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Influence of Demographic and Academic Variables on Portuguese Nursing Undergraduate Students' Critical Thinking

Influencia de las Variables Demográficas y Académicas en el Pensamiento Crítico de los Estudiantes Portugueses de Grado en Enfermería

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ABSTRACT:
Introduction: Critical thinking skills and dispositions are essential for performance and competence in clinical nursing practice. They significantly influence clinical judgment, decision-making, and problem-solving. These skills are crucial for nurses' adaption to changes in healthcare practices, technology and patient needs, ensuring the quality of care.
Aim: This study aims to evaluate if critical thinking skills and dispositions are influenced by gender, age, admission grade, and academic year of undergraduate nursing students in Portugal.
Methods: We conducted a cross-sectional, descriptive correlational study with a convenience random sample of 382 participants. Data was collected using the Critical Thinking Questionnaire for Students and Health Professionals and the Critical Thinking Dispositions Scale, validated for the Portuguese population. Statistical analysis was performed using a t-test, ANOVA, and hierarchical multiple regression model.
Results: Gender, age, and admission grade don't influence critical thinking skills and dispositions. The students in the second and third academic years have lower scores than those in the first and fourth. There were no significant correlations between the participants' critical thinking skills and dispositions.
Conclusions: All nursing students have high critical thinking dispositions and skills. The academic year grade is the only variable that influences critical thinking skills and dispositions.
Key words: Critical thinking; Skills; Students; Nursing.

RESUMEN:
Introducción: Las habilidades y disposiciones de pensamiento crítico son esenciales para el desempeño y la competencia en la práctica clínica de enfermería, ya que influyen significativamente en el juicio clínico, la toma de decisiones y la resolución de problemas. Estas habilidades son cruciales para que las enfermeras se adapten a los cambios en las prácticas sanitarias, la tecnología y las necesidades de los pacientes, garantizando una atención de calidad.
Objetivos: investigar si las habilidades y disposiciones de pensamiento crítico están influenciadas por el género, la edad, el grado de admisión y el año académico de los estudiantes universitarios de enfermería en Portugal.
Metodología: estudio descriptivo correlacional transversal con una muestra aleatoria por conveniencia de 382 participantes. Los datos fueron recogidos mediante el Cuestionario de Pensamiento Crítico para Estudiantes y Profesionales de la Salud y la Escala de Disposiciones de Pensamiento Crítico, validados para la población portuguesa. El análisis estadístico se realizó mediante una Prueba-t, un ANOVA y un modelo de regresión múltiple jerárquica.
Resultados: El género, la edad y la nota de admisión no influyeron en las habilidades y disposiciones de pensamiento crítico. Los estudiantes de segundo y tercer año académico obtuvieron puntuaciones más bajas que los de primero y cuarto. Asimismo, no hubo correlaciones significativas entre las habilidades y disposiciones de pensamiento crítico de los participantes.
Conclusiones: Todos los estudiantes de enfermería tuvieron altas disposiciones y habilidades de pensamiento crítico. El año académico es la única variable que ha influido en las habilidades y disposiciones de pensamiento crítico.
Palabras clave: Pensamiento crítico; Habilidad; Estudiantes de enfermería.

INTRODUCTION

Nursing is a dynamic and demanding occupation requiring professionals to make decisions promptly and correctly in a complex healthcare environment. Due to the complexity of healthcare systems and the growing need for patient-centred care and evidence-based practices, the healthcare environments are becoming more complicated and demanding. Several authors and international organizations consider critical thinking skills and dispositions essential to achieve the best performance and competence in clinical nursing practice. Critical thinking skills and dispositions are likely to influence clinical judgment, decision-making, and problem-solving, essential components of professional practice[1,2]. Critically thinking nurses are also more adaptable to new practices, technology changes, and patient profiles, resulting in increased diagnostic accuracy, as high thinking skills are required to interpret patient information accurately[3].

Critical thinking has been considered an essential component of professional responsibility and nursing care quality. A rigorous definition of critical thinking in nursing emerged from a Delphi study It includes a set of mental habits or affective dispositions such as confidence, contextual perspective, creativity, flexibility, curiosity, intellectual integrity, intuition, open-mindedness, perseverance, and reflection. A set of cognitive skills that critical thinkers should practice includes analysis, application of standards, discrimination, information seeking, logical reasoning, prediction, transformation of knowledge into practice, and prognosis[4]. According to the hypothesis of a sutdy by Nieto and valenzuela, the dispositional component would combine motivations and mental habits, although the contributions of each of those two factors vary as a function of the practice gained in such thinking. The cognitive skills guide the individual's task performance, whereas dispositions, comprising motivation, regulate the inherent predisposition, desire, will, and inclination to apply their cognitive capabilities[5].

Skills and dispositions, the components of critical thinking, are conceived as an intellectually disciplined process of actively and skillfully conceiving, applying, analyzing, synthesizing, and evaluating information gathered from or generated by observation, experience, reflection, reasoning, or communication as a guide to belief and action[6].

Although skills are pivotal for critical thinking, their proficiency alone does not ensure effectiveness. Therefore, it is essential to foment and motivate professionals to use these skills when necessary. Critical thinking dispositions are considered more valuable than merely possessing critical thinking skills, especially regarding transferability and sustained application over the long term[7].

Critical thinking skills and dispositions are crucial to delivering quality care. Its mobilization should occur at all stages of the decision-making process in nursing, namely to identify health problems and the reason for the consultation, gather information, analyze ideas and arguments, examine and interpret data, classify and decode the meaning of the data, and verify it, in case of doubt, with reliable data[8, 9]. Nurses must be open-minded, curious, analytical, inquisitive, and systematically collect data. They must seek out the data's credibility and demonstrate self-confidence and cognitive maturity with the patient and family to interact and create a relationship of trust[9].

Given the significance of critical thinking skills and dispositions in nursing training, it is necessary to comprehend the factors influencing them, allowing higher education institutions to actively promote their enhancement by integrating them into academic curricula[10]. The research on critical thinking skills in undergraduate nursing students has shown mixed results for the importance of age, gender, and academic year. Some studies found no differences, while others found punctual factors contributing to higher critical thinking. Age only correlates with critical thinking occasionally[11], with older students showing higher critical thinking[12]. Narni and colleagues found no difference in critical thinking between males and females[13], while other reports found differences in favour of females[14] or males[15].

In the same line, academic year have an opposite or neutral effect on critical thinking across years of study[8,11,15]. Critical thinking depends on various complex factors, and students of all ages, genders, and academic years have the potential to develop strong critical thinking skills. More research is needed to help clarify how these factors impact nursing students' development of critical thinking[16]. Improving critical thinking skills and dispositions challenges educators to foster more significant interaction with students and actively involve them in their learning process through active methodologies that stimulate critical thinking[9]. Most studies on nursing students' critical thinking present mixed results concerning gender, age, and academic year and do not assess critical thinking skills and dispositions or the admission grade variable. Furthermore, Portugal needs more studies on this subject due to the specificity of each country's high education and educational culture. The objectives of this study are:

- To analyze differences in critical thinking skills and dispositions according to gender, age, academic year, and admission grade.
- To analyze the relationship between admission grades, critical thinking skills, and dispositions.
- To investigate the relationship between critical thinking skills and dispositions.

METHODS

Study design

A cross-sectional descriptive-correlational study explored the relationships between gender, age, academic year, and admission grade (The admission grading uses a 50% average of the secondary education grades and a 50% average of the national admission examinations results) with critical thinking skills and dispositions in Portuguese undergraduate nursing students. Data was collected from October 2022 to July 2023.

Participants

The current study used a convenience sample of 382 nursing students from three higher nursing schools in northern Portugal.

Instruments

The Critical Thinking Questionnaire for Students and Health Professionals (CTQSHP), developed and validated for the Portuguese population[17]. This is a set of multiple-choice questions based on clinical dilemmas in various contexts and involving different professional areas within the health context.

The instrument assesses reasoning and validates whether or not the individual answering links to a specific critical thinking skill and puts it into practice through their choice of answer to the dilemma. It is not an assessment of clinical and health knowledge but rather the verification of reasoning demonstrating the assessed competence. The presented dilemmas focus on hypothetical clinical and health situations, allowing respondents to identify situations that can happen in their current or future professional context. The questionnaire assesses the critical thinking skills: Interpretation, Analysis, Evaluation, Inference, and Explanation. It has 19 questions (three on Interpretation, three on analysis, four on evaluation, five on inference, and four on explanation). When faced with a clinical dilemma, students must choose between four options, the one they consider to be the most correct and complete. Cronbach's alpha from the results in the present study was 0.62.

The score for each skill assessed by the CTQSHP ranges from 4 to 20 points, and the total score in the CTQSHP ranges from 20 to 100. The authors established cut-off points for the score on the questionnaire at above 75, between 50 and 75, between 25 and 49, and below 25 for high, average, low, and very low demonstration of critical thinking, respectively. Each subscale's score cut-off points are 5, 10, and 15[17].

The Critical Thinking Dispositions Scale (CTDS) is a self-report tool comprising 35 Likert-type items designed to assess the dispositions of college students. The instrument is structured around seven factors derived from the Facione Delphi report: truth-seeking, open-mindedness, analyticity, systematicity, self-confidence, inquisitiveness, and maturity of judgment[18]. Validation for the Portuguese population [19] demonstrated overall solid reliability for the CTDS ($\alpha = 0.94$) and good to acceptable reliability for seven subscales (α ranging from 0.62 to 0.75).

The CTDS yields a total score ranging from 70 to 350 points, with each disposition contributing 10 to 50 points. They were established threshold scores for Interpretation: a CTDS score of 280 indicates a high disposition towards critical thinking, a score between 210 and 279.9 reflects a positive disposition, a range of 140 to 209.9 signifies an ambivalent disposition and a score below 140 indicates a low disposition to critical thinking. Corresponding cut-off points on each subscale are 39, 30, and 20 points[19].

Ethical considerations

All ethical principles were respected, and all participants agreed that they knew and accepted the principles of informed consent, voluntary participation, and confidentiality of their answers. The study's ethical approval has been obtained by the ethical committee of the higher education institution of the authors of this study (Ref. Doc53-CE-UTAD-2022).

STATISTICAL ANALYSIS

Data analysis was carried out utilizing IBM SPSS Statistics, version 27. The validity of all necessary assumptions for the conducted statistical analyses was verified. Comparisons between total scores and scores from the CTDS and CTQSHP dimensions were performed using student t-tests and analysis of variance (ANOVA). When ANOVA indicated statistical significance, post-hoc Tukey HSD was applied to identify specific groups showing significant differences. Pearson and Spearman coefficients were computed to examine the correlation between subscale scores and other variables. The significance level for all statistical tests was set at 5%.

RESULTS

The participants' ages ranged from 17 to 48 (M=21.5, SD=4.8), and most were female (Table 1).

The sample size of participants for each academic year of the course was balanced, with a uniform proportion of participants of each gender across the four years ($X^2(3) = 2.16$, $p = 0.540$).

Table 1: Participants gender and curricular year.

Gender	***Academic year***				**Total**
	1	2	3	4	
Male	17 (4.5%)	25 (6.5%)	23 (6.0%)	12 (3.1%)	77 (20.2%)
Female	82 (21.5%)	82 (21.5%)	80 (20.9%)	61 (16.0%)	305 (79.8%)
Total	99 (25.9%)	107 (28.0%)	103 (27.0%)	73 (19.1%)	382 (100%)

The results obtained with the 382 nursing students revealed a CTDS (alpha=0.911) that is excellently reliable, and the CTQSHP was acceptable (alpha=0.601). The scores in the CTDS dimensions showed a significant correlation with the total score (r between 0.604 and 0.843, p<0.001). The scores in the CTQSHP dimensions significantly correlated with the total score (r between 0.583 and 0.644, p<0.001). The average score of study participants at CTDS was 275.4 (SD=30.2), indicating a favourable disposition toward critical thinking.

Almost all respondents had a favourable or high disposition toward critical thinking (379 students, 99.2%).

The students' age had a significant negative association with the total CTDS and with the dispositions: truth-seeking (r=-0.335, p<0.001), open-mindedness (r=-0.284, p<0.001), inquisitiveness (r=-0.107, p=0.037), and maturity of judgment (r=-0.123, p=0.016).

An analysis of the CTDS results by gender revealed that the two groups did not differ in the total CTDS and dispositions except for systematicity and cognitive maturity (Table 2).

Table 2: CTDS scores analysis by gender.

Variables	Gender	N	M	SD	t	df	*p*
Truth-seeking	Male	77	37.5	7.99	-1.53	380	0.127
	Female	305	39.0	7.93			
Open-mindedness	Male	77	37.3	7.08	-1.49	380	0.137
	Female	305	38.7	7.38			
Analyticity	Male	77	39.4	5.90	-1.47	380	0.142
	Female	305	40.3	4.62			
Systematicity	Male	77	39.5	4.90	-2.00	380	0.046
	Female	305	40.6	4.21			
Self-confidence	Male	77	38.3	5.32	1.28	380	0.203
	Female	305	37.4	5.09			
Inquisitiveness	Male	77	39.8	5.30	-1.67	380	0.096
	Female	305	40.7	4.27			
Maturity of judgment	Male	77	38.2	5.85	-2.75	380	0.006
	Female	305	40.0	4.86			
CTDS	Male	77	269.9	33.61	-1.79	380	0.075
	Female	305	276.8	29.18			

Female students had significantly higher scores than male students in systematicity, maturity of judgment, and total CTDS.

First-year students tended to have higher average scores in all dimensions of the CTDS than students in the following course years (Table 3). Students in different academic years showed significantly different average scores in the total CTDS and its dimensions, except for systematicity and self-confidence, which were tendentially uniform among the four years of the course.

Table 3: CTDS scores analysis per academic year.

Variables		N	M	SD	F	df	p
Truth-seeking	year 1	99	44.2	4.00	28.0	(3.378)	<0.001
	year 2	107	36.4	8.36			
	year 3	103	36.0	7.94			
	year 4	73	38.5	7.76			
Open-mindedness	year 1	99	42.9	4.55	20.6	(3.378)	<0.001
	year 2	107	36.4	7.60			
	year 3	103	36.3	7.87			
	year 4	73	38.4	6.62			

Variables		N	M	SD	F	df	p
Analyticity	year 1	99	40.5	4.10	2.64	(3.378)	0.049
	year 2	107	39.4	5.11			
	year 3	103	39.8	5.67			
	year 4	73	41.3	4.25			
Systematicity	year 1	99	40.5	4.16	0.13	(3.378)	0.945
	year 2	107	40.3	4.57			
	year 3	103	40.2	4.70			
	year 4	73	40.4	3.93			
Self-confidence	year 1	99	37.2	4.61	1.12	(3.378)	0.342
	year 2	107	37.3	4.88			
	year 3	103	37.7	5.84			
	year 4	73	38.5	5.16			
Inquisitiveness	year 1	99	42.4	3.99	9.10	(3.378)	<0.001
	year 2	107	39.5	4.48			
	year 3	103	39.8	4.69			
	year 4	73	40.8	4.23			
Maturity of judgment	year 1	99	41.2	4.70	5.58	(3.378)	0.001
	year 2	107	38.6	5.09			
	year 3	103	38.9	5.35			
	year 4	73	40.1	4.89			
CTDS	year 1	99	288.9	22.1	11.7	(3.378)	<0.001
	year 2	107	267.9	31.3			
	year 3	103	268.5	33.2			
	year 4	73	278.0	27.4			

As observed in Table 3, considering the posthoc comparisons, first-year students were more truth-seeking and open-minded than students in any other course year. They were more inquisitive and mature in judgment than their peers in the second or third-course year and had a higher CTDS total score. Second-year students were more analytical than fourth-year students.

The correlation between the CTDS score and the nursing course admission grade was reduced and not significant (-0.035 and 0.009). It was analyzed only for the 99 students in the first year.

Generally, we observed that nursing students had an average demonstration of critical thinking skills of 73.2 (SD=9.2) on the CTQSHP, resulting from the individual average or high classifications on thinking skills (380 students, 99.5%).

The CTQSHP total score did not show differences between female and male students (Table 4).

Table 4: CTQSHP scores analysis by gender.

Variables	Gender	N	M	SD	t	df	*p*
Interpretation	Male	77	13.8	3.69	-0.02	380	0.981
	Female	305	13.8	3.24			
Analysis	Male	77	15.0	3.45	-2.11	380	0.035
	Female	305	15.9	3.01			

Variables	Gender	N	M	SD	t	df	*p*
Evaluation	Male	77	14.6	2.87	-1.58	380	0.114
	Female	305	15.2	2.84			
Inference	Male	77	15.1	3.11	-1.19	380	0.236
	Female	305	15.5	2.63			
Explanation	Male	77	13.0	2.80	-0.85	380	0.393
	Female	305	13.3	3.02			
CTQSHP	Male	77	71.5	10.36	-1.85	380	0.065
	Female	305	73.7	8.81			

As observed for the CTDS, first-year students had average scores higher than students in other years in almost all the dimensions (Table 5).

Table 5: CTQSHP scores analysis by academic year.

		N	M	SD	F	df	p
Interpretation	year 1	99	14.2	3.28	7.56	(3.378)	<0.001
	year 2	107	13.1	3.12			
	year 3	103	13.3	3.46			
	year 4	73	15.2	3.05			
Analysis	year 1	99	16.8	2.29	7.52	(3.378)	<0.001
	year 2	107	15.0	3.24			
	year 3	103	15.1	3.20			
	year 4	73	16.0	3.38			
Evaluation	year 1	99	15.8	2.19	3.45	(3.378)	0.017
	year 2	107	14.6	3.21			
	year 3	103	14.7	2.92			
	year 4	73	15.3	2.84			
Inference	year 1	99	16.0	2.45	2.89	(3.378)	0.035
	year 2	107	15.3	3.28			
	year 3	103	15.3	2.49			
	year 4	73	14.8	2.41			
Explanation	year 1	99	13.3	2.67	6.17	(3.378)	<0.001
	year 2	107	12.8	3.14			
	year 3	103	12.7	3.01			
	year 4	73	14.5	2.75			
CTQSHP	year 1	99	76.1	6.75	9.91	(3.378)	<0.001
	year 2	107	70.9	9.64			
	year 3	103	71.1	9.81			
	year 4	73	75.8	8.78			

Significant differences were observed between students in the four years in the total CTQSHP score and the scores by dimension. Posthoc comparisons showed that first-year students were more analytical than those in their third year. They also showed better evaluation and inference skills than their peers in the second and fourth years, respectively. Those finishing graduation in the fourth year had better interpretation skills than those in the second and third years and had better explanation skills than those in any other course year.

The correlations between the CTQSHP scores and the admission grade for the 99 students enrolled in the first year were not statistically significant for the total and most of the dimensions (range between -0.109 and 0.135). Exception for the correlation between the admission grade and dimension evaluation skills (r =0.206, p =0.041), which, being significative, has a limited interest due to its low absolute value.

The correlation between the participant's age and the CTQSHP scores was significant for the analysis dimension (*r*=-0.147, *p*=0.004). There was no observed relationship between CTDS and CTQSHP total scores (r=0.050, p=0.331). Punctual low-value significant correlations were observed between self-confidence and maturity of judgment dispositions and CTQSHP total score (r=-0.107, p=0.037r=0.105, p=0.040, respectively). Analysis skills were positively associated with CTDS total score (r=0.136, p=0.008)

DISCUSSION

The literature provides contradictory results regarding the influence of demographic and académic variables, such as age, gender, academic year, and admission grade, on critical thinking skills and dispositions. This study aimed to clarify the influence of these variables on the critical thinking skills and dispositions of undergraduate nursing students in Portugal.

Almost all students had average or high critical thinking skills and dispositions. These results in nursing students are a desirable outcome linked to potentially improved clinical judgment, problem-solving, and clinical decision-making, resulting in better patient nursing care[20, 21]. Recognizing the significance of critical thinking in educational environments, academic institutions can implement learning techniques to encourage these skills in students. These strategies contribute to educating nurses with more critical reflective skills and autonomy in decision-making that can positively impact their future professional performance[22].

The results obtained from the CTDS scale revealed that undergraduate nursing students have a high overall disposition to think critically. Higher scores on the CCTDI are associated with improved problem-solving skills, highlighting the significance of these affective qualities in students' overall critical thinking.

The analysis of the dispositions studied revealed that female nursing students generally presented the highest scores on the "truth-seeking" and "open-mindedness" subscales and lower on "systematicity" and "self-confidence".

Open-mindedness and "truth-seeking", as essential critical dispositions, play a crucial role in expanding students' knowledge. These traits are important for fostering a desire to learn and have been linked to better academic performance in higher education, underscoring their potential impact. Truth-seeking behaviour has been described as the main predictive dispositional factor for an individual with robust critical thinking. Truth-seeking is crucial for reassessing beliefs, particularly in healthcare, where new information and scientific advancements frequently arise. This mindset helps evaluate and accept fact-based insights that may challenge existing theories and practices[23]. While analytical skills and confidence in reasoning contribute to problem-solving, they

are not as indicative of student success and readiness as qualities like open-mindedness[24].

Female students also had a higher mean score on the analysis dimension and CTQSHP total score. The results are consistent with those obtained for Portuguese university students from various academic fields[25]. In the study conducted with nursing students from Ghana, mean scores were highest on the confidence in the reasoning subscale and lowest on the truth-seeking. Research from more democratic environments reports a greater willingness of nursing students to think critically, possibly because there is more space for freedom of expression[22].

In the present study, female students had a higher inclination towards critical thinking in particular domains, which is consistent with several works suggesting that females possess more critical-thinking dispositions[26, 27]. However, gender differences are not unanimous once research has produced contradictory results, between lack of differences or only slightly ones between genders[4,13, 28].

The influence of students' age on their critical thinking dispositions was found to have a significant negative association with the total CTDS and with the dispositions of truth-seeking, open-mindedness, inquisitiveness, and maturity of judgment. Studies have shown that older students tend to have slightly lower levels of critical thinking dispositions, especially in domains such as open-mindedness, self-confidence, and maturity[29].

Previous studies present contradictory trends, with positive[12] and negative associations between age and critical thinking. In the present study, the negative correlation between age and the CTQSHP dimension of analysis suggests that younger students may have more analytical skills.

The results suggest that as students advance in their studies, their critical thinking shifts to problem-solving, limiting their openness to new perspectives. Although senior students gain confidence and reflective skills, their increased experience may narrow their focus, reducing receptiveness to diverse ideas. A study by Gittens and Facione on open-mindedness found that younger university students tend to have a greater disposition toward critical thinking, as they are more open to questioning established ideas and concepts while still in the process of forming their own beliefs and values[30].

The practical significance of the correlations found must be interpreted cautiously, as the relationship between age and critical thinking can be complex and depend on other factors, such as previous education and life experience[30].

The knowledge, experience, and skills acquired during nursing education are simulated anticipations to shape the decisions and practices of individuals in their professional careers[11,18]. We found significant differences in students' critical thinking dispositions and skills across different curricular years, generally similar to those observed for age once the course is expected to have older students as it progresses. First-year students consistently exhibit higher critical thinking dispositions and skills scores across various dimensions and in the total CTDS and CTQSHP compared to their peers in later years.

Early education and experiences influence critical thinking, with the first year being a particularly formative period for the development of student's skills and dispositions[12, 31]. A study found that college freshmen exhibited strengths in open-mindedness and inquisitiveness, but weaknesses in systematicity and resistance to truth-seeking[30]. Other studies reported a significant improvement in critical thinking skills[20] and dispositions[29] over the academic years. Some research shows a positive relationship between academic progression and higher scores in critical thinking skills[20], while in others, no statistically significant difference was determined between the critical thinking levels of the students measured at the beginning and end of the academic year [8]. These differences may be due to variations in methodological approaches, cultural aspects, and the teaching-learning process[8, 12].

In the present study, no significant associations were observed between the students' admission grades and CTDS and CTQSHP scores. The literature review did not find studies that analyzed the relationship between critical thinking and the student's admission grade. The variable most similar to the admission grade is the GPA (Grade Point Average). Most of these studies relate GPA to academic performance. Some authors suggest a positive correlation between high academic performance in university and strong critical thinking skills and dispositions. Students who perform well in standardized tests or have high GPAs often demonstrate better critical thinking[32].
The relationship between critical thinking skills and dispositions is another subject of interest in nursing education research. Generally, a positive correlation exists between critical thinking skills and dispositions. We did not find any correlation between the two constructs in the present study. Nursing students who exhibit strong critical thinking dispositions are more likely to develop and apply critical thinking skills effectively in clinical practice.

Limitations of this study: While the study's sample size of 382 students may be viewed as a drawback, it met the necessary assumptions for statistical analysis. Any extrapolation of results should consider that the sampling process was not randomized. Another drawback could be adopting a measure based on students' assessments of their critical thinking dispositions. The social desirability may bias self-reported questionnaires. Additionally, bias could arise from respondents' perceptions of their stance concerning the notion and how they interpret the idea covered in the questions.

CONCLUSIONS

This study has contributed to understanding how demographic and academic factors affect Portuguese nursing students' critical thinking dispositions and skills. Of the variables gender, age, academic year, and admission grade, we found that only the students' academic year influences their critical thinking skills and dispositions. As the student progresses in the nursing course, apparently, they lose their critical thinking skills and dispositions. These findings should be a clue for nursing school teachers to research the causes of that reduction in critical thinking, viewing the implementation of strategies to correct that apparent bias. Further research and exploration of the factors influencing critical thinking in nursing students is necessary to understand how to support their development and avoid their reduction. The educational programs may benefit from addressing age-specific needs in training critical thinking to maintain an open-mind throughout academic progression. Nursing students should develop critical

thinking skills as a valuable tool to improve their decision-making ability and quality of care in complex clinical circumstances after graduation.

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