


Writing anxiety and self-regulation strategies among medical English students



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ABSTRACT

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Writing is often regarded as the most challenging skill. Writing anxiety often hinders the improvement of learners' writing quality and achievement. Many studies have focused on writing anxiety related to learning a foreign language. However, limited research has been done on the use of self-regulation strategies to overcome anxiety. As an essential emotional factor, anxiety is of great significance in language learning. Hence, this study aims to investigate the extent of writing anxiety and the use of self-regulation strategies to understand college students' writing anxiety and self-regulation strategies to reduce writing anxiety and improve writing performance. A quantitative method was employed to investigate medical English students' writing anxiety and self-regulation strategies in China. A total of 156 students from a medical university in Ningxia, China, was randomly selected to participate in the survey. The research findings revealed that medical English students' writing anxiety is widespread, and the majority of students experience high writing anxiety, while the use of self-regulation strategies is at an average level. It was found that students' use of self-regulation strategies generally decreased with increasing anxiety levels. This study sheds light on writing anxiety among medical English university students, raises awareness among instructors, and improves learners' writing ability.

Contribution/Originality: Limited research has been carried out on anxiety related to medical English writing and its relationship with self-regulation strategies. In this study, medical English students' writing anxiety and the use of self-regulation strategies have been investigated, which fills the research gap and enriches the scope of related research.

1. INTRODUCTION

Due to globalization, the English language has become universal (Küçük, 2023) so that people can better understand the world by learning it (Celik & Yildiz, 2019) and achieve a successful life with its increasing popularity (Andayani, 2022). Writing is vital in learning a foreign language (Kassem, 2017) and is increasingly important in social, economic, political and technical communication. Understanding a language requires mastering its grammatical principles and basic skills, such as writing, speaking and listening (Ilhan & Tutkun, 2020). In English language learning, writing is recognized as the most difficult basic skill (Kaur, Haron, & Mohd Radzi, 2019) and is regarded as a complicated and demanding task cognitively (Rasool, Qian, & Aslam, 2023; Yildiz, 2019).

It is also considered to be one of the most difficult language skills to acquire and teach (Klimova, 2014). Therefore, Karlina and Pancoro (2018) believe that English language learners should improve their writing skills because they are life-long skills that affect other disciplines.

However, learners always face difficulties and feel anxious in English language writing (Aydin & Ciğerci, 2020), and it presents significant challenges during the language learning process, which leads to learners feeling uncomfortable and stressed (Jugo, 2020). Anxiety has gradually become an important focus in the field of second language acquisition and English as a Foreign Language (EFL) learning and is an essential factor which significantly affects students' English language learning and writing (Küçük, 2023). As a specific form of EFL anxiety, writing anxiety mainly refers to the anxiety and behavior of EFL learners in the writing process (Ma & Dong, 2017), which can seriously hinder writing progress and lead to disappointment or despair if they don't meet expectations (Küçük, 2023). There has been growing interest in EFL writing anxiety. Daly and Wilson (1983) edited the Writing Apprehension Test (WAT) for native learners. Cheng (2004) edited the Second Language Writing Anxiety Inventory (SLWAI) for measuring second language (SL) and EFL writing anxiety. There are also many related studies on writing anxiety, including the correlation between writing anxiety and ability (Li, 2015) and strategies to alleviate writing anxiety (Zhong & Fan, 2018). While numerous studies have focused on EFL writing anxiety measurement and performance, there are few studies on self-regulation strategies to overcome writing anxiety. Self-regulation is an essential internal factor of anxiety regulation, which is also one of the critical factors in alleviating writing anxiety (Hunutlu, 2023). In college English writing classes, low self-regulation was commonly seen among students, leading to negative and time-consuming effects on writing (Zhang, 2022). In view of this, self-regulation directly influences language writing, which can predict the language writing score.

Therefore, how to assist students in relieving the pressure of EFL writing has become an urgent problem to be solved. The purpose of this study is to assist medical English students in understanding and mastering self-regulation, increase instructors' awareness of writing task design, reduce students' anxiety in English language writing, and improve their writing performance.

2. LITERATURE REVIEW

Studies have shown that English language writing is affected by many factors. Among them, related studies on the impact of emotional factors have found that anxiety is an essential factor affecting English language writing. Hence, it is crucial to investigate the extent of students' writing anxiety. The literature is reviewed primarily from two aspects to correspond with the research questions.

2.1. Research on Writing Anxiety

Daly and Miller (1975) first discussed writing anxiety in 1975 for native language writing, and they compiled the Writing Apprehension Test (WAT) for native language writers. Writing anxiety is described as feelings, attitudes, or behaviors that interfere with people's ability to complete a writing tasks cognitively (Bloom, 1985). The early research participants were mainly native speakers, and the WAT for native speakers was not fully applicable to the measurement of foreign language writing anxiety because some core characteristics of foreign language writing anxiety may not have been measured entirely (Cheng, 2004). Hence, Cheng (2004) compiled the Second Language Writing Anxiety Inventory (SLWAI) to precisely measure foreign language writing anxiety through comprehensive consideration and reference to previous studies that have been widely used in China and have high reliability and validity (Bai, 2017; Guo & Xu, 2014). In recent years, the SLWAI was utilized to investigate students' writing anxiety. Li (2021) employed the SLWAI in a study of 1,602 middle school and college students and recorded that anxiety negatively impacted the improvement in students' writing, independent learning, and inquiry abilities. The SLWAI has been extensively applied to examine language writing anxiety, and in this study, Cheng's SLWAI was adopted to determine the level of English writing anxiety among Chinese

medical students. Past studies have investigated the relationship between foreign language writing anxiety and performance. A significant negative correlation was reported between second or foreign language writing anxiety and performance – highly anxious students' writing performance has often been lower than their peers who exhibit low anxiety. Scholars have also researched writing anxiety in college English teaching, revealing that writing anxiety is widespread among learners of English in Chinese colleges and is negatively related to writing performance, which seriously hinders the improvement of learners' writing ability (Li, 2015). In view of this fact, the current research primarily focuses on the relationship between general English language writing anxiety and academic performance, as few studies have been carried out on English for Specific Purposes (ESP) writing. Nevertheless, as an important branch of ESP, medical English is vital for medical students' academic and professional needs (Yin & Ni, 2019). Therefore, this study focuses on medical English writing, which will enrich the scope of related research and fill the research gap.

Related studies on alleviation strategies for writing anxiety were found. As a kind of obstructive anxiety, English language writing anxiety hinders the improvement of students' writing quality and performance to a certain extent (Zhong & Fan, 2018). Hence, how to improve learners' foreign language writing ability and performance by alleviating or eliminating writing anxiety has become the focus of research on writing anxiety. Given the characteristics of English language learners, scholars mainly conduct studies to alleviate or eliminate writing anxiety, focusing on (a) teaching models and methods (Zhong & Fan, 2018) (b) writing methods (Guo, 2011) and (c) learning methods (Wu & Gu, 2011). It mainly stimulates students' positive emotions in learning writing, eliminates negative emotions, and effectively assists students in overcoming psychological obstacles to writing. However, studies on medical English language writing anxiety are limited. Medical terminology is complex, which increases the difficulty of English language learning for medical professions (Cui & Kaur, 2023a, 2023b; Cui, Kaur, & Shariff, 2024). Since the lack of vocabulary affects writing performance and causes anxiety (Küçük, 2023) this study aims to determine medical English language students' writing anxiety levels and further assist them in relieving it, which will not only enrich the research content but also increase the depth of research.

2.2. Research on Self-Regulation in Writing

Over time, many self-regulation models have been proposed (Pintrich, 2000; Zimmerman, 2000). In this paper, the theoretical study of self-regulation strategies is based on different perspectives, which results in the respective research directions. There are many concepts and terms related to self-regulation, such as self-learning, self-monitoring, and self-planning. Oxford (2011) established a strategic self-regulation model based on SL learning theory and research results, containing cognitive, emotional, and socio-cultural interaction dimensions. (Zhou et al., 2022) believe that self-regulation learning is a cyclical model with three stages: setting goals, implementing plans, and self-reflection. In this process, the reflection stage can always provide new feedback information, assisting learners in re-adjusting their learning goals and plans. Li (2017) conducted research on SL self-regulation and summarized and sorted the research on self-regulation from the perspective of theoretical and empirical research, as well as some factors related to self-regulation, providing references for researchers to study self-regulation theory in depth. All of these studies provide theoretical support for the related research. By deeply understanding the connotations of self-regulation, researchers can better conduct studies on it. However, different scholars have proposed different models of self-regulation strategies. Hence, it is difficult to determine if the self-regulation modes proposed by different scholars cover all the contents of self-regulation strategies.

Research on how learners control anxiety through their own efforts includes the following aspects: The first is the correlation between self-regulation strategies and academic writing performance, and vocabulary learning and learning anxiety, which show significant positive correlations between self-regulation strategies and writing performance and also self-regulation ability and academic performance in vocabulary learning (Hilden & Pressley, 2007; Zimmerman & Schunk, 2011). The second is the influence of self-regulation on learning anxiety (Xu & Kou,

2015), showing that college students' learning anxiety is widespread, and the frequency of using self-regulation strategies is correlated with the degree of learning anxiety. [Sherafati and Mahmoudi Largani \(2023\)](#) employed a writing self-regulation scale teaching experiment with 42 Iranian EFL learners at Islamic Azad University and found that the students' performances improved significantly.

Research on the self-regulated learning of foreign languages covers a wide range, but limited empirical studies have reported on it, let alone medical English language writing. Regardless of whether it's from the perspective of students, or teacher intervention, most existing studies have explored ways to reduce EFL writing anxiety from the external factors of learners. In this study, quantitative research is performed, which will provide references for students, instructors and researchers. Medical English students can understand their writing anxiety by participating in the survey so that they can strengthen their understanding of the role and the negative effects of writing anxiety. The study can also assist them in understanding and mastering knowledge of self-regulation strategies so they can employ appropriate self-regulation strategies to alleviate their anxiety. It will also assist instructors in profoundly understanding the adverse effects of writing anxiety on students and provide references for them to actively conduct relevant research by knowing the extent of students' writing anxiety and use of self-regulation strategies. Researchers can make scientific plans to alleviate writing anxiety by referring to the experimental data obtained from this study, further contributing to medical English writing.

3. METHODOLOGY

To investigate the extent of Chinese students' writing anxiety related to medical English and their use of self-regulation strategies, this study employed a descriptive design by using a quantitative survey. According to [Creswell \(2012\)](#) survey research determines individual opinions, which aims to statistically process big data when this data needs to be studied.

3.1. Research Questions

This study aims to assist medical English students in understanding their writing anxiety and choosing appropriate self-regulation strategies to cope with it. The research questions are as follows:

1. What is the extent of writing anxiety among medical English students?
2. What self-regulation strategies do medical English students use to cope with writing anxiety?
3. Are there differences in the self-regulation strategies used by students with different anxiety levels?

3.2. Research Participants

This study selected first-year and second-year medical English students from Ningxia Medical University in China as the research participants. A total of 156 students from different medical majors (for instance, clinical medicine, traditional Chinese medicine, oral medicine, and preventive medicine) were randomly selected. In total, 156 questionnaires were issued, and 156 were returned, giving a recovery rate of 100%.

3.3. Research Instrument

This study employed a questionnaire survey implemented on a Chinese questionnaire survey platform named Wen Juan Xing (WJX), which was composed of three parts: (a) demographic information, including gender, grade, length of English language study, and language proficiency; (b) the scale of English writing anxiety; and (c) the scale of self-regulation strategies for English writing anxiety.

The writing anxiety scale designed by [Cheng \(2004\)](#) was adopted in this study. Since the scale is described in English, the Chinese version of the questionnaire translated by [Guo and Qin \(2010\)](#) was employed to avoid students' misunderstanding of the topic. This questionnaire has been used and verified many times and has good internal consistency ([Li, 2021](#)). The scale of self-regulation strategies for English language writing anxiety was

adopted from [Ma and Dong \(2017\)](#) which was proved to be highly reliable and valid and was used to investigate medical English students' use of self-regulation strategies to alleviate writing anxiety.

In this study, the questionnaire comprised 44 items, 22 for English language writing anxiety and 22 for self-regulation strategies. A 5-point Likert scale was used with the following response options: completely non-consistent, relatively non-consistent, somewhat consistent, comparatively consistent, and completely consistent. The reliability and validity of the questionnaire were examined through a pilot survey. The Cronbach's alpha value of 0.852 indicated that the questionnaire was reliable, and the Kaiser–Meyer–Olkin (KMO) value of 0.831 and Bartlett's test showed that the questionnaire had high validity. The data was analyzed with SPSS 26.0 statistical software. Descriptive statistics, t-tests, and single factor analysis of variance between groups were used to reveal medical English students' writing anxiety and their use of self-regulation strategies.

4. FINDINGS AND DISCUSSION

According to the data collected, the findings are presented and discussed in response to the research questions.

4.1. Writing Anxiety Level of Medical English Students

A statistical analysis of the writing anxiety questionnaire from 156 medical English students revealed that the highest writing anxiety score is 105 and the lowest is 38, with a difference of 67, which shows a large range of writing anxiety, indicating that students experience writing anxiety to some degree. This concurs with [Küçük \(2023\)](#) who found that many students experience anxiety related to English language writing.

Table 1. Descriptive data of medical English students' writing anxiety.

N	Minimum	Maximum	Mean	Std. deviation
156	38	105	68.69	12.66

Table 1 shows the writing anxiety scores among medical English students. The distribution of the writing anxiety scores shows that the students' scores are normally distributed. According to [Cheng \(2004\)](#) the theoretical scores of the SL writing anxiety scale range from 22 to 110. The students' writing anxiety scores in this study range from 38 to 105, which is within the theoretical score range. According to [Rezaei and Jafari \(2014\)](#) in classifying writing anxiety levels, a score above 65 indicates high writing anxiety, a score between 50 and 65 shows moderate writing anxiety, and 50 or less indicates low writing anxiety. Hence, in this study, the students' mean score for writing anxiety indicates a high level of anxiety. The students were divided into high, moderate and low writing anxiety groups to understand the degree of anxiety according to the anxiety scores. The number of people and the level of writing anxiety in the three groups are presented in **Table 2**.

Table 2. The percentage of participants and writing anxiety levels.

Level of writing anxiety	Number	Range	Percentage
High	91	66–105	58.3%
Moderate	55	51–65	35.3%
Low	10	38–50	6.4%
Total	156	38–105	100%

From **Table 2**, we can see the percentage of writing anxiety in the three groups; more than half of the students have high writing anxiety, 35.3% report moderate writing anxiety, and only 6.4% report low writing anxiety. It is apparent that the participants all have different degrees of writing anxiety in general, and those with high writing anxiety account for the majority. A similar result was found by [Rabadi and Rabadi \(2020\)](#) who examined EFL writing anxiety among 684 first-year medical students from Jordanian universities employing the SLWAI,

revealing that medical students experienced high writing anxiety. Likewise, Pravita and Kuswandono (2022) found that undergraduates had high levels of writing anxiety, with a score of 65.25, and English language learners generally have varying levels of writing anxiety. It has been found that learners experience writing anxiety because of language difficulties, low self-confidence, insufficient writing practice, fear of writing tests, fear of making mistakes, and fear of being evaluated (Rabadi & Rabadi, 2020). Nevertheless, aside from the reasons recorded, this study speculates the reason why medical students may spend a limited amount of time on English language courses and writing since they have to learn more specialized knowledge, which is relatively complex and requires more time and energy on professional learning courses (Zhao & Zheng, 2014). Meanwhile, with the increasing difficulty of writing, course pressure, exam pressure, and employment pressure, medical students are more likely to have various psychological conflicts and contradictions that affect writing, leading to apparent writing anxiety. Thus, it is clear that writing anxiety has become a factor that hampers medical English students' writing performance.

4.2. Self-regulation Strategies Used by Medical English Students

To deeply analyze the characteristics of self-regulation strategies used by medical English students and provide references for their English language writing, this study divided self-regulation strategies into four sub-regulation strategies, according to Ma and Dong (2017). The data was analyzed to understand their use of self-regulation strategies, and the following results were obtained:

Table 3. Descriptive data of medical English students' use of self-regulation strategies.

N	Minimum	Maximum	Mean	Std. deviation
156	32	110	63.60	12.04

Table 3 shows that the average value of medical English students' self-regulation strategies is 63.60, with a standard deviation of 12.04. The maximum score is 110, and the minimum score is 32, with a difference of 78, indicating a significant difference in students' use of self-regulation strategies. According to the data above, medical students' use of self-regulation strategies is moderate ($M = 63.60$). In other words, most medical English students have not actively utilized self-regulation strategies, which correlates with the results reported by Li and Peng (2019) who conducted a questionnaire survey on 141 Chinese college English major students and found that students' use of self-regulation in English language writing was at an average level. Similar results were reported by Sun and Wang (2020) who surveyed 330 EFL undergraduates at two universities in northwest China, finding that students infrequently used self-regulation strategies in writing courses. The specific data was further analyzed to understand medical English students' use of each sub-regulation strategy, as presented in Table 4.

Table 4. The specific use of self-regulation strategies.

Strategy type	N	Minimum	Maximum	Mean	Std. deviation
Action strategies	156	7	35	18.62	5.33
Conceptualization strategies	156	3	15	9.44	2.74
Avoidance strategies	156	5	25	13.35	4.16
Affective strategies	156	7	35	22.20	4.45

As is shown in Table 4, the mean values of action, conceptualization, avoidance, and affective strategies utilized by medical English students are 18.62, 9.44, 13.35, and 22.20, respectively. The frequency of use from high to low are affective, action, avoidance, and conceptualization strategies, indicating that when medical English students encounter writing anxiety, they most often utilize affective strategies, followed by action and avoidance strategies, while conceptualization strategies vary widely from other strategies. Studies revealed that students often regulated

their behaviors and emotions in English language writing (e.g., taking a break during a writing task or persisting at it) (Varier et al., 2021) indicating that affective strategies are highly utilized in English language writing.

In short, medical English students did not utilize self-regulation strategies frequently, which may be attributed to the following reasons: Firstly, medical English students face many learning pressures (for instance, complex medical courses, various competitions, and learning tasks) (Zhou et al., 2022) so they usually complete the writing assignment without reflecting or summarizing the teacher’s feedback. Secondly, students with writing anxiety may be aware of writing anxiety and follow some form of regulation; however, they do not know how to utilize the correct self-regulation strategies (Li & Peng, 2019). Therefore, teachers should assist students in understanding writing anxiety and suggest some regulation methods or strategies. Thirdly, students with high writing anxiety use more avoidance strategies and avoid writing tasks instead of treating them positively, resulting in a vicious circle. That is, the more they avoid the task, the lower the writing scores they obtain. Even if some self-regulation is carried out, the effectiveness is not apparent. This is because anxiety is more likely to produce self-degradation, which has a negative, inhibitory impact on learners’ enthusiasm, efforts and persistence, preventing students from using positive actions to improve their learning efficiency (Ma & Dong, 2017). The higher the writing anxiety, the less the self-regulation. Therefore, instructors should be aware of students’ use of avoidance strategies and take the initiative to help them reduce their use of such strategies and encourage them to utilize positive regulation strategies, such as affective and action strategies.

4.3. Differences in the Use of Self-Regulation Strategies Among Students with Different Anxiety Levels

To further investigate the correlation between medical English students’ writing anxiety and their use of self-regulation strategies, a t-test on the two variables was conducted (please refer to Table 5 for the specific results). In this study, the p-value is significant at the 0.05 level. EVA = equal variances assumed, and EVNA = equal variances not assumed.

Table 5. Independent sample test of writing anxiety and self-regulation strategies use.

Levene’s test for equality of variances			T-test for equality of means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% confidence interval of the difference	
								Lower	Upper
EVA	0.98	0.32	3.63	310	0.00	5.08	1.39	2.33	7.84
EVNA			3.63	309.22	0.00	5.08	1.39	2.33	7.84

In Table 5, the significant value of writing anxiety and the use of self-regulation strategies is 0.00, indicating a significant negative correlation between the two. In other words, the higher the level of writing anxiety, the fewer self-regulation strategies students use.

This study also compared self-regulation strategies used by the three groups of students with high, moderate, and low writing anxiety through independent sample t-tests to further explore the differences in the use of self-regulation strategies among students of different anxiety levels.

The results show that the frequency usage of self-regulation strategies generally decreases with the increase in writing anxiety level. This correlates with the research results of Ma and Dong (2017) who found college students’ frequency usage of self-regulation strategies to decrease when writing anxiety increases. The writing anxiety indexes of the high and moderate anxiety groups are significantly negatively related to the use of self-regulation strategies (p = 0.000 < 0.05 for the high anxiety group and p = 0.001 < 0.05 for the moderate anxiety group). Conversely, the anxiety index of the low anxiety group is reported to be positively related to the use of self-regulation strategies, indicating that self-regulation strategies can alleviate writing anxiety.

Table 6. Relationship between writing anxiety and self-regulation strategies.

Test style		Levene's test for equality of variances		t-test for equality of means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% confidence interval of the difference	
								Lower	Upper	
High writing anxiety	EVA	0.15	0.69	8.54	180	0.000	13.28	1.55	10.21	16.35
	EVNA			8.54	175.62	0.000	13.28	1.55	10.21	16.35
Moderate writing anxiety	EVA	14.83	0.00	-3.38	108	0.001	-5.27	1.55	-8.36	-2.18
	EVNA			-3.38	68.19	0.001	-5.27	1.55	-8.38	-2.16
Low writing anxiety	EVA	20.94	0.00	-1.80	18	0.088	-12.50	6.93	-27.06	2.06
	EVNA			-1.80	9.471	0.103	-12.50	6.93	-28.06	3.06

The self-regulation strategies used separately by students with different anxiety levels were also analyzed to further investigate the use of the four sub-regulation strategies. Table 7 illustrates the data in detail.

Table 7. The differences in self-regulation strategies used among learners with different writing anxiety levels.

Strategy type	Group	High anxiety group (n = 91)		Moderate anxiety group (n = 55)		Low anxiety group (n = 10)		F	Sig.
		M	SD	M	SD	M	SD		
Action strategies		17.93	4.98	19.69	4.79	18.90	9.55	10.55	0.001
Conceptualization strategies		9.02	2.72	9.87	2.41	10.80	3.88	1.58	0.208
Avoidance strategies		14.45	3.87	12.45	3.70	8.30	4.64	36.17	0.000
Affective strategies		21.95	4.12	23.00	3.93	20.00	8.32	5.16	0.024

Table 7 presents significant differences among the high, moderate, and low anxiety groups with respect to action ($p = 0.001$), avoidance ($p = 0.000$), and affective ($p = 0.024$) strategies. However, no statistical difference was recorded among the high, moderate and low anxiety groups regarding the use of conceptualization strategies ($p = 0.208$).

The usage frequency of action strategies decreased with the increase in writing anxiety, as it can be seen that the high anxiety group utilized self-regulation strategies the least frequently. Significant differences were recorded among the three groups, which is basically consistent with Ma and Dong (2017) who found that the high anxiety group is less likely to use action strategies compared to the moderate and low anxiety groups because anxiety is more likely to lead to self-deprecation, which has a negative, inhibiting effect on learners' motivation, effort and persistence and prevents students from adopting positive actions to improve learning efficiency. However, it has been proven that action strategies, such as reviewing and prewriting, are effective in improving writing performance (Varier et al., 2021). Hence, it is suggested that students adopt more action strategies in their English language writing to enhance writing achievements.

Likewise, the use of conceptualization strategies decreased with the increase in writing anxiety. The frequency of use of the conceptualization strategies by the low anxiety group was at the highest level, while no significant difference was recorded among the three groups (see Table 7). It was reported that learners with high anxiety levels spent part of their limited cognitive resources on processing tasks and self-cognitive activities such as worrying about negative evaluations (Fulker & Eysenck, 1979) thus affecting the use of cognitive strategies such as conceptualization. Participants with low anxiety levels utilized conceptualization strategies highly, confirming that making a plan before writing reduced writers' cognitive stress and allowed them to be more flexible in choosing strategies (Li, 2008). Hence, cognitive activities such as conceptualization can effectively improve learners' writing performance (Varier et al., 2021) and reduce SL writing anxiety (Schweiker-Marra & Marra, 2000).

In contrast, the use of avoidance strategies increased in tandem with elevated anxiety levels. The low anxiety group demonstrated the lowest use of strategies, while the high anxiety group utilized avoidance strategies most frequently. This concurs with the research results found by [Pravita and Kuswando \(2022\)](#) that is, learners with high writing anxiety demonstrate the highest avoidance behavior. A significant difference was recorded among the three groups (see [Table 7](#)). [Xu and Kou \(2015\)](#) also found the usage frequency of avoidance strategies to increase with higher anxiety levels, and significant differences were reported among the high, moderate, and low anxiety groups. This implies that problem avoidance is an inappropriate anxiety regulation strategy and is not conducive to reducing anxiety but has the reverse effect ([Xu & Kou, 2015](#)). Learners with high anxiety develop anticipatory anxiety before and during the writing process, leading to negative attitudes toward the writing task and more severe avoidance behavior.

Similar to the avoidance strategies, the frequency of use of affective strategies increased with the degree of anxiety deepening. The three groups showed significant differences (see [Table 7](#)). Affective strategies mainly include self-encouragement and self-referral, which shows that those with low writing anxiety can engage in positive self-regulation and encourage themselves to overcome writing anxiety ([Ma & Dong, 2017](#)). Students with moderate and high writing anxiety levels have a tendency to avoid writing tasks due to the fear of being evaluated negatively or worrying about the distress caused by their poor writing performance, which results in lower odds of using affective strategies.

Therefore, from the above analysis and discussion, we can see that writing anxiety levels and self-regulation strategies are interlinked. Writing anxiety affects medical English students' use of self-regulation strategies, and self-regulation strategies influence students' writing performance, which is accordant with the previous studies which found that the use of self-regulation strategies contributed positively to students' achievements ([Elhusseini, Tischner, Aspiranti, & Fedewa, 2022](#); [Kanoksilapatham, 2021](#); [Kellen & Antonenko, 2018](#); [Meşe & Mede, 2023](#); [Rollins, Sanders, Jolivet, & Virgin, 2022](#)). Medical English students with different levels of writing anxiety tend to utilize different self-regulation strategies. However, some self-regulation strategies, such as avoidance strategies, are not beneficial for their English language writing. Hence, the students are encouraged to obtain more knowledge on self-regulation and choose appropriate strategies to overcome writing anxiety.

Overall, many studies have focused on EFL writing anxiety measurement and performance, while limited research has been recorded on self-regulation strategies to cope with writing anxiety. In this study, not only is EFL students' writing anxiety investigated, but their use of self-regulation strategies is specifically surveyed and analyzed to better assist students in overcoming writing anxiety. Existing research primarily focuses on general English language writing anxiety, and few studies have reported on ESP writing. This study focuses on medical English writing, which is different from the other studies.

5. CONCLUSIONS AND RECOMMENDATIONS

In this study, medical English students' writing anxiety and their use of self-regulation strategies were investigated. It can be concluded that medical English students experience some degree of writing anxiety, which is primarily at a high level. The use of self-regulation strategies, however, is only at a medium level. When medical English students experience writing anxiety, the most highly utilized self-regulation strategies are affective strategies, and the least frequently used are conceptualization strategies. The use of self-regulation strategies generally decreases with increased anxiety levels, the higher the writing anxiety, the lower the use of self-regulation strategies. By thoroughly investigating medical English students' writing anxiety, this study obtained statistical data which will not only assist students in understanding their writing anxiety but also raise instructors' awareness of writing courses and how they affect students. Students can learn to overcome their fear of writing by knowing their writing anxiety level and learning self-regulation strategies, and teachers can learn ways to teach English language writing courses more effectively. Most importantly, this study will enrich the scope of research on

English language writing anxiety as there are limited studies that specifically focus on medical English writing anxiety. Given the dearth of experimental studies on self-regulation strategies, this study distributed a questionnaire survey to medical English students and attained scientific data, which can provide references for future studies on medical English writing.

The present study has some limitations. The research participants of this study are medical English students at Ningxia Medical University, China, and cannot represent the full population of medical English students in China. Hence, it is suggested that future studies include participants from several different universities. The research method used was a questionnaire survey, which revealed students' writing anxiety levels and use of self-regulation strategies. Nevertheless, richer data could be obtained if more research methods are employed, such as in-depth interviews, think-aloud protocols and mixed methods research. Thus, various research methods will create theoretical significance and practical value for medical English writing.

It is known that in foreign language learning, many aspects (for instance, cognitive factors and language features of limited vocabulary, content, and structure) can cause writing anxiety (Daud, Daud, & Kassim, 2016) which negatively affects students' writing performance and directly influences learners' motivation and determination (Rasool et al., 2023). Hence, some recommendations are proposed to assist learners in relieving writing anxiety. First, writing anxiety needs to be understood and treated correctly. Anxiety is an influential language learning element (Rasool et al., 2023) and moderate anxiety will promote students' writing (Küçük, 2023). Given that fear of English language writing tests or evaluations can cause writing anxiety (Rabadi & Rabadi, 2020), teachers should be fully aware of the prevalence of students' writing anxiety, analyze the reasons why students' writing anxiety arises, and assist them in coping with anxiety in English language writing. Students should also understand that anxiety can be overcome and positively face writing anxiety to improve their academic performance.

Additionally, teachers should guide students regarding positive self-regulation strategies. Avoidance strategies can temporarily relieve anxiety in specific contexts, but long-term avoidance in writing will reduce students' confidence and interest in learning and writing the English language. Therefore, teachers need to understand students' psychology and encourage them to utilize positive self-regulation strategies to develop self-confidence, since a lack of confidence leads to writing anxiety (Rabadi & Rabadi, 2020). For example, instructors can guide students to use affective strategies to consciously understand their emotional states and assist them in developing self-management and regulation.

Third, it is essential to expose learners to increased writing practice and adjust teaching methods accordingly. Studies have reported that the lack of writing practice is one primary cause of writing anxiety in academic careers (Rabadi & Rabadi, 2020). Hence, it is vital to organize learners to complete higher quantities of writing exercises. Writing skills will not improve from just one or two classes, since the practice and reflection of writing after class is also critical. As such, teachers should extend writing practice from in-class to after class, for instance, through conscious training to think in-class and guide learners to focus on the writing process after class.

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