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Chinese university EFL learners' English for General Academic Purposes: relationships between target needs and self-efficacy

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To prepare university students for better participation in global academic activities and address learners' needs for greater proficiency in academic English, English for General Academic Purposes (EGAP) courses are provided in many Chinese universities. This study investigates the characteristics of and relationships between university English as a Foreign Language (EFL) learners' target needs and self-efficacy in China's EGAP context. With a sample of 1340 EFL learners from four Chinese universities, the results indicated high levels of target needs but low levels of self-efficacy of EGAP among the Chinese university EFL learners. Students at a research-oriented university demonstrated higher levels of target needs and self-efficacy than their counterparts at teaching-oriented universities. Medical students demonstrated higher levels of lacks and wants than students in other majors. Structural equation modelling analysis showed positive relationships between Chinese learners' necessities and self-efficacy in EGAP. Learners' lacks had significantly negative relationships with self-efficacy, while their wants had inconsistent relationships with the five dimensions of self-efficacy. The findings deepen our understanding of learners' target needs and have implications for enhancing learners' self-efficacy in the EGAP context.

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Introduction

As part of the academic internationalisation process, Chinese higher education institutions are seeking a more significant presence in the global academic community; students' need for English for academic purposes (EAP) increased, to facilitate academic activities such as writing for international publications and preparing overseas study documents. It has been proposed that in college-level English Language Teaching (ELT), English for General Academic Purpose (EGAP) (Ministry of Education Higher Institution College Foreign Language Teaching Commission, 2020) should supplement General English (GE). Unlike GE, which is not designed for a particular purpose and usually appears in school exams, EGAP is designed to address learners' needs for greater proficiency in academic English skills such as academic listening with note-taking, academic writing, reference skills and others (Jordan, 1997). Of the various approaches to investigating learners' needs (e.g., Munby 1978; Richterich and Chancerel 1977), Hutchinson and Waters (1987) proposed a target needs analysis (TNA) for language classrooms, which consists of three dimensions: necessities, lacks, and wants. This approach has been widely used to investigate students' needs in language learning (e.g., Liu et al. 2011).

Research has suggested that learners' target needs indicate their learning goals (Berwick 1989; Schunk 1983), which serve as a significant indicator of mastery for enhancing self-efficacy (Bandura and Schunk 1981). Furthermore, learners' self-efficacy has a significant positive relationship with learners' academic performance (Honicke and Broadbent 2016). Accordingly, understanding learners' target needs and self-efficacy as well as their interrelationships is key to improving learners' academic performance. Unlike previous studies of language learners' needs and self-efficacy that have typically targeted the particular English language skills of students of the same major (e.g., Menggo et al. 2019; Shang 2010), this study focuses on the general needs and self-efficacy in EGAP of college students of different majors using different skills in academic English, and the relationships between the two constructs. In other words, the present study aims to reveal the characteristics of and relationships between learners' target needs and self-efficacy in EGAP courses to provide practical implications for improving university EFL learners' performance in EGAP.

Literature review

Language learner's needs. Over the past few decades, learners' needs have been extensively studied by educational researchers (Bocanegra-Valle 2016). This research has suggested that courses of all kinds, especially those designed for specific purposes, should be relevant to learners' needs (Long 2005). Although learners' needs have typically been addressed in the contexts of teacher and corporate training programs (cf. Brown 2002; Grace 2001), they have also been widely acknowledged in language-learning settings, especially in English for Special Purposes (ESP), a learners' needs-based approach to language teaching (Brown, 2009). A substantial body of literature (e.g., Belcher 2009; Dudley-Evans and St John 1998; Jordan 1997) has suggested that determining ESP learners' needs is fundamental to meeting the needs of both learners and teachers. In EAP, studies have shown that analyses of learners' needs contribute to course and pedagogy renewal and can boost proficiency in lexis (Evans and Green 2007), oral communication (Elisha-Primo et al. 2010), genres (Cai 2013), writing (Al-Khairy 2013) and reading (Chowdhury and Haider 2012).

To conceptualise learners' needs, researchers have attempted to look at language learners' needs from different angles. A widely recognised distinction is that between learners' perceived needs and their felt needs; these represent experts' judgment of learners' education gaps and students' self-expressed wants and desires, respectively (Berwick 1989). Another distinction, based on whether needs derive from the target situation or the learning process (Dudley-Evans and St John 1998), is that between needs that are goal-oriented and those that are process-oriented. The former represents what learners must be able to do in their studies and jobs at the end of the language course (Widdowson 1981), while the latter considers the gap between learners' existing knowledge and their desired knowledge (Berwick 1989). Given the disparate classifications and constantly varying values of the assessors and other educational stakeholders, it has been argued that needs are an equivocal construct that should be formulated for each new assessment; this has increased the complexity of needs assessment (Berwick 1989; Richterich 1983). Additionally, it has been argued that previous studies have placed the responsibility of identifying needs solely on the teacher, as learners were considered an unreliable source (Belcher 2009; Bocanegra-Valle 2016; Brown 2009), and thus there has been a paucity of research on learners' needs from learners' perspectives. To bridge this gap, Holme and Chalauisaeng (2006) conducted a series of needs analyses in which learners determined their own needs; the study found that needs determined by students were related to learners' sense of ownership, self-direction, and motivation.

In sum, while the research has demonstrated the significance of language learners' needs to the learners, very few studies have investigated the systematic classification of such needs, as well as the needs determined by learners themselves.

Needs analysis in EGAP. Needs analysis is "the systematic investigation of needs for the design of a language course and the optimisation of language teaching and learning" (Bocanegra-Valle 2016, p. 560). It was not until the 1970s that the concept of needs analysis in ESP became widespread with its "adoption and espousal by The Council of Europe's modern language project" (Nunan 1988, p. 43). The exploration of needs analysis in ESP has informed the study of needs analysis in EGAP which constitutes a main strand of ESP (Jordan 1997). There are different approaches to needs analysis, such as the highly specific model for Target-Situation Analysis (TSA) devised by Munby (1978). This utilises the Communication Needs Processor (i.e., a set of questions involving key communication variables such as topic, participants and medium, among others) to ascertain students' language ability at the end of the course. In contrast, Richterich and Chancerel's (1977) Present-Situation Analysis (PSA) establishes students' language ability at the beginning of the language course. Although TSA is one of the most detailed and best-known works of needs analysis, because it is a language-centred approach, TSA has been limited to assessing linguistic features (Hutchinson and Waters 1987).

To address the aforementioned issues, Hutchinson and Waters (1987) proposed a TNA that segments target needs into three sub-analyses: necessities (the language skills and related knowledge that the learner must acquire to function effectively in the target situation); lacks (the disparity between the learner's actual and target proficiency); and wants (the learner's self-perceived necessities). The approach folds learners' needs in TSA, as well as lacks and wants in PSA into a TNA (Flowerdew et al. 2013). A number of empirical studies have been conducted to identify and determine learners' necessities, wants and lacks (e.g., Arroyyani and Nurhayati 2019; Liu et al. 2011).

Academic self-efficacy and its relationship with learners' needs. Self-efficacy refers to individuals' beliefs in their capacity to

execute the actions necessary for specific achievements (Bandura 1997). In educational research, self-efficacy has long been a concept of great interest (Usher and Pajares 2008) and is a proven predictor of students' academic performance across academic disciplines and stages (Honicke and Broadbent 2016). As for language learning, the literature over the past two decades has suggested a positive relationship between learners' self-efficacy and their academic competence. In terms of the aspects of self-efficacy for English learning, previous studies have focused on reading (Shang 2010), speaking (Zhang et al. 2020), writing (Van de Poel and Gasiorek 2012) and listening (Graham 2011). As the purpose of EAP courses is to cultivate learners' study skills in English (Jordan 1997), this study measures EAP learners' self-efficacy in terms of listening, speaking, reading, writing and study skills.

To help learners promote their academic self-efficacy, teachers should first deal with the sources of these beliefs (Woolfolk and Shaughnessy 2004; as cited in Usher and Pajares 2008). Bandura (1997) theorised four sources of self-efficacy: mastery experiences, vicarious experiences, verbal persuasion, and emotional and physiological states. A significant indicator of mastery for improving self-efficacy is the attainment of subgoals in goal setting (Bandura and Schunk 1981). For instance, goals generated by learners' comparison of their present performances to their expectations have been found to enhance their self-efficacy while learning (Bandura and Schunk 1981; Schunk 1983). The literature suggests that the objectives necessary for both the learners themselves and other education stakeholders as well as the gap between learners' current performance and their target performance could be perceived as learners' needs (Berwick 1989; Widdowson 1981). Theoretically, learners' needs, such as wants, can affect learning efficacy (Liu et al. 2011). Empirical research also suggests that learners' social and emotional learning needs are positively related to learners' self-efficacy (Totan 2014). However, the relationships between learners' target needs and self-efficacy in the EGAP context require more empirical evidence.

The Chinese context. In China, college ELT has undergone a great deal of change and reform since its official inception (Han, 2017). In the last century, college English teaching in China emphasised GE, but also valued English reading for science and technology (Cargill et al. 2012). However, in the mid-1980s, college ELT researchers and practitioners argued that learners in universities ought to develop strong, basic English language skills which, once mastered, would help students do well in an academic context. In addition, China's college English teaching curriculum was largely determined by the Ministry of Education, which mandated that college English teaching should develop learners' four basic skills and translation ability (Feng 2009). Since then, college ELT in the Chinese curriculum has mostly included topics of general human interest rather than academic materials (Cai 2012). As a result, EAP lost ground and has gradually been marginalised (Duan and Gu 2005).

In recent years, China's higher education sector has sought a higher profile in global academic communities, and in 2018 China became the largest producer of scientific publications (Tollefson 2018). As a result, numerous research-oriented universities have developed English-medium and bilingual courses to enhance students' proficiency in EAP. As university students' English proficiency improves, their motivation to handle repetitive and tiring general English materials plummets. In addition to their current academic activities, many students also plan to study overseas, which involves academic English tests such as TOEFL and IELTS and the need to write curriculum vitae

and personal statements. In response to the needs of both the universities and the students, the national guideline for China's college English curriculum reform now includes supplementing GE with EGAP courses.

Given the growing realisation that EGAP is becoming the trend in China's college ELT, this study aims to investigate the characteristics of and relationships between Chinese university EFL learners' target needs and self-efficacy in the EGAP context based on the following research questions: (1) What are the characteristics of learners' target needs and self-efficacy in EGAP? (2) What are the relationships between learners' target needs and self-efficacy in EGAP?

Methods

Participants. Using a convenience sampling approach, this study takes Shandong Province, an economically developed province in East China as a case. A total of 1340 undergraduates from four universities were invited to voluntarily participate in an online questionnaire survey. Of the participants, 888 (66.3%) were from a key, national, research-oriented university, and 452 (33.7%) were from ordinary, provincial, teaching-oriented universities. The participants were majoring in the arts ($n = 247$, 18.4%); science ($n = 320$, 23.9%); engineering ($n = 580$, 43.3%); and medicine ($n = 193$, 14.4%). There were 828 (61.8%) freshmen and 512 (38.2%) sophomores, among which 679 (50.7%) were males and 661 (49.3%) were females. The sample of the study was considered representative of Chinese higher education institutions because it consisted of students from various types of universities across different academic years and majors, and featured a fairly balanced gender distribution. Table 1 displays the demographic characteristics of participants.

Instruments. The questionnaire was composed of two parts. The first part collected data on the participants' backgrounds, such as gender, major, grade and type of institution. The second part consisted of two scales: the Target Needs Analysis (TNA) scale and the Learner Academic Self-efficacy (LAS) scale.

The TNA scale. The TNA scale was designed based on the Hutchinson and Waters (1987) analysis of learners' target needs and Cai's (2012) item descriptions of learners' needs for EGAP courses. The scale consists of three sub-scales: necessities (six items, e.g., "I need to read professional literature and articles in English.",); lacks (14 items, e.g., "It is difficult for me to join in academic discussions in English.",); and wants (18 items, e.g., "I hope I will be able to write a research proposal in English by taking EGAP courses.",). All the items were scored using a 5-point Likert scale (1 = *totally disagree*, 5 = *totally agree*), where higher scores reflect higher target needs.

The LAS scale. The 34-item LAS scale was developed based on the descriptions of learners' language proficiency in the BALEAP Can Do Framework (2013), learners' difficulties in language and EAP competencies in the Smith and Thondhlana's (2015) study and EGAP learners' study skills in the Cai's (2012) study. Learners' academic self-efficacy in EGAP was measured in five dimensions: listening (three items, e.g., "I can understand my professional, academic courses in English by listening to them"), speaking (six items, e.g., "I can raise and answer questions in class in English"), reading (three items, e.g., "I can read academic literature in English by using skills like skipping, skimming, intensive reading and others."), writing (six items, e.g., "I can cite the ideas and methods of others correctly") and study skills (four items, e.g., "I understand the basic formatting and styles of literature citation").

All items were scored on a 5-point Likert scale, with higher scores indicating greater self-efficacy.

Data analysis. Exploratory factor analysis (EFA) was conducted using SPSS 26.0 to determine the construct structure and factor loadings of all the items, and Cronbach's α coefficients were computed to test internal reliability. To further examine the construct validity of the scales, confirmatory factor analysis (CFA) was conducted using Amos 26.0. Descriptive statistics (M and SD) and correlations were calculated for the learners' target needs and self-efficacy. Inferential statistical methods involving an independent-sample t-test and analysis of variance (ANOVA) were used to compare the differences between learners' target needs and academic self-efficacy caused by gender, grade, major and type of university. Full structural equation modelling (SEM) was then developed to explore the relationships between learners' target needs and self-efficacy using Amos 26.0. A series of indices including chi-square values (χ^2), degrees of freedom (df), corresponding significance values (p), the Comparative Fit Index (CFI), the Tucker–Lewis index (TLI) and the Root Mean Square Error of Approximation (RMSEA) were used to interpret the CFA and SEM results. The literature suggests an acceptable model fit with the CFI and TLI values above 0.90 and the RMSEA value below 0.10 (Schermelleh-Engel et al. 2003). Given the large sample size and the considerable statistical power, we classified our result in terms of effect size following the guidance of Gignac and Szodorai (2016) (small = 0.10–<0.20, medium = 0.20–< 0.30, large ≥ 0.30).

Results

Validity and reliability. Prior to carrying out factor analysis of the TNA scale, we examined two indicators; the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy index, which was 0.959, and Bartlett's test of sphericity, which was significant ($\chi^2_{(df = 703, N = 1340)} = 42059.384$, $p < 0.001$), indicating the appropriateness of the data for factor analysis. With regard to our adaptation of the TNA scale, EFA was conducted using the principal components analysis extraction method with a varimax rotation on the original 38-item TNA scale. Three factors were extracted, which was consistent with Hutchinson and Waters' (1987) three dimensions of target needs. The result indicated that the loading of Item 2 ("I need to study abroad as an exchange student or a full-time student") was lower than 0.4, and it was therefore dropped. In the second round of EFA, the factor loadings of the remaining 37 items ranged from 0.41 to 0.79, accounting for 61.36% of the variances, and the Cronbach's α coefficients of the three factors were 0.89 (necessities), 0.91 (lacks), and 0.97 (wants). The KMO measure of sampling adequacy index for the LAS scale was 0.947, and Bartlett's test of sphericity was significant ($\chi^2_{(df = 231, N = 1340)} = 21470.951$, $p < 0.001$). The factor loadings of the 22 items ranged from .50 to 0.89, and the Cronbach's α coefficients of the five factors were 0.89 (listening), 0.93 (speaking), 0.82 (reading), 0.91 (writing), and 0.76 (study skills). Five factors were extracted, accounting for 72.98% of the variances. The CFA indices of the TNA scale ($\chi^2 = 358.184$, df = 41, $p < .001$, CFI = 0.97, TLI = 0.96, RMSEA = 0.076) and the LAS scale ($\chi^2 = 2097.911$, df = 199, $p < .001$, CFI = 0.91, TLI = 0.90, RMSEA = 0.084) were all acceptable, indicating that both the TNA scale and the LAS scale had good psychometric features.

Descriptive analysis and correlation analysis. Table 2 shows that the mean scores of all three sources of target needs were above 3, the median value of a 5-point Likert scale, but only the mean score of self-efficacy in study skills ($M = 3.42$, $SD = 0.68$) was above 3 and was significantly higher than that of the other

Table 1 The demographic characteristics of participants ($N = 1340$).

Category	Total		Key		Provincial	
	$N = 1340$		$n = 888$		$n = 452$	
	n	%	n	%	n	%
Gender						
Male	679	50.7	484	54.5	195	43.1
Female	661	49.3	404	45.5	257	56.9
Major						
Humanities	247	18.3	100	11.3	147	32.5
Science	320	23.9	162	18.3	158	35
Engineering	580	43.3	434	48.9	146	32.3
Medicine	193	14.4	192	21.6	1	0.02
Grade						
Freshman	828	61.8	494	55.6	334	73.9
Sophomore	512	38.2	394	44.4	118	26.1

dimensions. Within target needs, the correlation analysis indicated that necessities were negatively correlated with lacks with a very small effect size ($r = -0.07$, $p < 0.01$), but positively correlated with wants with a very large effect size ($r = 0.60$, $p < 0.01$). Lacks were positively correlated with wants with a small effect size ($r = -0.11$, $p < 0.01$). Within self-efficacy, the correlation analysis showed that all the dimensions were positively correlated with each other with large effect sizes. Turning to the correlation between target needs and self-efficacy, necessities were positively associated with all the factors of self-efficacy with medium effect sizes, except with writing ($r = 0.16$, $p < 0.01$). Lacks were negatively associated with all the factors of self-efficacy, including self-efficacy in listening ($r = -0.34$, $p < 0.01$), speaking ($r = -0.38$, $p < 0.01$), reading ($r = -0.34$, $p < 0.01$) and writing ($r = -0.39$, $p < 0.01$) with large effect sizes, and with self-efficacy in study skills with a very small effect size ($r = -0.08$, $p < 0.01$). Although all factors of self-efficacy were positively associated with wants, only the correlation between self-efficacy in study skills and wants showed a large effect size ($r = 0.30$, $p < 0.01$).

Comparison of differences. To examine whether the target needs and self-efficacy of students with different demographic characteristics differed statistically, a series of independent-sample t-tests and an ANOVA were conducted to compare the mean scores between the different groups. Table 3 shows a significant difference in the mean scores of necessities ($t_{(1338)} = -4.21$, $p = 0.000$ ($p < 0.001$)) and wants ($t_{(1338)} = -4.81$, $p = 0.000$ ($p < 0.001$)) between male and female students, with female students scoring higher on these five factors. Turning to the different types of institutions, students from the key university scored significantly higher than their counterparts from ordinary universities on necessities ($t_{(1338)} = 8.77$, $p = 0.000$ ($p < 0.001$)), lacks ($t_{(1338)} = 3.77$, $p = 0.000$ ($p < 0.001$)), wants ($t_{(1338)} = 14.62$, $p = 0.000$ ($p < 0.001$)) and self-efficacy in study skills ($t_{(1338)} = -4.15$, $p = 0.000$ ($p < 0.001$)) with small to medium effect sizes. Students at ordinary universities scored higher on self-efficacy in writing ($t_{(1338)} = -4.04$, $p = 0.000$ ($p < 0.001$)) with a small effect size. Although there were differences in target needs and self-efficacy between freshmen and sophomores, the effect size of the differences was very small ($d < |0.2|$) and therefore had no practical meaning. Notably, the differences between them in lacks had a small effect size ($d = -0.29$), with freshmen's scores significantly lower than those of sophomores. An ANOVA showed differences between different majors on lacks ($F_{(3, 1336)} = 11.30$, $p = 0.000$ ($p < 0.001$)) and

Table 2 Reliabilities, descriptive statistics, and correlations of the factors.

	Necessities	Lacks	Wants	EL	ES	ER	EW	ESS
Target Needs								
Necessities	-							
Lacks	−0.07**	-						
Wants	0.60**	0.11**	-					
Self-efficacy in								
Listening	0.26**	−0.34**	0.09**	-				
Speaking	0.28**	−0.38**	0.18**	0.65**	-			
Reading	0.26**	−0.34**	0.19**	0.57**	0.73**	-		
Writing	0.16**	−0.39**	0.02	0.65**	0.71**	0.69**	-	
Study Skills	0.28**	−0.08**	0.30**	0.27**	0.39**	0.44**	0.39**	-
M	3.59	3.8	3.95	2.4	2.87	2.95	2.59	3.42
SD	0.80	0.75	0.75	0.85	0.83	0.83	0.79	0.68
Cronbach's α	0.89	0.91	0.97	0.89	0.93	0.82	0.91	0.76

Note: *EL* Self-efficacy in listening, *ES* Self-efficacy in speaking, *ER* Self-efficacy in reading, *EW* Self-efficacy in writing, *ESS* Self-efficacy in study skills. Factors that are in bold are statistically significant ($p < 0.05$) and have at least a medium effect size ($r > |0.20|$). **$p < 0.01$; *$p < 0.05$ (2-tailed).

Table 3 Gender, type of institution, grade, and major differences in target needs and self-efficacy.

Factor		Group		M	SD	F/t	Comparison
Target Needs based on	Necessities	Gender	Male	3.50	0.84	−4.21***	Male < Female
			Female	3.68	0.75		
		Type of Institution	Key	3.72	0.77	8.77***	Key > Ordinary
			Ordinary	3.32	0.80		
	Lacks	Type of Institution	Key	3.85	0.58	3.77***	Key > Ordinary
			Ordinary	3.72	0.62		
		Grade	Freshman	3.74	0.59	−5.29***	Freshman < Sophomore
			Sophomore	3.91	0.60		
		Major	Arts	3.82	0.53	11.30***	Medicine > Arts, Science, Engineering
			Science	3.73	0.64		
			Engineering	3.76	0.59		
			Medicine	4.02	0.58		
	Wants	Gender	Male	3.86	0.78	−4.81***	Male < Female
			Female	4.05	0.70		
		Type of Institution	Key	4.15	0.67	14.62***	Key > Ordinary
			Ordinary	3.56	0.74		
		Major	Arts	3.86	0.71	6.55***	Medicine > Arts, Science
			Science	3.86	0.77		
			Engineering	3.98	0.76		
			Medicine	4.12	0.66		
Self-efficacy in	Listening	Major	Arts	2.53	0.87	4.78**	Arts > Medicine
			Science	2.37	0.84		
			Engineering	2.41	0.86		
			Medicine	2.22	0.78		
	Writing	Type of Institution	Key	2.52	0.77	−4.04***	Key < Ordinary
			Ordinary	2.71	0.81		
		Major	Arts	2.67	0.80	6.51***	Arts, Engineering, Science > Medicine
			Science	2.60	0.80		
			Engineering	2.62	0.76		
			Medicine	2.36	0.80		
	Study Skills	Type of Institution	Key	3.47	0.65	4.15***	Key > Ordinary
			Ordinary	3.31	0.70		

Note. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$ (2-tailed).

wants ($F_{(3, 1336)} = 6.55$, $p = 0.000$ ($p < 0.001$)), self-efficacy in listening ($F_{(3, 1336)} = 4.78$, $p = 0.003$ ($p < 0.01$)) and writing ($F_{(3, 1336)} = 6.51$, $p = 0.000$ ($p < 0.001$)). Students specialising in medicine scored higher on wants and lacks than the others, but scored lower on self-efficacy in writing and listening with small effect sizes.

Relationships between learners' target needs and self-efficacy. To explore the relationship between EFL learners' target needs and academic self-efficacy, a model was constructed using SEM on AMOS 26.0. This assumed that correlations were allowed between the independent variables (target needs) and the dependent variables (self-efficacy). The SEM results, as presented in Fig. 1, indicated that the data fit of the model was acceptable ($\chi^2 = 3064.855$, $df = 467$, $p < 0.01$, CFI = 0.92, TLI = 0.91, RMSEA = 0.064), with the explained variance of self-efficacy factors ranging from 0.15 to 0.25. Specifically, necessities were positively related to all the factors of self-efficacy, and lacks were negatively related to all the factors of self-efficacy. Wants were negatively related to self-efficacy in listening ($\beta = −0.09$,
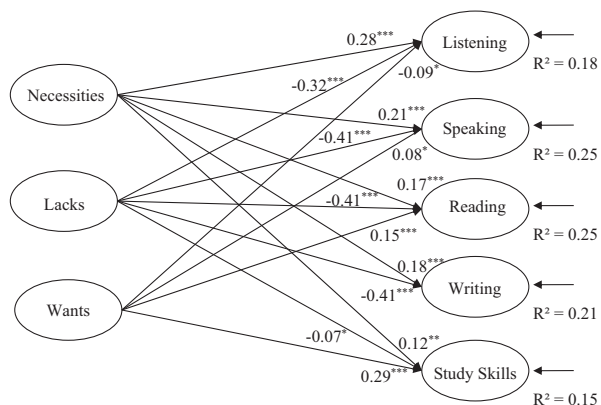
Fig. 1 SEM of the relations between target needs and academic self-efficacy. *Note*: SEM model results showing significant regression paths. *$p < 0.05$; **$p < 0.01$, ***$p < 0.001$; Goodness-of-fit indices: $\chi^2 = 3064.855$, $df = 467$, $\chi2/df = 6.563$, $p < 0.01$, CFI = 0.92, TLI = 0.91, RMSEA = 0.064.

$p = 0.022$ ($p < 0.05$)), and positively related to reading ($\beta = 0.15$, $p = 0.000$ ($p < 0.001$)), speaking ($\beta = 0.08$, $p = 0.025$ ($p < 0.05$)) and study skills ($\beta = 0.29$, $p = 0.000$ ($p < 0.001$)). The path from wants to self-efficacy in writing was dropped as no significant relationship was found.

Discussion

This study contributes to language learning research by revealing characteristics of Chinese university EFL learners' perceptions of target needs and self-efficacy, and by verifying the relationship between these two variables. In addition to highlighting the importance of investigating target needs from students' perspectives, the findings of this study also shed some light on how to enhance learners' self-efficacy in developing academic English language skills.

The characteristics of EFL learners' target needs and self-efficacy. This study revealed a high level of target needs for EGAP from the perspective of Chinese university EFL learners, showing the need for EGAP learning. Specifically, they were aware of the institutional demands on their academic language skills, and have a strong need to learn EGAP. On the one hand, students' needs for EGAP courses were likely to be influenced by the internationalisation of higher education in China, which requires them to take classes with English-medium instruction. On the other hand, this might be related to the increasing number of students who would like to continue their studies either at home or abroad, both of which require basic academic language skills (Durga and Rao 2018). With the objective of teaching basic academic language skills, EGAP can smooth the transition from GE to discipline-specific EAP. Meanwhile, it should be noted that although students were aware of external and internal needs for EGAP, the mean score of lacks was relatively higher, showing the gap between students' anticipated level of academic language proficiency and their existing proficiency. This echoes research showing that students usually have difficulties in academic listening, reading, etc. when beginning EGAP learning (Generoso and Arbon 2020). In general, although some research has questioned the need for EGAP courses in Chinese universities, this study offers strong support for their implementation from the perspective of Chinese university EFL learners.

Students reported low self-efficacy scores on language skills and high scores on study skills, meaning that they were less confident in their academic English language skills than in their study skills. On the one side, the less favourable perceptions of

self-efficacy in academic English language skills are in line with the findings of Banister's (2021) study, which found that students enrolled in EGAP courses usually felt puzzled and had difficulties in grasping reading, writing, speaking, and listening practices. In China, students usually have little exposure to EGAP courses before entering universities. Thus, as the current EGAP courses are targeted at freshmen and sophomores, a majority of EGAP learners are likely still in the process of developing their competence in academic language skills and feel a limited sense of control, which may in turn contribute to their lack of confidence in EGAP learning. On the other side, the higher level of self-efficacy in study skills reported by the Chinese university EFL learners is inconsistent with the findings of Durga and Rao's (2018) study which revealed that Chinese university students lacked confidence in their study skills. This may be explained by the fact that the study skills in this study were investigated through the lens of learning decontextualised and universal academic techniques such as taking notes and constructing a bibliography, while high-level competence and language skills that are deemed to be difficult to develop were not included.

The differences in learners' target needs and self-efficacy. Significant differences in target needs were found between students at the key university and those at ordinary universities, with students from the key university scoring higher on all three sub-dimensions, i.e., necessities, wants, and lacks. This indicates a clearer understanding of EGAP learning and greater needs for EGAP-related knowledge among key university EFL learners. The discrepancy in the learners' perceptions of target needs may be explained by the differences in the educational objectives of the different types of Chinese universities. In China, key universities have been encouraged to take an active role in advancing the internationalisation of higher education which is characterised by the sharing of knowledge and technology worldwide (Liu et al. 2019). As English is the academic lingua franca, key universities generally exhibit a more favourable attitude towards the implementation of EGAP teaching compared to ordinary universities (Wang et al. 2013). A recent survey revealed that of the approximately 66 Chinese universities that implemented EGAP teaching, the key universities outperformed the ordinary universities (Liao 2019). Furthermore, as the college English curriculum reform in China was initially implemented in key universities that are research-oriented targeting to cultivate internationally competitive students (Song and Zhou 2022), and gradually extended to ordinary teaching-oriented universities, students at the key university who had more exposure to EGAP teaching were more likely to have a better understanding of EGAP than those of the ordinary university with less experience in implementing EGAP teaching.

Another interesting finding is that medical students reported high scores on target needs but low scores on self-efficacy. This indicates that while medical students agreed with the need for EGAP learning, both objectively and subjectively, they showed insufficient competencies and lacked confidence in reaching the anticipated language proficiency. On the one hand, the perceived high necessities and wants towards EGAP learning among medical students may be driven by the need to integrate into their professional community. This requires high proficiency in discipline-specific English (Choi 2021) because most professional materials, such as medical academic journals, magazines, and conferences, are in English (Maher 1986). To better grasp these materials, medical students need a considerable language proficiency, which may prompt high demand for EGAP learning. On the other hand, the low self-efficacy reported by medical students may be related to the nature of medical English, with its

complex terminology and sentence structure (Deng et al. 2022). These complex structures increase medical students' difficulties in understanding (Shi and Gan 2012) and may therefore decrease their confidence in listening and writing.

The relationships between learners' target needs and self-efficacy. The results revealed that necessities were positively related to learners' academic self-efficacy in all five aspects. This indicates that perceptions of higher objective needs tended to reinforce Chinese university EFL learners' belief in EGAP learning. This is in line with previous findings suggesting that students assigned challenging learning goals are likely to show higher levels of self-efficacy (Salancik 1977). Compared with GE, learners' necessities in academic-oriented and practice-based EGAP learning (Hyland and Shaw 2016) are formulated by challenging and specific goals, such as being able to understand academic lectures and participate in academic discussions. These goals may turn into challenging stressors for EFL learners, increasing their effort and persistence and further boosting their motivation (Travis et al. 2020). For example, the course requirements could motivate students to practice more, thereby improving their self-efficacy in EGAP learning. This may contribute to the positive relationship between learners' necessities and their self-efficacy.

On the contrary, lacks exhibited a negative relationship with learners' academic self-efficacy in all five aspects, indicating that the EFL learners who had difficulty coping with the target situation were likely to show low confidence with EGAP learning. This is consistent with a previous study that demonstrated that when EFL learners performed poorly in class or were unable to use English in practice, they typically felt depressed and demotivated in language learning (Wang and Littlewood 2021). A possible explanation is that the large gap between the learners' current ability and their anticipated proficiency frustrates them, thereby undermining their efficacy beliefs. Lacks indicate aspects that learners perceive as insufficient and that need improvement to achieve their desired goals (Kim and Na 2015). Research has suggested that if students' efforts fail to produce the desired effect, their confidence in succeeding diminishes (Usher and Pajares 2008). Therefore, when EFL learners perceive higher levels of lacks, they tend to have lower self-efficacy.

Overall, learners' wants showed a positive relationship with their academic self-efficacy, particularly in reading and study skills. This indicates that when the EFL learners had internal needs for EGAP courses, they tended to show confidence in EGAP learning. This finding provides empirical evidence to support the statement that learners' wants influence their learning efficacy (Kim and Na 2015). As wants denote the learners' expectations of their performance after taking a certain course (Menggo et al. 2019), they can be viewed as the goals set by the learners themselves. Research has suggested that self-set learning goals can activate students' learning incentives (Miller and Brickman 2004) and motivate them to invest more time and effort in achieving these goals (Vasalampi et al. 2012). Furthermore, wants indicate learners' positive attitudes towards the language learning process, which are found positively related to learners' self-efficacy (Roshandel et al. 2018). This may explain the positive relationship between learners' wants and their academic self-efficacy.

Conclusion
This study investigates the characteristics of and the relationships between Chinese university EFL learners' target needs and academic self-efficacy in the context of EGAP. The results suggest that learners have high target needs but rather low academic self-efficacy when it comes to EGAP learning. Learners' target needs

that are based on necessities and wants have an overall positive effect on their academic self-efficacy, while target needs based on lacks have significantly negative effects on academic self-efficacy.

Implications for practice. Given the above discussion, several suggestions could be made to address the emerging issues. To enhance learners' self-efficacy in EGAP, universities and teachers may consider improving learners' necessities, lacks, and wants. Since necessities represent learners' perceptions of the external necessity to learn and use EGAP, educational researchers may enhance necessities in two ways; they could create an EGAP-oriented environment for students, or they could enhance learners' perceptions of EGAP necessity in their current setting. Learners will use EGAP in a large number of activities in English-medium courses. To achieve the goals of improving their international rankings and cultivating scholars with a global perspective, universities may attempt to teach some of their foundation courses in English, thus necessitating the use of EGAP and adding an academic English context to students' specialised studies. Furthermore, based on the current teaching setting, universities may pay attention to learners' views of EGAP usage. When holding seminars and symposiums that include English-speaking experts and take place in English, universities could design activities during the event that maximise learners' perceptions of the way EGAP is used in these specific academic English environments. Learners' wants should also be taken care of, as they have been shown to positively affect learners' self-efficacy in study skills. Learners' wants include the outcome they expect to achieve after taking the EGAP courses, as well as their plans for their next step, such as seeking to publish in English or to study abroad. The university can play a role that makes the wants of students studying for a bachelor's degree more convenient and workable by offering preparatory courses on publishing in academic journals and applying for universities abroad. Although publishing and studying abroad are not requirements for bachelor's degree students, they have become more necessary than ever as educational competition in China becomes stronger and stronger. Universities could also publish their academic journals in English, offering students a way of testing their English proficiency in advance of publishing in an international journal. When learners find the prospect of utilising EGAP is both promising and workable, the need for EGAP will increase. If the EGAP courses are successful, universities will take a major step forward towards their goal of academic globalisation.

Another issue is that learners from research-oriented universities, especially those specialising in medicine, scored lower on self-efficacy in writing than their counterparts from teaching-oriented universities. This may cause underperformance in academic writing. The path analysis indicated that learners' target needs based on lacks were negatively related to learners' self-efficacy. To improve learners' self-efficacy, universities may investigate ways of weakening learners' perceptions of their lacks; guiding learners by setting their goals and wants in accordance with the current lacks they encounter may be a way of doing this. As Sales (1970) suggested, if learners translate their difficulties in a task into goals, then the problems they meet may be positively related to performance. Setting learners' lacks as positive goals instead of as barriers (Miller and Brickman 2004) can heighten students' commitment to their learning and have a positive relationship with their self-efficacy. Furthermore, it is understandable that learners may initially doubt their ability to attain challenging goals, but as they work towards those goals, their self-efficacy will be developed through their engagement in the task (Schunk 1990). The university could assist in this by modifying the EGAP courses they offer based on the lacks that students

worry about. When the university provides enough engagement in the course to demonstrate that learners are addressing their lacks, learners' perceptions of their lacks may weaken.

Limitations and directions for future research. This study sheds light on the characteristics of and relationships between learners' target needs and self-efficacy. As an exploratory study conducted in a coastal province in East China, it confronted two limitations that may inspire future research. First, as the relationships between learners' target needs and self-efficacy have rarely been studied, confirmation of the causal relationship between learners' target needs and self-efficacy requires further research.

Second, the students taking part were from a developed province in East China and this inevitably limits the generalisability of the study. The difference in development levels between the various provinces may result in differences in educational funding and faculty quality in higher education, thus affecting the learning environment for academic English. Future research may consider adopting stratified sampling to obtain a more representative sample.

Data availability

The datasets are available in the supplementary file.

References

Al-Khairy MA (2013) Saudi English-Major undergraduates' academic writing problems: a Taif University perspective. English Lang Teach 6(6). https://doi.org/10.5539/elt.v6n6p1

Arroyyani R, Nurhayati L (2019) Students' necessities, lacks and wants on ICT-Based English for nursing students. ANGLO-SAXON: J Ilm Program Stud Pendidik Bhs Ingg 10(2):159–176

BALEAP (2013) Can Do Framework for EAP syllabus design and assessment. https://www.baleap.org/wp-content/uploads/2016/04/Can_Do_Framework__with_sample_activities_April_2013.pdf Accessed 20 Aug 2020

Bandura A (1997) Self-efficacy: the exercise of control. W. H. Freeman and Company, New York

Bandura A, Schunk DH (1981) Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. J Pers Soc Psychol 41(3):586–598. https://doi.org/10.1037/0022-3514.41.3.586

Banister C (2021) Harnessing learner research agendas to continuously explore EAP learners' needs. J Engl Acad Purp 51:100980. https://doi.org/10.1016/j.jeap.2021.100980

Belcher D (2009) What ESP is and can be: an introduction. In: Belcher D (ed) English for specific purposes in theory and practice. University of Michigan Press, Ann Arbor

Berwick R (1989) Needs assessment in language programming: from theory to practice. In: Johnson RK (ed) The second language curriculum. Cambridge University Press, Cambridge, pp 48–62. https://doi.org/10.1017/cbo9781139524520.006

Bocanegra-Valle A (2016) Needs analysis for curriculum design. In: Hyland K, Shaw P (eds) The Routledge handbook of English for academic purposes. Routledge, London, pp 560-576. https://doi.org/10.4324/9781315657455

Brown J (2002) Training needs assessment: a must for developing an effective training program. Public Pers Manag 31(4):569–578. https://doi.org/10.1177/009102600203100412

Brown JD (2009) Foreign and second language needs analysis. In: Long MH, Doughty CJ (eds) The handbook of language teaching. Blackwell Publishing, pp 269–293

Cai J (2012) Academic English: needs analysis and teaching methods (in Chinese). Foreign Lang Learn Theory Pract 2:30–35

Cai J (2013) Students' perceptions of academic writing: a needs analysis of EAP in China. Lang Educ Asia 4(1):5–22. https://doi.org/10.5746/LEiA/13/V4/I1/A2/Cai

Cargill M, O'Connor P, Li Y (2012) Educating Chinese scientists to write for international journals: addressing the divide between science and technology education and English language teaching. Engl Specif Purp 30(1):61–69

Choi LJ (2021) Implementing English for Medical Purposes (EMP) in South Korea: Nursing students' ongoing needs analysis. Nurse Educ Today 104:104989. https://doi.org/10.1016/j.nedt.2021.104989

Chowdhury TA, Haider MZ (2012) A Need-based evaluation of the EAP courses for the Pharmacy students in the University of Asia Pacific (UAP), Bangladesh. Asian Soc Sci 8(15):93–107. https://doi.org/10.5539/ass.v8n15p93

Deng J, Zhou K, Al-Shaibani GKS (2022) Medical English anxiety patterns among medical students in Sichuan, China. Front Psychol 13:895117. https://doi.org/10.3389/fpsyg.2022.895117

Duan P, Gu W (2005) Technical communication and English for specific purposes: the development of technical communication in China's universities. Tech Commun 52(4):434–448

Dudley-Evans T, St John MJ (1998) Developments in English for specific purposes: a multi-disciplinary approach. Cambridge University Press, Cambridge

Durga SS, Rao CC (2018) Developing students' writing skills in English—a process approach. J Res Scholars Professionals Engl Lang Teach 6(2):1–5

Elisha-Primo I, Sandler S, Goldfrad K, Ferenz O, Perpignan H (2010) Listening to students' voices: a curriculum renewal project for an EFL graduate academic program. System 38(3):457–466. https://doi.org/10.1016/j.system.2010.02.002

Evans S, Green C (2007) Why EAP is necessary: a survey of Hong Kong tertiary students. J Engl Acad Purp 6(1):3–17. https://doi.org/10.1016/j.jeap.2006.11.005

Feng A (2009) English in China convergence and divergence in policy and practice. AILA Rev 22(1):85–102

Flowerdew L (2013) Needs analysis and curriculum development in ESP. In: Paltridge B, Starfield S (eds) The handbook of English for specific purposes. Wiley-Blackwell, pp 325–46

Generoso JC, Arbon AMM (2020) Language needs analysis: an EAP curriculum design to develop foreign students' English skills. J Asia TEFL 17(2):428–445. https://doi.org/10.18823/asiatefl.2020.17.2.8.428

Gignac GE, Szodorai ET (2016) Effect size guidelines for individual differences researchers. Pers Individ Differ 102:74–78. https://doi.org/10.1016/j.paid.2016.06.069

Grace M (2001) Training needs analysis. Br Dent J 190(10):524–526

Graham S (2011) Self-efficacy and academic listening. J Engl Acad Purp 10(2):113–117. https://doi.org/10.1016/j.jeap.2011.04.001

Han J (2017) College English teacher development in China: a mixed method study. Peter Lang International Academic Publisher, Bern

Holme R, Chalauisaeng B (2006) The learner as needs analyst: the use of participatory appraisal in the EAP reading classroom. Engl Specif Purp 25(4):403–419. https://doi.org/10.1016/j.esp.2006.01.003

Honicke T, Broadbent J (2016) The influence of academic self-efficacy on academic performance: a systematic review. Educ Res Rev 17:63–84. https://doi.org/10.1016/j.edurev.2015.11.002

Hutchinson T, Waters A (1987) English for specific purposes. Cambridge University Pressy, Cambridge

Hyland K, Shaw P (2016) The Routledge handbook of English for academic purposes. Routledge, London

Jordan RR (1997) English for academic purposes: a guide and resource book for teachers. Cambridge University Press, Cambridge

Kim H-S, Na Y-H (2015) Needs analysis in a general English program. Mod Stud Engl Lang Lit 59(1):489–518. https://doi.org/10.17754/MESK.59.1.489

Liao L (2019) A study on the curriculum design and implementation of EAP courses in Chinese universities (in Chinese). J PLA Univ Foreign Languages 42(3)

Liu J-Y, Chang Y-J, Yang F-Y, Sun Y-C (2011) Is what I need what I want? Reconceptualising college students' needs in English courses for general and specific/academic purposes. J Engl Acad Purp 10(4):271–280. https://doi.org/10.1016/j.jeap.2011.09.002

Liu Q, Turner D, Jing X (2019) The "Double First-Class Initiative" in China: background, implementation, and potential problems. Beijing Int Rev Educ 1:92–108. https://doi.org/10.1163/25902547-00101009

Long MH (2005) Methodological issues in learner needs analysis. In: Long MH (ed) Second language needs analysis. Cambridge University Press, Cambridge, pp 19–76

Maher J (1986) The development of English as an international language of medicine. Appl Linguist 7(2):206–218. https://doi.org/10.1093/applin/7.2.206

Menggo S, Suastra IM, Budiarsa M, Padmadewi NN (2019) Needs analysis of academic-English speaking material in promoting 21st century skills. Int J Instr 12(2):739–754. https://doi.org/10.29333/iji.2019.12247a

Miller RB, Brickman SJ (2004) A model of future-oriented motivation and self-regulation. Educ Psychol Rev 16(1):9–33. https://doi.org/10.1023/B:EDPR.0000012343.96370.39

Ministry of Education Higher Institution College Foreign Language Teaching Commission. (2020). College English Curriculum Requirements (2020 ed). Higher Education Press, Beijing

Munby J (1978) Communicative syllabus design: a sociolinguistic model for designing the content of purpose-specific language programmes. Cambridge University Press, Cambridge

Nunan D (1988) The learner-centred curriculum: a study in second language teaching. Cambridge University Press, Cambridge

Richterich R, Chancerel J-L (1977) Identifying the needs of adults learning a foreign language. Pergamon Press, Oxford

Richterich R (1983) Case studies in identifying language needs. Pergamon Press, Oxford

Roshandel J, Ghonsooly B, Ghanizadeh A (2018) L2 motivational self-system and self-efficacy: a quantitative survey-based study. Int J Instr 11(1):329–344. https://doi.org/10.12973/iji.2018.11123a

Salancik GR (1977) Commitment and the control of organizational behavior and belief. N. directions Organ Behav 1(5):54

Sales EG (1970) Sex differences in responsiveness to two classes of social approval stimuli. Dissertation, University of Michigan

Schermelleh-Engel K, Moosbrugger H, Müller H (2003) Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. MPR-Online 8(2):23–74

Schunk DH (1983) Developing children's self-efficacy and skills: the roles of social comparative information and goal setting. Contemp Educ Psychol 8(1):76–86. https://doi.org/10.1016/0361-476X(83)90036-X

Schunk DH (1990) Goal setting and self-efficacy during self-regulated learning. Educ Psychol 25(1):71–86. https://doi.org/10.1207/s15326985ep2501_6

Shang H (2010) Reading strategy use, self-efficacy and EFL reading comprehension. Asian EFL. Journal 12(2):18–42

Shi WN, Gan YN (2012) Analysis of language anxiety based on the characteristics of dental English (in Chinese). J Inn Mong Univ Nationalities 18:225–226. https://doi.org/10.3969/j.issn.1008-5149.2012.06.115

Smith AFV, Thondhlana J (2015) The EAP competencies in a group case study project as revealed by a task analysis. J Engl Acad Purp 20:14–27. https://doi.org/10.1016/j.jeap.2015.03.001

Song Y, Zhou J (2022) Revising English language course curriculum among graduate students: an EAP needs analysis study. SAGE OPEN 12(3). https://doi.org/10.1177/21582440221093040

Tollefson J (2018) China declared world's largest producer of scientific articles. Nature 553(7686):390. https://doi.org/10.1038/d41586-018-00927-4

Totan T (2014) The Canonical effect of task articulation, peer relations, and self-regulation based social and emotional learning needs to fields of self-efficacy. EGIT BILIM 39(171):331–343

Travis J, Kaszycki A, Geden M, Bunde J (2020) Some stress is good stress: the challenge-hindrance framework, academic self-efficacy, and academic outcomes. J Educ Psychol 112(8):1632–1643. https://doi.org/10.1037/edu0000478

Usher EL, Pajares F (2008) Sources of self-efficacy in school: critical review of the literature and future directions. Rev Educ Res 78(4):751–796. https://doi.org/10.3102/0034654308321456

Van de Poel K, Gasiorek J (2012) Effects of an efficacy-focused approach to academic writing on students' perceptions of themselves as writers. J Engl Acad Purp 11(4):294–303. https://doi.org/10.1016/j.jeap.2012.07.003

Vasalampi K, Nurmi J-E, Jokisaari M, Salmela-Aro K (2012) The role of goal-related autonomous motivation, effort and progress in the transition to university. Eur J Psychol Educ 27(4):591–604. https://doi.org/10.1007/s10212-011-0098-x

Wang C, Schwab G, Fenn P, Chang M (2013) Self-efficacy and self-regulated learning strategies for English language learners: comparison between Chinese and German college students. J Educ Dev Psychol 3(1). https://doi.org/10.5539/jedp.v3n1p173

Wang S, Littlewood W (2021) Exploring students' demotivation and remotivation in learning English. System 103. https://doi.org/10.1016/j.system.2021.102617

Widdowson HG (1981) English for specific purposes: criteria for course design In: Selinker L, Tarone E, Hanzeli V (eds) English for academic and technical purposes. Newbury House Publishers, Boston

Woolfolk A, Shaughnessy MF (2004) An interview with Anita Woolfolk: the educational psychology of teacher efficacy. Educ Psychol Rev 16(2):153–176. https://doi.org/10.1023/B:EDPR.0000026711.15152.1f

Zhang X, Ardasheva Y, Austin BW (2020) Self-efficacy and English public speaking performance: a mixed method approach. Engl Specif Purp 59:1–16. https://doi.org/10.1016/j.esp.2020.02.001

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F.W.: Writing—original draft preparation; X.G.: Writing—original draft preparation, Software, Data curation; J.H.: Conceptualisation, Writing—review and editing.

Competing interests

The authors declare no competing interests.

Ethical approval

This study has been ethically reviewed and approved by the institutional research committee of the School of Foreign Languages and Literature of Shandong university and complied with the tenets of the Helsinki Declaration. There was no number attached to the approval.

Informed consent

Informed consent was obtained from all individual participants included in the study.

Additional information

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