International Journal of Linguistics, Literature and Translation
ISSN: 2617-0299 (Online); ISSN: 2708-0099 (Print)
DOI: 10.32996/ijllt
Journal Homepage: www.al-kindipublisher.com/index.php/ijllt

IJLLT
AL-KINDI CENTER FOR RESEARCH AND DEVELOPMENT

| RESEARCH ARTICLE

Graduate – Level Research Papers Across Academic Departments: A comparative Analysis

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| ABSTRACT
This study Investigates the lexical diversity, sentence structures and modality embodied in graduate-level research abstracts across various academic departments. These abstracts have been written by graduate students enrolled in the University of Hilla and affiliated to the following departments: Nursing, Medical Physics, Radiology and Ultrasound, and Anesthesia. It endeavors to unravel concomitant linguistic features that grant franchise to each field of specialty. Such an approach is a handy tool that furnishes insights into the linguistic peculiarities of each discipline.

| KEYWORDS
Research papers, , lexical diversity, modality. Sentence structures.

| ARTICLE INFORMATION
ACCEPTED: 15 November 2024 **PUBLISHED:** 06 December 2025 **DOI:** 10.32996/ijllt.2025.8.12.10

1. Introduction

This study highlights the use of certain linguistic categories such as lexical diversity, sentence structures and modality confluent in certain graduate research papers . It is argued that these categories vary rather obtusely across disciplines. Taking these variations into account can elucidate adopting assiduous writing styles of the academic writings as regards respective fields (Englander,2014). Let us embark on a rapid review of these categories.

Lexical diversity is how to calculate the number of different lexical words and how often they occur in a text. They are nouns ,adjectives, adverbs and verbs that carry meaning in a text. The most common approach to measure lexical diversity is based on the ratio of different words(Types) to total number of words(Tokens) (Dewaele and Pavlenko,2003; Wang,2014)

Sentence structure refers to the organization of all the parts in a sentence. It deals a lot with independent and dependent clauses and the way they combine to create four types of sentence structure :simple, compound, complex and compound complex (Jonz,2014).

Modality can be envisaged as a semantic category .Modal expressions can make the speaker assess a particular situation in terms of possibility, probability, permission, volition , obligation and necessity.(Portner,2009)

In this vein, graduate research writing is critical for academic knowledge dispersal. (Corcoran,2019; Bruna, 2020). Academic writing refers to a style of expression that researchers use to define the intellectual boundaries of their disciplines and specific areas of expertise. Characteristics of academic writing include a formal tone, a clear focus on the research problem under investigation, and precise word choice. Academic writing is designed to convey agreed meaning about complex ideas or concepts within a community of scholarly experts and practitioners. (Zhang,2023).

Abstracts of scientific writing serves as a crucial means for summarizing research findings ,presenting the hypotheses and telling the readership the nature of this or that scientific community .Due to their brevity and standardized forms they ought to convey the impetus behind the message with clarity and precision . As such , they provide a fecund ground for linguistic analysis , showing how scientific knowledge is being communicated.(Hardy &Frginal, 2016; Nikoulina,2020).

As a rule of thumb ,research papers are a bedrock of modern science and the most effective way to share information across a wide network. However, most people are familiar with research papers from school; college courses often use them to test a student's knowledge of a particular area or their research skills in general. Considering their gravity, research papers favor formal, even bland language that strips the writing of any bias. Researchers state their findings plainly and with corresponding evidence so that other researchers can consequently use the paper in their own research(Christine et al ,2020; Rakedzon & Tsabari, 2017; Gurung, 2022)

As regards our data, it seems that the graduate students are exhorted to admonish their abstracts as being crammed with scientific terminology. Scientific language is some sort of a linga franca or a genre used by one or several scientific societies . It is either specific form of a given language that is esoteric and abstruse in conducting science, or it is the set of a discrete language variety in which science is carried out. (Adam,2017; Micheal,2017 ;Nesselhauf, 2009; Ahmad; 2012; Viera, 2019).

2. Methodology

This study limits itself to the analysis of the abstracts of the research papers presented by graduate students at The University of Hilla in partial fulfillment of the requirements for the degree of B.Sc. The students are affiliated with the following scientific departments: Medical Physics, Radiology and Ultrasound, Nursing., and Anesthesia .

The analysis addresses the following

- Lexical diversity: to asses the range of vocabulary used including general academic words; technical terminology; and common vocabulary. (Zakhrova & Savina, 2020)
- Sentence structures: to evaluate complexity, length, and syntactic variations.(Wijaya et al,2023).
- Modality: to examine the use of modal verbs and expressions epitomizing epistemic modality(possibility, and prediction) ; deontic modality (obligation and permission);dynamic modality(ability , willingness, or future events) (Hoye,1997; Qarashova,2024).

The procedures followed touch up these intriguing categories of each field separately for sake of clarity and afterwards the discussion scrambles for putting together all the findings alluding to all departments so as to accentuate points of either differences as a parting of the ways and/ or similarities and how the distribution of all the quintessential and pervasive categories are statistically (SPSS) asserted to reach out cogent conclusions.

3. Discussion

3.1 Radiology and Ultrasound Department

3.1.1 Sentence Structure

The abstracts analyzed from the Department of Radiology and Ultrasound show a predominant use of simple sentences (44%). This indicates a clear intent to ensure readability and straightforward communication, particularly important in scientific writing, where clarity is critical for effectively conveying complex information. The relatively high proportion of complex sentences (30%) which boosts detailed explanations, relationships, and subtle shades of arguments, particularly in contexts requiring technical profundity.

The **compound sentences (20%)** present the connection of related ideas without excessively raveling the text. **Compound-complex sentences (6%)**, while sporadically used, they are pivotal tools to help conveying important nuance on a specific topic.

3.2 Lexical Diversity

The **general academic words (42%)** cram up the lexical diversity of the abstracts, so as to render the content understandable within an academic setting .They can be used to describe research and to structure writing. Academic words are basically the code used in academic pursuits and act as essential for many functional aspect of education

The presence of **technical terminology (38%)** demonstrates the graduate pledge to preserving precision and subject-specific accuracy, particularly essential in radiology and ultrasound academic papers , which often utilize sophisticate technologies and

specialized procedures .All in all, the technical terminology is seen as a way of gaining great depth and accuracy of meaning with economy of words.

Common vocabulary (20%) It supports simplifying explanations or preparing technical findings for wider cognizance. The low percentage is due to the belief that papers on science topics aims at precision .Thus specialized terminology assists researchers to convey ideas and findings with clarity avoiding ambiguity that might arise from common vocabulary)

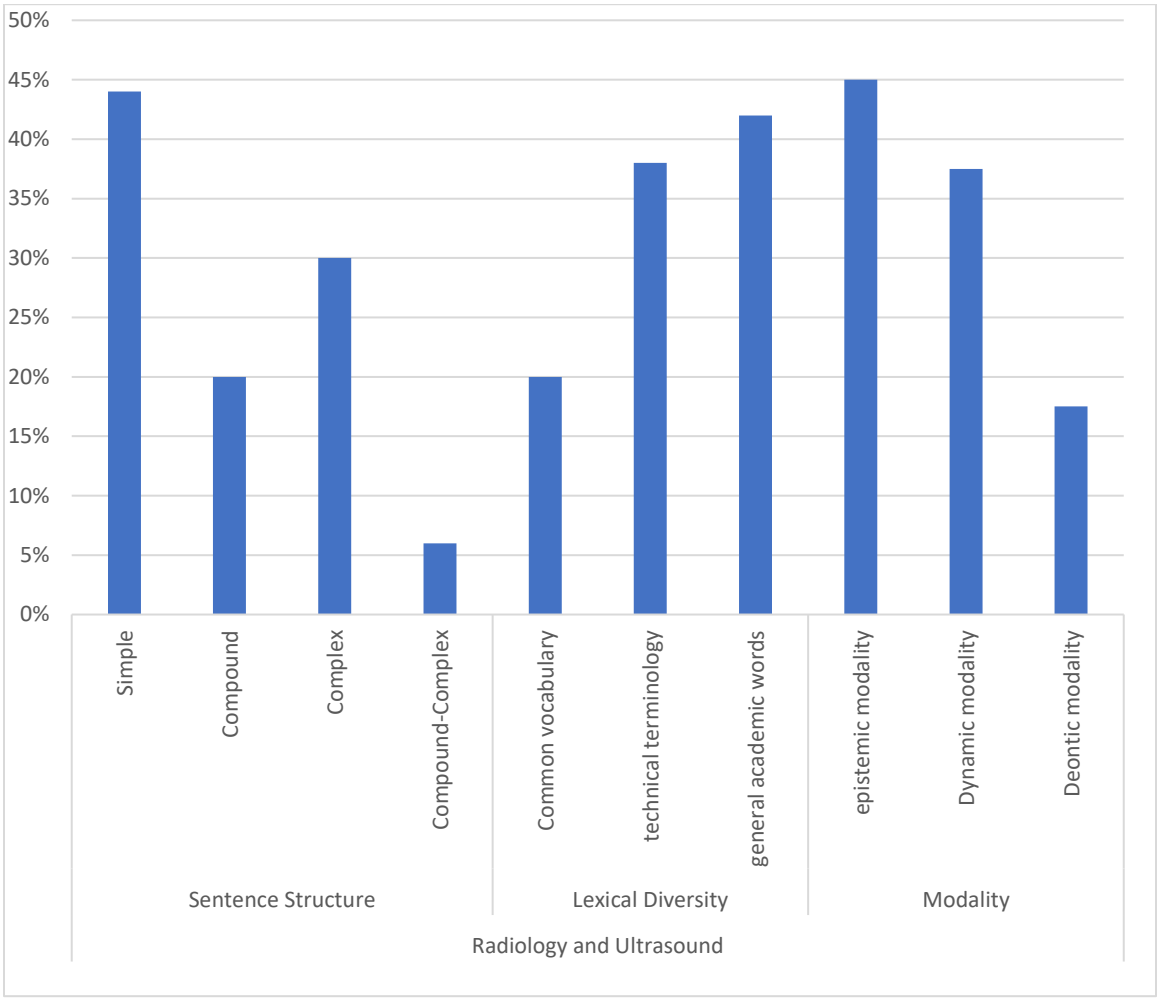
3.3 Modality

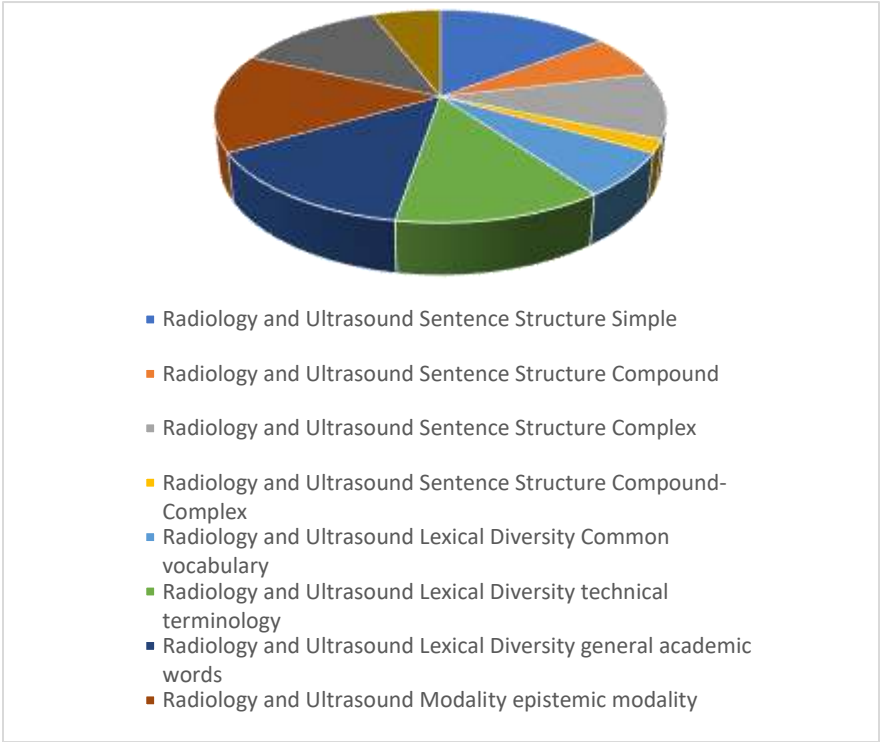
The abstracts' use of modality indicates a strong preference for **epistemic modality (45%)**, reflecting the emphasis on certainty and evidence-based assertions in scientific research. This aligns with the need to convey confidence in findings and ensure credibility within the medical community.

Dynamic modality (37.5%) is the second most frequent, highlighting the focus on capabilities, potential applications, and advancements in medical imaging technologies. This is particularly relevant in fields like radiology and ultrasound, where innovation and adaptability are crucial.

Deontic modality (17.5%) appears less frequently, which aligns with the descriptive and analytical nature of these abstracts. The relatively low emphasis on obligation or necessity suggests that the abstracts prioritize exploration over prescriptive conclusions.

Department	Category	Type	Occurrence (%)
Radiology and Ultrasound	**Sentence Structure**	**Simple**	**44%**
		Compound	**20%**
		Complex	**30%**
		Compound-Complex	**6%**
	Lexical Diversity	**Common vocabulary**	**20%**
		technical terminology	**38%**
		general academic words	**42%**
	Modality	**epistemic modality**	**45%**
		Dynamic modality	**37.5%**
		Deontic modality	**17.5%**


50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Simple
Compound
Complex
Compound-Complex
Common vocabulary
technical terminology
general academic words
epistemic modality
Dynamic modality
Deontic modality
Sentence Structure
Lexical Diversity
Modality
Radiology and Ultrasound


Radiology and Ultrasound Sentence Structure Simple
Radiology and Ultrasound Sentence Structure Compound
Radiology and Ultrasound Sentence Structure Complex
Radiology and Ultrasound Sentence Structure Compound-Complex
Radiology and Ultrasound Lexical Diversity Common vocabulary
Radiology and Ultrasound Lexical Diversity technical terminology
Radiology and Ultrasound Lexical Diversity general academic words
Radiology and Ultrasound Modality epistemic modality

4. Department of Medical Physics

4.1 Sentence Structure

The sentence structure analysis of the abstracts from the Department of Medical Physics reveals a clear preference for clarity and accessibility in scientific writing. The breakdown is as follows:

- **Simple Sentences (40%)**: This category represents the largest proportion of sentences in the abstracts, emphasizing a preference for straightforward communication. Simple sentences are typically used for clear statements, direct facts, and concise information, which is essential in scientific writing where clarity is paramount. This suggests that the authors aim to make the information easily digestible for a broad audience.
- **Complex Sentences (26%)**: The second most common structure, complex sentences, reflects the need for detailed explanations and nuanced relationships. Medical physics is a highly specialized field that often involves complex ideas and multi-step processes, requiring authors to elaborate on intricate concepts and ideas. These sentences typically use subordinate clauses to add depth to the primary idea, helping to explain relationships or causal effects within the research.
- **Compound Sentences (24%)**: the connection of related ideas without excessively raveling the text. **Compound-Complex Sentences (10%)**: The least common structure, compound-complex sentences, are a blend of compound and complex forms, involving multiple independent clauses and at least one dependent clause. These sentences tend to be more difficult to follow and are likely used sparingly to avoid overwhelming the reader with too much information at once. Their relatively low usage indicates that while some level of complexity is necessary for conveying certain ideas, the authors aim to keep the text as clear and readable as possible.

In summary, the **high percentage of simple and complex sentences** highlights the importance of clarity in scientific writing. The balance between **compound and compound-complex sentences** reflects a conscious effort to avoid overly complex constructions, ensuring the content remains accessible to the intended audience.

4.2. Lexical Diversity

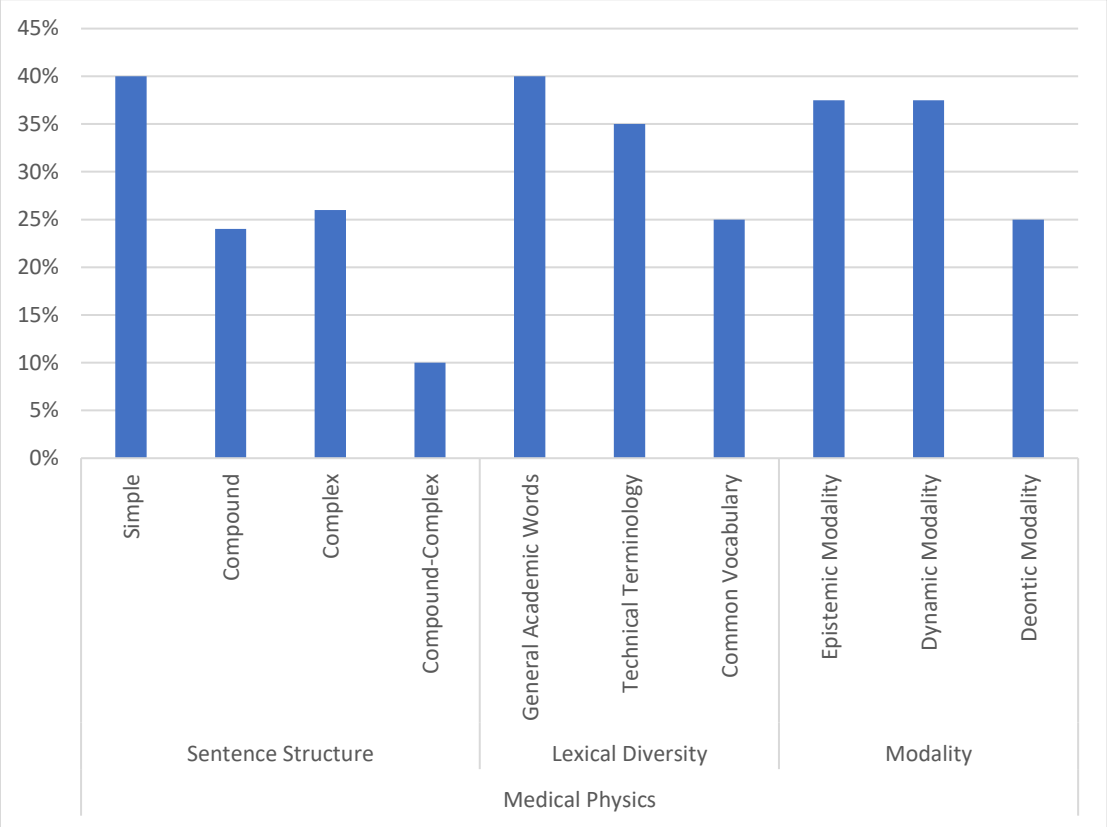
- **General Academic Words (40%)**: The highest proportion of vocabulary used in the abstracts belongs to general academic terms. These words are common across various disciplines and are used to frame the research within the context of broader scientific inquiry. This choice suggests an attempt to ensure the abstracts are comprehensible to a wider academic audience, including those not specialized in medical physics. The use of general academic words aids in making the research more accessible while maintaining a professional tone.
- **Technical Terminology (35%)**: The use of technical terms specific to the field of medical physics accounts for 35% of the vocabulary. This reflects the need for precision and subject-specific language in scientific communication. These terms are essential for conveying complex scientific concepts, experimental methods, and findings. The prominence of technical vocabulary ensures that the core scientific content is communicated accurately and unambiguously.
- **Common Vocabulary (25%)**: A quarter of the vocabulary is made up of common words, typically non-technical terms that might be used to describe basic actions, processes, or general concepts. This suggests that the authors are attempting to maintain a level of readability, ensuring that their research remains accessible not just to specialists but also to interdisciplinary researchers or a broader audience. Common vocabulary can serve to bridge the gap between specialized concepts and general understanding.

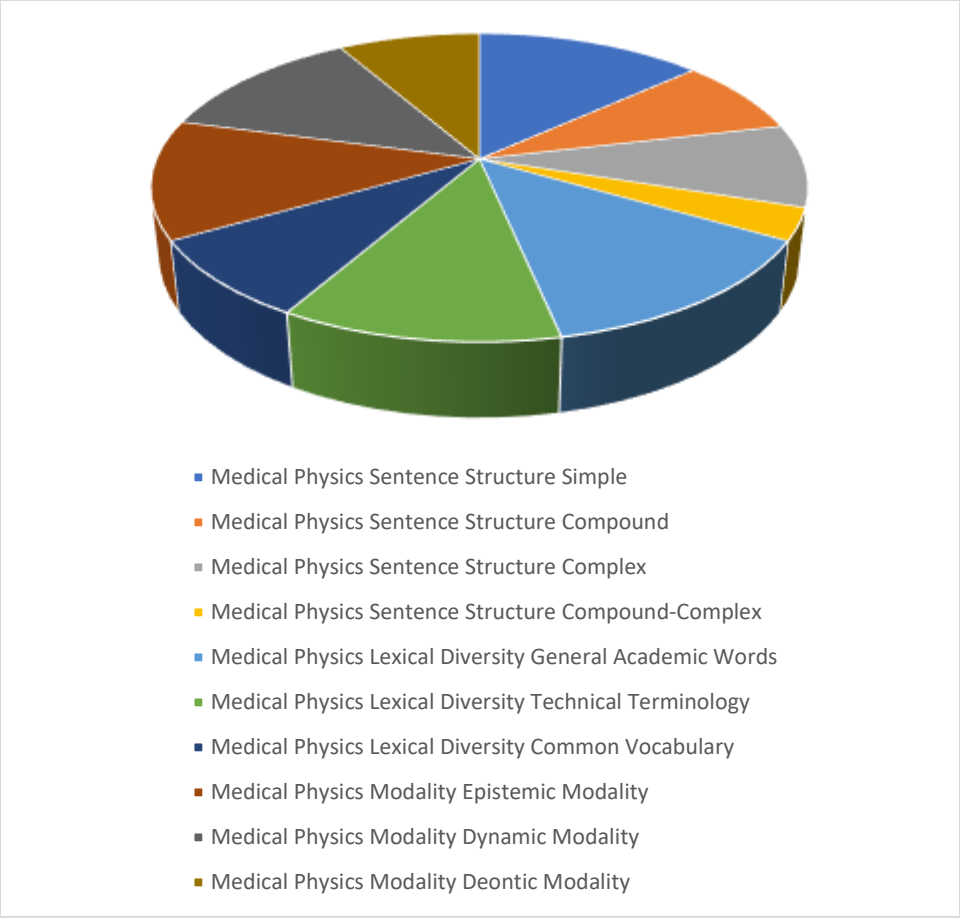
4.3. Modality

- **Epistemic Modality (37.5%)**: This modality, which expresses levels of certainty or knowledge, is the most frequent in the abstracts. It reflects the authors' attempt to indicate their degree of confidence in the statements made. In scientific writing, **epistemic modality** is crucial for communicating findings, presenting evidence, and discussing results with varying levels of certainty. This is especially important in the context of research where the strength of evidence may be variable or evolving.
- **Dynamic Modality (37.5%)**: Dynamic modality, which refers to the expression of capability or potential (e.g., "can," "able to"), also makes up 37.5% of the usage. This suggests a focus on the potential applications of the research and the capabilities of the technologies or methods discussed. In fields like medical physics, dynamic modality is particularly relevant when discussing innovations, experimental possibilities, or future research directions, as these often involve exploring what can be achieved rather than what is definitively known.
- **Deontic Modality (25%)**: The least common modality, **deontic modality**, conveys obligations, necessity, or permission (e.g., "must," "should"). Its lower frequency indicates that the abstracts focus more on presenting findings and potential capabilities than on prescribing specific actions or obligations. This is consistent with the nature of research abstracts, which tend to emphasize exploration and description rather than prescribing guidelines or mandates.

In conclusion, the **epistemic and dynamic modalities** are used most frequently, emphasizing the certainty of knowledge and the potential applications of the research. The relatively low use of **deontic modality** aligns with the descriptive, exploratory nature of the abstracts, where the primary focus is on presenting findings and exploring possibilities rather than establishing obligations or prescriptions.

Medical Physics	**Sentence Structure**	**Simple**	**40%**
		Compound	**24%**
		Complex	**26%**
		Compound-Complex	**10%**
	Lexical Diversity	**General Academic Words**	**40%**
		Technical Terminology	**35%**
		Common Vocabulary	**25%**
	Modality	**Epistemic Modality**	**37.5%**
		Dynamic Modality	**37.5%**
		Deontic Modality	**25%**





5. Nursing department

5.1 Discussion

5.1.1. Sentence Structure

- **Simple sentences**: These are straightforward statements that present information concisely. Simple sentences tend to dominate in the abstracts,(55%) as they are commonly used to provide background information, objectives, and conclusions. This choice enhances readability and helps maintain a direct focus on the main points of the study.
- **Compound sentences**: Compound sentences are less frequent (25%) but appear in sections where results or relationships between variables were being discussed, allowing for a clearer connection between different aspects of the research.
- **Complex sentences**: These sentences, which contain both independent and dependent clauses, are often used to explain methodology, discuss results, and provide justifications. Complex sentences are relatively not common(15%), though they indicating a need to explain the relationships between different factors or variables in the study.
- **Compound-complex sentences**: These sentences, which combine multiple clauses, are used sparingly (5%)y. However, they may provide more nuanced information, such as detailed descriptions of the study design or the implications of findings, which require multiple points to be conveyed simultaneously.

The dominance of simple and compound sentences suggests a focus on clarity and straightforward communication of the research findings, which is typical for abstracts, where brevity is key.

5.2. Lexical Diversity

Lexical diversity refers to the variety and complexity of the vocabulary used in the abstracts. The analysis indicated the following types of lexical diversity:

- **General vocabulary**: They score (60)%. Common medical and research terms such as "nurse," "study," "knowledge," and "results" are heavily featured. This type of vocabulary is essential for communicating the core aspects of the research, making it accessible to a broad academic audience.
- **Technical vocabulary**: Specific terms related to nursing practices score(30%) These terms are vital for a precise understanding of the study's focus and outcomes.

- **Common vocabulary**: Words like "implications," "assessment," and "evaluation" are less used in the discussion and conclusion sections(10)%, despite the fact that these words are important for interpreting the significance of the study and linking it to broader contexts.

The high proportion of basic and technical vocabulary highlights the abstracts' focus on presenting research findings in a clear and professional manner. The use of more abstract vocabulary, though present, is limited, as these abstracts aim to provide straightforward summaries of the research rather than detailed theoretical discussions.

5.3 Modality

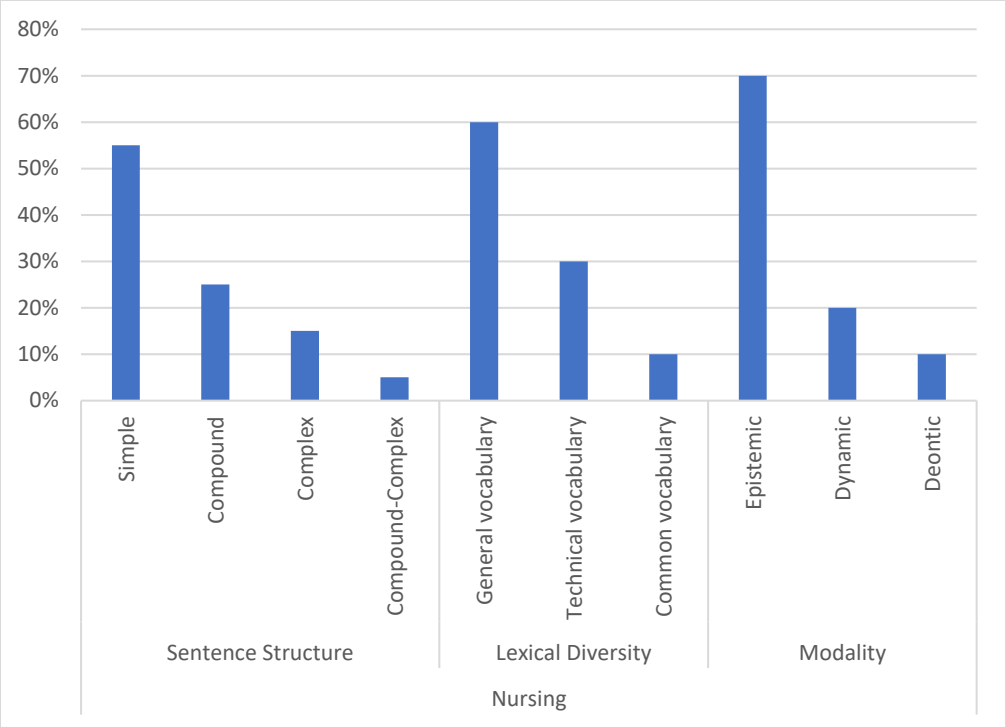
The dominance of certainty in the abstracts highlights the factual and conclusive nature of the findings. The use of possibility and obligation in the recommendations suggests that while the research provides valuable insights, there is still room for further exploration and action in the field.

The analysis of the nursing department abstracts reveals a clear emphasis on straightforward communication, with a preference for simple and compound sentence structures. The lexical diversity reflects a focus on core medical and research terms, ensuring that the abstracts are precise and accessible. The modality of the abstracts largely conveys certainty, underlining the confidence of the researchers in their findings, though some cautious language appears in the recommendations, suggesting areas for further exploration.

Overall, the abstracts are structured to communicate research findings efficiently and professionally, ensuring that the key points are easily understood by the target academic and clinical audience.

Data Table:

Nursing	**Sentence Structure**	**Simple**	**55%**
		Compound	**25%**
		Complex	**15%**
		Compound-Complex	**5%**
	Lexical Diversity	**General vocabulary**	**60%**
		Technical vocabulary	**30%**
		Common vocabulary	**10%**
	Modality	**Epistemic**	**70%**
		Dynamic	**20%**
		Deontic	**10%**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Simple
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General vocabulary
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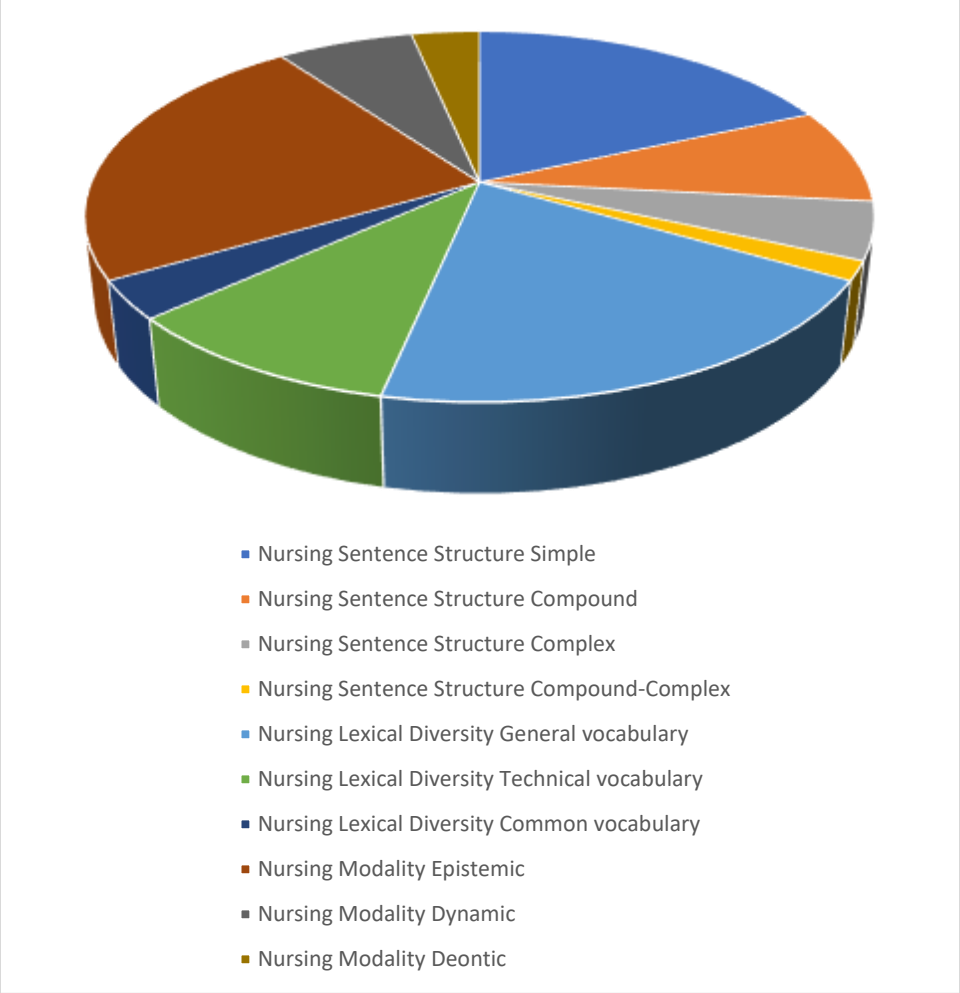
Common vocabulary
Epistemic
Dynamic
Deontic
Sentence Structure
Lexical Diversity
Modality
Nursing


Nursing Sentence Structure Simple
Nursing Sentence Structure Compound
Nursing Sentence Structure Complex
Nursing Sentence Structure Compound-Complex
Nursing Lexical Diversity General vocabulary
Nursing Lexical Diversity Technical vocabulary
Nursing Lexical Diversity Common vocabulary
Nursing Modality Epistemic
Nursing Modality Dynamic
Nursing Modality Deontic

6. Anesthesia Department

6.1 Discussion

6.1.1 Sentence Structures

6.1.1.1 Simple Sentences

The analysis of sentence structures in the abstracts from the Anesthesia Department revealed a predominant use of simple sentences, constituting 40% of the total. Simple sentences are often employed in scientific writing to convey ideas clearly and concisely. This choice of structure aligns with the need for unambiguous communication of critical information in medical research.

Complex sentences, representing 30%, are the next most frequent type. Their usage demonstrates the necessity to elaborate on findings, methodologies, and implications. For instance, detailed descriptions of study designs or explanations of results often require subordinating clauses to provide context and depth.

Compound sentences (20%) and compound-complex sentences (10%) occur less frequently but play a critical role in connecting related ideas or presenting comparisons and contrasts. The relatively lower occurrence of these structures may indicate a preference for simplicity in presenting research findings to ensure clarity.

6.1.2 Lexical Diversity

Technical terms dominate the lexical diversity category at 50%. This is expected in medical abstracts, where precise terminology is crucial for accuracy and to communicate effectively with a specialized audience. Terms such as "hemodynamic stability," "spinal anesthesia," and "transversus abdominis plane block" underscore the technical nature of the discourse.

General vocabulary (30%) provides accessibility and supports the narrative flow, ensuring the content remains comprehensible to a broader audience, including interdisciplinary researchers or practitioners.

Common vocabulary, while present at 20%, is relatively controlled. This balance reflects an awareness of the potential for overusing niche terms, which might alienate readers outside the immediate field of anesthesia. The careful selection of jargon likely enhances the abstracts' utility across related specialties.

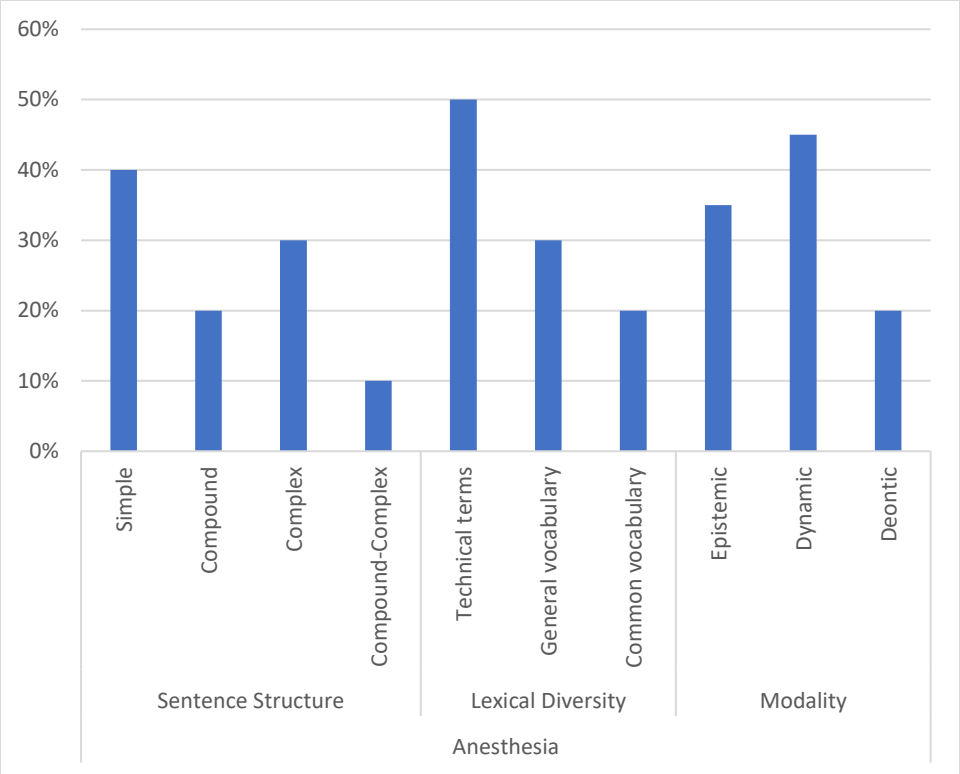
6.2 Modality

Epistemic statements account for 35%, indicating a strong confidence in the results presented. For example, conclusions like "methadone significantly reduces postoperative pain" reflect robust evidence derived from the studies.

Dynaic expressions are most common, at 45%. These are often associated with discussions of findings that require further validation or are context-dependent, such as "TAP blocks have potential" or "ketofol provides more hemodynamic stability in certain cases."

Deontic modality (20%) is used to highlight areas requiring further investigation. Phrases such as "further research is needed" or "this suggests" illustrate cautious interpretation of findings, characteristic of scientific rigor.

Anesthesia	**Sentence Structure**	**Simple**	**40%**
		Compound	**20%**
		Complex	**30%**
		Compound-Complex	**10%**
	Lexical Diversity	**Technical terms**	**50%**
		General vocabulary	**30%**
		Common vocabulary	**20%**
	Modality	**Epistemic**	**35%**
		Dynamic	**45%**
		Deontic	**20%**


60%
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Simple
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Technical terms
General vocabulary
Common vocabulary
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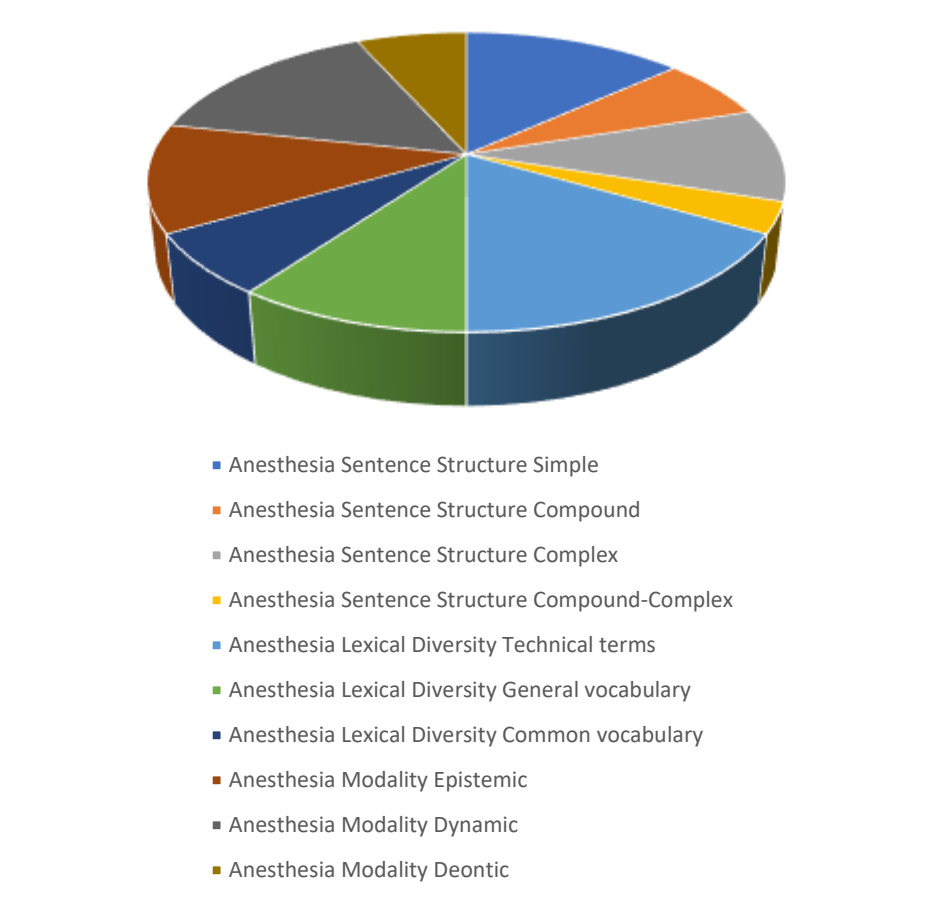
Sentence Structure
Lexical Diversity
Modality
Anesthesia


Anesthesia Sentence Structure Simple
Anesthesia Sentence Structure Compound
Anesthesia Sentence Structure Complex
Anesthesia Sentence Structure Compound-Complex
Anesthesia Lexical Diversity Technical terms
Anesthesia Lexical Diversity General vocabulary
Anesthesia Lexical Diversity Common vocabulary
Anesthesia Modality Epistemic
Anesthesia Modality Dynamic
Anesthesia Modality Deontic

7. Results and Discussion

The data of this study include abstracts written by graduate level students enrolled in four scientific departments. The number of abstracts varies according to these departments . They are as follows : Radiology and Ultrasound (6) abstracts, Nursing (6) abstracts, Medical Physics (12) abstracts , and Anesthesia (9) abstracts.

Below, the targeted categories are sequentially analyzed :

7.1 Sentence structures

It is seen that the simple sentences are widely used and their number of occurrences outweigh the number of other kind of sentences . This can be seen when we examine the scored e percentages of simple sentence structure according to the following departments: Radiology and Ultrasound 44% ;Nursing 55%; Medical 40% ; and Anesthesia 40%. .

This elucidates a clear scheme to ensure readability and straightforward communication, which particularly important in scientific writing, where clarity is critical for efficaciously conveying intricate information. Simple sentences are often employed in scientific writing to convey ideas clearly and concisely. This choice of simple structure lines up with the need for unambiguous communication of The use of compound sentences are less frequent. They score the following percentages: Radiology and Ultrasound 20%, Nursing 25%, Medical Physics 24%, and Anesthesia 20%. They appear to play a role where results or relationships between variables are being discussed, paving the way towards a clearer connection between different aspects of the research. They present the connection of related ideas without excessively raveling the text . Students are perseverant in using compound sentences to express multiple thoughts , provide details and depth , and efficiently transmit meaning in their writing.(Douglas,2007).

- The scoring percentage of complex sentences is higher than the scoring percentage of the compound sentences as is shown below: Radiology and Ultrasound 30% , Medical Physics 26%, Anesthesia 30%. Complex sentences are more common in academic writing than compound sentences since they allow the researchers to convey much more intricate connections between ideas (Nhan &Lap, 2023). The only exception regards the Nursing Department where the percentage is 15%. The lower percentage can be due to the assumption that graduate student at this department try to have clear short sentences instead of writing long sentences. Or, since English for them is a foreign language , they have indulged themselves in using simpler structures and keeping themselves connected to what they are after without unnecessary complexity(Mubishirah, et al,2023)
- The compound complex sentences score the least percentages : Radiology and Ultrasound scores 6%, Nursing scores 5%, Medical Physics scores 10%, a and Anesthesia scores also 10%. It is clear that graduate students lean toward simple sentence forms. They do not want to stumble along sentences connected by a conjunction. It becomes more of a problem if one of the sentences has two different adjuncts . Writing in all complex compound sentences can be tiresome, and can be pedantic and rebarbative(Fadhila 2022).

7.2 Lexical Diversity

- This category as it has been stated earlier is a composite of :common vocabulary , technical terminology, and general academic words. By examining this category it seems that the common vocabulary records the least percentage : Radiology and Ultrasound 20%, Nursing 10% , Medical physics 25%, and Anesthesia 20%, whereas general academic vocabulary scores the highest percentage ; Radiology and Ultrasound 42%, Nursing 60%, Medical physics 40%, and Anesthesia 30%. The technical terminology comes next in attaining higher percentage: Radiology and Ultrasound 38%, Nursing 30%, Medical Physics 35%, and Anesthesia 50%.
- Actually, writing researches on scientific topics have specific linguistic features and purposes. Researchers here are admonished from the beginning to use laborious language and try to make things less clear because they are in a different mindsets than other researchers working ,for example, in the field of humanities. Researchers immersed in scientific work hard at getting all the necessary information, but they are less proficient in passing the information to laymen in a logical and understandable order. That is why the common vocabulary is not widely deployed since the concepts bastioned and inculcated through the abstracts are complicated , and the message conveyed in the them may be nuanced. Scientific language aims for precision . Technical complex terminology can convey specific meanings. So, common and simpler vocabulary might not capture those elaborate nuances. As such, it is seen that scientific papers are mostly written not for the general public .They often use special , precise terminology , rather than normal words to enable writers to pack a lot of ideas in a small space (Green,2013; Mazgutova & Kormos, 2015)

7.3 Modality

Department	Category	Type	Occurrence (%)
Radiology and Ultrasound	Sentence Structure	Simple	44%
		Compound	20%
		Complex	30%
		Compound-Complex	6%
	Lexical Diversity	Common vocabulary	20%
		technical terminology	38%
		general academic words	42%
	Modality	epistemic modality	45%
		Dynamic modality	37.5%
		Deontic modality	17.5%
Nursing	Sentence Structure	Simple	55%
		Compound	25%
		Complex	15%
		Compound-Complex	5%
	Lexical Diversity	General vocabulary	60%
		Technical vocabulary	30%
		Common vocabulary	10%
	Modality	Epistemic	70%
		Dynamic	20%
		Deontic	10%
Medical Physics	Sentence Structure	Simple	40%
		Compound	24%
		Complex	26%
		Compound-Complex	10%
	Lexical Diversity	General Academic Words	40%
		Technical Terminology	35%
		Common Vocabulary	25%
	Modality	Epistemic Modality	37.5%
		Dynamic Modality	37.5%
		Deontic Modality	25%
Anesthesia	Sentence Structure	Simple	40%
		Compound	20%
		Complex	30%
		Compound-Complex	10%
	Lexical Diversity	Technical terms	50%
		General vocabulary	30%
		Common vocabulary	20%
	Modality	Epistemic	35%
		Dynamic	45%

		Deontic	**20%**

- In our data, modality pivots on framing certainty ,hypotheses, and recommendations which revolves round obligation and future actions (Huddleston & Pullum,2002 ; White,2003)). By examining these relationships through out the data ,it is seen that epistemic modality attains nearly the highest rated percentages : Radiology and Ultrasound 45%, Nursing 70% , Medical physics 37.5%, and Anesthesia 35%.It is used in the most factual and uncontroversial modes of discourse Broadly speaking, epistemic modality refers to the degree of assurance of what a speaker/ writer says (Ngula,2015).
- With view to unearthing the scoring rates of the dynamic modality, graduate students are reluctant in using this type for it means, among other things, be able and having power., willingness , or future events: Radiology and Ultrasound 37.5%, Nursing 20%, Medical Physics 37.5%, and the exception is the anesthesia department where it scores 45%, which it is taken for sure that their abstracts are carried out with the help from their supervisors. Thus , they find themselves unable to clarify the obscurity regarding this type; or it may suggest that they are not full-fledged researchers to have their own academic stances .For them , there seems to be no a priori reason that dynamic modality is confined to the topics they are working on and to ability and volition, as it usually disseminates (Kim,2017).

By examining the totality of abstracts it is noticed that there is a minimal use of the deontic modality. This is illustrated by the low percentages scored : Radiology and Ultrasound 17.5%, Nursing 10%,, Medical Physics 25%, and Anesthesia 20%). The topic selection may heavily influence the use of this type of modality (Beugre,2012). It appears that medical researches restrict the use of deontic expressions and favor the use of epistemic modalizing devices(Suhadi,2011) The deontic modality is associated with the predictive function , the indication of organization, the expression of authority (Mushin.2013; Alvarez-Gil,2022)

In their abstracts , graduate students stand in fear lest their findings appear to lack validity due to the excessive attenuation that prevents their involvements from being checked against the veracity of the information that emerges from the researches that have been carried out. Graduate students are driven by a clear scheme to ensure readability and straightforward communication, particularly important in scientific writing, where clarity is critical for efficaciously conveying intricate information.

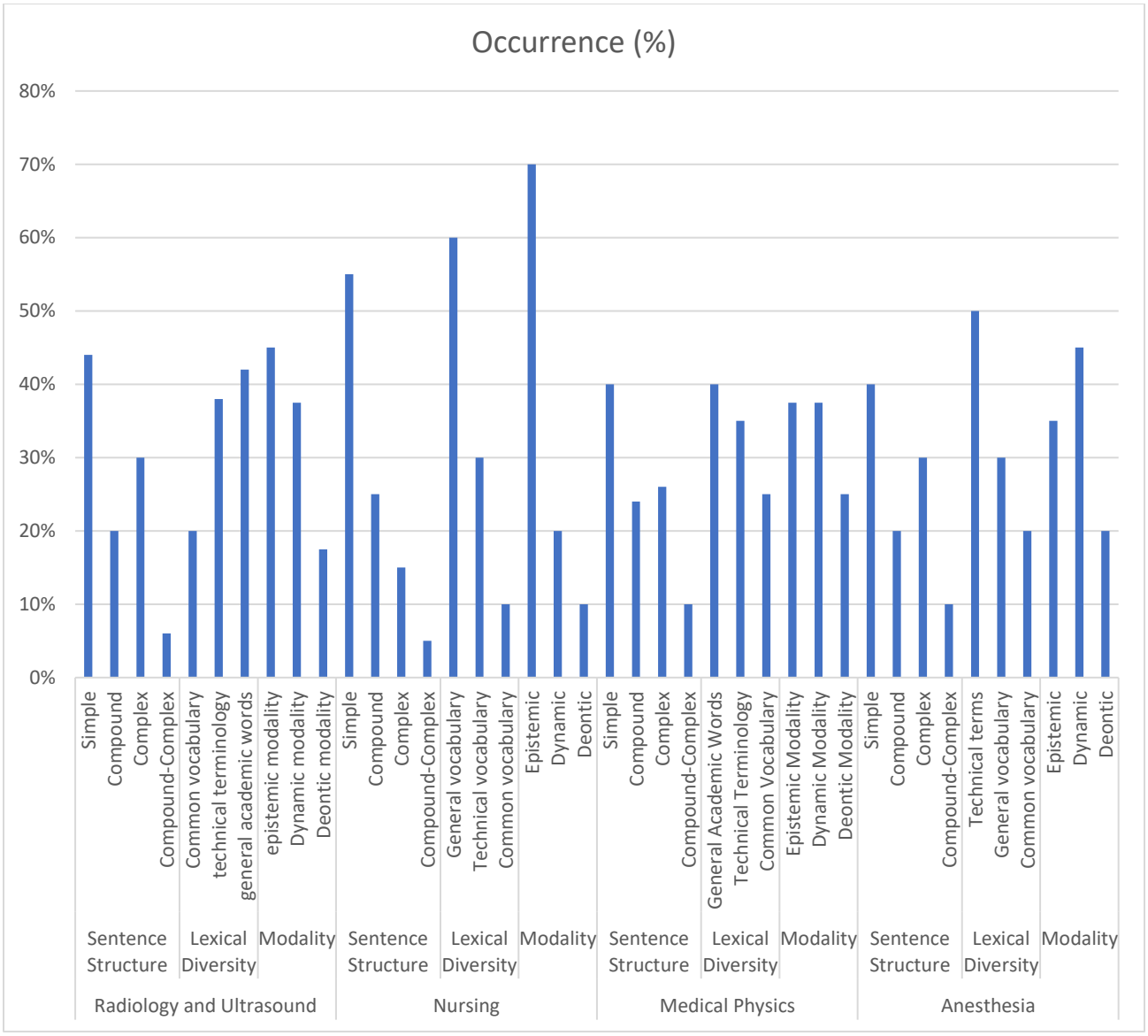
8. Conclusions

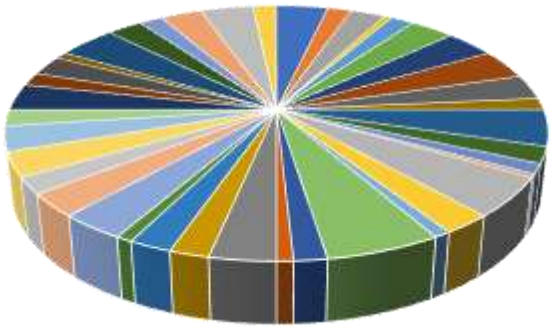
This study has analyzed graduate-level research papers across academic departments, focusing on sentence structure, lexical diversity, and modality use. The findings provide insights into linguistic tendencies in academic writing, highlighting common strategies as well as areas for further exploration. The analysis reveals a strong preference for simple sentences in graduate research papers, in an attempt to reflect an emphasis on clarity and approachability. However, this tendency may come at the expense of syntactic complexity, potentially limiting the richness and depth of expression in some disciplines. Regarding lexical diversity, the dominance of general academic words underscores their profitability in maintaining coherence and academic fineness but may indicate a lack of discipline-specific terminology in certain papers , which may insinuate, so as to speak, the use of other types of vocabulary may impede comprehensibility and make the work less clear.

The lower-scoring categories point to underlying trends in academic writing that prioritize clarity, general applicability, and epistemic caution, which may at times limit the use of more complex structures or discipline-specific terms. ,where clarity is critical for efficaciously conveying intricate information. Simple structures are often employed in scientific writing to convey ideas clearly and concisely. (Kozak,2022)

Finally, the frequent use of epistemic modality highlights the careful balance between certainty and caution in academic argumentation. Yet, it also suggests a potential over-reliance on hedging, which might weaken the assertiveness of scholarly claims. The modality findings underscore the need for nuanced linguistic strategies tailored to disciplinary conventions and the rhetorical goals of academic writing.

While simple sentences, general academic words, and epistemic modality predominate in the research papers, certain categories show lower percentages, reflecting distinct linguistic choices that deserve attention. In their abstracts , graduate students stand in fear lest their findings appear to lack validity due to the excessive attenuation that prevents their involvements from being checked against the veracity of the information that emerges from the researches that have been carried out. This indicates a clear scheme to ensure readability and straightforward communication, particularly important in scientific writing, where clarity is critical for efficaciously conveying intricate information(Hong&Choi,2018).


Occurrence (%)
80%
70%
60%
50%
40%
30%
20%
10%
0%
Simple
Compound
Complex
Compound-Complex
Common vocabulary
technical terminology
general academic words
epistemic modality
Dynamic modality
Deontic modality
Simple
Compound
Complex
Compound-Complex
General vocabulary
Technical vocabulary
Common vocabulary
Epistemic
Dynamic
Deontic
Simple
Compound
Complex
Compound-Complex
General Academic Words
Technical Terminology
Common Vocabulary
Epistemic Modality
Dynamic Modality
Deontic Modality
Simple
Compound
Complex
Compound-Complex
Technical terms
General vocabulary
Common vocabulary
Epistemic
Dynamic
Deontic
Sentence Structure
Lexical Diversity
Modality
Sentence Structure
Lexical Diversity
Modality
Sentence Structure
Lexical Diversity
Modality
Sentence Structure
Lexical Diversity
Modality
Radiology and Ultrasound
Nursing
Medical Physics
Anesthesia



- Radiology and Ultrasound Sentence Structure Simple
- Radiology and Ultrasound Sentence Structure Compound
- Radiology and Ultrasound Sentence Structure Complex
- Radiology and Ultrasound Sentence Structure Compound-Complex
- Radiology and Ultrasound Lexical Diversity Common vocabulary
- Radiology and Ultrasound Lexical Diversity technical terminology
- Radiology and Ultrasound Lexical Diversity general academic words
- Radiology and Ultrasound Modality epistemic modality
- Radiology and Ultrasound Modality Dynamic modality
- Radiology and Ultrasound Modality Deontic modality
- Nursing Sentence Structure Simple
- Nursing Sentence Structure Compound
- Nursing Sentence Structure Complex
- Nursing Sentence Structure Compound-Complex
- Nursing Lexical Diversity General vocabulary
- Nursing Lexical Diversity Technical vocabulary
- Nursing Lexical Diversity Common vocabulary
- Nursing Modality Epistemic
- Nursing Modality Dynamic
- Nursing Modality Deontic
- Medical Physics Sentence Structure Simple
- Medical Physics Sentence Structure Compound
- Medical Physics Sentence Structure Complex
- Medical Physics Sentence Structure Compound-Complex
- Medical Physics Lexical Diversity General Academic Words
- Medical Physics Lexical Diversity Technical Terminology
- Medical Physics Lexical Diversity Common Vocabulary
- Medical Physics Modality Epistemic Modality
- Medical Physics Modality Dynamic Modality
- Medical Physics Modality Deontic Modality
- Anesthesia Sentence Structure Simple
- Anesthesia Sentence Structure Compound
- Anesthesia Sentence Structure Complex
- Anesthesia Sentence Structure Compound-Complex
- Anesthesia Lexical Diversity Technical terms
- Anesthesia Lexical Diversity General vocabulary
- Anesthesia Lexical Diversity Common vocabulary
- Anesthesia Modality Epistemic
- Anesthesia Modality Dynamic
- Anesthesia Modality Deontic

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