

**معرفة المصطلحات الطبية واستراتيجيات تعلم المفردات
التي يستخدمها طلبة التمريض في جامعة نينوى**

**Medical Terminology Knowledge and
Vocabulary Learning Strategies Employed
by Nursing Students at Ninevah University**

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**الكلمات المفتاحية: المفردات الطبية، استراتيجيات التعلم، معرفة المفردات، استراتيجيات تعلم
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الملخص

تهدف الدراسة الحالية إلى معرفة أنواع استراتيجيات التعلم التي يستخدمها طلاب التمريض لتعلم المصطلحات الطبية ودراسة أنواع الاستراتيجيات المعتمدة على معرفة الطلبة بالمفردات. تم استخدام أداتين لجمع البيانات، وهما اختبار المصطلحات الطبية واستبيان استراتيجيات تعلم المصطلحات الطبية. وقد صمم الباحث الاختبار لقياس معرفة الطلبة بالمصطلحات الطبية. تم تطوير معايير الاستبيان من قبل الباحث لدراسة استراتيجيات المفردات. وأظهرت النتائج أن طلبة كلية التمريض يستخدمون أنواعاً مختلفة من استراتيجيات التعلم مثل استراتيجيات الذاكرة تليها الاستراتيجيات المعرفية، واستراتيجيات التحديد. الاستراتيجيات الأقل استخداماً هي الاستراتيجيات الاجتماعية والاستراتيجيات ما وراء المعرفية. كما أظهرت النتائج أن استراتيجيات الذاكرة هي أكثر الاستراتيجيات استخداماً من قبل طلبة المستوى العالي، في حين أن الاستراتيجيات المعرفية هي الأكثر تفضيلاً من قبل طلبة المستوى المنخفض. فضلاً عن ذلك، فإن الاستراتيجيات الأقل استخداماً من قبل الطلبة ذوي المستوى العالي هي الاستراتيجيات ما وراء المعرفية، في حين أن الاستراتيجيات الاجتماعية هي الاستراتيجيات الأقل استخداماً من قبل طلبة ذوي المستوى المنخفض.

Abstract

The present study aims to explore the types of learning strategies employed by nursing students to learn medical terminology and examines the types of strategies based on students' vocabulary knowledge. Two instruments are used for data collection, namely a medical terminology test and a medical terminology learning strategies questionnaire. The results showed that nursing students use different types of learning strategies such as memory strategies followed by cognitive strategies, and determination strategies. The least used strategies are social strategies and metacognitive strategies. The results also showed that memory strategies are the most used strategies by high-level students, whereas cognitive strategies are most preferred by low-level students. In addition, the least used strategies by high-level students are metacognitive strategies, whereas social strategies are the least used strategies by low-level students.



1.Introduction

Since the release of the first studies on good language learners (e.g., Rubin, 1975; Stern, 1975), vocabulary learning strategies (henceforth VLSs) have garnered significant scholarly attention over the last several decades. A plethora of research projects has been dedicated to exploring the types of strategies that second language learners use for learning vocabulary (e.g., Griffiths, 2004; O'Malley & Chamot, 1990; Rogulj & Čizmić, 2018; Schmitt, 1997). This attention coincident with the pedagogy shift to be learner-centred instead of teacher-led (Alahmed, 2023). Students have been urged to take charge of their learning and choose the VLSs that best suit their needs (Rogulj & Čizmić, 2018). VLSs play an essential role in enhancing foreign language learning as vocabulary is considered the core of second language acquisition (Laufer, 1986). With access to a wide range of vocabulary, learners could communicate their ideas effectively and be more motivated to use the target language appropriately in various situations. However, learners who do not have a wide vocabulary knowledge will not be able to effectively communicate their meanings or convey their opinions about particular topics or activities (Jafari & Kafipour, 2013). In terms of nursing education, developing good knowledge of medical terminology (Henceforth MT) can lead to straightforward communication in typical clinical settings. MT learning assists nursing students in better describing anatomical conditions or preparing for their future careers (Kabouha, 2014; Rogulj & Čizmić, 2018). However, it has been demonstrated that VLSs usage varies amongst foreign language learners due to individual preferences (Takač, 2009). For this reason, conclusive findings in this area appear elusive. Thus, to establish a learning condition that promotes desired learning outcomes, it is crucial to understand the types of VLSs that Nursing College students employ for learning MT.

1.1 Problem of the Study

The term MT is used by healthcare-related professionals including nurses to exchange knowledge and document information in patient records. Nurses are required to learn how to read and write medical language in English to create hospital admission records, diagnoses, and orders that they will later need to read and follow to perform nursing interventions and care for their patients. To communicate in medical language, nurses must first acquire MT. However, due to its varied etymologies, the acquisition of MT is a challenging task for EFL students who study healthcare-related degree programs in general and nursing major in particular (Kabouha, 2014). Those who are not fluent in medical English and terminology may find it challenging to communicate with doctors, patients and other professionals due to the mix of outdated and modern MT (Hussein, 2021; Pearce, 2011). It is believed understanding,



retaining and using MT in various communication situations is crucial for students' success. However, it can also be a significant barrier to entry for some students who find it too complex or intimidating. MT has been characterized as an open system with a huge number of low-frequency words and newly generated words. For this reason, it seems impossible for teachers to teach all medical terms to their students (Yang, 2005). Consequently, it would be more efficient if teachers focus the attention on VLSs that learners employ for inferring word meanings rather than teaching every vocabulary item encountered. It has been found that high-frequency medical terms can be taught. However, low-frequency medical terms require learners to develop certain VLSs for determining their meanings (Schmitt, 2000, Wang, Kao & Liao, 2016). In this connection, it has been suggested that learners would develop good vocabulary knowledge if they employed certain learning strategies that enable them to comprehend new words, store them in memory, and use them in appropriate settings (Semenchuk, 2022).

1.2 Aim of the Study

Based on the problem mentioned above, the current study aims to explore the types of VLSs used by first-year Nursing College students to learn MT. Further, it tries to investigate if there are any significant differences between students with high-levels and low-levels in their use of MT learning strategies.

1.3 Research Questions

The study tries to address the following research questions:

Q1) What are the types of VLSs employed by first-year nursing students to learn MT?

Q2) What are the types of MT learning strategies employed by high-level students?

Q3) What are the types of MT learning strategies employed by low-level students?

Q4) Are there any significant differences between students with high and low levels in their use of MT learning strategies?

2. Literature Review

2.1 Vocabulary Learning Strategies

Before discussing VLSs, it's critical to clarify the connection between language learning strategies and VLSs. Language learning techniques are described as "learners' deliberate, goal-oriented endeavors to increase their proficiency in the target language" (Alahmed, 2017, p. 36).

VLSs are considered a subset of language learning strategies (Nation, 2001). Due to individual differences, VLSs vary in usage from one language learner to another depending on certain variables such as age, personality, gender, attitude, and level of language ability (Jafari &



Kafipour, 2013, p. 23). Although there is no unique definition among scholars for VLSs, they can be referred to as those strategies that language learners use for acquiring new words. For instance, VLSs are defined as “actions that learners take to help themselves understand and remember vocabulary” (Cameron, 2001, p. 92). Oxford (1990) defines them as “specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations”(p. 8). Schmitt (1997) explains VLSs as "any action which affects this rather broadly-defined process" (p. 203). Since it is hard for foreign language learners to commit every medical term to their memories, they could employ VLSs to speed up the process of expanding their vocabulary knowledge and helping them retain these words.

During the 1990s, several attempts were made to categorize VLSs into frameworks. For instance, VLSs were classified by O'Malley & Chamot (1990) into three types, namely metacognitive, cognitive, and social/affective strategies. Another taxonomy was developed by Oxford (1990) which classified general learning strategies into six types under two main groups: Direct strategies and indirect strategies. The former includes memory strategies, cognitive strategies, compensation strategies and knowledge. The latter contains metacognitive strategies, affective and social strategies. Schmitt (1997) criticized Oxford's (1990) taxonomy for not including strategies that refer to the discovery of new words without the assistance of another person. Consequently, he developed his comprehensive taxonomy of VLSs that contained five main types under two main dimensions: Discovery strategies and consolidation strategies. The discovery strategies are used for discovering new vocabulary. They include determination strategies and social strategies. Determination VLSs are employed by learners to acquire a new word. Social VLSs are used by learners to learn words through communication with others. Conversely, the consolidation strategies are used to assist in retaining the meaning of a recently learnt word. They include memory strategies, cognitive strategies and metacognitive strategies. Memory strategies are used to connect new words to previously learned information. Cognitive VLSs are mechanical strategies used for memorization, and metacognitive strategies which are mental processes that include planning, monitoring, and assessing one's own learning.

2.2 Medical Terminology

Within the branch of English for specific purpose, MT is utilized in medical, nursing, and healthcare domains to precisely and scientifically depict the human body and its constituent parts, procedures, conditions, processes and treatments (Collins, 2014). The goal of teaching MT is to equip students with a foundational understanding of the language commonly used in healthcare-related professions. This includes



demystifying medical terms through the use of “word roots, prefixes, suffixes, and linking vowels”, and teaching them how to spell, pronounce, and abbreviate terms (Chabner, 2022, p.3). Nursing students can access a primary source of medical information through medical English and terminology. It also gives a rapid and effective way for them to communicate with peers in the same field (Khan, 1986). Most of the medical terms are derived from Latin and Greek. Approximately 74% of the terms used in medicine are thought to have Greek roots. This is because during the 4th century B.C., an ancient Greek physician called Hippocrates who lived during Greece's Classical period practiced medicine (Ikonomova, 2017). However, the medical language has evolved over time into several languages. English is now has become the preferred language at international conferences and is utilized in the majority of prestigious medical journals (Wang, Kao & Liao, 2016).

2.3 Components of Medical Terms

The following components can be present in an MT in any combination: “prefix, suffix, combining vowel, and word root” (Chabner, 2022, p.3). The basic building block of most MT is the word root. Thus, every medical term has a minimum of one-word root. Since the majority of word roots came from Greek and Latin, words with distinct roots may have the same meaning (Yang, 2005). For example, the Greek word “*dermatoses*” and the Latin word “*cutane*” both refer to the skin, but they have different use. Greek roots typically represent an illness, condition, remedy, or diagnostic. Anatomical structures are described by Latin roots. The Greek root “*dermat*” describes a disease, of the skin “e.g., *dermatitis*= *inflammation of the skin*”, and the Latin root “*cutane*” identifies an anatomical structure “e.g., *cutaneous*”.

A combining form is produced when a vowel (usually “o,” or sometimes “i.”) and a word root are combined. The combining form is often created by adding a suffix or using one or more roots. The combining vowel allows two or more word parts to be linked together. For example, the term “gastroenterology=study of the stomach and small intestine” has two combining vowels to link two word roots and a suffix.

A word element located at the start of a medical term is called a prefix (Collins, 2014). Prefixes are used to modify word roots. They provide additional information to a medical term through indicating a quantity, type, location, time, negation, or direction. For instance, a prefix “tachy=fast” is put in front of a word root “*cardia*=the heart”) to become “*tachycardia* (fast heart beat)”.

A suffix is placed at the end of a word root. When a suffix is added to a word root, it might provide a new meaning or alter the previous meaning. Suffixes typically represent a surgical diagnostic process, an illness, or its symptoms. For example, when the suffix



“megaly=enlargement” is added to the wort root gastr/o=stomach, it results in a new MT to refer to an illness in a stomach which means enlargement of a stomach (Yang, 2005).

3. Methodology

3.1 Setting and Participants

The current study has been conducted at the College of Nursing, Ninevah University, Iraq. The participants were first-year students enrolled in English language course during the second semester of the academic year 2022-2023. They were 152 females and 95 males students whose ages ranged from 20 to 23 years. A convenience sampling technique was used in the study. The participants were recruited based on their willingness to take part voluntarily. All participants were supplied with informed consent forms and informed that their responses would be confidential.

3.2 Methods of Data Collection

In this study, two instruments are used for data collection: a MT test and medical terminology learning strategies questionnaire.

3.2.1 Medical Terminology Knowledge Test

The MT test has been designed by the researcher to measure students' MT knowledge. The MT test included 50 multiple-choice items. The overall test score is 100. Each item of the test is given two scores for the correct answer and zero score for incorrect ones. The participants are classified according to their scores, into two groups: high-level group and low-level group. Participants who scored 81 above are classified as high-level students and those who got below this score are classified as low-level students. Consequently, 54 subjects were defined as high-level students and 60 as low-level ones.

3.2.2 The Medical Terminology Learning Strategies Questionnaire

The second instrument is a developed medical terminology learning strategies (Henceforth, MTLs) questionnaire. The MTLs questionnaire is based on Schmitt's (1997) taxonomy for investigating vocabulary strategies. Participants are required to answer the items of the MTLs questionnaire on a 5-levels scale ranging from 1 never (20); 2 occasionally (40); 3 often (60); 4 usually (80) and 5 always (100). The MTLs questionnaire consisted of two main parts. Part one collects background information about the participants. Part two included 44 items grouped into five categories of MTLs, namely determination strategies, social strategies, memory strategies, cognitive strategies and metacognitive strategies.



3.2.2.1 Validity of the MTLs Questionnaires

The questionnaire has been tested and revised following a pilot study with 50 nursing students similar to the participants in the study.

3.2.2.2 Reliability of MTLs Questionnaire

To estimate the internal consistency reliability of the items in each category of the MTLs, Cronbach's Alpha test has been utilized. The MTLs questionnaire in its final version consisted of 44 items distributed over five main categories. The Cronbach's Alpha values of the overall scale showed high consistency reliability ($\alpha=.90$), and its main five categories showed to be within the acceptable size as follows: Determination strategies ($\alpha=.70$), social strategies ($\alpha=.77$), memory strategies ($\alpha=.84$), cognitive strategies ($\alpha=.77$) and metacognitive strategies ($\alpha=.78$).

3.3 Data Collection and Analysis Procedures

3.3.1 The MTLs Questionnaire

For data analysis obtained from the MTLs questionnaire, descriptive statistics were used to characterize the learning strategies used by Nursing College students to learn medical terms. The MTLs questionnaire was administered online using Google Forms. A link for the questionnaire was created and sent to the respondents to be completed by them. As for analysis procedures, descriptive statistics were employed through the use of SPSS version 26. Mean scores and standard deviation were calculated. The following criteria in the Likert type scale were used to interpret and weight the data: Always=Most frequently used (81-100); Usually=frequently used (60-80); Often=Moderately used (41-60); Occasionally=Slightly used (21-40); Never=least/Never used (0-20).

4. Results

Results of Research Question One: What are the types of VLSs employed by first-year nursing students to learn medical terminology?

Table 1: Descriptive statistics of MTLs (n=114): Five main categories

Categories of MTLs	Number of Items	Mean	Std. Deviation
Determination (DET) strategies	9	63.66	14.33
Social (SOC) strategies	7	49.82	20.51
Memory (MEM) strategies	14	67.65	16.54
Cognitive (COG) strategies	5	67.64	22.88
Metacognitive (MCOG) strategies	9	51.65	17.49
Total	44		

Table 1 presents the overall mean scores and standard deviations of the five main categories of MTLs used by participants. The frequently used strategies by Nursing College students are memory strategies with a mean score 67.65 and SD 16.54 followed by cognitive strategies M=67.64,



SD, 22.88, and determination strategies $M=63.66$, SD, 14.33. The moderately used strategies are social $M=49.82$, SD, 20.51 and metacognitive strategies $M=51.65$, SD, 17.49.

As for individual items, responses of all participants on the questionnaire's items are ordered from mostly preferred to least preferred strategies. Table 2 below presents the first five most preferred strategies and the last five least preferred strategies by participants for learning medical terminology.

Table 2: Most used and least used strategies by all participants: Individual items

Item no.	Order	Categ ory	Strategy	Mean
22	1	MEM	I study how the new medical terms are sound.	87.02
31	2	COG	I keep saying the new medical term many times.	82.63
32	3	COG	I write the new medical term many times.	80.70
2	4	DET	To better understand the new medical term, I break it down into its components (e.g., prefix, root, suffix).	77.19
18	5	MEM	I study how the new medical terms are spelled.	76.14
13	6	SOC	When I use word lists, I ask my teacher to check their accuracy.	39.30
38	7	MCOG	I increase my understanding of medical terminology by listening to English radio shows	35.96
39	8	MCOG	I read English-language medical newspapers and magazines to increase my vocabulary.	34.04
8	9	DET	I use an English/English dictionary to learn medical terms.	33.16
43	10	MCOG	I skip the new medical word.	19.47

It is apparent in Table 2 above that item 22 ($M=87.02$, memory strategy, I study how the new medical terms are sound) is the most frequently used strategy, followed by items 31 ($M=82.63$, cognitive strategy, I keep saying the new medical term many times), item 32 ($M=80.70$, cognitive strategy, I write the new medical term many times). Item 2 ($M=77.19$, determination strategy, to better understand the new medical term, I break it down into its components (e.g., prefix, root, suffix), and item 18 ($M=76.14$, memory strategy, I study how the new medical terms are spelled). As for the least five used strategies, the result revealed that item 43 ($M=19.47$, metacognitive strategy, I skip the new medical word) is the least used strategy, followed by moderately used strategies which are item 8 ($M=33.16$, determination strategy, I use an English/English dictionary to learn medical terms), item 39 ($M=34.04$, metacognitive strategy, I read English-language medical newspapers and magazines to increase my vocabulary), item 38 ($M=35.96$) metacognitive strategy, I increase my understanding of medical terminology by listening



to English radio shows), and item 13 (M=39.30, social strategy, when I use word lists, I ask my teacher to check their accuracy)

Results of Research Question Two: What are the types of MT learning strategies employed by high-level students?

Table 3: Most used and least used strategies by high-level students: Five categories

Category	N	Mean	Std. Deviation
Memory strategies	54	71.66	16.39
Cognitive strategies	54	68.07	24.63
Determination strategies	54	65.76	12.66
Metacognitive strategies	54	52.79	17.34
Social strategies	54	45.39	21.40

Table 3 presents the overall mean scores and standard deviations of the five main categories of MTLs used by high-level participants. The results showed that the frequently used strategies by high-level participants are memory strategies of a mean score 71.66 and SD 16.39 followed by cognitive strategies M=68.07, SD, 24.63, and determination strategies M=65.76, SD, 12.66. The least used strategies are metacognitive M=52.79, SD, 17.34 and social strategies M=45.39, SD=21.40 at moderate level. As for individual items, respondents on the MTLs questionnaire's items are ordered from mostly preferred to least preferred strategies. Table 4 below presents the results of first five most used strategies and the last five least used strategies by high-level participants for learning medical terminology.

Table 4: Most used and least used strategies by high-level students: Individual items

Item no.	Order	Category	Strategy	Mean
22.	1	MEM	I study how the new medical terms are sound.	91.11
31.	2	COG	I keep saying the new medical term many times.	85.19
18.	3	MEM	I study how the new medical terms are spelled.	84.07
32.	4	COG	I write the new medical term many times.	82.96
1	5	DET	I identify the parts of the new medical word (prefix, root, combining form, suffix) to help me know its meaning.	80.00
13.	6	MEM	When I use word lists, I ask my teacher to check their accuracy.	40.00
39.	7	MCOG	I read English-language medical newspapers and magazines to increase my vocabulary.	37.04
38.	8	MCOG	I increase my understanding of medical terminology by listening to English radio shows.	36.30



8.	9	DET	I use an English/English dictionary to learn medical terms.	30.00
43.	10	MCOG	I skip the new medical word.	11.48

As shown in Table 4 above, the most frequently used strategies by high-level students are items 22 (M=87.02, memory strategy, I study how the new medical terms are sound), followed by item 31 (M=82.63, cognitive strategy, I keep saying the new medical term many times), item 18 (M=84.07, memory strategy, I study how the new medical terms are spelled), item 32 (M=80.70, cognitive strategy, I write the new medical term many times), item 1 (M=80.00, determination strategies, I identify the parts of the new medical word (prefix, root, combining form, suffix) to help me know its meaning). Concerning the least used strategies, the results revealed that item 43 (M=19.47, metacognitive strategy, I skip the new medical word) is the least used strategy by high-level participants, followed by item 8 (M=33.16, determination strategy, I use an English/English dictionary to learn medical terms, item 38 (M=35.96) metacognitive strategy, I increase my understanding of medical terminology by listening to English radio shows), item 39 (M=34.04, metacognitive strategy, I read English-language medical newspapers and magazines to increase my vocabulary), and item 13 (M=39.30, social strategy, When I use word lists, I ask my teacher to check their accuracy). Results of Research Question Three: What are the types of MT learning strategies employed by low-level students?

Table 5: Most used and least used strategies by low-level students: Five categories

Category	N	Mean	Std. Deviation
Cognitive strategies	60	67.26	21.38
Memory strategies	60	64.04	15.96
Determination strategies	60	61.77	15.54
Social strategies	60	53.80	18.98
Metacognitive strategies	60	50.62	17.71

Table 5 shows the mean scores and standard deviations of the five main categories of MTLs used by low-level participants. The results showed that the frequently used strategies by low-level participants are cognitive strategies with a mean score 67.26, SD=21.38 followed by memory strategies M=64.04, SD=15.96, and determination strategies M=61.77, SD=15.54. The least used strategies are social M=53.80, SD=18.98 and metacognitive strategies M=50.62, SD=17.71 at moderate level.

As for individual items, respondents on the questionnaire's items are ordered from most frequently used to least used strategies. Table 6 below



presents the results of first five most used strategies and last five least used strategies by low-level participants for learning medical terminology.

Table 6: Most used and least used strategies by low-level students: Individual items

Item no.	Order	Category	Strategy	Mean
22	1	MEM	I study how the new medical terms are sound	83.33
31	2	COG	I keep saying the new medical term many times.	80.33
32	3	COG	I write the new medical word many times.	78.67
2	4	DET	To better understand the new medical term, I break it down into its components (e.g., prefix, root, suffix).	74.67
1	5	DET	I identify the parts of the new medical word (prefix, root, combining form, suffix) to help me know its meaning.	70.33
13	6	SOC	When I use word lists, I ask my teacher to check their accuracy.	38.67
8	7	DET	I use an English/English dictionary to learn medical terms.	36.00
38	8	MCOG	I increase my understanding of medical terminology by listening to English radio shows.	35.67
39	9	MCOG	I read English-language medical newspapers and magazines to increase my vocabulary.	31.33
43	10	MCOG	I skip the new medical word.	26.67

As shown in Table 6, the most frequently used strategies by low-level students are items 22 (M=83.33, memory strategy, I study how the new medical terms are sound), followed by item 31 (M=80.33, cognitive strategy, I keep saying the new medical term many times), item 32 (M=78.67, cognitive strategy, I write the new medical term many times), item 2 (M=74.64, determination strategy, To better understand the new medical term, I break it down into its components (e.g., prefix, root, suffix), and item 1 (M=70.33, determination strategies, I identify the parts of the new medical word (prefix, root, combining form, suffix) to help me know its meaning). Concerning the least used strategies, the results revealed that item 43 (M=26.67, metacognitive strategy, I skip the new medical word) is the least used strategy by low-level participants, followed by item 39 (M=31.33, metacognitive strategy, I read English-language medical newspapers and magazines to increase my vocabulary), item 38 (M=35.67, metacognitive strategy, I increase my understanding of medical terminology by listening to English radio shows), item 8 (M=36.00, determination strategy, I use an English/English dictionary to learn medical



terms), and item 13 ($M=38.67$, social strategy, When I use word lists, I ask my teacher to check their accuracy).

Results of Research Question Four: Are there any significant differences between students with high and low levels in their use of MT learning strategies?

A one-way between subjects ANOVA was applied to find any significant differences between students with high and low levels in using of strategies for learning medical terms. Table 7 below shows the results.

Table 7: ANOVA test results of high and low levels students in their use of medical terminology learning strategies.: Five categories

Category	High-level		Low-level		F	Sig.(p)
	M	SD	M	SD		
Determination	65.76	12.66	61.77	15.54	2.21	.139
Social	45.39	21.40	53.80	18.98	4.94	.028
Memory	71.66	16.39	64.04	15.96	6.31	.013
Cognitive	68.07	24.63	67.26	21.38	.035	.852
Metacognitive	52.79	17.34	50.62	17.71	.434	.511

Table 7 shows a significant difference between high-level and low-level students at the $p<.05$ level in the use of social strategies in favour of low-level students ($F=4.94, p=.028$). This means that low level nursing college students prefer social strategies for learning new medical terms more than high level students. However, the results show a significant difference between high-level and low-level students at the $p<.05$ level in the use of memory strategies in favour of high-level students ($F=6.31, p=.013$). These results indicate that high-level students prefer memory strategies for learning new medical terms more than low-level students. Also, the results show no significant difference between high-level and low-level students in the use of determination strategies, cognitive strategies and metacognitive strategies.

To ascertain whether there is any significant difference between high-level and low-level students in the use of learning medical terms strategies based on individual items, a one-way between subjects ANOVA was also employed. Table 8 shows the means, standard deviations F value and sig.



Table 8: ANOVA test results of high and low levels students in their use of medical terminology learning strategies: According to individual items

Number of Item	High-level		Low-level		F	Sig.
Determination Strategies (1-9)	M	SD	M	SD		
1-I identify the parts of the new medical word (prefix, root, combining form, suffix) to help me know its meaning.	80.00	21.97	70.3	27.18	4.29	.040
9. I try to guess the meaning of a new medical term from its context.	71.48	22.52	60.67	27.30	5.25	.024
Social Strategies (10-16)						
14. I seek assistance from classmates to understand the meaning of new medical terms.	47.78	27.31	65.00	29.60	10.34	.002
15. I learn the meaning of new medical terms through group work activities.	45.56	31.42	62.67	28.39	9.32	.003
16. I study and practice the meaning of the new medical words through group work activities.	44.44	31.95	56.00	31.63	3.75	.055
Memory Strategies (17-30)						
17. I draw an image in my head for the meaning of a new medical word.	75.93	27.84	64.33	30.38	4.47	.037
18. I study the spelling of the new medical words.	84.07	24.06	69.00	28.38	9.24	.003
22. I study how the new medical terms are sound.	91.11	17.66	83.33	24.19	3.77	.055
Meta Cognitive Strategies (31-35)						
43. I skip the new medical word.	11.48	18.87	26.67	27.47	11.57	.001

The results in Table 8 show that, within the categories of determination and memory strategies, there is a significant difference between high-level and low-level students in items number 1, 9, 17, 18, and 22 in favor of high-level students. However, in social and cognitive strategies, the results show a significant difference between high-level and low-level students in items number 14, 15, 16, and 43 in favor of low-level students.



5. Discussion of Results

The study results are discussed and interpreted in this section in the context of existing literature and theoretical framework. The two instruments-the MT test and the MTLs questionnaire have been used to address the research questions. The study findings revealed that the most frequently used strategies by Nursing College students are memory strategies, cognitive strategies and determination strategies. The least used strategies are social strategies and metacognitive strategies which were used at moderate level by the participants. These findings are in line with the results of the studies conducted by Aljdee (2011) Abid (2017) who also found that the most frequently used strategies by students are determination strategies, memory strategies and cognitive strategies. With respect to the least used strategies, these results of the present study are in congruent with Abid's (2017), Haddad's (2020) and Leilei's (2016) findings in which they also found that social and metacognitive strategies are moderately used strategies by EFL learners. A possible explanation for the moderate use of metacognitive VLSs by Nursing College students may be that most of them lack a clear understanding of how to apply metacognitive strategies efficiently in learning MT. The findings also showed that, according to individual items, Nursing College students frequently use memory strategies to study how the new medical terms are pronounced. The participants' focus on the MT's pronunciation could be attributed to the fact that MT is complex and many of them are difficult to pronounce correctly from the first time. Concerning the cognitive strategies, the finding revealed that nursing college students most frequently prefer to use verbal and written repetition as a strategy for learning MT. A possible explanation for this might be that participants are familiar with the repetition strategy, and it is easy to be used for learning MT. In addition, Schmitt (2000) points out that learners commonly prefer to employ simple, shallow and mechanical strategies for learning vocabulary such as "memorization, repetition, and taking notes"(p. 133).

The findings also show that memory, cognitive, and determination strategies are the most frequently used VLSs by high-level participants. The possible explanations for the multiple use of VLSs by high-level learners could be attributed to their proficiency level, and they are considered good learners. It has been found that good learners use different VLSs simultaneously. As opposed to poor learners, Schmitt (2000) has stated that "good learners do things such as use a variety of strategies, structure their vocabulary learning, [...]they are conscious of their learning and take steps to regulate it." (p.133).

Concerning the differences between high-level and low-level students, the results showed a significant difference between high-level and low-level students in the use of memory strategies in favour of high-level



students. These results indicate that high-level Nursing College students prefer memory strategies for learning new medical terms more than low-level students. The findings of the current study also revealed that high-level students prefer to use discovery strategies for learning MT through identifying the parts of the new MT, and guessing strategies as they reported that they guess the meaning of the new medical word from the context in which it occurs, make a picture in their mind about the meaning of the new MT and studying the spelling and the sound of the new MT. These results agree with Fan (2003), Kabouha (2014) who found that guessing strategies were among the strategies most employed by good learners. Nosidlak (2013) also found that successful learners most frequently employ VLSs for “memorizing spelling and pronunciation including those consisting in creating mental linkages, using imagination and mechanical repetition/rewriting” (p. 659).

However, the results of the current study showed that low-level students use social strategies for learning new MT such as asking classmates and working in groups more than high-level students. Low-level students also reported that they skipped the new MT. A possible explanation of these results could be ascribed to the proficiency level of participants. It has been found that less proficient learners are unaware of their learning and cannot take steps to regulate it through using different types of VLSs (Yunhao, 2011). Thus, rather than discover the meaning of a medical term by themselves, they either ignore it or recourse to classmates to assist them in knowing the meaning of the new MT. These results align with Ghalebi, Sadighi & Bagheri's (2021) results as they also found in their study that low-level learners are more oriented toward employing social strategies. Ahmed (1989) also found that poor learners always ignore new vocabulary.

6. Conclusions and Implications

This study set out to explore the types of VLSs used by Nursing College students to learn MT and examine the types of used strategies according to students' vocabulary knowledge i.e., high-levels and low-levels. The findings of the study revealed that Nursing College students employ a range of VLSs for learning MT. The other major finding is that high-level students use memory, repetition, and guessing strategies for learning MT whereas low-level students either skip the new MT or use social strategies through seeking assistance from others. In addition, metacognitive strategies are found to be the least used strategies by all participants. The least use of metacognitive strategies may suggest that they have not established learning plans, which are critical for their academic achievement. The findings of the present study have significant implications for the understanding of how MT is learned by Nursing College students at Ninevah University and provide insights for MT



lecturers about the strategies that their students use. MT lecturers are recommended to equip their students with clear understanding of how to apply different VLSs effectively in learning MT. Lecturers need to raise students' awareness towards the importance of using complex deeper VLSs such as memory strategies and metacognitive strategies for learning MT instead of using shallow once like repetition and memorization. Despite its significant contribution, the current study was restricted to Nursing College students at Ninevah University. Larger samples from various Iraqi universities should be included in future research, along with the gender variable.

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