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DEVELOPMENT OF CRITICAL THINKING IN NURSING STUDENTS

DESENVOLVIMENTO DO PENSAMENTO CRÍTICO NOS ESTUDANTES DE ENFERMAGEM

DESARROLLO DEL PENSAMIENTO CRÍTICO EN LOS ESTUDIANTES DE ENFERMERÍA

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Objective: To analyse the critical thinking developed by students participating in a curricular component of undergraduate nursing programmes. Method: Qualitative, observational and comparative study before and after the intervention. A sociodemographic questionnaire and text stimulus were applied in two phases. The sample consisted of 48 students enrolled in the Critical Thinking In Nursing course. Results: In the first phase, the students recognized critical thinking as important in decision-making, in the development of skills and in the process of educating them to think. In the second phase, the comments indicated an active role of the school, and the knowledge of students improved in the formative context. Final considerations: In the critical thinking developed by the students who participated in the curricular component of the nursing programme, a significant change was found in the lexicon in both phases, and critical thinking skills were developed, in particular interpretation, argumentation, analysis, and evaluation.

Descriptors: Thought. Knowledge. Clinical Decision-Making. Nursing Education. Nursing students.

Objetivo: analisar o pensamento crítico desenvolvido pelos estudantes participantes de um componente curricular do curso de graduação em enfermagem. Método: estudo de natureza qualitativa, observacional e comparativa, antes e após a intervenção. Foi aplicado questionário sociodemográfico e texto-estímulo em dois momentos. A amostra foi constituída por 48 estudantes que frequentaram a unidade curricular de Pensamento Crítico em Enfermagem. Resultados: no primeiro momento, os estudantes reconheceram o pensamento crítico como importante na tomada de decisão e no desenvolvimento de competências, educar para pensar. No segundo momento, os comentários indicaram um papel ativo da escola, e a informação e o conhecimento do estudante são acurados no contexto formativo. Considerações finais: no pensamento crítico desenvolvido pelos estudantes participantes do componente curricular do curso de enfermagem constatou-se alteração significativa no léxico dos dois momentos, houve desenvolvimento de habilidades de pensamento crítico, das quais destacamos a interpretação, a argumentação, a análise e avaliação.

Descritores: Pensamento. Conhecimento. Tomada de Decisão Clínica. Educação em Enfermagem. Estudantes de Enfermagem.

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Objetivo: analizar el pensamiento crítico desarrollado por estudiantes que participan en un componente curricular de la carrera de licenciatura en enfermería. Método: estudio cualitativo, observacional y comparativo, antes y después de la intervención. Se aplicó un cuestionario sociodemográfico y un "texto estímulo" en dos momentos. La muestra estuvo constituída por 48 estudiantes que cursaron la unidad curricualar de Pensamiento Crítico en Enfermería. Resultados: en un primer momento, los estudiantes reconocieron el pensamiento crítico como importante en la toma de decisiones y en el desarrollo de habilidades, educar para pensar. En un segundo momento, los comentarios indicaron un papel activo de la escuela, y la información y los conocimientos del alumno son precisos en el contexto formativo. Consideraciones finales: en el pensamiento crítico desarrollado por los estudiantes que participaron en el componente curricular de la carrera de enfermería, hubo un cambio significativo en el léxico de los dos momentos, hubo un desarrollo de habilidades de pensamiento crítico, de las cuales se destacan la interpretación, argumentación, análisis y evaluación.

Descriptores: Pensamiento. Conocimiento. Toma de decisiones clínicas. Educación en enfermería. Estudiantes de enfermería.

Introduction

Critical thinking comprises a set of skills including inference, assumption, deduction, interpretation, and evaluation. It is also defined as judgement with purpose, self-regulation, interpretation, analysis, evaluation, and inference[1-2]. Critical thinking allows clarifying objectives, assumptions and evidence, holding others accountable for their actions, and evaluating conclusions[3]. In this sense, there is consensus that critical thinking is not a method to be learned but rather a process that requires a set of dispositions recognized as necessary to think critically[3-4]. These dispositions also allow for trust, for envisioning contexts, for being creative, flexible, curious, intellectually conscientious, and for building intuitive capacity, understanding, firmness and reflection; therefore, they are necessary characteristics in the domain of both cognitive and affective reasoning.

Critical thinking is defined as a mental process involving the perception, analysis, synthesis, and active and skilful evaluation of information collected through observation, experience and communication; this thinking can guide the construction of nursing diagnoses and facilitate treatment decisions[5-6].

Critical thinking competency, despite materializing into decisions, is essentially a mental process, a way of critically and creatively looking at data. Thus, knowing that competence manifests in and is evaluated based on action taken, when critical thinking is presented as a competence, it is important to establish that the action of thinking is being referenced herein.

The development of these competencies can help in problematization and in decision-making and interventions. For these reasons, in the context of nursing training, a course is offered that is taught using different strategies, for example, concept mapping and the interpretation, analysis and evaluation of clinical cases, enabling students to engage in critical thinking. A previous study investigated the skills or cognitive attributes of critical thinking as structural and essential elements in the development of critical thinking and presented a teaching strategy based on the construction of concept maps[7]. The same authors, in a study with undergraduate nursing students, reinforced the idea of using a teaching strategy that involved the construction of concept maps, as the results indicated good performance in the promotion of general critical thinking and associated skills. Teaching strategies based on constructivist theories should be encouraged because they play a significant role in improving students' learning and critical thinking[8].

Thus, the objective of this study was to analyse the critical thinking developed by students who participated in a curricular component of an undergraduate nursing programme.

Method

This is a qualitative, observational, and comparative study that compares measures before the intervention and after the intervention.

The study setting was a nursing school at a university in southern Portugal; the participant were students enrolled in the Critical Thinking in Nursing course, which was offered as an option in the first and second curricular years of the nursing undergraduate programme. As a pedagogical strategy, different methodologies were used: individual verbal methods with exposure, explanation, dialogue, and debates and intuitive methods through written text, concept mapping, and group work with critical and reflective analyses of case studies.

All students enrolled in the Critical Thinking in Nursing course participated in the study. Thus, the sample consisted of 48 participants, mostly female, with a mean age of 19 years; all students were in their 1st or 2nd year of the undergraduate nursing programme.

Data collection occurred during the first in-person class immediately after a formal 30-minute introduction of students and the professor and during the last class of the curricular unit. A sociodemographic questionnaire and a written testimony, as a stimulus text, were used as data collection instruments, which were applied by the professor responsible for the course. Regarding the procedures, a stimulus text, an excerpt from "Competent Rebels," a lecture by the author[6], was provided to the participants. The text address the concept of "competent rebels" and the fact that there is "nothing better" to generate disobedience than art and creativity. According to the author, "Today's schools should teach how to think, choose, and act," and he emphasizes that schools should educate to foster critical thinking among students, thus forming "competent rebels"[6].

A free critical analysis of the excerpt was requested during the first and last class sessions of the curricular unit; the students were unaware of the evaluation, and the analysis did not have a word count limit. The results before and after the intervention were compared to detect potential changes in the thought process of students.

The collected data were subjected to textual analysis using the software *Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires* (IRAMUTEQ)[9]. This approach allowed describing the material produced as well as performing a relational analysis. The software quantitatively analyses textual data, from basic lexicography to multivariate analysis, through descending hierarchical classification (DHC), providing contexts and classes of content based on vocabulary similarity. The analysis is based on frequencies and means; the text segments are classified based the vocabulary, which is distributed based on the frequency of the reduced forms.

A stable and definitive classification was obtained based on matrices that were created by crossing the text segments and the words in repeated chi-square tests. The classes are composed of several text segments or elementary context units (ECU) based on the predominance of vocabulary[9].

Next, the data were processed, and the text segments identified were used as excerpts to support the naming of the classes. They were analysed and compared for both phases using content analysis of the excerpts/text segments.

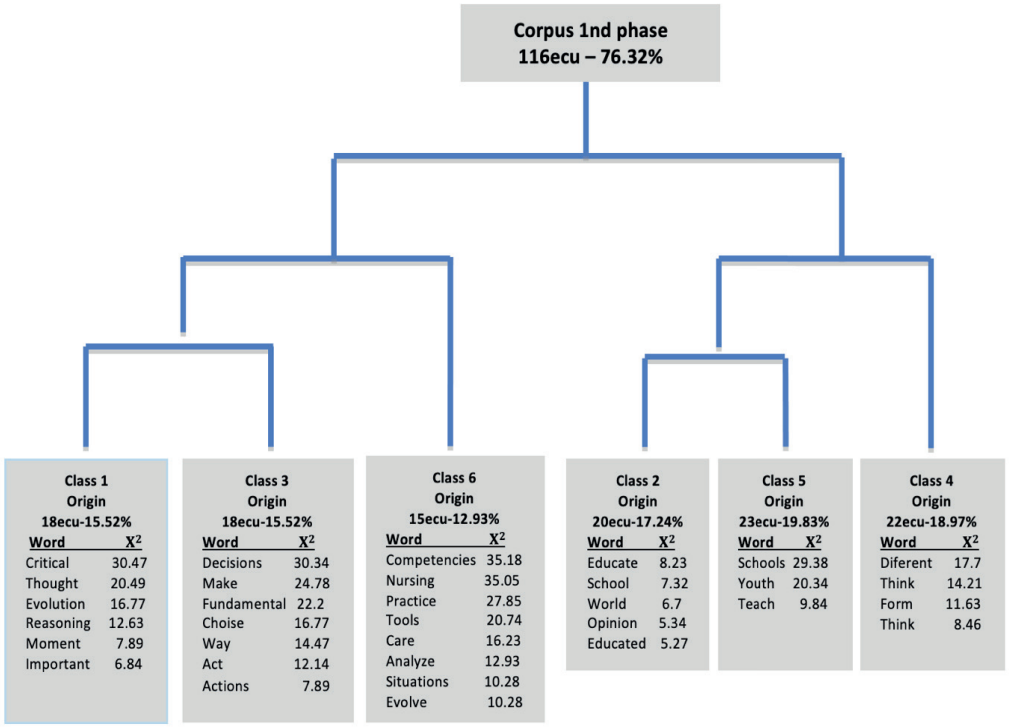
This study was approved by the Ethics Committee for Research in the Areas of Human Health and Welfare of the University of Évora, Portugal, under no. 15005. All participants included in the study signed an informed consent form. To maintain the anonymity of the participants, the letter Q (questionnaire) followed by a number was adopted. This coding ensures that the identity of the subject cannot be associated with individual responses, and the results are presented in such a manner that the study participants cannot be recognized.

Results

The study participants were provided with the text stimulus and asked to comment on the text at the beginning and end of the course. Thus, the

48 comments from the first phase constitute one corpus under analysis. In the textual analysis, the DHC retained 116 text segments, corresponding to 76.32% of the total text analysed, and divided the corpus into six classes, as shown in Figure 1.

Figure 1 – Dendrogram of classes based on comments on the text "Competent Rebels" (first phase)



Source: Prepared by the authors.

The dendrogram (Figure 1) shows a clear division of the corpus into two branches. The first branch, which encompasses classes 1, 3 and 6, highlights the importance of "critical thinking in decision-making" and, consequently, contains fewer comments regarding the development of competencies (51 ECUs). The second branch, which includes classes 2, 5 and 4, contains a dimension marked by "schools need to teach thinking", includes most of the comments (65 ECUs) and is therefore a more relevant dimension for these participants.

When analysing the classes individually in order of frequency of ECUs, class 1 within the first branch focused on "critical thinking as something important," supported by the following statement:

> [...] *the author defends* [...] *distinguishing what is right and what is wrong using critical thinking in the decisions and indecisions of our life* [...]. (Q6).

Class 3 included "critical thinking as something important side-by-side with decision-making," supported by the following statement:

> [...] *we can have knowledge to correct bad practices* [...] *to ask questions to be able to make decisions based on critical thinking* [...]. (Q4).

In this branch, class 6 emphasised "competencies and their support,", supported by the following statement:

> [...] *tools such as knowledge are needed to develop skills for good clinical practice* [...] *the school is an institution that should support and sustain the development of thinking* [...]. (Q8).

Class 5, in the second branch of the corpus, contained the highest percentage of comments, focused on the "school context" as a place of knowledge transfer, supported by the following statement:

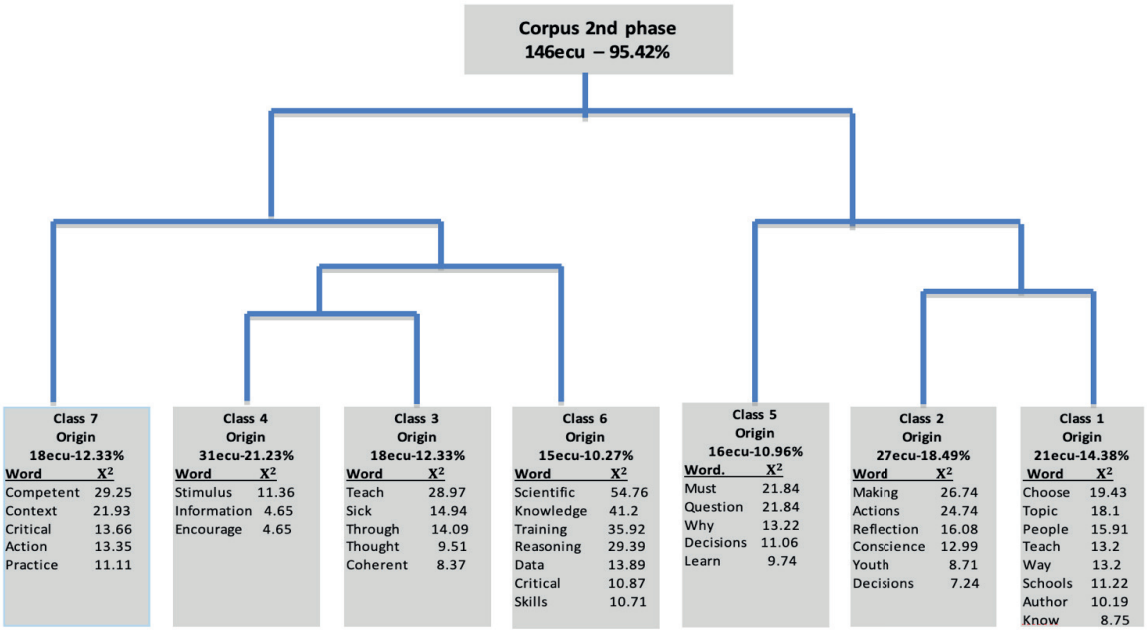
> [...] *schools, among others, should educate students for critical thinking* [...] *they should form competent rebels to open up horizons in their knowledge* [...]. (Q4).

Class 2 emerged at the level of class 5 and focused again on schools as entities that teach thinking (*e.g.,* schools should generate a critical disposition in students regarding all matters of their lives). Class 4 revealed the need for schools to be entities that focus on students and train them to "think differently", supported by the following excerpt:

> [...] *there is criticism, and through it, we can overcome certain attitudes* [...]. (Q2).

The 48 comments from the second phase constitute another level of the corpus under analysis, i.e. the post-training phase. Regarding the textual analysis results, the DHC retained 146 text segments, corresponding to 95.42% of the text under analysis, and divided the corpus into seven classes, as shown in Figure 2. The analysis also allowed for the division of the corpus into two major branches. The first branch encompassed classes 7, 4, 3 and 6, and the number of comments indicated that "information" determined by context can "teach coherent thinking" through the use of scientific knowledge.

Figure 2 – Dendrogram of classes in the 2nd phase of comments regarding the text "Competent Rebels"



Source: Prepared by the authors.

By analysing the classes based on the number of comments, class 4 had the highest percentage (21.33%) but with very low chi-square values. This class was dominated by "stimulus/information":

> [...] *the greater the stimulus/information for critical thinking, the greater the acquisition of knowledge* [...]. (Q1).

Class 7 had two words with high chi-square values, "competent and context", which the participants associated with action and practice, as clarified in the following excerpt:

> [...] *the critical and complete approach, as already mentioned, begins with a context... to evaluate the context again to reformulate our action* [...]. (Q10).

"Teaching coherent thinking" appeared in class 3, supported by the following excerpt:

> [...] *Critical thinking should be developed during school time through exercises or real situations* [...]. (Q21).

Class 6 had very high chi-square values and reflected a tendency to more developed thinking; for example, "scientific knowledge" can be derived from "training" and lead to "reasoning". The participants reclaimed a set of concepts that they use and consider important, which is evident in the following statements:

> [...] *analyse the situations, collect data and information from them, and process this information, and then, we*

> *must ponder by using clinical reasoning from clinical experience and scientific knowledge* [...]. (Q7).

> [...] *Critical thinking allows one to better assess the situation and reflect on it, which leads to decision-making and subsequently to the action that incorporates scientific knowledge* [...]. (Q16).

The second branch involves classes 5, 2 and 1, in order of the number of comments. Class 2 reflected the concept that "action" involves "reflection" to "learn to make decisions", as stated by one of the participants:

> [...] *there would never be a good decision-making without this tool or, more importantly, a reflection on our actions* [...]. (Q3).

Class 1 included the dimension "school" to "teach how to choose", which was considered little explored in the students' discourse, as can be observed in the following assertion:

> [...] *Critical thinking is not developed in schools, but it should be because it is through it that we can question, try to change, and learn how to argue* [...]. (Q9).

The dimension "learning to question," so as to make informed decisions, was included in class 5. The participants valued the fact that teachers encourage them to be active elements in the classroom, in nursing practice, and in personal development, as illustrated in the following text:

> [...] *encourages students to always seek the best decisions through self-awareness and self-reflection* [...]. (Q2).

Discussion

The participants in this study were enrolled in an optional course called Critical Thinking in Nursing, i.e., the students were there by their own choice. This is a determining factor in their development because, when they chose, they already had a natural predisposition to explore and develop the topic. Experience fosters the development of critical and reflective thinking about nursing actions from the perspective of systematized care and the establishment of connections in academia and clinical practice with professors and hospital staff; furthermore, incorporating scientific evidence is important for the resolution of clinical practice issues to ensure safe and quality nursing care[10].

The results found in this representational study of the process of developing critical thinking skills are divided into two phases: before the intervention and after the intervention. The data indicate that the participants at the first phase, before the intervention, considered the development of critical thinking as something necessary in decision-making and, consequently, in the development of competencies. Conceptually, this reinforces the importance of critical thinking in evaluations, diagnoses, and the planning of interventions, corroborating the results of studies developed by other authors, who consider the use of critical thinking in the diagnostic process essential to achieve accurate nursing diagnoses and provide safe and quality care[3,10-12]. In addition, the results of the first phase of the study represent a dimension marked by the school having the responsibility of teaching critical thinking, a result that we consider consistent with those of studies that involve interviews and concept mapping. In addition, learning to think and analyse arguments by developing skills or cognitive attributes is considered a structural and essential element for the development of critical thinking[7-8,13].

In the second phase of the study, post-intervention, there was very significant development at the conceptual level, including the concept of critical thinking and its applicability to nursing students. The concept of information emerged, supported by the formative context, indicating that critical thinking should be taught using scientific knowledge. This idea is corroborated by another study[11] that propping that critical thinking should be combined with knowledge and that students should be encouraged to think about thinking. In turn, there was an action revealed in the post-intervention phase that would lead to consistency in the process of learning to make decisions: schools/universities have the function/obligation to teach students how to learn and to question reality, both from a theoretical and practical point of view. This idea is corroborated by authors[3-4,12] who refer to thinking as self-directed, self-disciplined, self-monitored and self-corrective,

which implies effective communication in problem-solving. This idea is of vital importance in the development of nursing as a discipline; it is considered highly relevant for possessing theoretical and clinical knowledge in the context of clinical practice and is seen as an agent that promotes reflection during actions. It is crucial to establish cooperative learning and a collaborative approach that promotes the integration of theory and practice and of the various agents involved, especially students. The evaluation of competencies in the context of clinical practice in the nursing programme allows optimizing these practices and establishing future professionals who have a greater degree of adaptability[14].

The scientific knowledge expressed by the students in the second phase indicates that evidence-based practice is a strategy with high potential to motivate students regarding knowledge acquisition. In addition, students became aware of the importance becoming familiar with patient preferences and clinical experience in decision-making[15]. This development of clinical reasoning improves the diagnostic capacity of students and, consequently, accurate nursing diagnoses, thus favouring the choice of more appropriate nursing actions to achieve the expected outcomes. Different diagnoses can be possible; however, students are better prepared to prioritize the diagnosis that best reflects the clinical presentation[16]. The findings of this study indicate that knowledge about the dynamism of the stages of nursing processes, the acquisition of scientific knowledge, the development of clinical reasoning, and intellectual skills can improve the diagnostic capacity of future nurses and, consequently, increase the accuracy of diagnoses[16].

Curricular units such as Critical Thinking in Nursing, like other critical thinking programmes, can empower nursing students and the critical-reflective thinking of undergraduate students with regard to aspects related to health-disease processes and can act as sources of transformation in the training of health professionals with regard to the health needs of people[10,16]. However, the students' post-intervention responses indicate that gathering information has special relevance in interdisciplinary dynamics, which is defined as a strategy for teaching skills, because in the training of students, information fills gaps when developing critical thinking, an approach supported by integrated training. Competence should be part of every training session and taught in an integrated manner throughout the curriculum to build a cognitive base in a continuous and procedural way, allowing students to internalize competencies and their importance in patient care; this is the reason why this course is taught in the second semester of the first year of the programme[17].

As the students mentioned in the second phase, learning to question leads teachers to consider applying other teaching-learning strategies, which can generate satisfaction and self-confidence. Simulation, one of the most talked about but still little used approaches, and traditional strategies can be used mutually in nursing training. Simulation-based education is an important component of preparing students for a successful transition to clinical practice. It allows students to practice diagnostic evaluations, actions, and outcome evaluations, as often as necessary, until becoming confident in their decision-making and actions. In addition, it contributes to the satisfaction, knowledge, confidence, competence, and critical thinking of students[18-19].

The training of future nurses should be built on the educator-student relationship and through an inclusive dialogue about the reality associated with clinical reasoning and the provision of quality care. This communication must be mediated by a coherent, receptive, and reflective discourse in a situational context to contribute to the professional training of nurses, in particular, the development of critical thinking skills in nurses[14-16,20].

This study may contribute to nursing education because it furthers the understanding of the development of critical thinking and consequent decision-making in evaluations, diagnoses, and the planning of actions, which are essential for an accurate diagnosis. In

addition, understanding the development of critical thinking in nurses may contribute to future interventions and studies that evaluate the development of this process, serving as a basis for the development and implementation of teaching strategies that aim to stimulate critical thinking skills throughout the nursing process.

The main limitation of this study is related to the fact that it was conducted with students from a nursing school of one public university. Thus, other educational institutions and public and private nursing schools should be included in future studies.

Final considerations

When analysing the critical thinking developed by the students enrolled in a curricular unit, similarities and differences were observed between the first and second phases under analysis.

Among the similarities, we highlight the importance attributed to critical thinking. As this is an optional curricular unit, students who choose to enrol have some desire to go through this training.

Among the similarities, the role attributed to the school in the process of developing critical thinking is also noteworthy. This is thus understood as a promoter of the nonconformity underlying "rebellious", creative, and critical thinking.

Regarding the differences, there is an increased capacity for the analysis of and inference from text and a significant change in the lexicon used in the two phases, denoting the development of critical thinking skills, of which interpretation, analysis, and evaluation are highlighted.

It can therefore be stated that the methodology used in the classroom allowed students to manifest necessary dispositions for critical thinking. The fact that different strategies were used allowed the students to develop a deeper understanding of the concept of critical thinking. This is recognized by the systematic use of concensus indicators among authors and a lack of necessary provisions for critical thinking.

The results of the study allow us to state that schools can teach competent rebellion. This process of the appropriation of critical thinking skills in students should be continued. It is not static and requires constant interdisciplinary monitoring and encouragement, as well as appropriate didactics for its implementation. Critical thinking is considered essential to the development of nursing students because it stimulates their creativity, flexibility, curiosity, intellectual integrity, intuitive ability, understanding, perseverance, and reflection in everyday activities and nursing practice.

Contributions:

1 – Conception, design, analysis and interpretation of the data: Maria do Céu Mendes Pinto Marques and Manuel José Lopes;

2 – Writing of the article and relevant critical review of the intellectual content: Maria do Céu Mendes Pinto Marques, Manuel José Lopes, and Dulce Magalhães;

3 – Final approval of the version to be published: Maria do Céu Mendes Pinto and Luís Sousa.

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