



## Review article

# Determinants of students' academic success in English as a medium of instruction (EMI) classes: A systematic review

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## ABSTRACT

With the rapid development of English as a medium of instruction (EMI), many education researchers have attempted to examine the extent to which EMI courses contribute to students' academic success. In a similar vein, several scholars have endeavored to locate the determinants of students' academic success in these courses. Given the fact that recognizing the predictors of academic success is of great help to educational administrators, teachers, and students, we aimed to uncover the various predictors of EMI students' academic success by scrutinizing the related research. In doing so, the relevant studies conducted on the antecedents of EMI students' academic success were identified through eight databases. Having gathered the related articles, we systematically reviewed the earlier investigations and their main findings. The review outcomes illuminated that English proficiency, vocabulary knowledge, academic self-concept, and self-efficacy are the important determinants of students' academic success. Finally, the limitations of prior studies, the directions for future inquiries, and the practical implications of the current study are briefly discussed.

## 1. Introduction

English as a medium of instruction (EMI) has been extensively employed in many instructional-learning contexts around the world [1,2]. This educational approach is defined as “the use of the English language to teach academic subjects other than English in countries where the first language of the majority of the population is not English” [3] (p. 1). In the EMI classes, the learning content, educational resources, and classroom interactions are all in English [4]. However, as mentioned by Jiang, Zhang, and May, other languages (i.e., learners' mother tongue) may be employed in a restricted and principled way in particular situations [5]. For instance, teacher-to-student and student-to-student interactions throughout group work or pair work may sometimes occur in students' native language to facilitate mutual comprehension in classroom contexts.

Inspired by the trend of internationalization of higher education (HE) that mainly focuses on the incorporation of intercultural/international facets into all activities of higher education institutions [2,4], multitudes of colleges and universities worldwide have employed EMI as a key strategy to respond to this global movement. Using English as the means of education, as Derakhshan, Rakhshanderoo, and Curle mentioned, may cause some social, cultural, and political changes in non-English-speaking countries where English is neither the native nor the formal language [6]. Notwithstanding this, the internationalization of HE and the tendency of higher education institutions to compete globally have led to the growth of EMI in all academic settings, notably non-English-speaking

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contexts. The growing use of English as a means of teaching has prompted many academics, practitioners, and scholars around the world to study the benefits and challenges of implementing EMI in instructional-learning contexts [7–15]. The increased implementation of EMI in higher education contexts has also encouraged several researchers worldwide to examine the effectiveness of EMI courses by investigating the academic success or academic achievement of students enrolled in these courses [16–18].

Continuing this line of inquiry, a group of scholars has explored the determinants of students' academic success in EMI classes. Put differently, some researchers have looked into the factors that may influence students' academic success or learning achievement in these classes [19–23]. In order to expand our awareness of the depth and breadth of the empirical research undertaken on the predictors of EMI students' academic success, a comprehensive examination of the earlier inquiries seems essential. Accordingly, in this review study, we intend to systematically review the previous studies conducted on the determinants of students' academic success or learning achievement in the EMI courses. The findings of this review study will directly benefit EMI teachers in that knowing the predictors and determinants of students' academic success in EMI classes enables them to guide their students toward greater learning accomplishments.

### 1.1. English as a medium of instruction (EMI)

English is not only taught as a foreign/second language alongside other academic subjects, but it is also utilized for teaching and learning a variety of subjects [24,25]. This means that the English language has shifted from an academic subject to a medium for educating other academic subjects. This phenomenon is technically called English as a medium of instruction (EMI) [26]. EMI has been generally defined by the “Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT)” as “the courses conducted entirely in English, excluding those whose primary purpose is language education” [22] (p. 2150). Macaro has recently defined EMI as the employment of the English language to instruct different academic disciplines in nations where English is not the primary or native language of the majority of people [3].

According to Phuong and Nguyen, EMI classes entail some important benefits for those who take part in these courses [12]. As they mentioned, the most outstanding benefit of EMI courses is that taking part in these courses enables students to dramatically improve their English language proficiency. Another significant advantage of the EMI courses is that attending these classes helps students find a wide range of learning materials written in English [12,27]. Besides these benefits, using English as a means of teaching and learning may bring some challenges for EMI students [28–30]. As pinpointed by Yıldız et al., having difficulty in understanding the course content, academic materials, and instructor explanations is the most important challenge students commonly experience in the EMI courses due to their poor English proficiency [30]. Another serious challenge that students may face in the EMI classes is the limited interaction between teachers and students [9]. Since the majority of EMI students are not proficient English users, they typically prefer to remain silent in the classrooms. Additionally, as Diezmas and Barrera mentioned, instructing the academic subjects in English may increase the turnover intention among EMI students [8]. They argued that teaching the course content in a language other than the students' native language can discourage them from pursuing their academic purposes.

### 1.2. Student academic success

Students' academic success is closely tied to their academic achievement in a given learning context [31]. Academic achievement, also known as learning attainment, generally means what individual students have accumulated throughout the learning process [32]. In Gajda, Karwowski, and Beghetto's words, student academic achievement is “the outcome of learning, which is typically measured by the classroom grades, classroom assessments, and external achievement tests” [33] (p. 269). As put forward by Zheng, Bhagat, Zhen, and Zhang, student academic achievement has to do with the accomplishment of course objectives by individual students [34]. Since course objectives are commonly multifaceted [35], student learning achievement is thought to be a multidimensional concept [36]. When it comes to EMI courses, students' academic achievement pertains to the amount of knowledge they have attained using the English language [37–39]. In fact, the learning outcome of students in the EMI courses has to do with how well they have mastered the learning content instructed in English.

The academic success of students in the EMI courses depends on a variety of personal, interpersonal, and contextual factors [19]. To identify these factors, several educational scholars worldwide have empirically inspected the predictors of student academic success in the EMI classes [20–23]. Nevertheless, no educational researcher has systematically reviewed the outcomes of these empirical inquiries. Thus, a systematic review needs to be done to offer a comprehensive image of the predictors of EMI students' academic success. Considering this, we intend to thoroughly review the previous investigations that empirically examined the antecedents of students' academic success in the EMI courses. To accomplish this, the following research questions were formulated.

- What factors contribute to students' academic success in the EMI classes?
- What is the most important predictor of EMI students' academic success?

## 2. Method

### 2.1. Search keywords and databases

A comprehensive electronic search was undertaken using popular databases, namely Google Scholar, CIVILICA, LLBA, ERIC, MEDLINE, PSYCINFO, SCOPUS, and Web of Science. To find the related manuscripts, the following keywords were used: “EMI”,

“English medium instruction”, “student”, and “academic success”. The initial search resulted in 673 articles. Having removed the duplicates, 457 articles remained. Following a review of the abstracts, a total of 18 empirical studies were identified for further examination.

## 2.2. Criteria for exclusion and inclusion

Articles were included in the current review if they matched the criteria listed below.

- Articles measured student academic success/academic achievement in the EMI classes;
- Articles explored the determinants/predictors of student academic success/academic achievement in the EMI classes;
- Articles published between 2010 (January) and 2022 (December);
- Articles were written in English

Articles were excluded from the present review if they.

- did not measure student academic success/academic achievement
- did not empirically examine the predictors of student academic success/academic achievement

The inclusion and exclusion criteria discussed above resulted in the inclusion of 18 relevant articles (Fig. 1)

## 2.3. Data extraction

To summarize the included manuscripts, the following information was provided in this review study (Table 1): (a) the publication date; (b) the sample; (c) the academic major; (d) the setting; (e) the measures of student academic success; (f) the measures of determinants/predictors; (g) the analytical methods; and (h) the major outcomes. For the sake of accuracy, all phases of the current systematic review were independently performed by two reviewers. Like many previous systematic reviews [40,41], the Cohen’s Kappa was employed to calculate the degree of consensus between the reviewers. The results of this statistic revealed a high inter-rater reliability between the reviewers ( $k = 0.97$ ).

## 3. Results

The outcomes of the present review study were presented in light of the main characteristics of the included articles, namely “the academic major of participants”, “the academic setting”, “the measures of student academic success”, and “the analytical methods”. Following that, the key findings of the reviewed studies were thoroughly discussed in terms of the various determinants and predictors of EMI students’ academic success.

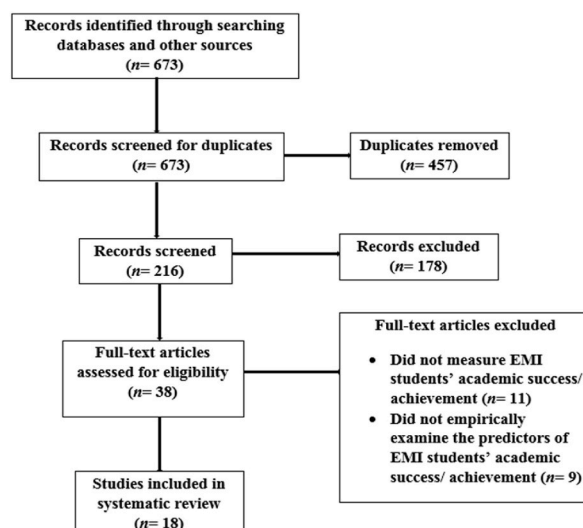


Fig. 1. The process of screening the articles.

**Table 1**  
Studies exploring the determinants of student academic success in EMI classes.

Study	Sample (N)	Academic major	Setting	Academic success measure	Determinant/predictor measure	Data analysis	Major outcomes
Altay et al. [16]	716 Turkish students	Engineering, Economics, Administrative Sciences	University	“General grade point average” (GPA)	“Cambridge preliminary English test” (PET)	“Multiple linear regressions”	“English language proficiency was found to be a significant predictor EMI students’ academic achievement”
Chou [42]	62 Taiwanese students	Educational Psychology	Language university	“Achievement test, in-class quizzes”	–	“One-way repeated measures analysis of variance, Paired <i>t</i> -test”	“Reciprocal teaching (RT) had positive effects on students’ academic performance”
Curle, Yuksel, Soruç, & Altay [43]	159 Turkish students	Economics	Public university	“Average point”	“Cambridge preliminary English test” (PET)	“Simple linear regression”	“General English proficiency was not a statistically significant predictor of EMI students’ academic success”
Lee & Shin [44]	65 Chinese students	Business	University	“Achievement test”	“Perceived self-efficacy scale, perceived value scale”	“Regression analysis”	“EMI students’ perceived self-efficacy had a significant impact on their academic achievement”
Lin & Lei [19]	205 Chinese students	Business	University	“Total score, assignment, participation, final exam”	“General grade point average” (GPA), “College English test” (CET)	“Regression analysis”	“English proficiency and academic ability were statistically significant predictors of EMI students’ academic outcomes with academic ability being a much stronger predictor than English proficiency”
Masrai et al. [20]	106 Saudi students	Not specified	Public university	“CBI final course grade” (mid-term and final exams)	“Self-rating vocabulary measure, self-perceptions questionnaire of L2 use”	“Paired sample <i>t</i> -test, correlation analysis”	“Vocabulary knowledge and self-perceptions of L2 skills significantly predicted student academic achievement in EMI courses”
Masrai, El-Dakhs, & Al Khawar [45]	106 Saudi students	Computer Engineering	University	“Final exams”	“Computer science specialist vocabulary test” (CSSVT), “general vocabulary test” (GVT)	“Correlational analysis”	“The general and specialist vocabulary knowledge predicted students’ academic achievement in EMI courses”
Study	Sample (N)	Academic major	Setting	Academic success measure	Determinant/predictor measure	Data analysis	Major outcomes
Muttaqin & Chuang [1]	201 Indonesian students	Not specified	State university	“General grade point average” (GPA)	“English proficiency test (EPT), questionnaire”	“Multiple regression, independent-samples <i>t</i> -test”	“The students’ secondary education major, English proficiency, number of semesters, and number of courses were correlated with and predicted their academic achievement in EMI classes”
Muttaqin et al. [21]	234 Indonesian students	Not specified	University	“General grade point average” (GPA)	“After-tax monthly family income in Indonesian Rupiah” (IDR)	“Regression analysis”	“Socioeconomic status (SES) significantly predicted students’ academic achievement in EMI courses”
Neumann, Padden, & McDonough [46]	110 Canadian students	Business	English-medium university	“General grade point average (GPA), course grades”	“Academic self-concept questionnaire, English proficiency test (EPT)”	“Multiple linear regressions”	“Academic self-concept and English proficiency of EMI students positively predicted their academic success”
Rose et al. [22]	146 Japanese students	Business	University	“Achievement test”	“TOEIC test, motivation questionnaire, academic-related skills assessments”	“Linear and multiple regression analysis”	“English proficiency and academic skills were significant predictors of student academic success.

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Table 1 (continued)

Study	Sample (N)	Academic major	Setting	Academic success measure	Determinant/predictor measure	Data analysis	Major outcomes
Soruç, Pawlak, Yuksel, & Horzum [47]	459 Turkish students	Engineering	University	“General grade point average” (GPA)	“Multi-items scales”	“Structural equation modelling” (SEM)	Motivation was not significantly correlated with EMI students’ success” “Except for the type of motivation, EMI students’ individual characteristics, namely their self-regulation skills and sense of self-efficacy, played a significant role in their academic success”
Thompson, Aizawa, Curle, & Rose [48]	139 Japanese students	International Business	University	“International business (IB) mid-term and final test scores”	“Self-beliefs survey, ESP vocabulary and key-concept test, Test of English for international communication (TOEIC)”	“Multiple linear regression”	“English proficiency, preparatory course performance, and self-efficacy positively predicted students’ success in the EMI course”
Thompson, Takezawa, & Rose [49]	87 Japanese students	Finance	Private university	“Midterm, final exams”	“English and mathematical self-efficacy scale, Test of English for international communication (TOEIC)”	“Regression analysis”	“Both preexisting mathematical ability and preexisting English language proficiency were significant predictors of EMI students’ academic success. English self-efficacy and mathematical self-efficacy were also significant predictors of students’ academic success”
Study	Sample (N)	Academic major	Setting	Academic success measure	Determinant/predictor measure	Data analysis	Major outcomes
Uchihara & Harada [50]	35 Japanese students	Not specified	Private university	“In-class quizzes” (midterm)	“Self-rated vocabulary scale”	“Correlational analysis”	“Vocabulary knowledge was significantly associated with EMI students’ academic achievement”
Virlan & Demirbulak [51]	39 Turkish students	Dentistry, Medicine	Public university	“Achievement test”	“Motivation questionnaire”	“Paired sample t-test, correlation analysis”	“There was no significant relationship between the academic success of the participants and their motivation”
Xie & Curle [2]	106 Chinese students	Business Management	State-owned university	“End-of-year content test” (final)	“Perceived success questionnaire, motivation scale, business English proficiency test”	“Linear regression, multiple regression”	“Language learning motivation did not predict students’ academic success in EMI courses. Business English proficiency and perceived success significantly predicted students’ academic success”
Yuksel et al. [23]	165 Turkish students	Business Administration, Mechatronics Engineering	Public university	“Final exam”	“Cambridge preliminary English test” (PET)	“Paired-sample t-tests, simple linear regression”	“English language improvement significantly and positively predicted students’ academic success in EMI courses”

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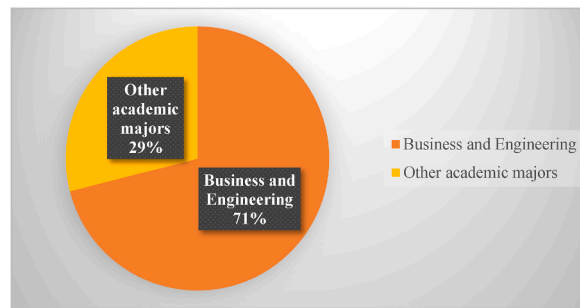


Fig. 2. Academic majors.

### 3.1. Academic majors

As Fig. 2 demonstrates, the majority of articles included in this review (71%) examined business and engineering students' learning success in the EMI classrooms. The rest (29%) inspected the learning success of students majoring in dentistry, medicine, finance, economics, psychology, and administrative sciences. It indicates that the academic success of EMI students majoring in other academic majors like art, history, music, and philosophy has been overlooked by previous studies.

### 3.2. Academic setting (public vs. private university)

As represented in Fig. 3, the majority of the included studies (83%) were conducted at public universities. Put differently, among 18 empirical articles conducted on the predictors of EMI students' academic success, only 2 studies (17%) were undertaken in private universities.

### 3.3. Measures of student academic success

As has been presented in Fig. 4, of the 18 manuscripts included in this review, ten studies (56%) employed the general grade point average (GPA) ( $n = 6$ ) and achievement tests ( $n = 4$ ) to measure EMI students' academic success. Other studies (44%) examined students' academic success in the EMI courses using final and/or midterm exams ( $n = 8$ ).

### 3.4. Analytical methods

As shown in Fig. 5, most of the articles ( $n = 12$ ) explored the role of different factors in predicting students' academic success through the regression analysis. Others ( $n = 6$ ) inspected the predicting power of different factors and the association between variables using t-tests, correlation tests, and structural equation modelling (SEM).

### 3.5. Potential predictors of EMI students' academic success

The following table (Table 2) displays the factors that may predict students' academic success in the EMI courses.

#### 3.5.1. General English proficiency

Of 18 manuscripts selected for this systematic review, nine studies tested the role of general English proficiency in predicting EMI

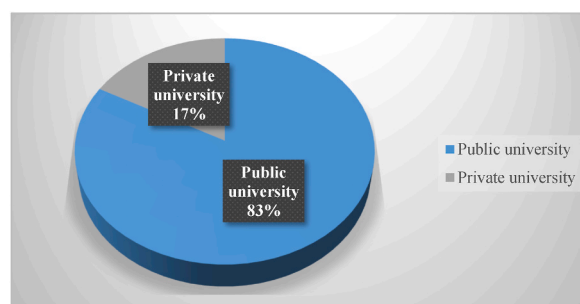


Fig. 3. Academic setting.

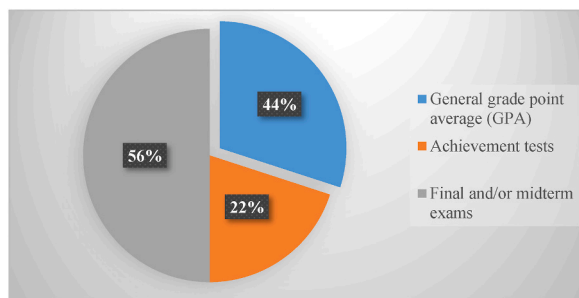


Fig. 4. Measures of student academic success.

students' learning success [1,16,19,22,23,43,46,48,49]. The results revealed that general English proficiency was the most important predictor of academic success, playing a vital role in EMI students' learning achievements. That is, the higher the English proficiency, the greater the academic achievement.

### 3.5.2. Perceived self-efficacy/self-concept

Among 18 empirical articles, five inquiries have assessed the power of EMI students' self-efficacy and self-concept in predicting their academic success [44,46–49]. As the outcomes of these studies indicated, both self-concept and self-efficacy are the important predictors of students' academic success in EMI courses. To put it simply, students with strong self-efficacy beliefs are more likely to succeed in the EMI classes.

### 3.5.3. Vocabulary knowledge

As shown in Table 1, only three studies explored the function of vocabulary knowledge in EMI students' learning success [20,45,50]. The findings represented that students' vocabulary knowledge is an important predictor of their academic success in the EMI courses. Put differently, EMI students' academic success is tied to the depth and breadth of their vocabulary knowledge.

### 3.5.4. Academic motivation

Some of the reviewed articles also evaluated the predicting role of EMI students' academic motivation [2,22,47,51]. In fact, they examined the extent to which learning motivation can influence EMI students' academic success. Interestingly, no positive, significant connection was found between EMI students' academic motivation and academic success. Moreover, academic motivation was not a significant antecedent of student academic success in the EMI classrooms.

## 4. Discussion

This part discusses the major findings of the reviewed articles. It also highlights the limitations of the selected manuscripts. With respect to the limitations, some important directions would be outlined for future research as well. The previous studies reported that EMI students' English proficiency is an important predictor of their academic success. It means that insufficient English proficiency may hinder students' academic success in the EMI classes. A logical explanation for this finding is that having a good command of English helps EMI students comprehend the course content instructed in English [3,52,53]. This finding may also be justified by the fact that EMI students who are proficient language users are more inclined to take part in the learning tasks [54]. This enables them to outperform their classmates with poor language skills [55]. The previous articles also found that the self-efficacy beliefs of EMI students are highly influential in their success. That is, EMI students who trust their language abilities and academic knowledge are more likely to succeed. It may be due to the fact that strong academic beliefs function as motivators, encouraging students to take an active

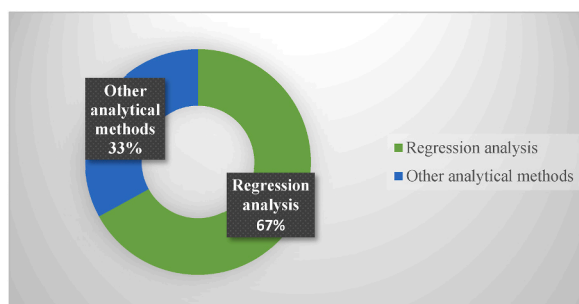


Fig. 5. Methods of data analysis.

**Table 2**  
Potential predictors of EMI students' academic success.

Potential predictors of academic success	Related studies
General English proficiency	Altay et al. [16] Curle et al. [43] Lin & Lei [19] Muttaqin & Chuang [1] Neumann et al. [46] Rose et al. [22] Thompson et al. [48] Thompson et al. [49] Yuksel et al. [23]
Perceived self-efficacy/self-concept	Lee & Shin [44] Neumann et al. [46] Soruç et al. [47] Thompson et al. [48] Thompson et al. [49]
Vocabulary knowledge	Masrai et al. [20] Masrai et al. [45] Uchiyama & Harada [50]
Academic motivation	Rose et al. [22] Soruç et al. [47] Virilan & Demirbulak [51] Xie & Curle [2]

role in the learning environments [56,57]. As pinpointed by Dogan, being active in the educational settings will culminate in increased learning attainment [58]. Besides students' English proficiency and self-efficacy, vocabulary knowledge was also found to be a significant predictor of students' academic success in the EMI classes. That is, the depth and breadth of students' vocabulary knowledge may have a significant impact on their academic success.

All the studies reviewed so far, however, suffer from some important limitations that need to be mentioned. The most significant limitation lies in the fact that the majority of previous studies were quantitative in nature. Future empirical inquiries are advised to employ a mixed-method approach to gain more comprehensive findings. Another source of limitation in the previous studies that should be considered by researchers was the method of data collection. Most of the previous studies employed a series of close-ended questionnaires to assess the determinants of student academic success. To provide a more complete insight into the topic, future empirical articles are recommended to utilize other data-gathering instruments such as open-ended scales, structured and unstructured interviews, and observations. Another weakness of the previous research was that almost all inquiries neglected the mediating or moderating effects of situational factors on EMI students' academic success. Accordingly, more work will need to be done to determine the impact of gender, age, academic major, and other situational factors on EMI students' academic success. Additionally, future investigations and experimentations into EMI classes are required to consider the role of cross-cultural and linguistic differences in students' academic success.

## 5. Conclusion

The present research aimed to provide a better insight into the determinants of students' academic success in the EMI courses. As the review of the relevant articles revealed, EMI students' academic success can be dramatically influenced by their English language proficiency, general and specialist vocabulary knowledge, academic self-concept, and academic self-efficacy. That is, all the aforementioned factors can significantly predict students' success in the EMI classes. Accordingly, it is safe to conclude that self-efficacious students with adequate English proficiency and appropriate vocabulary knowledge are more likely to experience success in the EMI classes. The outcomes of this systematic review would be of great help to all EMI teachers around the world. It is because recognizing the predictors of student academic success empowers teachers to efficiently lead their pupils towards the learning success. As reported by the previous research [1,16,19,43,59], English language proficiency is the most important predictor of students' academic success in the EMI courses. Hence, to enhance students' learning outcomes, EMI teachers need to help their learners improve their language skills and abilities [60]. The current study's findings may also be enlightening and beneficial to EMI students. Given the key role of self-efficacy beliefs in predicting EMI students' academic success [44,46–48], EMI students with low academic grades should trust their academic skills and abilities to have a better performance in the classroom settings. Additionally, the results of this review study may be informative for educational administrators as well. Considering the power of English language proficiency in predicting EMI students' academic success, educational administrators need to design some general English courses in universities to help EMI students make rapid progress in English.

## Authors contribution

All authors listed in the study have participated in the research and article preparation. Additionally, all authors have approved the final article.



## Author contribution statement

All authors listed have significantly contributed to the development and the writing of this article.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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