traditional medicine word lists contain a broad spectrum of frequency words, ranging from high-, mid- to low-frequency words in relation to BNC(Nation, 2012) vocabulary bands. Various classifications of technical vocabulary items were mentioned in the literature. For example, Nation (2016) classifies technical vocabulary into two main categories. The first category is words that are technical and are part of general language knowledge (e.g., *lungs, penicillin*). The second category is words that are technical and part of specialized knowledge (e.g., *xiphoid, hemoglobin*). Another example is Lu's (2018) study, she used other classifications to classify her word lists into four categories: (1) General technical words, i.e., those words are used in the same meaning in both general usage and technical context, (2) Specialised technical words, i.e.,

those words with additional technical meanings in medicine (3) Metaphorical technical words, i.e., those words are used with an extension of the general meaning. (4) Highly technical words, i.e., those words have constant meaning and are only specific to traditional medicine.

2.2. How to Identify Technical Words?

Several approaches were used to identify technical vocabulary. Chung and Nation (2004) compared four different approaches to identifying technical vocabulary. The first approach that they assumed was the best way is using a rating scale to classify words based on whether words' meaning belongs to a subject area or not. This way involves specialists with their specialised knowledge to rate words' meanings. However, classifying technical words in this way might be time-consuming and require more than one rater to avoid subjectivity. It also requires raters to have a good knowledge of a specific field so they can use their knowledge to identify word meanings. The second approach is based on clues that the writer provides in the texts such as definitions after technical terminology or diagrams' labels or typographical signals such as bolding, italics, and brackets. However, Chung and Nation (2004) showed that using clues is the least effective approach. This is because not all terminologies need clues after them, and with the assumption that in technical texts, the majority of audiences are individuals who already have background knowledge in that field, therefore clues are not always compulsory. Moreover, it is also demanding to recognise all terms with clues on a large scale.

The third way is using technical dictionaries where technical vocabulary might be found, such as anatomy dictionaries. In this approach, words that occur in a technical dictionary were considered technical words. Although the accuracy rate of identifying technical terms was high, Chung and Nation (2004) showed that a great number of non-technical terms also appear in a technical dictionary, which means that using a dictionary can not eliminate non-technical items with high accuracy. Moreover, using a technical dictionary is not always feasible, since it depends on the size of the dictionary, and there is no guarantee that all technical vocabulary will be included in a specific dictionary. It was also time-consuming, which is similar to the two first approaches.

The fourth way is using the computer-based approach (e.g., corpora) and software to extract technical words, which combines both the statistical approach (i.e., comparing the range and frequency of words in a specialised corpus and a general corpus) and the linguistic approach (e.g. word form analysis, semantic rating scale). A corpus (plural: corpora) refers to a large and structured collection of texts or spoken language that represents language use in different contexts. A corpus is used for linguistic analysis such as studying vocabulary, collocations (i.e., words that frequently appear together in the corpus), language patterns, structures, and usage. Using a corpus-based approach has the advantage of saving time for researchers compared to other approaches but also relies on the representativeness of specialised corpora and referenced corpora. The foundation of corpus representativeness is established by the linguistic research goal, which combines linguistic features with a relevant discourse domain (Egbert et al, 2022). Since the corpora's nature would impact greatly the quality of word lists, the corpora should represent as closely as possible the texts that target learners will encounter (Dang, 2019).

The fourth way of using corpora to compare keywords in technical corpus and general corpus was supported by many researchers. The idea behind the corpus comparison approach is that words occurring more frequently in the technical corpus than in the general corpus might be potential technical words (Chung & Nation, 2004; Kwary, 2011; Lu, 2018; Nation, 2022; Quero, 2017). However, keyword analysis might include non-technical vocabulary items. Empirical studies conducted by Kwary (2011); Lu (2018); and Tongpoon-Patanasorn (2018) have demonstrated that not all keywords identified through corpora comparison are classified as technical words. Therefore, a combination of keyword analysis through corpora comparison and a semantic rating scale by experts in the field was used to effectively identify technical vocabulary items.

2.3. Word Selection Criteria

Researchers based on *objective* criteria such as *frequency*, *range*, and *dispersion* to create single-word lists. Firstly, *frequency* refers to how often a word or multiword item (e.g., *pregnant women*, *gestational diabetes*, *morbidity rate*) appears throughout the entire corpus. For instance, Coxhead (2000) used a *minimum frequency* of selected words as 100 times, this means word items or word family members had to occur at least 100 times in her

corpus to be included in the final list. Secondly, *range* denotes the number of distinct texts or subcorpora in which the word or multiword item is found. For example, Wang et al. (2008) only selected words found in at least 50% of the subject areas. In other words, vocabulary items must appear in at least 16 of the 32 subject areas to be selected. Thirdly, *dispersion* indicates the evenness of the word distribution across different texts or subcorpora. In order to choose the useful words that learners might encounter, the lists aim at words with higher frequency, wider range, and more even distribution (Dang, 2019). While objective criteria ensure that the lists are replicable, they did not consider word meanings in the context. As a result, these lists might include non-technical terms. Therefore, *subjective* criteria such as experts' opinions and semantic rating scales can be used along with statistical measures to ensure the words meet the statistical thresholds and have technical meanings.

2.4. Unit of Counting

This section will discuss different ways of counting vocabulary items such as *running words (tokens)*, *word types*, *lemmas*, *flemmas*, *level-6 word family*, and the strengths and weaknesses of each unit of counting.

The first distinction that should be considered is the differences between *running words (tokens)* and different words (*types or families*). While counting *tokens* involves counting every word form in a spoken or written text regardless of their repetition, for *types* counting, only different words will be counted (Nation, 2022). For instance, in the sentence: "It is difficult to count it correctly", there are 7 *tokens* or *running words* but only 6-word *types* because the word "it" occurs twice.

Another important consideration when working with single-word lists is the distinction between different word counting units such as *types*, *lemmas*, *flemmas*, or *level-6 word families*. First, as mentioned earlier, counting by *types* refers to counting each distinct word form only once regardless of how many times that word appears in the corpus. If the words appear multiple times, only once will be counted. Word *type* also does not account for a singular or plural form of a word. For instance, the words "*pregnancy*" and "*pregnancies*" would be counted as two separate *word types*. The advantage of using *word types* as a unit of counting for technical word lists is that it draws learners' attention to

specific word forms that are more frequent in the corpus. However, a major disadvantage is that counting by *types* does not provide learners with words's parts of speech. This can confuse learners, as a word's meaning may change depending on whether it is used as a noun, verb, or another part of speech.

Second, a *lemma* includes a headword and its inflections and reduced forms (n't), and they all share the same part of speech (Dang, 2019; Nation, 2022). For instance, *book* (singular, noun) and *books* (plural, noun) should be the members of the same lemma because they are both nouns. The inflections include plural, third-person singular present tense, past tense, past participle, -ing, comparative, superlative, and possessive (Bauer & Nation, 1993). However, the issues with lemma forming are dealing with irregular forms because irregular forms will require learners more effort into learning compared to regular forms, and there is also debate about what should be considered as a base form (Nation, 2022). Despite these issues, using a lemma as a unit of counting offers several benefits for list users. First, it reduces the number of units in the corpus, which helps lighten the learning burden for learners (Nation, 2022). Second, using lemmas allows list users to identify parts of speech of vocabulary items and distinguish vocabulary items by their part of speech and their meaning. For example, with the same word form, *fast* (adjective) means quick or speedy, which has a different meaning from *fast* (verb) meaning abstain from eating for a period of time. Moreover, an empirical study by Brown et al. (2022) with second language (L2) learners suggests that the most suitable units of counting for word lists are *lemma* and *flemma*.

Third, the *flemma* is similar to the lemma, but it does not distinguish parts of speech (Dang, 2019; Nation, 2022). For example, *book* (verb) and *book* (noun) are counted as two *lemmas* but only one *flemma*. Using *flemma* has advantages over *lemma* because it can group words into a small size, but in some cases, it can cause students confusion because a word (noun) could have a different meaning from that word in verb form.

Finally, the word family consists of a stem and its potential inflections and derivations that include affixes up to a certain level on a one-to-seven scale (Bauer & Nation, 1993). This scale starts from elementary and transparent members to less obvious possibilities. A level 6 word family (e.g., *admire*) would include the *stem* (*admire*), and members derived from one or more affixes up to level 6 (e.g., *admirable*, *admirably*, *admiration*, *admirer*, *admirers*,

admiringly) (Dang, 2019). Using word families as a unit of counting the wordlists has disadvantages because not all family members of a word family appear equally in the corpus. Brown et al. (2022) provide empirical evidence from their study involving L2 English learners, indicating that the broader *word family* unit is not feasible, because it demands substantial knowledge of affixes and the ability to effectively use that knowledge.

The decision on what word counting unit to choose depends on many factors such as the study purpose, the target users, productive or receptive skills, the technical or non-technical word lists, the pre-knowledge of learners, and the learning burden (Dang, 2019; Nation, 2016, 2022).

2.5. Medical Word Lists

For learners in English for Specific Purposes (ESP) and English for Academic Purposes (EAP) classes, mastering academic and technical vocabulary items of their field is an efficient way to handle academic texts (Nation, 2022). Therefore, many researchers have conducted corpus-based research to provide specialised medical word lists for ESP and EAP learners. Each researcher examined medical vocabulary word lists from different perspectives. For example, Wang et al. (2008) developed a general medical word list covering various subspecialties, while Yang (2015) created an academic word list from nursing research articles. Additionally, Hsu (2013) compiled a corpus from both textbooks and articles to bridge the gap between technical words and non-technical words, Lu and Coxhead (2023) focused on a technical word list for traditional medicine, and Li et al. (2021) created a word list specific to Neurology. The following section will briefly review the most widely used word lists in the field of medicine.

Wang et al. (2008) introduced a medical word list derived from a corpus of 288 research articles across 32 subspecialties, containing 1,093,011 running words. The authors based their list on three main criteria: (1) *specialised occurrence* (i.e., words outside the 2000 most frequent words in the West's (1953) list), (2) *range* (i.e., words must appear in at least 16 of the 32 subject areas and (3) *frequency* (i.e., words must occur at least 30 times in the corpus of medical research articles). The established list contains 623 word families, accounting for 12.24% of the tokens in the medical articles. However, this list has some limitations. First, Wang et al. excluded research articles written by non-native English speakers,

potentially making the corpora of the study less representative of the texts that students typically encounter. Second, by relying on the general service word lists of West (1953) to exclude the 2000 most common words, Wang et al. overlooked technical vocabulary that may appear in these high-frequency words, as academic and technical items can also be in the first 2000 common words. Additionally, Wang et al. (2008) did not account for word meanings in the context, which led to the inclusion of non-medical words such as *nevertheless*, *per*, *approximate*, *versus*, *whereas*. Moreover, Wang et al (2008) removed 20 medical terminologies from the list such as *carcinoma*, *pulmonary*, *hepatic*, *cerebral*, and *hemorrhage*, this list ignored technical vocabulary items, thus challenging the usefulness of the list since students may face difficulties when learning technical terminologies. Despite these limitations, Wang et al.'s (2008) word list has played a foundation role in guiding further research on medical word lists, helping scholars refine and expand medical word lists for ESP and EAP learners.

Hsu (2013) compiled a corpus of 15 million tokens from 155 textbooks covering 31 medical subject areas. Three selection criteria included: (1) *specialised occurrence* (i.e., words outside the most frequent 3,000-word families of Nation's (2012) BNC/COCA lists), (2) *frequency* of at least 863 times in the whole 15 million tokens corpus, and (3) *range* (i.e., word family had to occur in more than half of the sub-disciplines). Hsu's Medical Word Lists contains 595 word families, aimed at bridging the gap between non-technical and technical vocabulary. However, by excluding the 3,000 most common words, Hsu's list may overlook high-frequency medical vocabulary that falls within this range. In addition, Hsu removed highly-specialised terminology that originated from the Greek or Latin language with the assumption that learners in this context had already completed basic medical terminology courses and would not struggle with these terms. This assumption, however, may not be applicable in all contexts, because fully technical vocabulary items could still pose challenges for other learners.

Yang (2015) developed a word list of academic vocabulary specific to nursing. The list was based on a corpus of 1,006,934 tokens that contains 252 English nursing research articles. Using *frequency* and *range* criteria, Yang identified 676 word families, which accounts for approximately 13.64% of the coverage in the corpus. Following Wang et al.'s (2008) approach, Yang excluded articles written by non-native English speakers and omitted the 2000 most frequent word families in English. Yang included words that have a minimum frequency of 33

times per 1 million tokens –one-third of frequencies in the Coxhead’s (2000) corpus since Yang’s corpus is one-third the size of Coxhead’s corpus. Additionally, only words that occurred in 11 or more of the 21 subject areas were included. Compared to Coxhead’s (2000) Academic Word List (AWL), which covered about 10% of the running words across four subject areas, Yang’s nursing-specific list provided a higher coverage of 13.64%. This highlights the need for academic word lists tailored specifically to nursing learners, as they better represent the vocabulary used in nursing texts.

Lei and Liu (2016) introduced a new medical word list with enhanced methods combining methods and procedures from Coxhead (2000) and Gardner and Davies (2014), the study developed a new medical academic vocabulary list with much better coverage of medical English while being 53% shorter than the existing medical academic word list developed by Wang et al. (2008). Lei and Liu built corpora that combine both medical articles and medical textbooks, which was superior to Wang’s (2008) corpora because Lei and Liu had (1) a 2.7 million-word corpus of medical academic English composed of medical journal articles and (2) a 3.5 million-word corpus of medical English textbooks. Different from Wang’s (2008) study, Lei and Liu included articles from both native and non-native English-speaking researchers because they believed that published articles have similar values and are carefully proofread by publishers. In terms of selection criteria, Lei and Liu (2016) did not base on any general service word lists but relied on statistical figures and meanings such as *minimum frequency*, *frequency ratio*, *Juilland’s D value*, and *measure meaning criterion* (i.e., lemma can be found in two of the selected medical dictionaries, showing that this lemma has medical meaning). However, as Chung and Nation (2004) pointed out that words appeared in specific medical dictionaries did not necessarily guarantee that they carry a medical meaning. In terms of word counting units, Lei and Liu did not use word family lists, instead, they used the *lemma* form, which helps learners focus on useful parts of speech.

Lu (2018) built a wordlist for ESP learners of traditional medicine by compiling both medical textbooks and research articles. She found that almost two in every five tokens in the Traditional Chinese Medicine (TCM) texts are technical. Lu’s (2018) research used *keyword analysis* to compare word frequencies of her corpus and reference corpus to identify potential technical words. In addition, Lu adapted *a semantic rating scale* from

Chung and Nation (2003) to classify technical vocabulary into four main categories: (1) General technical words, i.e, words have meaning used the same way in general usage and traditional medicine (2) Specialised technical words, i.e, words are used with an additional technical meaning in traditional medicine (3) Metaphorical technical words, i.e, words are used with an extension of the general meaning (4) Highly technical words, i.e., words have constant meaning and are specific only in traditional medicine or its related disciplines. She examined both single words and multiword units and classified her list into smaller sublists, which is beneficial for learners to approach her lists. Compared to previous studies such as Wang et al. (2008), Yang (2015), Lei and Liu (2016), and Hsu (2013), the word lists of Lu (2018) were superior, as Lu examined both single words units and multiword units. Moreover, Lu (2018) accounted for word meaning in the context, providing more comprehensive technical word lists. However, Lu's (2018) study used word *type* for her study, which does not provide learners with the part of speech of vocabulary items, which might confuse list users about word meaning, as with the same word type but different parts of speech might carry different meanings.

Li et al. (2021) developed a word list for the field of Neurology called Neurology word lists (NeuroWL). To create this list, Li et al. compiled 970 neurological research articles published in 10 journals to have a 6.1 million token corpus. They excluded the first 2000 most frequently words in West's (1953) GSL and set a minimum frequency threshold of 200 occurrences, with words required to appear in at least 9 out of 10 journals. This process resulted in a list of 717 word families designed to assist graduate students and researchers from related fields such as psychology, linguistics, and computer science, in reading scientific articles more easily. NeuroWL covers 12.99% of the Neurocorpus, which is double the coverage of Coxhead's AWL. However, NeuroWL has certain limitations: it relies solely on minimum frequency and range criteria to select words, overlooking word meanings in context, and the list contains only single-word units.

Many researchers support the research word lists in specific disciplines because specific word lists will better serve learners in ESP and EAP classrooms (Durrant, 2014; Hyland & Tse, 2007; Li et al., 2021; Lu & Coxhead, 2023). Several medical word lists reviewed above exist in the literature and provided learners with medical wordlists in various sub-discipline such as Wang et al.'s (2008) medical wordlist, Hsu's (2013) medical word lists,

Yang's (2015) academic nursing wordlist, Lu's (2018) traditional medicine wordlists, Li et al.'s (2021) neurology wordlist. However, there is a notable lack of wordlists specifically for the OB&GYN field. Therefore, building a technical word list tailored for medical practitioners in Obstetrics & Gynecology (OB&GYN) is crucial to facilitate teaching and learning vocabulary, thus enhancing reading comprehension and writing development.

3. Methodology

This section outlines the methodology employed in the study, beginning with the research paradigms and ethical considerations, followed by a detailed description of corpus construction. The procedures for creating word lists using computer tools and an adapted semantic rating scale will also be presented. The final stage details the approach for classifying vocabulary items into smaller groups sharing common themes.

3.1. Research Paradigm

Since the main purpose of the present study is to create word lists that are useful and practical for teachers and learners in the OB&GYN field, *pragmatism* is identified as the most suitable paradigm for the study. *Pragmatism* emphasizes the practical application of research findings and the usefulness of results in real-world settings, and research problems should be resolved empirically and practically (Islam, 2022). It integrates both quantitative and qualitative data as tools to solve practical problems. By focusing on outcomes that are beneficial for teachers and learners, *pragmatism* aligns with the study's goal of creating practical word lists that enhance medical vocabulary learning in ESP classes.

To address the first research question of identifying high-frequency technical vocabulary, the study combines both quantitative and qualitative methods. Quantitative analysis was used to determine the frequency of words within a technical corpus compared to a reference corpus with subsequent comparisons of word frequencies between these corpora. The keyword list derived from this corpora comparison suggests potential technical vocabulary, under the assumption that technical words appear more frequently in the technical corpus than in the general corpus (Chung & Nation, 2004; Kwary, 2011; Lu, 2018; Nation, 2022; Quero, 2017). Following this, a qualitative approach was employed to examine keywords used in the context and to evaluate keywords' meaning to decide if they are technical vocabulary using a semantic rating scale. For the second research question, which involves classifying technical vocabulary items in each sublist in the thematic groups, a qualitative approach was employed to arrange items in groups with shared topics.

3.2. Ethical considerations

Although obtaining approval from ethics committees is not always mandatory for corpus studies, ethical considerations in the present study were thoroughly addressed. Firstly, this study involves only written text analysis and thus does not directly impact human subjects. Secondly, while all medical journals used in the present study are not open-access, the texts were accessed through a paid account provided by the University of Exeter. Thirdly, the collection of written texts from medical research articles is intended solely for research purposes and not for commercial profits, which aligns with the copyright regulation set by the publishers. The findings of this corpus research are expected to positively contribute to the comprehensive understanding of medical academic language features and could benefit researchers in both medical and linguistic fields. In addition, the corpus will be securely stored and not shared publicly to ensure compliance with copyright laws. Moreover, all journals used are appropriately described to acknowledge the publishers and respect their intellectual property. The medical journal articles included were also ethically approved and anonymised, thus did not affect patients' confidentiality. Based on all the above-mentioned factors, the study proceeded after thorough ethical considerations.

3.3. Corpus Construction

The corpus used in this study comprises 1,222,463 tokens from medical research articles in the Obstetrics and Gynecology field (OB&GYN corpus). The focus on research articles rather than medical textbooks is because the target users of the word list are specialists and medical practitioners who need to read medical research articles to stay updated on research findings. As the target users have already graduated from medical schools, they tend to read articles rather than textbooks.

The OB&GYN corpus consists of 350 articles published in five journals, with 70 articles from each journal, totaling about 1.2 million tokens for analysis. These journals were selected because they are indexed in the Scopus system, and they are recommended by two Vietnamese OB&GYN specialists with at least 5 years and 10 years of experience, respectively. Table 3.1 lists the five journal names. For each journal, the 70 most recent articles as of May 2024 were selected. The *New England Journal of Medicine* publishes fewer articles compared to specialised journals, so the 70 articles span from 2018 to May 2024. For the other four journals, the 70 articles per journal were all published in 2023 and 2024. The

minimum, maximum, and median text lengths for each journal are presented in Table 3.1. Only relevant sections of texts were retained, while non-relevant parts such as authors' names, tables, figures, labels, diagrams, notes, endnotes footnotes, references, and appendices were removed.

Table 3.1: Description of journals in the OB&GYN corpus

No.	Journal	No. of text	Text length (tokens)		
			Min	Max	Median
1	New England Journal of Medicine (OB&GYN articles)	70	2581	4550	3663.5
2	OB&GYN Green Journal (a branch of the American College of Obstetricians and Gynecologists - ACOG)	70	2347	4456	3232
3	AJOG (American Journal of Obstetrics and Gynecology)	70	2946	5372	3862.5
4	BJOG (An International Journal of Obstetrics and Gynecology)	70	2406	4502	3619
5	EJOG (European Journal of Obstetrics and Gynecology and Reproductive Biology)	70	2270	4890	3047.5

OB&GYN corpus includes both original research and systematic review articles, which follow the structure: Introduction or Background – Methods – Results – Discussion. The reason systematic review articles were selected alongside original research is justified as target users (i.e., medical doctors and healthcare practitioners in OB&GYN field) read both types of research, and systematic reviews are also valuable to the readers, this approach is supported by Lei and Liu (2016). While some studies such as Wang et al., (2008) and Yang (2015) only compiled articles with the first authors being native speakers, in this study, selected papers were not differentiated by their authors' native language. Both native and non-native writers' articles were included for several reasons. First, identifying the authors' native language is not always be possible and time-consuming, making it impractical given

the large number of papers. Second, in the field of medicine, articles often result from collaborations among researchers from various countries, and it might be unclear which authors contribute the most to writing papers. Also, the target users read both native and non-native authors' articles, and articles are peer-reviewed and proofread by publishers to ensure clarity and scientific value.

3.4. Data Processing Procedure and Word Selection

The following paragraphs will detail the unit of counting, and the keyword analysis process to identify potential technical words. These single potential technical words were then examined in the context to check whether they have multiword units having technical meaning. Both single words and multi-word units were next rated for their meanings through an adapted semantic rating scale to make decisions if they are technical words.

3.4.1 The Unit of Counting

Although some research studies such as Lu (2018), and Quero (2017) about the technical vocabulary used *word type* as the unit of counting, in this study, *lemma* was employed in the keyword analysis process (the differences between *word type* and *lemma* were introduced in the section 2.4 of Literature Review chapter). The present study has some advantages by using lemma forms. First, the lemma provides words with part of speech information. Many words have technical meanings in noun form but they do not have technical meaning in other forms. For example, as an adjective, *patient* describes a characteristic of a person who remains calm and does not get easily frustrated or upset, especially in situations requiring tolerance or endurance. As a noun, *patient* refers to a person who is receiving medical care or treatment from a healthcare professional. Second, the lemma word list provides learners and teachers focus only on the part of speech that occurs more frequently in the list. For example, *study* as a noun (e.g., *the clinical study*, *the retrospective study*) appears more frequently in the technical corpus rather than the verb *study*. Therefore, it is easier for teachers and learners to teach and learn words by focusing on the meaning of those forms. Third, the part of speech of lemma benefits the research at the later stage to rate words' meaning using an adapted semantic rating scale. For example, it is easier for the rater to classify the word *group* as a noun (e.g., *the treatment group*) into technical meaning rather than considering *group* as both a noun and a verb, thus facilitating the process of semantic rating. The study takes further steps of examining the inflections of

each lemma to determine whether each inflection of the lemma equally appears and meets the inclusion criteria. The inflection forms of lemma that did not meet the selection criteria were excluded from the list, and thus the final lists contain technical vocabulary items along with their parts of speech.

3.4.2. Keyword Analysis

In order to identify technical vocabulary, a corpus comparison method (keyword analysis) was employed to compare the frequencies of words between two corpora, one technical corpus (target corpus), and one general corpus (reference corpus). The idea behind the corpus comparison approach is that words that occur more frequently in the technical corpus than in the general corpus might be potential technical words (Chung & Nation, 2004; Kwary, 2011; Lu, 2018; Nation, 2022; Quero, 2017). For keyword analysis, two separate word lists together with the words' frequency of two corpora were created. Then the programs *Antconc* (Anthony, 2023), and *Lancsbox* (Brezina et al., 2021) were used to systematically compare the frequencies of words in these two lists and explore keywords in the multiword units in the corpus. This enables researchers to identify *positive* keywords (i.e. words occurring much *more* frequently in the target corpus than in the reference corpus) and *negative* keywords (words appearing much *less* frequently in the target corpus than in the reference corpus) (Durrant et al., 2022).

The reference corpus employed in this study was *BNC (2014) baby +*, which is a spoken and written English corpus with a total of 5 million tokens. The reference corpus (*BNC2014 baby+*) was chosen because it was five times larger than the target corpus (OB&GYN corpus). Therefore, it might be big enough to allow high-frequency general words to occur. Also, it was free of charge, ready to use and it also included written language compiled from various sources such as newspapers, fiction, academic components, and E-language (e.g., social media (Facebook and Twitter posts), emails, blogs, discussion forums, and product reviews). Although there are some texts of reference corpus coming from medicine, they only included 170,000 tokens, which accounted for 3.4% of the *BNC(2014) baby+* corpus. Therefore *BNC(2014) baby+* could be the reference corpus to compare.

Lancsbox version 6.2 (Brezina et al., 2021) was chosen for keyword analysis because it is free of charge and provides *Words* function to calculate the frequencies of words in two

corpora and then compare them by *simple math* calculation. In the literature, various statistical measures were proposed for keyword analysis, such as *log-likelihood ratio* or *Chi-square*. However, *log-likelihood* was being shown to overemphasize keywords (Brezina, 2018; Kilgarriff, 2009). Therefore, a *simple math* calculation as the ratio of normalised frequencies was preferred for better accuracy and easier interpretation (Durrant et al., 2022; Kilgarriff, 2009). For example, the lemma *pregnancy* appears 4279 times per one million words in the OB&GYN corpus and only 18 times per one million words in the *BNC(2014)baby+* corpus. Therefore, the lemma *pregnancy* is 237.7 times more frequent in the OB&GYN corpus than in the *BNC(2014)baby+* corpus. In the case of the lemma *postpartum* occurs 647 times per one million words of the OB&GYN corpus, but does not occur in the reference corpus, we can not divide by zero. Kilgarriff (2009) suggested that a fixed number (e.g., 1, 10, or 100) could be added to both the nominator and denominator of the above-mentioned ratio to calculate a new score. A fixed number can be added depending on analysts and corpus size. The higher the number added, the more the outcome will emphasize very frequent words rather than those that are infrequent in both corpora (Durrant et al., 2022), this helps to minimize the false inclusion of infrequent words.

Lancsbox offers a tool called *simple math* to calculate the ratio of word frequencies, where words with higher scores appear more frequently in the target corpus than the reference corpus. The default cut-off scores provided by *Lancsbox* are greater than 1.1 to identify *positive* keywords and less than 0.9 for *negative* keywords. However, in this study, a stricter cut-off point of 1.3 was applied to focus on the most frequent keywords. Function words, proper nouns, symbols, and numbers were excluded, while acronyms and abbreviations relevant to the technical field were retained.

In this study, in order to identify high-frequency technical words, a *minimum frequency* was set at 40 (i.e., words must appear at least 40 times per the 1.2 million words in the target corpus). Also, a *minimum range* of 10 was set (i.e., words must appear in at least 10 out of 350 texts to be included). The rationale for choosing 40 times as the minimum frequency and 10 texts after several trials is that the purpose of the study was not to identify all the technical words but only high-frequency technical words, ensuring the word list remained practical and manageable for teaching and learning purposes. With the cut-off point of simple math score set at 1.3, minimum frequency of 40 times per 1.2 million

tokens, and minimum range of 10 texts, the resulting keywords were then included for further analysis.

One issue with the keyword analysis is that it only provides single-word units (e.g., *pregnancy, patients, birth*), but technical words might be single or multi-word units (e.g., *pregnancy outcome, preterm birth, gestational diabetes*). Many single words alone do not have medical meaning (e.g., *group*), but they bring medical meaning in their multiword units (e.g., *control group, placebo group*). Therefore, the second step after *keyword analysis* involves examining single words to explore if they have collocates (multiple words occur together) and whether multiword units bring medical meaning or not. The *Cluster* function in the *Antconc* (Anthony, 2023) tool could provide clusters of words (words co-occur frequently with each other), the cluster sizes were two or three words on the left and/or on the right of the single word to focus on two-word and three-word multiword units. Three criteria were set for a cluster: (1) has additional *medical meaning* compared to single words (2) the *minimum frequency* that they co-occur was set at 40 per 1.2 million tokens and (2) the *minimum range* was set at 10. For example: the lemma *pregnancy* has two collocations to meet the criteria: (1) *pregnancy outcome* and (2) *ectopic pregnancy*. Other collocations including single words and prepositions such as *during pregnancy* or *after pregnancy* were excluded. This process also requires the researchers to bring their knowledge to classify clusters with medical meaning. In this study, the researcher has medical knowledge (i.e., holding a Bachelor's degree in medicine from Vietnam), good English proficiency (i.e., C1 level following the Common European Framework of Reference for Languages (CEFR) framework), and experience teaching medical English (i.e., Diploma in TESOL and 4 years of experience in teaching medical English).

3.4.3. Semantic Rating Scale

The original four-level semantic rating scale was introduced by Chung and Nation (2003) to identify technical words in anatomy by examining the nature of technical words in anatomy. There are four categories of words classification: (1) words independent of subject matter (i.e, function words), (2) words having a minimal meaning related to anatomy (i.e., words describe positions, movements, or features of the body), (3) words that have a meaning that closely related to the field of anatomy (i.e, structures, region of the body), and (4) words having a meaning that is only specific to anatomy field. Based on Chung and

Nation's (2003) scale, Lu (2018) built a modified scale to identify technical words and non-technical words in Traditional Medicine, and Tongpoon-Patanasorn (2018) also adapted that scale to identify technical words in finance. The present study adapted the semantic rating scale of Chung and Nation's (2003) scale and Lu's (2018) scale to tailor to language in the OB&GYN field. The rating scale in this OB&GYN study added a new level of examining technical words that have different meanings from general usage (level 2.2 in Table 3.2) because it will help teachers to draw the attention of learners to specialised technical words and avoid learners' confusion. Also, a research-related technical words level (level 2.3) was used in the study to help teachers focus on technical meaning not only useful in the OB&GYN research but also in other sub-specialties (e.g, cardiology), this helps teachers to deal with other similar classes. The technical level has 4 sub-levels as described in Table 3.2

Table 3.2: Adapted semantic rating scale

Scale	Description	Examples
1. Non-technical	Words have no meaning specific to medicine	total, overall, addition, introduction, common, furthermore
2. Technical	2.1. General technical words: words having a meaning related to the medical field and are the same as the general meaning in daily life.	kidneys, oxygen, cancer, healthcare, physician, symptom
	2.2. Specialised technical words: words having a meaning related to medicine and/or the GYN&GYN field but are different from the general meaning	delivery (n), discharge (n), failure (n), examination (n), labor (n)
	2.3. Research-related technical words: words having a meaning related to medical research, not only in the OB&GYN	cohort study, control group, placebo group, relative risk

	field but also can apply to another sub-discipline in medicine (e.g., cardiology, pediatrician)	
	2.4. Fully technical words: words having meaning only specific to the OB&GYN	gestational diabetes, postpartum, hysterectomy, antenatal, intrauterine

Although the main purpose of the semantic rating scale was to identify technical and non-technical vocabulary, the technical levels were subdivided into four main sub-levels to provide learners and teachers with more details of vocabulary levels to facilitate teaching and learning vocabulary. For example, specialised words in level 2.2 having different meanings from general usage remind teachers to draw learners' attention to specific technical meanings, avoiding learners' confusion. Additionally, words having fully technical words in level 2.4 might need more effort to learn compared to words in level 2.1 which has similar meaning from general use. In addition, the lists also benefit learners from various language proficiency levels. For instance, while learners with low language proficiency levels might need to learn words from level 2.1, learners with intermediate and advanced levels might be more interested in level 2.4. From teachers and curriculum designers' perspectives, the words in level 2.3 reveal words related to research, not only useful in the OB&GYN field but also can be applied to other classes of different learners (e.g., English for Cardiologists, English for Pediatricians). Therefore, each vocabulary level might provide value to various learners with different English proficiency levels.

Table 3.3 was used by the researcher to systematically rate and classify words into different categories. During the meaning rating, the researcher also examined words in the context using *Antconc* software and also considered some meanings from Merriam-Webster Dictionary¹ and Cambridge Vocabulary Profile². The researcher brings both their knowledge of the subject matter and is also supported by Dictionaries to classify words into different categories.

Table 3.3: Analysing semantic checklist

No.	Words	Non-technical	Technical				Acronyms
			<i>General</i> technical words	<i>Specialised</i> technical words	<i>Research</i> -related technical words	<i>Fully</i> technical words	
1	neonatal_adj					✓	
2	cohort study (n)				✓		
3	delivery (n)			✓			
4	addition (n)	✓					
5	postpartum (adj)					✓	
6	total (adj)	✓					
7	stillbirth (n)					✓	
8	BMI						✓
9	preterm birth					✓	
10	cancer		✓				

¹ Merriam-Webster Dictionary: <https://www.merriam-webster.com/>

² Cambridge Vocabulary Profile: <https://www.englishprofile.org/wordlists/evp>

The results of the semantic rating scale provide sub-lists of *general* technical words, *specialised* technical words, *research-related* technical words, and *fully* technical words, and acronyms. This can benefit both learners, teachers, and course designers.

3.5. Thematic Groups within each Sublist

After classifying technical words into five sublists using the semantic rating scale, the next step involved organising items within each sublist into smaller groups, ensuring that items within each group shared a common topic. In addition, items belonging to the same word family were placed together and highlighted either in italics or underlined for easier tracking. The rationale for this grouping was to facilitate the teaching and learning process by making the sublists more manageable, thus reducing the learning burden on learners.

For example, the general technical wordlist could be divided into thematic groups such as anatomy (e.g, *liver, kidneys, venous, artery*), signs and symptoms (e.g., *pain, infection, bleeding*), pathologic conditions (e.g, *cancer, diabetes, stroke*), diagnostic tests and medical procedures (e.g., *laboratory, injection, blood transfusion*), treatment (e.g, *surgery, dose, therapy*). The themes of each group can be partially predicted due to the nature of approaching patients in medical settings, starting with body organs that patients have problems with (anatomy), processing to subjective symptoms that patients experience, and objective signs that healthcare staff can measure (signs and symptoms), following by lab tests and clinical procedures to diagnose diseases (diagnostic tests and medical procedures), giving diagnoses (pathologic conditions), suggesting treatment plans (treatment). Similarly, for the *fully* OB&GYN technical vocabulary list, some themes could be anticipated based on the process of pregnancy and childbirth, including groups such as anatomy, pregnancy, maternal health, labor and delivery, newborn health, pathologic conditions, diagnostic tests and procedures, and treatment. For themes that are less predictable, specialised knowledge and teaching experience of the researcher were employed to classify the remaining items effectively. If there were any items that are ambiguous and could be classified into more than one theme, these items would be in one category named *Others*.

4. Results

The previous chapter explained methods that combined keyword analysis to identify potential technical vocabulary in the OB&GYN corpus, a semantic rating scale to classify technical terms into different categories, and thematic group prediction of vocabulary items in each sublist. This chapter presents the findings of technical wordlists in relation to the research questions posed in the dissertation:

1. What are the high-frequency technical vocabulary items in the OB&GYN corpus?
2. How can these high-frequency technical vocabulary items be grouped into different themes based on their meaning to support teaching and learning vocabulary?

In the first stage of keyword analysis, 1349 lemmas met the criteria of a simple math score cutoff of 1.3, a minimum frequency of 40, and a minimum range of 10, qualifying them for the next step in the semantic rating scale. In the second stage, 721 items were identified as having technical meaning and they were classified into 5 categories. In the final stage, items within each category were further organised into smaller groups based on their similar meanings within specific topics.

The results section will present five sublists. The first list includes *general* technical vocabulary; i.e., words that have meanings related to the medical field and are consistent with their general usage. The second list introduces *specialised* technical words, which have meanings specific to medicine and/or the OB&GYN field and differ from their general usage. The third word list focuses on *research-related* technical words, relevant to medical research across various sub-disciplines, including OB&GYN. The fourth list comprises *fully* OB&GYN technical words, which are specific to the OB&GYN. The final list contains useful *acronyms* related to OB&GYN diseases and research terminology. The numbers of word items in each word list are presented in Table 4.1.

Table 4.1: Sublist description

Sublist	Name of sublist	No. of items
Sublist 1	<i>General</i> technical vocabulary word list	254
Sublist 2	<i>Specialised</i> technical vocabulary word list	43
Sublist 3	<i>Research-related</i> technical vocabulary word list	111

Sublist 4	<i>Fully OB&GYN technical vocabulary word list</i>	284
Sublist 5	<i>Acronyms word list</i>	29
Total		721

For the second research question, after technical vocabulary items were classified into 5 sublists, items in Sublist 1, Sublist 3, and Sublist 4 were examined and grouped into smaller groups based on their meanings, this allows teachers, learners, and material designers to approach sublists in manageable sizes and easier to use the list. Sublist 2 and Sublist 5 with small sizes of items were not examined. Table 4.2 shows the themes of each group within sublists.

Table 4.2: Themes of each group within sublists

	Group	Themes of groups	No. of items
Sublist 1: <i>General technical vocabulary word list</i>	1	Anatomy	44
	2	Healthcare and hospital setting	45
	3	Signs and symptoms	41
	4	Pathologic conditions	29
	5	Diagnostic tests and medical procedures	23
	6	Treatment	34
	7	Diseases prevention	19
	8	Others	19
	Total items of sublist 1		
Sublist 3: <i>Research-related technical vocabulary word list</i>	1	Study design	39
	2	Criteria and outcomes analyses	36
	3	Statistical Measures	36
	Total items of sublist 3		
	1	Anatomy of the reproductive system	48
	2	Maternal outcomes	36
	3	Newborn outcomes	44
	4	Pregnancy	29

Sublist 4: <i>Fully OB&GYN</i> technical vocabulary word list	5	OB&GYN pathologic conditions	37
	6	Labor and delivery	14
	7	Hormonal and menstrual health	22
	8	Reproductive health	22
	9	Procedures and treatment	22
	10	Others	10
	Total items of sublist 3		

The following section presents word lists of each stage, including the top word lists ranking from highest to lowest simple math score after keyword analysis, and items in each sublist and each theme.

4.1. Keyword analysis

After conducting keyword analysis between the OB&GYN corpus and *BNC2024 baby+* corpus, Table 4.3 shows the top 20 lemma with their frequency (i.e., their normalised frequency in 10000 tokens in each corpus), ranges, and simple math scores ranking from the highest to the lowest score.

Table 4.3: Top 20 lemma from keyword analysis

No.	Lemma	Frequency (OB&GYN corpus)	Range (OB&GYN corpus)	Frequency (BNC2014 baby+ corpus)	Range (BNC2014 baby+ corpus)	Score
1	pregnancy_n	42.75	250	0.18	9	37.04
2	outcome_n	36.53	317	0.61	12	23.35
3	patient_n	48.34	291	1.32	11	21.23
4	birth_n	30.44	225	0.51	12	20.85
5	Cl_n	20.18	232	0.04	4	20.45
6	maternal_adj	18.82	212	0.27	5	15.62
7	trial_n	23.53	186	0.59	12	15.47
8	delivery_n	25.46	225	0.76	12	15

9	study_n	64.84	340	3.5	13	14.63
10	risk_n	35.83	320	1.58	12	14.25
11	clinical_adj	14.96	316	0.26	9	12.68
12	gestational_adj	11.35	186	0.01	1	12.26
13	adverse_adj	12.11	201	0.08	7	12.19
14	cohort_n	12.17	238	0.15	3	11.42
15	analysis_n	31.22	343	1.85	13	11.33
16	associate_v	18.32	317	0.77	12	10.91
17	gestation_n	9.82	177	0.02	5	10.65
18	vaginal_adj	9.51	127	0	0	10.51
19	participant_n	19.31	206	1.03	9	10.01
20	group_n	46.19	312	3.84	13	9.75

For the next step, 1349 lemmas were examined in the context of the OB&GYN corpus and rated following the semantic rating scale described in the methodology section. The next section presents word lists in 5 sublists and groups of items within each sublist.

4.2. Word lists

4.2.1. General technical vocabulary word list

Table 4.4 provides the top 30 items of the general technical vocabulary word list (i.e., ranking from the highest to the lowest of the simple math score) along with their part of speech, where *n* denotes noun, *v* denotes verb, and *adj* denotes adjective. For words with additional parentheses, such as *study(es)_n*, it provides learners with extra information that both forms (i.e., singular noun and plural noun) *study_n* and *studies_n*, appear in the OB&GYN corpus and meet the word selection criteria. For the complete list of 254 items, please refer to the Appendix A.

Table 4.4: Examples of 30 items in the general technical vocabulary word list

No.	Item	No.	Item	No.	Item
1	patient(s)_n	11	clinical implications	21	disease(s)_n
2	patient characteristics_n	12	health_n	22	disease progression_n
3	patient satisfaction_n	13	health care professionals_n	23	cardiovascular disease_n
4	heart rate_n	14	mental health_n	24	surgery(es)_n
5	treatment(s)_n	15	health insurance_n	25	follow up period_n
6	surgical treatment_n	16	side effects_n	26	hospital(s)_n
7	treatment period_n	17	care_n	27	hospital stay_n
8	clinical_adj	18	cancer(s)_n	28	diagnosis(es)_n
9	clinical practice	19	breast cancer_n	29	blood_n
10	clinical characteristics	20	death(s)_n	30	blood pressure_n

Table 4.5 shows items within three groups of the general technical vocabulary sublist in smaller groups that items in each group are under the same themes (i.e., anatomy, healthcare and hospital setting, signs and symptoms, pathologic conditions, diagnostic tests and medical procedures, treatment, diseases prevention, and others). Words with similar components will be italicized or underlined for easier tracking. For full items of eight groups, see Appendix B.

Table 4.5: Examples of 60 items from three groups of Sublist 1

Group 1: Anatomy	Group 2: Healthcare and hospital setting	Group 3: Signs and symptoms
anatomy_n	<u>patient(s)_n</u>	infection(s)_n
heart rate_n	<u>inpatient_n</u>	infectious_adj
blood_n	<u>outpatient_n</u>	<u>symptom(s)_n</u>
serum_n	patient characteristics_n	<u>symptomatic_adj</u>
plasma_n	patient satisfaction_n	<u>asymptomatic_adj</u>

hemoglobin_n	clinic_n	pain_n
blood pressure_n	clinical_adj	severe_adj
systolic_adj	clinically_adv	recurrent_adj
diastolic_adj	clinically significant_adj	recurrence_n
<u>cardiac</u> _adj	clinician(s)_n	bleeding_n
<u>cardiovascular</u> _adj	clinical practice_n	acute_adj
vascular_adj	clinical characteristics_n	chronic_adj
vessels_n	clinical implications_n	injury(es)_n
<u>venous</u> _adj	healthy_adj	prolapse_n
intravenous_adj	health_n	syndrome_n
artery_n	care_n	<u>abnormal</u> _adj
arterial_adj	health system_n	<u>abnormality</u> (es)_n
urine_n	healthcare_n	onset_n
urinary_adj	tertiary care_n	defect(s)_n
urinary tract_n	health care professionals_n	disability(es)_n

4.2.2. Specialised Technical Word List

Table 4.6 provides 43 items of *specialised* technical vocabulary word lists along with their part of speech, where *n* denotes noun, *v* denotes verb, and *adj* denotes adjective. For words with additional parentheses, such as *discharge(ed)_v*, it means that two verb forms *discharge_v* and *discharged_v* occur in the OB&GYN corpus and meet the selection criteria. Some items with two different spellings, such as *labor_n* in American English and *labour_n* in British English, will be considered as a single item.

Table 4.6: The specialised technical vocabulary

No.	Word form	No.	Word form	No.	Word form
1	delivery(es)_n	16	condition(s)_n	31	discharge(ed)_v
2	deliver_v	17	tissue(s)_n	32	conception_n
3	test(s)_n	18	treat(ed,ing)_v	33	specificity_n
4	labor_n/ labour_n	19	induction_n	34	agent(s)_n
5	procedure(s)_n	20	labor induction_n	35	termination(s)_n

6	screening_n	21	induced_v	36	distress_n
7	stage(s)_n	22	administered_v	37	respiratory distress_n
8	early stage_n	23	administration_n	38	carrier(s)_n
9	advanced stage_n	24	parity_n	39	presentation_n
10	sensitivity_n	25	examination_n	40	viral_adj
11	disorder(s)_n	26	admission_n	41	suspension_n
12	hypertensive disorders_n	27	concentration_n	42	cavity_n
13	positive_adj	28	failure_n	43	temporal_adj
14	false positive_adj	29	discharge_n		
15	negative_adj	30	hospital discharge_n		

Table 4.7 provides the meaning of *specialised* technical items in their general usage and medical meaning, followed by examples in italics, with *n* denoting a *noun*, *v* denoting a *verb*, (*B1*), and (*B2*) denoting words' proficiency level according to the CEFR framework. Definitions and examples were extracted from *EnglishProfile The CEFR for English*¹, *Merriam Webster Dictionary*² and *Cambridge Dictionary*³. Three technical vocabularies were not defined in the dictionary (i.e., *specificity*, *sensitivity*, *respiratory distress*), the researcher provided the meaning based on her specialised knowledge, and examples were from the OB&GYN corpus.

For the demonstration of all specialised technical vocabulary, see Appendix C.

Table 4.7: Examples of specialised technical words with their meanings

No.	Words	General Meaning	Medical Meaning (OB&GYN field)
1	delivery_n	(B1) when things such as goods, letters, or parcels are taken to people's houses or places of work:	the act or process of birth:

		<i>We get two deliveries of mail a day.</i>	<i>She had a difficult delivery.</i>
2	deliver_v	(B1) to take things such as goods, letters and parcels to people's houses or places of work: <i>Mail is delivered to our office twice a day.</i>	to give birth to a baby, or to help someone do this: <i>She delivered her third child at home. The baby was delivered by a midwife.</i>
3	test(s)_n	(A1) a way of discovering, by questions or practical activities, what someone knows, or what someone or something can do: <i>The class are doing/having a spelling test today.</i>	a medical examination of part of your body in order to find out how healthy it is or what is happening with it: <i>The doctors have done some blood tests to try and find out what's wrong with her.</i>
4	labour_n/ labor_n	(C1) work, especially the type of work that needs a lot of physical effort: <i>The car parts themselves are not expensive, it's the labour that costs the money.</i> (C1) workers, especially people who do practical work with their hands: <i>skilled/unskilled labour</i>	(C2) the stage of pregnancy when the woman has pain because the baby is coming out: <i>She went into (= started) labour at twelve o'clock last night.</i>

¹EnglishProfile The CEFR for English <https://www.englishprofile.org/wordlists/evp>

²Merriam Webster Dictionary <https://www.merriam-webster.com/>

³Cambridge Dictionary <https://dictionary.cambridge.org/>

4.2.3. Research-related Technical Vocabulary Word List

Table 4.8 shows the top 30 items of research-related technical vocabulary ranking from highest to lowest simple math score. For the full items of 111 items, see Appendix D.

Table 4.8: Research-related technical vocabulary word list

No.	Word form	No.	Word form	No.	Word form
1	study(es)_n	11	case-control study_n	21	secondary outcome(s)_n
2	cohort study(es)_n	12	prospective study_n	22	clinical outcomes_n
3	study population_n	13	study cohort_n	23	health outcomes_n
4	study design_n	14	patient population_n	24	risk(s)_n
5	study period_n	15	placebo group_n	25	risk factor(s)_n
6	retrospective cohort study_n	16	control group_n	26	adjusted relative risk_n
7	observational study(es)_n	17	intervention group_n	27	relative risk(s)_n
8	retrospective study_n	18	treatment group(s)_n	28	analysis(es)_n
9	study participants_n	19	trial group(s)_n	29	statistical analysis(es)_n
10	prospective cohort study_n	20	primary outcome(s)_n	30	meta-analysis(es)_n

Table 4.9 includes examples of 30 items from three groups within the research-related technical vocabulary word list. For the full 111 items of three groups, see Appendix E.

Table 4.9: Examples of 30 items of three groups of Sublist 3

Group 1: Study design	Group 2: Criteria and outcomes analyses	Group 3: Statistical Measures
study(es)_n	inclusion criteria_n	risk(s)_n
cohort study(es)	exclusion criteria_n	risk factor(s)_n
prospective_adj	eligibility criteria_n	adjusted relative risk_n

prospectively_adv	diagnostic criteria_n	relative risk(s)_n
prospective study_n	health outcomes_n	odds ratio_n
prospective cohort study_n	primary outcome(s)_n	adjusted odds ratio_n
retrospective_adj	secondary outcome(s)_n	hazard ratio_n
retrospective study_n	clinical outcomes_n	hazard_n
retrospective cohort study_n	survival_n	risk ratio_n
case-control study_n	overall survival_n	statistical_adj

4.2.4. Fully OB&GYN Technical Vocabulary Word List

The *fully OB&GYN* technical words list consists of 284 items. Table 4.10 provides examples of 30 items of the *fully OB&GYN* technical vocabulary word list. For the complete list, please refer to the Appendix F.

Table 4.10: Examples of 30 items in the fully OB&GYN technical vocabulary word list

No.	Word form	No.	Word form	No.	Word form
1	pregnant patients_n	11	clinical pregnancy_n	21	adverse outcomes_n
2	pregnant women_n	12	pregnancy loss_n	22	maternal outcomes_n
3	pregnancy(es)_n	13	ectopic pregnancy_n	23	birth outcomes_n
4	postmenopausal women_n	14	pregnancy complications_n	24	neurodevelopmental outcomes_n
5	nulliparous women_n	15	late pregnancy_n	25	infant outcomes_n
6	parous women_n	16	multiple pregnancy(es)_n	26	adverse perinatal outcomes_n
7	pregnancy outcome(s)_n	17	singleton pregnancy(es)_n	27	spontaneous preterm birth_n
8	adverse pregnancy outcome(s)_n	18	twin pregnancies_n	28	preterm birth_n
9	early pregnancy_n	19	neonatal outcomes_n	29	birth weight_n
10	pregnancy rate(s)_n	20	perinatal outcomes_n	30	live birth_n

Table 4.11 presents examples of 30 items from three groups (i.e., anatomy of the reproductive system, maternal outcomes, and newborn outcomes). For a complete list of items from all 10 groups, see Appendix G.

Table 4.11: Examples of 30 vocabulary items from three groups of Sublist 4

Group 1: Anatomy of reproductive system	Group 2: Maternal outcomes	Group 3: Newborn outcomes
vagina_n	maternal_adj	<i>perinatal</i> outcomes_n
vaginal_adj	maternity_n	<i>perinatal</i> death_n
vaginally_adv	maternal outcomes_n	adverse <i>perinatal</i> outcomes_n
transvaginal_adj	maternal age_n	adverse outcomes_n
<u>uterine</u> _adj	maternal-fetal medicine_n	neurodevelopmental_adj
intra <u>uterine</u> _adj	maternal morbidity_n	neurodevelopmental
uterine artery_n	severe maternal morbidity_n	outcomes_n
utero_n	maternal mortality_n	<i>preterm</i> _adj
uterus_n	maternal death(s)_n	<i>preterm</i> birth_n
fallopian tube_n	maternal characteristics_n	<i>preterm</i> infants_n
		<i>premature</i> _adj

4.2.5 Acronyms Word List

Table 4.12 shows 29 acronyms in the acronyms wordlist their full explanation extracted from the OB&GYN corpus.

Table 4.12: Acronym word list

No	Acronym	Full term
1	CI_n	Confidence interval
2	BMI_n	body mass index
3	GDM_n	gestational diabetes mellitus
4	PTB_n	preterm birth
5	PPH_n	postpartum haemorrhage_n

6	aOR_n	adjusted odds ratio
7	BP_n	blood pressure
8	MRI_n	magnetic resonance imaging
9	SGA_n	small-for-gestational-age
10	IVF_n	in vitro fertilization
11	HIV_n	human immunodeficiency virus
12	SD_n	standard deviation
13	POP_n	pelvic organ prolapse
14	IQR_n	interquartile range
15	PPROM_n	Preterm pre-labor rupture of membranes
16	NICU_n	neonatal intensive care unit
18	GA_n	gestational age
19	OS_n	overall survival
20	hCG_n	human chorionic gonadotropin
21	AUC_n	area under the curve
22	aRR_n	adjusted relative risk
23	FIGO_n	International Federation of Gynecology and Obstetrics
24	ICU_n	intensive care unit
25	AMH_n	anti-Müllerian hormone
26	PCR_n	polymerase chain reaction
27	ICD-10_n	International Classification of Diseases, Tenth Revision
28	RCTs_n	Randomised controlled trials
29	CDC_n	Centers for Disease Control and Prevention

5. Discussion

The discussion section will discuss aspects following two main research questions.

5.1. Technical Word Lists

Research question 1: What are the high-frequency technical vocabulary items in the OB&GYN corpus?

The results of this study identify a total of 721 vocabulary items, categorised as follows: 254 items of *general* technical vocabulary, 43 *specialised* technical vocabulary items, 111 *research-related* technical terms, 284 fully OB&GYN technical vocabulary, and 29 technical acronyms. The methodology employed in this research integrates both keyword analysis and a semantic rating scale, ensuring that selected words not only meet the minimum frequency and range criteria but also carry technical meanings. In contrast, Li et al. (2021), in their study on neurology word lists, did not prioritize technical meaning, resulting in the inclusion of non-technical words such as *hence*, *furthermore*, *nevertheless*, *nonetheless*, *somewhat*, *thereby*, *via*, *whereas*. Only 102 words (14.22%) from their 717-word neurology word list appear in the OB&GYN word list, suggesting that each medical sub-discipline might require its own specific word lists.

5.1.1 Single Words and Multiword Units

OB&GYN sublists include both single and multiword units. Specifically, 464 items (64.35%) in the OB&GYN list are single-word items, while 35.65% are multi-word items. This indicates that a technical vocabulary list can consist of both single-word and multi-word units. This is similar to Lu's (2018) lists since her lists also present a mix of both types of word units. In addition, OB&GYN word lists diverge from those of Wang et al. (2008), Hsu (2013), Lei and Liu (2016), and Li et al. (2021), which exclusively feature single-word units.

OB&GYN wordlist could better serve learners and teachers compared abovementioned lists for several reasons. First, it examines both single words and multiword units within the OB&GYN corpus, thereby, including technical vocabulary in both forms. Second, the OB&GYN wordlist is based on both statistical measures (keyword analysis) and semantic rating scale by examining word meanings in the context of the whole corpus before putting them into the lists, while Wang et al. (2008) did not account for word meanings in the corpus. As a result, their list has a weakness of including words that do not have medical

meaning such as *nevertheless, per, approximate, versus, whereas*. Moreover, Wang et al (2008) remove 20 medical terminologies from the list such as *carcinoma, pulmonary, hepatic, cerebral, and hemorrhage*, whereas the OB&GYN wordlist retains such terminology items since students may face difficulties when learning terminologies. In the context of teaching ESP in Vietnam, empirical research by Thi To Hoa and Thi Tuyet Mai (2016) reveals that Vietnamese university students in their context have difficulties when approaching technical materials because they lack technical terminologies.

In addition, in our research, 254 vocabulary items belong to *general* technical vocabulary and 284 items belong to the *fully OB&GYN* technical sublist, these two groups share a similar proportion in the whole list. Since the *fully OB&GYN* technical vocabulary might demand greater effort from learners compared to the *general* technical list, organising these items into separate groups can be beneficial for teachers to draw learners' attention to the *fully OB&GYN* technical word list and design suitable vocabulary drilling tasks for learners. OB&GYN wordlist categories align with those of Lu (2018) in her inclusion of both single and multiword units and in the categorisation of sublists. Similar to Lu's (2018) list, in our study, *general* technical word lists and *fully* technical word lists are presented. However, while Lu (2018) includes metaphorically-based technical words relevant to traditional medicine, our list does not have this type of lexical because our list is in the OB&GYN field, a branch of Western medicine, thus it might differ from Chinese traditional medicine.

5.1.2. Part of Speech and Unit of Counting

Our results provide vocabulary items along with their corresponding parts of speech, this is similar to the approach used by Lei and Liu (2016), who employed lemma forms in their study. In contrast, the lists by Wang et al. (2008), Hsu (2013), and Li et al. (2021) do not provide this information in their word lists. Including parts of speech in the OB&GYN list can assist learners in identifying which parts of speech occur more frequently in the corpus. In addition, compared to Lei and Liu's (2016) list, our list further examines each inflection of the lemma to determine whether they equally appear in the corpus and meet the selection criteria. Only those inflections that meet the minimum frequency and range thresholds in the corpus are included.

The findings suggest that not all inflections of a base word appear equally in the corpus. The implications for these findings are that teachers and learners should focus on word forms that appear more frequently in the corpus instead of all inflection words of a lemma. Additionally, the vocabulary researcher should take further steps to examine the inflections of each lemma to provide learners with the most useful vocabulary items. For example, *bowel_n* occurs 94 times in the whole corpus and is included in 21 texts out of 350 texts, thus it meets the inclusion criteria, while its plural form *bowels_n* appears only once and in only one text in the whole corpus, thus it is excluded. In this case, only *bowel_n* was put on the final list, suggesting that learners should focus on *bowel_n* rather than *bowels_n*. Similarly, the verb *dispense_v* also has one verb form *dispensed_v* that meets the minimum frequency and range, while *dispense_v* and *dispensing_v* were excluded. This pattern also applies to several other word items such as *injection_n*, *muscle_n*, *nerve_n*, and *mortality_n*. By focusing on main word forms rather than all inflections of base words, OB&GYN lists allow learners and teachers to concentrate on essential vocabulary, reducing attention to less frequent forms.

In addition, with all members of a word family put together in the final words, the findings reveal that not all members of a word family appear frequently in the corpus to meet the selection criteria. For example, within the word family of *urine_n*, only two members (i.e., *urine_n* and *urinary_n*) are frequent enough in the corpus to be included, while other related members (i.e., *urinal*, *urinals*, *urinate*, *urinated*, *urinates*, *urinating*, *urination*, *urines*) do not meet the minimum frequency and range requirements. Therefore, the word family lists provided by Wang et al. (2008), Hsu (2013), and Li et al (2021) may overestimate the less frequent members of a word family, potentially adding unnecessary learning burden on learners.

5.1.3. Specialised Technical Word List

The *specialised* technical words may need more attention in further research. Among 721-word items in the OB&GYN word lists, 43 items have specialised meanings, therefore there is a need to examine words with different meanings between general and technical contexts. Our lists include *specialised* technical word lists and provide explanations of the different meanings of words in daily and technical contexts. This feature is not addressed by other medical word lists such as Wang et al (2008), Le et al (2021), and Hsu (2013). Notably,

26 of 36 specialised single-word items are high-frequency words in the BNC wordlist (Nation, 2012). Therefore, OB&GYN word lists, with specialised word items, could benefit learners because it could prevent learners from being confused about the general meaning and technical meaning. A study by Le and Miller (2023) examined Hsu's (2013) lists and revealed that 302 words (51%) from Hsu's list have polysemes or homographs that challenge the usefulness of Hsu's medical word list.

5.1.4 The Importance of High-frequency Words in the List

Our list does not base on any fixed list to exclude high-frequency words, while Wang et al. (2008) excluded the first 2000 common words from the West's (1953) list, and Hsu (2013) removed 3000 high-frequency words from the BNC (Nation, 2012) word list. Our findings include technical words across the frequency spectrum. For example, the lists include high-frequency words such as *blood_n*, *vessels_n*, *breast_n*, *muscle_n*, *brain_n*, mid-frequency words such as *urine_n*, *kidney_n*, *bladder_n*, *bowel_n*, and low-frequency words such as *cephalic_adj*, *pediatric_adj*, *asymptomatic_adj*, *hypertensive_adj*. This suggests that technical vocabulary word lists can span high-, mid-, and low-frequency words. This is consistent with Lu's (2018) findings, in her research, 1,325 items (47.7%) out of 2,778 items in Chinese traditional medicine were from the general high-frequency word lists. Therefore, the list of Wang et al (2008), Hsu (2013) and Yang (2015), Li et al. (2021) excluding 2000 or 3000 most frequency words might overlook technical vocabulary from the high-frequency band. This suggests other researchers examine technical words in both high-frequency words.

5.1.5. Research-related Technical Vocabulary Word List

The OB&GYN list has 111 *research-related* technical vocabulary items, accounting for 15,39% of the whole list. This type of vocabulary plays an important role in understanding study design and research results. Our list separates this list into one category because the research-related terminology requires learners to have background knowledge about research to understand and use those words. For example, some words in the list such as *relative risk*, *cohort study*, and *case-control study* need more research knowledge rather than linguistic knowledge. Therefore, this type of sublist might require learners much effort into learning vocabulary compared to other items of *general* technical wordlists and *fully* technical wordlists. Therefore, the *research-related* technical word list also serves as a

valuable source for learners to explicitly explore this type of vocabulary outside of the language classroom. From teachers' perspective, this list could be adapted and applied to similar ESP classes such as English for Cardiology, and English for Pediatrician, as these fields might share the same research-related technical vocabulary.

5.2. Thematic Groupings within each Sublist

Research question 2: How can these high-frequency technical vocabulary items be grouped into different themes based on their meaning to support teaching and learning vocabulary?

Within each sublist, the list was further examined and grouped in smaller sizes based on the shared topics. The *general* technical vocabulary items were divided into 8 groups (i.e., anatomy, healthcare and hospital setting, signs and symptoms, diagnostic tests and medical procedures, pathologic conditions, treatment, disease prevention, and others). The *research-related* technical vocabulary sublist has 3 main groups (i.e., study design, criteria and outcomes analyses, and statistical measures), *Fully OB&GYN* technical vocabulary word list includes 10 smaller groups (i.e., anatomy of the reproductive system, maternal outcomes, newborn outcomes, pregnancy, OB&GYN pathologic conditions, labor and delivery, hormonal and menstrual health, reproductive health, procedures and treatment, and others). For two sublists *Specialised* technical vocabulary word list and the *Acronyms* word list were not grouped because they are already in small sizes.

Many existing studies only provide word lists without further guidance on themes and meaning. Our study takes further steps to examine the sublists and put them in thematic groups in small sizes. The thematic grouping method also was employed in the study by Kwary (2011) word list about the financial field. While other medical lists do not mention thematic grouping themes, thematic grouping can help users to be aware of words that share similar meanings, also the members in a word family were put together, and some words sharing the common parts also be underlined or in italic forms. For example, postnatal, postoperative, and postpartum would be put together in a group, since they share the same prefix post-. Grouping and highlighting items sharing the common elements can help learners make connections between vocabulary items, thus helping learners learn

vocabulary more easily. This could better serve list users and reduce the cognitive load on learning and teaching vocabulary.

However, grouping items in the list was not an easy task because of some reasons. First, it requires the researchers and raters to have background knowledge in the specialised knowledge, in this study the required knowledge is background knowledge in medicine. It also requires raters to explore the themes to cover most items in the groups. This was not an easy task to look at items, especially on a large scale to group them into different themes. In addition, grouping items by themes and arranging them together might take enormous time for raters. In addition, the boundaries between each sublist and each theme are not always clear, thus challenging raters to put them in a correct thematic group.

6. Conclusion

The conclusion section will summarise key findings, followed by the implications for teachers, learners, and material designers. The limitations of the study and suggestions for further research will be mentioned.

6.1. Summary of Key Findings

In this study, the corpus-based study was to compile 350 research articles from five journals in the OB&GYN field to build the OB&GYN corpus. The researcher used keyword analysis to compare vocabulary items between the OB&GYN corpus and the *BNC2014 baby+* corpus to identify potential technical words. Then the semantic rating scale was used to classify words into different sublists. The findings of the study provide a total of 721 vocabulary items with 254-word items being *general* technical vocabulary, 43 vocabulary items of *specialised* technical vocabulary, 111-word items being *research-related* technical vocabulary, 284 *fully* OB&GYN technical vocabulary, and 29 technical acronyms.

Within each sublist, the list was further examined and grouped in smaller sizes based on the shared topics. The *general* technical vocabulary items were divided into 8 groups (i.e., anatomy, healthcare and hospital setting, signs and symptoms, diagnostic tests and medical procedures, pathologic conditions, treatment, disease prevention, and others). The *research-related* technical vocabulary sublist has three main groups (i.e., study design, criteria and outcomes analyses, and statistical measures), *fully OB&GYN* technical vocabulary word list includes 10 smaller groups (i.e., anatomy of the reproductive system, maternal outcomes, newborn outcomes, pregnancy, OB&GYN pathologic conditions, labor and delivery, hormonal and menstrual health, reproductive health, procedures and treatment, and others). For two sublists *Specialised* technical vocabulary word list and the *Acronyms* word list were not grouped because they are already in small sizes.

6.2. Implications

OB&GYN word lists are useful for learners, teachers, and material designers in ESP classrooms, especially for healthcare professionals in the OB&GYN field. First, healthcare practitioners can use OB&GYN word lists to explicitly learn high-frequency technical vocabulary, thus facilitating reading comprehension when they approach scientific articles to update their knowledge in the OB&GYN field. Besides, the word lists are not only useful for

reading skills but also for writing and publishing research in the OB&GYN field. Furthermore, learners might apply research-related word lists in reading various research articles, and they can use the word lists to make flashcards and review technical vocabulary, which would facilitate their reading and writing skills. From teachers' perspective, it is also important to note that learning and teaching vocabulary from word lists does not necessarily mean teaching technical terms in a decontextualized context. Additionally, teachers and materials designers can use the lists to design learning tasks and vocabulary assessments for classrooms to help learners encounter and review technical vocabulary items that are highly frequent.

Different sublists might benefit in different ways. For example, teachers can draw students' attention to specialised technical words that have different meanings from general usage. Additionally, since the research-related technical vocabulary accounted for 15,39% of the whole list, this type of vocabulary plays an important role in understanding study design and research results. Therefore, teachers can encourage learners to extensively read background knowledge related to research terminology. There are many areas of vocabulary knowledge that are beyond the responsibility of language teachers, so they can suggest to learners self-exploring research terminology and fully technical terminology, and language teachers can refer learners to specialists in the OB&GYN field for more explanation.

6.3. Limitations

The study has some limitations due to the shortage of time and resources. The first limitation of the study is the small size corpus. Due to the short duration of the master dissertation, the corpus only comprises 350 research articles from five journals totaling 1.2 million tokens. The small size of the corpus might affect the representativeness of the corpus (Egbert et al, 2022). The second limitation of the study is also due to the limitations of the tools used in this study. Since the study combines two tools (i.e., Lancsbox and Antconc) to analyse data, different tools will have different ways of counting tokens, which might lead to light bias in the results. In addition, the research uses a semantic rating scale, and the cutoff point for simple math scores and minimum frequency and range were set by the researcher, which might be subjective and depend on the researcher's knowledge. The wordlist therefore be beneficial for specific learners. Finally, the wordlist does not have a validation process to validate the sublists.

6.4. Suggestions

Further studies might be carried out with a bigger corpus size and add more text types to the corpus (e.g., textbook), and the validation process should be considered to validate the lists. This study also suggests further study in various sub-disciplines in medicine such as Pediatrics and Cardiology to tailor the lists for various classes in specific disciplines. Furthermore, the vocabulary researchers also take into account the lexical unit of counting into the lists and provide lists with parts of speech to facilitate learning. Moreover, further studies should pay attention to the specialised words which have technical meanings differing from general usage because it might confuse learners. A list of specialised words should be included and an explanation of different meanings in general usage and technical usage might help learners with reading comprehension and writing development. In addition, further studies should not only focus on single words but also examine multiword units to cover most technical vocabulary. Additionally, vocabulary researchers may consider options of grouping vocabulary items into smaller thematic categories could help learners, teachers, and material designers use the lists effectively. Finally, the wordlist should also be based on learners' knowledge and take teachers' and learners' perspectives into account in creating a word list process to better fit users' needs.

References

- Anthony, L (2023). AntConc (Version 4.2.4) [Computer Software]. Tokyo, Japan: Waseda University. Available from <https://www.laurenceanthony.net/software>
- Bauer, L., & Nation, P. (1993). Word families. *International Journal of Lexicography*, 6(4), 253–279. <https://doi.org/10.1093/ijl/6.4.253>
- BNC2014 Baby+, version 1 (2019). Compiled by Vaclav Brezina, distributed by Lancaster University, available via #LancsBox <http://corpora.lancs.ac.uk/lancsbox>
- Brezina, V., Weill-Tessier, P., & McEnery, A. (2021). #LancsBox v. 6.2. Available from <https://lancsbox.lancs.ac.uk/>
- Brezina, V. (2018). *Statistics in Corpus Linguistics*. Cambridge University Press. <https://doi.org/10.1017/9781316410899>
- Brown, D., Stoeckel, T., Mclean, S., & Stewart, J. (2022). The most appropriate lexical unit for L2 vocabulary research and pedagogy: A brief review of the evidence. *Applied Linguistics*, 43(3), 596–602. <https://doi.org/10.1093/applin/amaa061>
- Chung, T. M., & Nation, P. (2003). Technical vocabulary in specialised texts. *Reading in a Foreign Language*, 15(2), 103–116. <https://scholarspace.manoa.hawaii.edu/server/api/core/bitstreams/6c848810-a8bb-4153-8666-216791f4066d/content>
- Chung, T. M., & Nation, P. (2004). Identifying technical vocabulary. *System*, 32(2), 251–263. <https://doi.org/10.1016/j.system.2003.11.008>
- Coxhead, A. (2000). A new academic word list. *TESOL Quarterly*, 34(2), 213-238. <https://doi.org/10.2307/3587951>
- Dang, T. N. Y. (2019). Corpus-based word lists in second language vocabulary research, learning, and teaching. In *The Routledge Handbook of Vocabulary Studies* (pp. 288–303). Routledge.
- Durrant, P. (2014). Discipline and level specificity in university students' written vocabulary. *Applied Linguistics*, 35(3), 328–356. <https://doi.org/10.1093/applin/amt016>

- Durrant, P., Siyanova-Chanturia, A., Kremmel, B., & Sonbul, S. (2022). *Research methods in vocabulary studies*. John Benjamins Publishing Company.
- Egbert, J., Biber, D., & Gray, B. (2022). *Designing and evaluating language corpora: A practical framework for corpus representativeness*. Cambridge University Press.
<https://doi.org/10.1017/9781316584880>
- Gardner, D., & Davies, M. (2014). A new academic vocabulary list. *Applied Linguistics*, 35(3), 305–327. <https://doi.org/10.1093/applin/amt015>
- Hyland, K., & Tse, P. (2007). Is there an “academic vocabulary”? *TESOL Quarterly*, 41(2), 235–253. <https://doi.org/10.1002/j.1545-7249.2007.tb00058.x>
- Islam, Md. R. (2022). Pragmatism. In M. R. Islam, N. A. Khan, & R. Baikady (Eds.), *Principles of Social Research Methodology* (pp. 117–127). Springer Nature Singapore.
https://doi.org/10.1007/978-981-19-5441-2_9
- Kilgarriff, A. (2009). Simple maths for keywords. In M. Mahlberg, V. González-Díaz, & C. Smith (Eds.), *Proceedings of Corpus Linguistics Conference*. <https://www.sketchengine.eu/wp-content/uploads/2015/04/2009-Simple-maths-for-keywords.pdf>
- Kwary, D. A. (2011). A hybrid method for determining technical vocabulary. *System*, 39(2), 175–185. <https://doi.org/10.1016/j.system.2011.04.003>
- Le, C. N. N., & Miller, J. (2023). A core meaning-based analysis of English semi-technical vocabulary in the medical field. *English for Specific Purposes*, 70, 252–266.
<https://doi.org/10.1016/j.esp.2023.01.006>
- Lei, L., & Liu, D. (2016). A new medical academic word list: A corpus-based study with enhanced methodology. *Journal of English for Academic Purposes*, 22, 42–53.
<https://doi.org/10.1016/j.jeap.2016.01.008>
- Li, M., Lee, Y., & Liu, D. (2021). Development of a neurology word list: A Corpus-based study. *Language and Cognitive Science*, 6(1), 44–59. <https://doi.org/10.35534/lcs.0601003>
- Lu, C. (2018). *Investigating knowledge and use of technical vocabulary in Traditional Chinese Medicine*. [Doctoral dissertation, Victoria University of Wellington]

[https://openaccess.wgtn.ac.nz/articles/thesis/Investigating knowledge and use of technical vocabulary in Traditional Chinese Medicine/17131862?file=31677065](https://openaccess.wgtn.ac.nz/articles/thesis/Investigating%20knowledge%20and%20use%20of%20technical%20vocabulary%20in%20Traditional%20Chinese%20Medicine/17131862?file=31677065)

Lu, C., & Coxhead, A. (2023). Specialized vocabulary across languages: The case of traditional Chinese medicine. *Studies in Second Language Learning and Teaching*, 13(1), 179–217.

<https://doi.org/10.14746/ssl.t.31677>

Nation, I. S. P. (2012). *The BNC/COCA headword lists*.

<https://www.wgtn.ac.nz/lals/resources/paul-nations-resources/vocabulary-lists>

Nation, I. S. P. (2016). *Making and using word lists for language learning and testing*. John Benjamins Publishing Company.

Nation, I. S. P. (2022). *Learning vocabulary in another language*. Cambridge University Press.

<https://doi.org/10.1017/9781009093873>

Quero, B. (2017). A Corpus comparison approach for estimating the vocabulary load of medical textbooks using The GSL, AWL, and EAP Science Lists. *TESOL International Journal*, 12(1), 177–192. <http://www.academicvocabulary.info/download.asp>.

Quero, B., & Coxhead, A. (2018). Using a Corpus-based approach to select medical vocabulary for an ESP course: The case for high-frequency vocabulary. In Y. Kırkgöz & K. Dikilitaş (Eds.), *Key Issues in English for Specific Purposes in Higher Education. English Language Education* (Vol. 11, pp. 51–75). Springer, Cham. https://doi.org/10.1007/978-3-319-70214-8_4

Thi To Hoa, N., & Thi Tuyet Mai, P. (2016). Difficulties in teaching English for specific purposes: Empirical study at Vietnam universities. *Higher Education Studies*, 6(2), 154–161. <https://doi.org/10.5539/hes.v6n2p154>

Tongpoon-Patanasorn, A. (2018). Developing a frequent technical words list for finance: A hybrid approach. *English for Specific Purposes*, 51, 45–54.

<https://doi.org/10.1016/j.esp.2018.03.002>

Wang, J., Liang, S. Ian, & Ge, G. chun. (2008). Establishment of a medical academic word list. *English for Specific Purposes*, 27(4), 442–458.

<https://doi.org/10.1016/j.esp.2008.05.003>

West, M. (1953). *A general service list of English words*. Longman, Green, & Co.

Yang, M. N. (2015). A nursing academic word list. *English for Specific Purposes*, 37(1), 27–38.

<https://doi.org/10.1016/j.esp.2014.05.003>

Appendices

Appendix A: General Technical Vocabulary Word List (ungrouped)

No.	Word items	No.	Word items	No.	Word items
1	patient(s)_n	26	hospital(s)_n	51	recurrence_n
2	patient characteristics_n	27	hospital stay_n	52	efficacy_n
3	patient satisfaction_n	28	diagnosis(es)_n	53	cell(s)_n
4	heart rate_n	29	blood_n	54	bleeding_n
5	treatment(s)_n	30	blood pressure_n	55	drug(s)_n
6	surgical treatment_n	31	complication(s)	56	chronic_adj
7	treatment period_n	32	intervention(s)_n	57	transfusion_n
8	clinical_adj	33	infection(s)_n	58	blood transfusion_n
9	clinical practice_n	34	follow-up_n	59	injury(es)_n
10	clinical characteristics_n	35	family history_n	60	prolapse_n
11	clinical implications_n	36	medical history_n	61	syndrome_n
12	health_n	37	weight(s)_n	62	genetic(s)_adj
13	health care professionals_n	38	medical_adj	63	diagnostic_adj
14	mental health_n	39	medical record(s)_n	64	glucose_n
15	health insurance_n	40	symptom(s)_n	65	consent_n
16	side effects_n	41	pain_n	66	informed consent_n
17	care_n	42	therapy_n	67	abnormal_adj
18	cancer(s)_n	43	severe_adj	68	guideline_n
19	breast cancer_n	44	surgical_adj	69	respiratory_adj
20	death(s)_n	45	diabetes_n	70	clinician(s)_n
21	disease(s)_n	46	health system_n	71	medication(s)_n
22	disease progression_n	47	dose_n	72	serum_n
23	cardiovascular disease_n	48	vaccine(s)_n	73	tumor(s)_n
24	surgery(es)_n	49	diagnose(ed)_v	74	emergency_n
25	follow up period_n	50	vaccination_n	75	urinary_adj
76	urinary tract_n	101	prescribed(ing)_v	126	breast_n
77	obesity_n	102	disability(es)_n	127	oxygen_n
78	clinic_n	103	congenital_adj	128	antibody_n
79	healthcare_n	104	hemoglobin_n	129	acute_adj
80	onset_n	105	biomarker(s)_n	130	membrane(s)_n
81	defect(s)_n	106	asymptomatic_adj	131	inflammation_n
82	gene_n	107	normotensive_adj	132	illness_n

83	physician(s)_n	108	body mass index_n	133	kidney_n
84	recurrent_adj	109	diabetes mellitus_n	134	laboratory_n
85	detection_n	110	hypertension_n	135	pulmonary_adj
86	monitoring_n	111	chronic hypertension_n	136	mental_adj
87	hypertensive_adj	112	chemotherapy_n	137	prevention_n
88	donor_n	113	monotherapy_n	138	cardiovascular_adj
89	physical_adj	114	pathogenic_adj	139	vascular_adj
90	vaccinated_v	115	prophylactic_adj	140	mutation_n
91	oral_adj	116	etiology_n	141	depression_n
92	surveillance_n	117	temperature_n	142	brain_n
93	invasive_adj	118	prescription(s)_n	143	iron_n
94	hospitalization(s)_n	119	indication(s)_n	144	dysfunction_n
95	supplementation_n	120	arterial_adj	145	suppression_n
96	clinically_adv	121	imaging_n	146	virus_n
97	clinically significant_adj	122	assay_n	147	artery_n
98	healthy_adj	123	lesion(s)_n	148	medically_adv
99	abnormality(es)_n	124	regimen_n	149	contraction_n
100	acid(s)_n	125	laser_n	150	cardiac_adj
151	adherence_n	176	injection_n	201	implantation_n
152	carbon_n	177	muscle_n	202	substance_n
153	occlusion_n	178	cerebral_adj	203	therapeutic_adj
154	medicine_n	179	recipients_n	204	receptor_n
155	pandemic_n	180	nerve_n	205	plasma_n
156	urine_n	181	infusion_n	206	inhibitor(s)_n
157	biopsy(es)_n	182	insulin_n	207	operative_adj
158	investigation_n	183	visual_adj	208	specimens_n
159	appointment(s)_n	184	renal_adj	209	vitamin_n
160	inpatient_n	185	symptomatic_adj	210	systolic_adj
161	organ(s)_n	186	biological_adj	211	ligament_n
162	cognitive_adj	187	bowel_n	212	vessels_n
163	systemic_adj	188	fluid_n	213	physiological_adj
164	calcium_n	189	metabolic_adj	214	pathological_adj
165	pandemic_adj	190	resistance_n	215	prognostic_adj
166	bladder_n	191	consultation_n	216	nutrition_n
167	inflammatory_adj	192	fasting_v	217	excision_n
168	oncology_n	193	isolated_adj	218	contraindications_n
169	outpatient_n	194	recovery_n	219	intravenous_adj
170	headache_n	195	bacterial_adj	220	voiding_v

171	seizure(s)_n	196	catheter_n	221	hepatitis_n
172	pathology_n	197	prognosis_n	222	posterior_adj
173	resection_n	198	pathologic_adj	223	anterior_adj
174	surgeon(s)_n	199	referral_n	224	malignancy_n
175	tertiary care_n	200	motor_n	225	impaired_adj
226	stroke_n	236	venous_adj	246	overweight_n
227	obese_adj	237	radiotherapy_n	247	infectious_adj
228	comorbidity(es)_n	238	benign_adj	248	autoimmune_adj
229	impairment_n	239	abruption_n	249	anatomy_n
230	malignant_adj	240	antibiotics_n	250	infiltration_n
231	pediatric_adj	241	dispensed_v	251	immunization_n
232	ventilation_n	242	feeding_n	252	cephalic_adj
233	biochemical_adj	243	molecular_adj	253	nausea_n
234	sac_n	244	immune_adj	254	blood transfusion_n
235	diastolic_adj	245	liver_n		

Appendix B: Groups of general technical vocabulary items by themes

Group 1: Anatomy	Group 2: Healthcare and hospital setting	Group 3: Signs and symptoms
anatomy_n	<u>patient(s)_n</u>	infection(s)_n
heart rate_n	<u>inpatient_n</u>	infectious_adj
blood_n	<u>outpatient_n</u>	<u>symptom(s)_n</u>
serum_n	patient characteristics_n	<u>symptomatic_adj</u>
plasma_n	patient satisfaction_n	<u>asymptomatic_adj</u>
hemoglobin_n	clinic_n	pain_n
blood pressure_n	clinical_adj	severe_adj
systolic_adj	clinically_adv	recurrent_adj
diastolic_adj	clinically significant_adj	recurrence_n
<u>cardiac_adj</u>	clinician(s)_n	bleeding_n
<u>cardiovascular_adj</u>	clinical practice_n	acute_adj
vascular_adj	clinical characteristics_n	chronic_adj
vessels_n	clinical implications_n	injury(es)_n
<u>venous_adj</u>	healthy_adj	prolapse_n
<u>intravenous_adj</u>	health_n	syndrome_n
artery_n	care_n	<u>abnormal_adj</u>
arterial_adj	health system_n	<u>abnormality(es)_n</u>
urine_n	healthcare_n	onset_n
urinary_adj	tertiary care_n	defect(s)_n
urinary tract_n	health care professionals_n	disability(es)_n
oral_adj	health insurance_n	temperature_n
breast_n	hospital(s)_n	lesion(s)_n
kidney_n	hospitalization(s)_n	<u>inflammation_n</u>
renal_adj	hospital stay_n	<u>inflammatory_adj</u>
pulmonary_adj	family history_n	headache_n
organ(s)_n	medical history_n	seizure(s)_n
bladder_n	medicine_n	<u>impaired_adj</u>
muscle_n	medical_adj	<u>impairment_n</u>

brain_n cerebral_adj cephalic_adj nerve_n visual_adj bowel_n liver_n fluid_n ligament_n cell(s)_n membrane(s)_n receptor_n antibody_n genetic(s)_adj gene_n sac_n	medically_adv medical record(s)_n consent_n informed consent_n guideline_n emergency_n physician(s)_n donor_n recipients_n physical_adj appointment(s)_n surgeon(s)_n cognitive_adj consultation_n isolated_adj referral_n pediatric_adj	overweight_n nausea_n contraction_n side effects_n metabolic_adj weight(s)_n voiding_v feeding_n mental_adj mental health_n complication(s) recovery_n body mass index_n
Total: 44 items	Total: 45 items	Total: 41 items
Group 4: Pathologic conditions	Group 5: Diagnostic tests and medical procedures	Group 6: Treatment
cancer(s)_n breast cancer_n death(s)_n disease(s)_n disease progression_n cardiovascular disease_n diabetes_n diabetes mellitus_n respiratory_adj tumor(s)_n benign_adj	<u>diagnosis(es)</u> _n <u>diagnose</u> (ed)_v <u>diagnostic</u> _adj <u>diagnostic</u> criteria_n <i>prognosis</i> _n <i>prognostic</i> _adj implantation_n injection_n <u>infusion</u> _n <u>transfusion</u> _n blood <u>transfusion</u> _n	treatment(s)_n surgical_adj surgical treatment_n treatment period_n surgery(es)_n intervention(s)_n dose_n drug(s)_n medication(s)_n prescribed(ing)_v prescription(s)_n

<u>malignant_adj</u> <u>malignancy_n</u> obese_adj obesity_n hypertension_n chronic hypertension_n hypertensive_adj normotensive_adj illness_n depression_n dysfunction_n oncology_n occlusion_n comorbidity(es)_n hepatitis_n stroke_n abruption_n congenital_adj	imaging_n assay_n laboratory_n biopsy(es)_n resection_n catheter_n operative_adj excision_n biomarker(s)_n investigation_n specimens_n biochemical_adj	invasive_adj supplementation_n <u>indication(s)_n</u> monitoring_n surveillance_n <u>contraindications_n</u> laser_n regimen_n suppression_n systemic_adj fasting_v <u>therapeutic_adj</u> <u>therapy_n</u> radiotherapy_n chemotherapy_n monotherapy_n antibiotics_n dispensed_v efficacy_n adherence_n nutrition_n follow-up_n follow up period_n
Total: 29 items	Total: 23 items	
Group 7: Disease prevention	Group 8: Others	
vaccine(s)_n vaccination_n vaccinated_v detection_n prevention_n pandemic_adj pandemic_n immune_adj autoimmune_adj immunization_n	oxygen_n iron_n calcium_n carbon_n glucose_n insulin_n vitamin_n inhibitor(s)_n substance_n acid(s)_n	

virus_n	motor_n	
resistance_n	posterior_adj	
bacterial_adj	anterior_adj	
etiology_n	molecular_adj	
<i>pathology_n</i>	infiltration_n	
<i>pathologic_adj</i>	mutation_n	
<i>pathological_adj</i>	ventilation_n	
<i>pathogenic_adj</i>	biological_adj	
prophylactic_adj	physiological_adj	
Total: 19 items	Total: 19 items	Total: 34 items

Appendix C: Specialised Technical Vocabulary Word List and Meaning Explanation

The table below provides the meaning of 43 specialised technical vocabulary items, followed by examples in italics. It is important to note that *n* denotes a noun, *v* denotes a verb, (B1) and (B2) denote words' proficiency level according to the CEFR framework. Definitions and examples were extracted from *EnglishProfile The CEFR for English*¹, *Merriam Webster Dictionary*² and *Cambridge Dictionary*³. Three technical vocabulary items were not defined in the dictionary (i.e., *specificity*, *sensitivity*, *respiratory distress*), the researcher provided the meaning based on her specialised knowledge, and examples were from the OB&GYN corpus.

No	Words	General Meaning	Medical Meaning (OB&GYN field)
1	delivery_n	(B1) when things such as goods, letters, or parcels are taken to people's houses or places of work: <i>We get two deliveries of mail a day.</i>	the act or process of birth: <i>She had a difficult delivery.</i>
2	deliver_v	(B1) to take things such as goods, letters and parcels to people's houses or places of work: <i>Mail is delivered to our office twice a day.</i>	to give birth to a baby, or to help someone do this: <i>She delivered her third child at home. The baby was delivered by a midwife.</i>
3	test(s)_n	(A1) a way of discovering, by questions or practical activities, what someone knows, or what someone or something can do: <i>The classes are doing/having a spelling test today.</i>	a medical examination of part of your body in order to find out how healthy it is or what is happening with it: <i>The doctors have done some blood tests to try and find out what's wrong with her.</i>

10	sensitivity	<p>(C1) an ability to understand what other people need, and be helpful and kind to them.</p> <p><i>The police showed commendable sensitivity in their handling of the case.</i></p>	<p>sensitivity refers to the ability of a test to correctly identify true positives—meaning how accurately it can detect a condition or trait when it is actually present.</p> <p><i>The sensitivity of HPV integration for CIN3+ was slightly higher than that of cytology in HPV16/18-positive women.</i></p>
11	disorder(s)_n	<p>(C1) uncontrolled, bad behaviour, especially by large groups of people:</p> <p><i>crime and disorder</i></p>	<p>(C1) an illness or medical condition:</p> <p><i>a blood disorder</i> <i>hypertensive disorder</i></p>
12	hypertensive disorders_n		
13	positive_adj	<p>(B1) full of hope and confidence, or giving cause for hope and confidence:</p> <p><i>a positive attitude</i></p>	<p>(C2) (of a test) showing that an illness, condition, drug, chemical, etc. is present:</p> <p><i>She learned the next day that the test was positive, and her doctor prescribed antibiotics.</i></p>
14	false positive_adj	<p>positive: similar to the above definition</p>	<p>A false positive is a mistake where the test result shows that the disease is present but it is not.</p> <p><i>The overall false-positive rate remained high.</i></p>

15	negative_adj	(B1) without hope, not expecting good things, or likely to consider only the bad side of a situation: <i>You're so negative about everything!</i>	(of a test) showing that an illness, condition, drug, chemical, etc. is not present. <i>The results of his HIV test were negative.</i>
16	condition(s)_n	(B1) the particular state that something or someone is in: <i>They left the flat in a terrible condition - there was mess everywhere.</i>	(B2) an illness: <i>He suffers from a rare heart condition.</i>
17	tissue_n	(B1) soft paper that is used for cleaning, especially your nose, and is thrown away after use, or a small rectangular piece of this: <i>She handed me a tissue just before I sneezed.</i>	a group of connected cells in an animal or plant that are similar to each other, have the same purpose, and form the stated part of the animal or plant: <i>human tissue brain/lung/muscle/fat tissue</i>
18	treat_v (treated_v, treating_v)	(B2) to behave towards or deal with someone in a particular way: <i>My parents treated us all the same when we were kids.</i>	(B2) to give medical care to someone for an illness or injury: <i>He is being treated for a rare skin disease.</i>
19	induction_n	an occasion when someone is formally introduced into a	the act of causing an event or process to happen:

20	labor induction	new job or organization, especially through a special ceremony: <i>Their induction into the church took place in June.</i>	<i>The doctor will determine whether to begin the induction of labour.</i>
21	induce(ed)_v	to persuade someone to do something: <i>They induced her to take the job by promising editorial freedom.</i>	to use a drug to make a pregnant woman start giving birth: <i>In this hospital, twins are often induced.</i>
22	administer_v	to control the operation or arrangement of something. <i>The local council employed five people to administer the programme.</i>	to give remedially <i>administer a dose of medicine</i>
23	administratio n_n	(C1) (also informal admin) the arrangements and tasks needed to control the operation of a plan or organization: <i>Teachers complain that more of their time is taken up with administration than with teaching.</i>	the act of giving or applying a drug or treatment to a patient. <i>Intrapartum administration of azithromycin to the mother reduces maternal postpartum infections.</i>
24	parity_n	equality, especially of pay or position:	the number of times a female has given birth counting multiple births as one and usually including stillbirths:

		<i>Firefighters are demanding pay parity with police.</i>	<i>The covariates include the control variables mentioned above (parity, season, education, and religion) plus the length of the previous birth interval.</i>
25	examination_n	(A2) an exam, a test: <i>a written examination</i>	when someone looks at or considers something carefully in order to discover something: <i>a medical examination</i> <i>I have a medical examination when I started my new job.</i>
26	admission_n	(B1) the money that you pay to enter a place or an event: <i>They are charging more for admission to the festival this year.</i>	the act or process of accepting someone into a hospital, clinic, or other treatment facility as an inpatient: <i>The patient was unconscious upon admission to the hospital.</i>
27	concentration_n	(B2) the ability to think carefully about something you are doing and nothing else: <i>The noise outside made concentration difficult.</i>	a large number or amount of something in the same place: <i>The glucose concentration was checked 1 hour after each increase.</i>

28	failure_n	(B2) when someone or something does not succeed: <i>Their attempt to climb Everest ended in failure.</i>	(B2) when something does not work, or stops working as well as it should: <i>He died of heart/liver failure.</i>
29 30	discharge_n hospital discharge	the act of sending out waste liquid or gas: <i>Thousands of fish were killed as a result of a discharge of poisonous chemicals from a nearby factory.</i>	official permission to leave the armed forces, a prison, or a hospital: <i>Patients were discharged from the hospital</i> Special meaning 2: liquid matter that comes from a part of the body and is often infected: <i>a vaginal discharge</i>
31	discharge (v) (discharged)	to send out a substance, especially waste liquid or gas: <i>Large amounts of dangerous waste are discharged daily by the factory.</i>	to allow someone officially to leave somewhere, especially a hospital or a law court: <i>Patients were discharged from the hospital because the beds were needed by other people.</i>
32	conception_n	(C2) an idea about what something is like or a way of understanding something:	the process of a male and a female sex cell joining and causing a baby to start to form:

		<i>They have no conception of how ordinary people live.</i>	<i>A model was used for the time from conception to the end of pregnancy.</i>
33	specificity_n	the quality of being clear and exact: <i>There was a dramatic lack of specificity in his answer.</i>	Specificity refers to the ability to correctly identify those who do not have the condition or disease: <i>An increase in the specificity of the test was observed.</i>
34	agent(s)_n	(B2) someone whose job is to deal with business for someone else: <i>Please contact our agent in Spain for further information.</i>	a chemically, physically, or biologically active principle: <i>an oxidizing agent</i>
35	termination(s)_n	the act of ending something or the end of something: <i>The termination of the bus service was a severe blow to many villagers.</i>	the intentional ending of a pregnancy, usually by a medical operation: <i>She made the difficult decision to terminate the pregnancy.</i>
36 37	distress_n respiratory distress	(C1) the feeling of being extremely upset or worried: <i>The newspaper reports caused her a great deal of distress.</i>	a state of great suffering of body or mind: <i>respiratory distress</i> Respiratory distress: difficulty breathing, characterized by shortness of breath or rapid breathing
38	carrier(s)_n	a person or thing that carries or delivers something.	someone who does not suffer from a disease but has the

		<p><i>She's got a job as a letter carrier.</i></p>	<p>infection or genetic fault that causes it and can give the disease to someone else.</p> <p><i>There are an estimated 1.5 million HIV carriers in the country.</i></p>
39	Presentation _n	<p>(B1) a talk giving information about something:</p> <p><i>The speaker gave an interesting presentation on urban transport.</i></p>	<p>the position in which the fetus lies in the uterus in labor with respect to the opening of the uterus:</p> <p><i>A woman gave birth to a baby in cephalic presentation at 37 weeks of gestation.</i></p>
40	viral_adj	<p>used to describe something that quickly becomes very popular or well known by being published on the internet or sent from person to person by email, phone, etc:</p> <p><i>Here's a list of the top ten viral videos this week.</i></p>	<p>caused by a virus:</p> <p><i>viral infections</i></p>
41	suspension_n	<p>the act of stopping something happening, operating, etc. for a period of time:</p> <p><i>The suspension of fighting is to take effect at 6 a.m. on Monday.</i></p>	<p>the act of hanging or the state of being hung:</p> <p><i>uterosacral ligament suspension</i></p>
42	cavity_n	<p>a hole, or an empty space between two surfaces:</p>	<p>a hollow space in an organ or body part:</p>

		<i>The gold was hidden in a secret cavity.</i>	<i>the upper nasal cavity abdominal cavity</i>
43	temporal_adj	relating to practical matters or physical things, rather than spiritual ones: <i>The tyranny of the monarchy lies in its spiritual rather than its temporal power: it tyrannizes the imagination.</i>	relating to the temple (= the side of the head behind the eyes) or the temporal bone of the skull beneath the temple: <i>the temporal bone/lobe</i>

¹EnglishProfile The CEFR for English <https://www.englishprofile.org/wordlists/evp>

²Merriam Webster Dictionary <https://www.merriam-webster.com/>

³Cambridge Dictionary <https://dictionary.cambridge.org/>

Appendix D: Research-related Technical Vocabulary Word List (ungrouped)

No.	Word items	No.	Word items	No.	Word items
1	study(es)_n	26	adjusted relative risk_n	51	cumulative incidence_n
2	cohort study(es)_n	27	relative risk(s)_n	52	adjusted odds ratio_n
3	study population_n	28	analysis(es)_n	53	odds ratio_n
4	study design_n	29	statistical analysis(es)_n	54	hazard ratio_n
5	study period_n	30	meta-analysis(es)_n	55	risk ratio_n
6	retrospective cohort study_n	31	sensitivity analysis(es)_n	56	inclusion criteria_n
7	observational study(es)_n	32	regression analysis_n	57	exclusion criteria_n
8	retrospective study_n	33	interim analysis_n	58	eligibility criteria_n
9	study participants_n	34	secondary analysis_n	59	diagnostic criteria_n
10	prospective cohort study_n	35	subgroup analysis(es)_n	60	progression-free survival_n
11	case-control study_n	36	primary analysis_n	61	overall survival_n
12	prospective study_n	37	data analysis_n	62	p value_n
13	study cohort_n	38	randomized controlled trial(s)_n	63	predictive value_n
14	patient population_n	39	clinical trial(s)_n	64	placebo_n
15	placebo group_n	40	randomized trials_n	65	confidence interval(s)_n
16	control group_n	41	trial design_n	66	median_adj
17	intervention group_n	42	incidence rate_n	67	interquartile range_n
18	treatment group(s)_n	43	mortality rates_n	68	regression(s)_n
19	trial group(s)_n	44	confounding factors_n	69	multivariable logistic regression_n
20	primary outcome(s)_n	45	regression model(s)_n	70	logistic regression_n

21	secondary outcome(s)_n	46	prediction model_n	71	linear regression_n
22	clinical outcomes_n	47	adverse effects_n	72	protocol_n
23	health outcomes_n	48	adverse event(s)_n	73	systematic review(s)_n
24	risk(s)_n	49	statistically significant_adj	74	randomization_n
25	risk factor(s)_n	50	significant difference(s)_n	75	statistical_adj
76	statistical significance_n	88	median_n	100	normality_n
77	percentile(s)_n	89	correlate(ed)_v	101	trial(s)_n
78	retrospective_adj	90	descriptive statistics_n	102	participant(s)_n
79	continuous variables_n	91	quantitative_adj	103	finding(s)_n
80	prospective_adj	92	qualitative_adj	104	sample(s)_n
81	variant(s)_n	93	coefficient_n	105	sample size(s)_n
82	hazard_n	94	prospectively_adv	106	incidence(s)_n
83	mean_n	95	cutoff_n	107	exposure_n
84	correlation_n	96	sampling_n	108	survival_n
85	covariates_n	97	univariate_adj	109	mortality_n
86	confounders_n	98	double-blind_adj	110	morbidity_n
87	standard deviation_n	99	outliers_n	111	prevalence_n

Appendix E: Groups of Research-related Technical Vocabulary Items by Themes

Group 1: Study design	Group 2: Criteria and outcomes analyses	Group 3: Statistical Measures
study(es)_n cohort study(es) prospective_adj prospectively_adv prospective study_n prospective cohort study_n retrospective_adj retrospective study_n retrospective cohort study_n case-control study_n observational study(es)_n study cohort_n study design_n study period_n trial design_n trial(s)_n clinical trial(s)_n randomized trials_n randomized controlled trial(s)_n randomization_n double-blind_adj sample(s)_n sample size(s)_n sampling_n protocol_n quantitative_adj	inclusion criteria_n exclusion criteria_n eligibility criteria_n diagnostic criteria_n health outcomes_n primary outcome(s)_n secondary outcome(s)_n clinical outcomes_n survival_n overall survival_n progression-free survival_n adverse effects_n adverse event(s)_n incidence rate_n mortality rates_n mortality_n morbidity_n incidence(s)_n cumulative incidence_n prevalence_n analysis(es)_n statistical analysis(es)_n meta-analysis(es)_n sensitivity analysis(es)_n interim analysis_n secondary analysis_n subgroup analysis(es)_n primary analysis_n	risk(s)_n risk factor(s)_n adjusted relative risk_n relative risk(s)_n odds ratio_n adjusted odds ratio_n hazard ratio_n hazard_n risk ratio_n statistical_adj descriptive statistics_n statistical significance_n statistically significant_adj significant difference(s)_n p value_n confidence interval(s)_n mean_n median_adj median_n standard deviation_n interquartile range_n percentile(s)_n correlation_n correlate(ed)_v confounding factors_n confounders_n variant(s)_n covariates_n

qualitative_adj systematic review(s)_n participant(s)_n exposure_n study population_n study participants_n patient population_n placebo_n placebo group_n control group_n intervention group_n treatment group(s)_n trial group(s)_n	data analysis_n regression(s)_n regression analysis_n regression model(s)_n linear regression_n logistic regression_n, multivariable logistic regression_n, prediction model_n	continuous variables_n univariate_adj coefficient_n predictive value_n outliers_n normality_n cutoff_n finding(s)_n
Total: 39 items	Total: 36 items	Total: 36 items

Appendix F: Fully OB&GYN Technical Vocabulary Word List (ungrouped)

No.	Word items	No.	Word items	No.	Word items
1	pregnant patients_n	26	adverse perinatal outcomes_n	51	prenatal care_n
2	pregnant women_n	27	birth	52	antenatal care_n
3	pregnancy(es)_n	28	spontaneous preterm birth_n	53	cervical cancer_n
4	postmenopausal women_n	29	preterm birth_n	54	ovarian cancer_n
5	nulliparous women_n	30	birth weight_n	55	endometrial cancer_n
6	parous women_n	31	live birth_n	56	cancer screening_n
7	pregnancy outcome(s)_n	32	vaginal birth_n	57	gestational_adj_n
8	adverse pregnancy outcome(s)_n	33	birth rate(s)_n	58	gestational diabetes_n
9	early pregnancy_n	34	cesarean delivery(es)_n	59	gestational hypertension_n
10	pregnancy rate(s)_n	35	preterm delivery_n	60	gestational diabetes mellitus_n
11	clinical pregnancy_n	36	vaginal delivery(es)_n	61	neonatal death_n
12	pregnancy loss_n	37	gestational age(s)_n	62	fetal death_n
13	ectopic pregnancy_n	38	maternal age_n	63	perinatal death_n
14	pregnancy complications_n	39	reproductive age_n	64	residual disease_n
15	late pregnancy_n	40	live birth rate_n	65	postpartum period_n
16	multiple pregnancy(es)_n	41	fetal heart rate_n	66	menstrual period_n
17	singleton pregnancy(es)_n	42	maternal_adj	67	propensity score_n
18	twin pregnancies_n	43	maternal-fetal medicine_n	68	apgar score(s)_n
19	neonatal outcomes_n	44	maternal morbidity_n	69	gestation(s)_n
20	perinatal outcomes_n	45	maternal mortality_n	70	infant(s)_n
21	adverse outcomes_n	46	maternal death(s)_n	71	preterm infants_n
22	maternal outcomes_n	47	maternal characteristics_n	72	neonatal_adj

23	birth outcomes_n	48	maternal complications_n	73	neonatal intensive care_n
24	neurodevelopmental outcomes_n	49	gestational weeks_n	74	neonatal complications_n
25	infant outcomes_n	50	reproductive health_n	75	neonatal morbidity_n
76	vaginal_adj	101	spontaneous labor_n	126	obstetric_adj
77	vaginal bleeding_n	102	uterine_adj	127	postoperative_adj
78	fetal_adj	103	uterine bleeding_n	128	placental_adj
79	fetal growth restriction_n	104	uterine fibroids_n	129	placental abruption_n
80	menstrual cycle_n	105	pregestational diabetes_n	130	congenital anomalies_n
81	blood loss_n	106	c(a)esarean section_n	131	sepsis_n
82	cord blood_n	107	stillbirth(s)_n	132	trimester_n
83	menstrual blood_n	108	hysterectomy_n	133	neonate(s)_n
84	pregnant_adj	109	menstrual_adj	134	placenta_n
85	postoperative complications_n	110	menstrual bleeding_n	135	placenta previa_n
86	cervical_adj	111	fetus_n	136	urinary incontinence_n
87	cervical dilation_n	112	perinatal_adj	137	endometriosis_n
88	low birth weight_n	113	perinatal mortality_n	138	ultrasound_n
89	fetal weight_n	114	prenatal_adj	139	cord(s)_n
90	ovarian_adj	115	pelvic_adj	140	umbilical cord_n
91	ovarian reserve_n	116	pelvic organ prolapse_n	141	opioid(s)_adj
92	postpartum_adj	117	pelvic floor_n	142	infertility_n
93	postpartum h(a)emorrhage_n	118	heavy menstrual bleeding_n	143	carcinoma_n
94	pelvic pain_n	119	genetic testing_n	144	antenatal_adj
95	embryo_n	120	breastfeeding_v	145	abortion_n
96	embryo transfer_n	121	miscarriage(s)_n	146	contraception_n
97	frozen embryo_n	122	preterm_adj	147	obstetrical_adj
98	severe maternal morbidity_n	123	endometrial_adj	148	abdominal_adj
99	labor induction_n	124	reproductive_adj	149	anomaly_n
100	preterm labor_n	125	preeclampsia_n	150	sexual_adj
151	h(a)emorrhage_n	176	dysmenorrhea_n	201	amniotic_adj
152	magnetic resonance imaging_n	177	endothelial dysfunction_n	202	amniotic fluid_n

153	oxytocin_n	178	newborn(s)_n	203	leiomyomas_n
154	postnatal_adj	179	uterine artery	204	chromosomal_adj
155	hormone(s)_n	180	maternity_n	205	embolism_n
156	intrauterine_adj	181	preoperative_adj	206	newborn_adj
157	myomectomy_n	182	cyst_n	207	steroid_n
158	blastocyst_n	183	contraceptive_adj	208	anemia_n
159	nulliparous_adj	184	twin_n	209	multiparous_adj
160	laparoscopic_adj	185	intensive care unit_n	210	parous_adj
161	hernia_n	186	phenotype(s)_n	211	intrapartum_n
162	fertility_n	187	antepartum_n	212	chorioamnionitis_n
163	umbilical_adj	188	neurodevelopmental_adj	213	histologic_adj
164	umbilical artery_n	189	cervix_n	214	ovulation_n
165	prepregnancy_n	190	hormonal_adj	215	in vitro fertilization_n
166	rupture(s)_n	191	fallopian tube_n	216	hypoglycemia_n
167	prelabor rupture_n	192	amniocentesis_n	217	ovary_n
168	gynecologic_adj	193	aneuploidy_n	218	childbirth_n
169	gynecologic oncology_n	194	ultrasonography_n	219	endometrium_n
170	obstetrics_n	195	postmenopausal_adj	220	follicle_n
171	menopause_n	196	ectopic_adj	221	fallopian_adj
172	analgesia_n	197	fibroid_n	222	fertilization_n
173	macrosomia_n	198	cerebral palsy_n	223	premenopausal_adj
174	oocyte(s)_n	199	uterus_n	224	transvaginal_adj
175	progesterone_n	200	dystocia_n	225	utero_n
226	adhesions_n	246	estrogen_n	266	prenatally_adv
227	anesthesia_n	247	gynecologist(s)_n	267	endometritis_n
228	follicular_adj	248	histology_n	268	dyspareunia_n
229	premature_adj	249	resuscitation_n	269	gastrointestinal_adj
230	peripheral_adj	250	anatomic_adj	270	menopausal_adj
231	malformations_n	251	eclampsia_n	271	ultrasonographic_adj
232	hysteroscopic_adj	252	vagina_n	272	perioperative_adj
233	perineal_adj	253	chromosome_n	273	chorionic_adj
234	midwives_n	254	menses_n	274	human papillomavirus_n
235	endothelial_adj	255	genital_adj	275	endocrine_adj
236	gynecology_n	256	amenorrhea_n	276	peritoneal_adj
237	preconception_n	257	pregestational_adj	277	intercourse_n
238	obstetrician(s)_n	258	corticosteroids_n	278	euploid_adj
239	embryonic_adj	259	menstruation_n	279	pelvis_n
240	epithelial_adj	260	epilepsy_n	280	oophorectomy_n

241	epithelial ovarian_n	261	histological_adj	281	vaginally_adv
242	intraoperative_adj	262	sperm_n	282	prelabor_n
243	prematurity_n	263	primiparous_adj	283	thrombosis_n
244	nonpregnant_adj	264	estradiol_n	284	intravenously_adv
245	intraepithelial_adj	265	forceps_n		

Appendix G: Groups of Fully OB&GYN Technical Vocabulary Items by Themes

Group 1: Anatomy of reproductive system	Group 2: Maternal outcomes	Group 3: Newborn outcomes
vagina_n	maternal_adj	<i>perinatal</i> outcomes_n
vaginal_adj	maternity_n	<i>perinatal</i> death_n
vaginally_adv	maternal outcomes_n	adverse <i>perinatal</i>
transvaginal_adj	maternal age_n	outcomes_n
<u>uterine</u> _adj	maternal-fetal medicine_n	adverse outcomes_n
intra <u>uterine</u> _adj	maternal morbidity_n	neurodevelopmental_adj
uterine artery_n	severe maternal	neurodevelopmental
utero_n	morbidity_n	outcomes_n
uterus_n	maternal mortality_n	<i>preterm</i> _adj
fallopian tube_n	maternal death(s)_n	<i>preterm</i> birth_n
fallopian_adj	maternal characteristics_n	<i>preterm</i> infants_n
cervical_adj	maternal complications_n	<i>premature</i> _adj
cervix_n	nulliparous women_n	<i>prematurity</i> _n
ovarian_adj	primiparous_adj	twin_n
ovary_n	nulliparous_adj	infant(s)_n
pelvic_adj	<u>parous</u> _adj	infant outcomes_n
pelvis_n	multiparous_adj	birth outcomes_n
pelvic floor_n	<u>parous</u> women_n	birth rate(s)_n
placental_adj	<i>prenatal</i> care_n	childbirth_n
placenta_n	<i>prenatal</i> _adj	birth weight_n
cord(s)_n	<i>prenatally</i> _adv	low birth weight_n
umbilical cord_n	<i>preoperative</i> _adj	stillbirth(s)_n
<i>endometrial</i> _adj	<u>antenatal</u> _adj	live birth_n
<i>endometrium</i> _n	<u>antenatal</u> care_n	live birth rate_n
abdominal_adj	<u>antepartum</u> _n	propensity score_n
gastrointestinal_adj	<i>postoperative</i> _adj	apgar score(s)_n
chorionic_adj	<i>postnatal</i> _adj	newborn(s)_n
umbilical_adj	<i>postpartum</i> period_n	newborn_adj

umbilical artery_n amniotic_adj amniotic fluid_n sperm_n oocyte(s)_n follicle_n follicular_adj epithelial_adj endothelial_adj epithelial ovarian_n intraepithelial_adj intravenously_adv peritoneal_adj peripheral_adj perineal_adj anatomic_adj genital_adj embryo_n embryonic_adj frozen embryo_n	postoperative complications_n postpartum_adj postpartum h(a)emorrhage_n perinatal_adj perinatal mortality_n perioperative_adj intrapartum_n intraoperative_adj breastfeeding_v	neonate(s)_n neonatal_adj neonatal outcomes_n neonatal death_n neonatal intensive care_n neonatal complications_n neonatal morbidity_n fetus_n fetal_adj fetal weight_n fetal heart rate_n fetal death_n fetal growth restriction_n cord blood_n congenital anomalies_n cerebral palsy_n malformations_n epilepsy_n
Total: 48 items	Total: 36 items	Total: 44 items

Group 4: Pregnancy	Group 5: OB&GYN pathologic conditions	Group 6: Labor and Delivery Group 10: Others
<p>pregnant_adj nonpregnant_adj pregnant patients_n pregnant women_n pregnancy(es)_n pregnancy outcome(s)_n adverse pregnancy outcome(s)_n early pregnancy_n late pregnancy_n pregnancy rate(s)_n clinical pregnancy_n pregnancy loss_n ectopic pregnancy_n ectopic_adj pregnancy complications_n multiple pregnancy(es)_n singleton pregnancy(es)_n twin pregnancies_n gestational_adj gestation(s)_n gestational age(s)_n gestational weeks_n gestational diabetes_n gestational hypertension_n gestational diabetes mellitus_n pregestational diabetes_n prepregnancy_n</p>	<p>gynecologic oncology_n cancer screening_n cervical cancer_n ovarian cancer_n carcinoma_n endometriosis_n endometritis_n endometrial cancer_n residual disease_n vaginal bleeding_n blood loss_n pelvic pain_n uterine bleeding_n uterine fibroids_n pelvic organ prolapse_n miscarriage(s)_n eclampsia_n preeclampsia_n placental abruption_n placenta previa_n urinary incontinence_n anomaly_n h(a)emorrhage_n blastocyst_n hernia_n macrosomia_n endothelial dysfunction_n cyst_n fibroid_n</p>	<p>labor induction_n spontaneous labor_n preterm labor_n prelabor_n prelabor rupture_n rupture(s)_n birth_n vaginal birth_n spontaneous preterm birth_n cesarean delivery(es)_n preterm delivery_n vaginal delivery(es)_n c(a)esarean section_n dystocia_n Group 10: Others genetic testing_n phenotype(s)_n chromosomal_adj chromosome_n aneuploidy_n euploid_adj human papillomavirus_n histology_n histologic_adj histological_adj</p>

<p><i>pregestational_adj</i></p> <p>trimester_n</p>	<p>leiomyomas_n</p> <p>embolism_n</p> <p>thrombosis_n</p> <p>anemia_n</p> <p>chorioamnionitis_n</p> <p>dyspareunia_n</p> <p>hypoglycemia_n</p> <p>sepsis_n</p>	
Total: 29 items	Total: 37 items	Total: 24 items

Group 7: Hormonal and Menstrual Health	Group 8: Reproductive Health	Group 9: Procedures and Treatment
menstruation_n menses_n menopause_n menopausal_adj postmenopausal_adj premenopausal_adj postmenopausal_women_n menstrual_period_n menstrual_cycle_n menstrual_blood_n menstrual_adj menstrual_bleeding_n heavy_menstrual_bleeding_n amenorrhea_n dysmenorrhea_n hormone(s)_n hormonal_adj progesterone_n oxytocin_n estrogen_n estradiol_n endocrine_adj	reproductive_adj reproductive_age_n reproductive_health_n ovarian_reserve_n infertility_n fertility_n fertilization_n sexual_adj intercourse_n midwives_n contraception_n contraceptive_adj preconception_n ovulation_n adhesions_n obstetric_adj obstetrics_n obstetrical_adj obstetrician(s)_n gynecologic_adj gynecologist(s)_n gynecology_n	cervical_dilation_n laparoscopic_adj hysteroscopic_adj hysterectomy_n myomectomy_n oophorectomy_n ultrasound_n ultrasonography_n ultrasonographic_adj magnetic_resonance_imaging_n amniocentesis_n in_vitro_fertilization_n embryo_transfer_n resuscitation_n abortion_n forceps_n analgesia_n steroid_n corticosteroids_n opioid(s)_adj anesthesia_n intensive_care_unit_n
Total: 22 items	Total: 22 items	Total: 22 items

Appendix H: Acronyms word list

No	Acronym	Full term
1	CI_n	Confidence interval
2	BMI_n	body mass index
3	GDM_n	gestational diabetes mellitus
4	PTB_n	preterm birth
5	PPH_n	postpartum haemorrhage_n
6	aOR_n	adjusted odds ratio
7	BP_n	blood pressure
8	MRI_n	magnetic resonance imaging
9	SGA_n	small-for-gestational-age
10	IVF_n	in vitro fertilization
11	HIV_n	human immunodeficiency virus
12	SD_n	standard deviation
13	POP_n	pelvic organ prolapse
14	IQR_n	interquartile range
15	PPROM_n	Preterm prelabor rupture of membranes
16	NICU_n	neonatal intensive care unit
18	GA_n	gestational age
19	OS_n	overall survival
20	hCG_n	human chorionic gonadotropin
21	AUC_n	area under the curve
22	aRR_n	adjusted relative risk
23	FIGO_n	International Federation of Gynecology and Obstetrics
24	ICU_n	intensive care unit
25	AMH_n	anti-Müllerian hormone
26	PCR_n	polymerase chain reaction
27	ICD-10_n	International Classification of Diseases, Tenth Revision
28	RCTs_n	randomised controlled trials
29	CDC_n	Centers for Disease Control and Prevention