

# Health education on anxiety disorders in biology instruction based on an inquiry-based teaching sequence

## ABSTRACT

The study presented in this paper analyzed the evaluations provided by high school students at a state school in the municipality of Taparuba, Minas Gerais, regarding an inquiry-based teaching sequence on anxiety disorders, developed as part of the biology curriculum. The IBTS was developed with 56 students and involved the participation of a health professional from a municipal agency focused on student health, as part of an intersectoral health education initiative. The approach to the topic sought to provide a broader perspective on mental health, with a focus on biopsychosocial aspects. The data were collected using the focus group method, with 12 students selected at random from among those who had participated in the IBTS. The researcher's observations during the IBTS and the analysis of the students' comments in the focus group indicate that the students view the IBTS on anxiety disorders positively. They believe that IBTS brought a relevant and necessary discussion to the school setting, as it applied biological knowledge to address the situations faced by adolescents both inside and outside of school. The students drew on their prior knowledge, and the IBTS facilitated the exploration and expansion of that knowledge. From the participants' perspective, anxiety disorders have an impact on school life, and making contact with healthcare professionals can help students seek qualified assistance. Inquiry-based biology instruction can contribute to a broader understanding of mental health and foster in students an investigative mindset for solving the problems they face.

**KEYWORDS:** biology education; inquiry-based learning; inquiry-based teaching sequence; health education; anxiety disorders.

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# Educação em saúde sobre transtornos de ansiedade no ensino de biologia a partir de uma sequência didática investigativa

## RESUMO

A pesquisa apresentada neste trabalho analisou a avaliação de estudantes do ensino médio de uma escola estadual do município de Taparuba-MG sobre uma sequência didática investigativa acerca dos transtornos de ansiedade, desenvolvida como parte do conteúdo de biologia. A SDI foi desenvolvida com 56 estudantes e envolveu a participação de profissional de saúde de órgão da gestão municipal voltado para a saúde dos estudantes, em uma ação intersetorial de educação em saúde. A abordagem do tema buscou uma perspectiva ampliada sobre a saúde mental, com atenção a aspectos biopsicossociais. Os dados foram produzidos por meio da técnica de grupo focal, com 12 estudantes sorteados entre aqueles que haviam participado da SDI. A observação realizada pelo pesquisador durante a SDI e a análise das falas dos estudantes no grupo focal permitem afirmar que os estudantes avaliam positivamente a SDI sobre transtornos de ansiedade. Consideram que ela aportou ao espaço escolar uma discussão pertinente e necessária, alinhando os conhecimentos em biologia para enfrentamento das situações enfrentadas pelos adolescentes dentro e fora do espaço escolar. Os estudantes mobilizaram conhecimentos prévios e a SDI possibilitou o questionamento e a ampliação desse conhecimento. Na perspectiva dos participantes, os transtornos de ansiedade possuem impactos sobre a vida escolar e o contato com profissionais de saúde pode contribuir para a busca de ajuda qualificada. O ensino de biologia por investigação pode contribuir para a compreensão da saúde mental em uma perspectiva ampliada e despertar nos estudantes um senso investigativo para resolução dos problemas que enfrentam.

**PALAVRAS-CHAVE:** ensino de biologia; ensino por investigação; sequência didática investigativa; educação em saúde; transtornos de ansiedade.

## INTRODUCTION

The intersections between science instruction and health education foster educational practices and theoretical reflections that engage with different perspectives on biology education. In this paper, we present and discuss the results of a master's thesis conducted within PROFBIO—the Professional Master's Program in Biology Education at the Federal University of Juiz de Fora—Governador Valadares Campus, which adopted an inquiry-based teaching approach to address anxiety disorders in first-year high school biology classes. The study was conducted using an inquiry-based teaching sequence (IBTS) implemented at a state school in the municipality of Taparuba, in the eastern region of the state of Minas Gerais. The theme was chosen because the lead author—a biology teacher at that school—had observed an increase in diagnosed cases of anxiety disorders among his students.

Anxiety is one of the most prevalent mental health conditions among adolescents in Brazil today. From a biomedical perspective, anxiety disorders are characterized by high levels of fear and anxiety, accompanied by avoidance behaviors. They are distinguished from adaptive fear and temporary stress reactions by their prolonged persistent nature. Treatment involves pharmacological and psychotherapeutic strategies (American Psychiatric Association, 2014). The literature identifies different types of anxiety disorders, the most common of which is generalized anxiety disorder, characterized by the persistent presence of anxiety and excessive worries that can vary in focus and are difficult to control, interfering with attention span. In addition, it manifests through symptoms such as restlessness, fatigue, difficulty concentrating, irritability, muscle tension, and sleep disturbances. These symptoms cause distress and clinically significant impairment (Barlow, 2023).

By focusing on anxiety as its theme, this study adopts a broad concept of health, in which mental health is not limited to a biomedical perspective restricted to individual diagnoses and prescriptions. In this regard, a partnership was established with a municipal agency in the municipality where the research was conducted, which is responsible for initiatives focused on student health, with the participation of a psychologist. Thus, the study sought what Prado *et al.* (2022) define as an intersectoral health initiative, capable of integrating agents with specific and complementary technical skills that contribute to reducing social inequities in health. The perspective of intersectoral action was driven by the belief that “synergy between health and education policies can ensure that children, adolescents, and young people have access to a better quality of life” (Brazil, 2022, p. 19). We therefore aim to establish an interdisciplinary and interprofessional network in the field of health, recognizing the school as a privileged setting for integrating education and health.

The overall objective of the study was to assess students' perceptions of how anxiety disorders were addressed in an inquiry-based teaching sequence implemented in first-year high school biology classes at a public school in the municipality of Taparuba, Minas Gerais.

## INQUIRY-BASED INSTRUCTION AT THE INTERSECTION OF SCIENCE AND HEALTH EDUCATION

Health is a central topic of interventions and research in the field of science education. Bara, Bara, and Pupe (2024) emphasize that school education can develop the skills necessary for the critical evaluation of health information and for making scientifically informed decisions. According to Lima and Costa (2023), health education is one of the main strategic pillars for promoting health in schools.

In the Brazilian context, various studies focus on the analysis of health education in schools. Metelski *et al.* (2025) analyze education on sexually transmitted infections and state that an integrated approach to health and education in the school setting should promote the shared construction of knowledge and enable actions capable of “influencing the health of children and adolescents and consolidating health promotion initiatives to address social vulnerabilities” (Metelski *et al.*, 2025, p. 2). Cunha *et al.* (2023) analyze the approach to medications and self-medication in textbooks and assert that health education in the school context is one of the ways to foster recognition of the student’s role as a citizen in a diverse society.

Specifically in the field of mental health, the school setting is viewed as an important space for health education. Dutra and Amaral (2021) conducted a literature review on anxiety among high school students in Brazil and emphasize that schools represent a strategic setting for the development of prevention and health promotion policies. However, they note that schools can foster an environment that promotes anxiety, given the demands placed on students in their daily lives. They conclude that conducting applied studies focused on educational initiatives related to this topic can contribute to the prevention of anxiety as well as coping strategies among adolescent students. Theodoro and Ricci Neta (2019) investigated depression in school contexts, focusing on the perspective of high school students. They show that according to the research participants, teachers and school administrators do not provide adequate attention to students with depressive symptoms. They argue for the need to discuss the topic in schools as a way to raise awareness among school communities.

Among the various possibilities for developing health education in conjunction with science education, we highlight the perspective of inquiry-based teaching. This approach promotes “activities in which students engage in solving a problem, developing work plans, collecting and analyzing data, identifying relevant variables, and constructing explanatory models for the situations under investigation” (Sasseron, 2021, p. 4). According to Franco (2021), inquiry-based teaching aims to integrate the conceptual, epistemic, and social domains. The first corresponds to the body of laws, theories, and models used by science to explain everyday phenomena and situations. The second corresponds to the epistemic criteria used by the scientific community in the production of knowledge. The third domain pertains to the ways in which scientific knowledge is communicated, represented, debated, and argued.

Various studies indicate the relevance of this perspective for science education. Silva, Franco, and Mendonça (2024) state that activities conducted in an investigative context promote students’ conscious positioning on socio-

scientific issues. Specifically regarding biology teaching, Santos *et al.* (2022) state that adopting this perspective encourages student protagonism, critical thinking, and autonomy, empowering them for continuous learning. Silva, Silva, and Tavares (2025) analyze the implementation of an inquiry-based teaching sequence on drug use in adolescence and its biopsychosocial repercussions at a school in the municipality of Betim, in the state of Minas Gerais, Brazil. They emphasize that inquiry-based teaching contributes to the development of contextualized teaching practices that are closely aligned with the logic of scientific production.

The inquiry-based teaching approach was adopted in a teaching sequence designed to address anxiety disorders, developed in biology classes, and analyzed in this paper as an initiative to foster dialogue between health education and science education.

## RESEARCH PATHWAY

This study employs a descriptive qualitative approach, and the data were collected using a focus group, in which a researcher brings together a group of people to discuss the research topic based on their prior experiences and knowledge (Habowski; Conte, 2020). The methodological foundation for structuring the proposal was based on the concept of the inquiry-based teaching sequence (IBTS) as a tool that integrates research and pedagogical practice, organized in a systematic manner to promote reflective learning and student protagonism (Costa; Gonçalves; Mariano, 2024). According to these authors, IBTS is not just a series of lessons, but a cycle that involves defining a problem situation and formulating hypotheses, enabling the teacher to act as a mediator and researcher of their own practice.

The starting point for the research was the implementation of an inquiry-based teaching sequence on anxiety disorders with 56 first-year high school students from the Orlando Alves Pereira State School, located in the municipality of Taparuba, in the state of Minas Gerais, Brazil. The school operates across three shifts, serving students from both urban and rural areas, and is a highly important educational institution in the region.

This research was approved by the Human Research Ethics Committee of the Federal University of Juiz de Fora, receiving reasoned opinion No. 6,469,759 on October 30, 2023. The students' assent and the consent of their guardians were registered in the relevant terms.

## INQUIRY-BASED TEACHING SEQUENCE (IBTS)

The IBTS was planned in accordance with the course syllabus and the school's organization and consisted of five stages, which are described below.

### Step One: Proposal Presentation to Students (1 class hour)

The teacher addressed the topic of 'anxiety disorders,' posing questions, engaging the students, and motivating them to participate in the initial discussion in order to assess the students' prior knowledge and stimulate their inquisitive

nature. Following the teacher's initial introduction, the Student Support Center (SSC) team, a municipal management entity focused on student health, was introduced and shared insights on the importance of discussing the topic. This first stage was held in the schoolyard, with the participation of first-year high school students.

### Step Two: Addressing Anxiety Disorders Using a Broad Concept of Mental Health (1 class hour)

First-year students were gathered in one of the school's classrooms and participated in a roundtable discussion with the SSC psychologist. At this stage, the aim was to listen to the students' knowledge and experiences, and provide an opportunity for them to share their thoughts and report on situations in which they had either come into contact with people exhibiting symptoms of anxiety or observed these symptoms in themselves. The psychologist presented a broader perspective on mental health, highlighting the biopsychosocial aspects relevant to understanding anxiety disorders.

### Step Three: Building Knowledge through Research (2 class hours)

For the development of the third stage, a chart was created based on Miranda, Braibante, and Pazinato (2015), as described below:

**Table 1**

*Description of the third stage in the inquiry-based teaching sequence (IBTS).*

Situação de ensino	Metodologia
Knowledge Approach	Initial administration of questionnaires to students regarding their knowledge of the most common signs and symptoms of anxiety, with the aim of linking this knowledge to their understanding of biology.
Problem-based Approach	Students were presented with various problem situations, such as the example below, in order to stimulate their curiosity and awaken their investigative spirit:  Carlos, a high school student, has been complaining of palpitations and, at times, has experienced sweating, even when at rest. In recent days, on the night before a test, he woke up feeling distressed, as if he couldn't breathe, and cried constantly. The following day, he did not show up at school, and his mother reported to the principal that he did not want to talk about it and would not attend class anymore.
Investigative Approach	Based on the discussion of the problem scenarios, it was possible to encourage students to seek information on the most common possible causes, effects on emotional health, and physiological changes associated with anxiety in young people and adolescents in the school context, drawing on consistent research from reliable sources cited by the teacher. Students were instructed to use the internet and/or biology or psychology textbooks, if available.

Situação de ensino	Metodologia
Knowledge systematization	Approach to biology content on the interaction between the nervous and endocrine systems and their role in physiological changes caused by anxiety, based on research conducted on websites and bibliographic references provided by the teacher, discussed in groups. Students were asked to create materials to promote the topic (videos, written texts, discussion groups, and so on).
Assessment	The students were asked to work in groups to prepare reports, texts, or videos on their educational experience, in which they should describe what they had learned on the topic.

Source: the authors, 2024.

#### Step Four: Integration between Education and Health Promotion (1 class hour)

A second discussion session, with the SSC psychologist, was held on ways to cope with anxiety using a biopsychosocial approach. The psychologist started the discussion by addressing the importance of talking about the topic, reviewing with the students various situations related to anxiety signs and symptoms, and advising them to seek help when necessary. She emphasized the negative impacts of pathological anxiety on daily life and highlighted the need to seek help to overcome this condition. She demonstrated that the city's educational and health institutions are prepared to assist each student. The psychologist provided her contact information so that students who felt the need could reach out to her for support. She emphasized that many students, out of shame or even fear, find it difficult to seek help, which can worsen their condition.

#### Step Five: Presentation to the School Community

At the end of the IBTS, the high school students, teachers, and other staff members took part in a moment of reflection on the topic, with the participation of the SSC psychologist, and once again, the students' engagement in the discussion facilitated by the psychologist was evident. The roundtable discussion created a less formal atmosphere, allowing the students to feel comfortable and at ease while interacting with the psychologist.

#### FOCUS GROUP

The focus group was held five days after the implementation of the inquiry-based teaching sequence (IBTS) and aimed to learn about the students' assessment of the inquiry-based approach on the anxiety disorders they had experienced. Twelve students participated, randomly selected among those who had taken part in the IBTS.

The researcher invited the students to start the discussion and interactions as part of the focus group by saying: *"We had classes on the topic of anxiety, using an inquiry-based teaching methodology. I would like to know what you thought of these classes."* The follow-up questions aimed to encourage the participants to

report their views by asking them to elaborate on their answers to the following questions: *Was the instructional sequence interesting? What did you think? What did you know about the topic beforehand?* The researcher also asked the students to talk about the positive and negative aspects of the inquiry-based teaching sequence, and provided an opportunity for them to make suggestions.

The students' statements were recorded and transcribed, and the analysis was carried out by organizing the accounts into themes, with the aim of understanding the participants' statements in the focus group and relating them to the insights found in the literature.

## RESULTS AND DISCUSSION

### NOTES ON THE TEACHING SEQUENCE

During the first stage of presenting the problem to the students, there was a positive response, and most of the students remained focused and engaged. One of the students said, "Oh, so that's what anxiety feels like, right? I've already felt that." The student's comment showed that she was already experiencing symptoms of anxiety but did not know how to identify them.

Another student expressed concern about a family member who suffered from anxiety attacks: "Can this kill you? Geez, I don't think my dad ever sought help! I'll find out!"

In the second stage, which involved addressing anxiety disorders within a broader concept of mental health, participation was strong. The psychologist presented anxiety as a mental health issue that affects various aspects of people's lives and should be understood within the context of their family and social life. This session was very important, as it brought the students into contact with a professional in the field of emotional health, which can help overcome barriers and taboos related to seeking out professionals who provide emotional well-being. The language used by the instructor created a less formal atmosphere, allowing the students to feel comfortable and at ease when interacting with her.

Thus, students' interest in the topic was observed, and the school was identified as an ideal setting for its discussion. This observation is consistent with studies that demonstrate that IBTS focused on building biological knowledge have a high potential for interaction, as it stimulates students' natural curiosity and becomes an effective strategy for scientific development (Moura; Fireman, 2025). The effectiveness of IBTS lies in its ability to transform abstract content into concrete objects of investigation, which is essential when addressing complex biological and psychosocial phenomena such as anxiety. Furthermore, additional observations are found in the work of Oliveira and Boruchovitch (2021), who state that studies on emotions in academic and school settings are still scarce in Brazil. The authors collected data through questionnaires administered to 957 high school students from six public schools and one private school in a municipality in Rio de Janeiro and a municipality in Minas Gerais. They conclude that anxiety needs to be taken into account by the school community and made the focus of pedagogical practices. Braga *et al.* (2025) discuss an intervention that addressed the biochemistry of anxiety in an integrated technical high-school program at the

Federal Institute of Science and Technology of Ceará. They conclude that incorporating the topic into a course can create opportunities for student expression, thereby fostering an environment that promotes information and dialogue.

The dynamics of the third stage, which were related to building biology knowledge through inquiry, were somewhat more complex. The stage demonstrated that the signs and symptoms of anxiety from a biological perspective proved challenging. Although the students identified the signs and understood that situations of fear and stressors can trigger anxiety, they found it difficult to link the physiology of these signs to the functioning of the nervous and endocrine systems.

The difficulty encountered may be related to the complexity of biology and the mechanisms by which different systems work together to maintain homeostasis. In this regard, Duré and Abílio (2021), in a study conducted with high school teachers in the state of Paraíba, Brazil, observed that the complexity of the terms, concepts, and technical language used in biology instruction makes it difficult for students, as it requires them to memorize the meanings of numerous terms. The authors also point out that teachers spend a significant amount of time ensuring that students understand the complex terms used in biological mechanisms, which can discourage student participation. To address this challenge, the literature indicates that teachers play the role of language mediators in an IBTS, helping students to grasp scientific discourses so that they can produce valid arguments based on concepts (Motokane, 2015).

During the applied IBTS, the students' comments on anxiety symptoms demonstrated the beginning of this scientific literacy process, in which biological knowledge is used to explain and understand emotional states. This observation regarding biological complexity is similar to the findings of Cunha *et al.* (2012) that highlight the difficulty of understanding the nervous system and emphasize the need for progress in making scientific knowledge more accessible to the general public. These authors emphasize that despite the complexity of neurobiology, activities such as science exhibitions and fairs can serve as strategies to make the subject accessible, thereby contributing to the development of critical thinking and an understanding of natural phenomena.

Despite the difficulties encountered, the students engaged in problem-posing and inquiry activities and sought research sources on the internet and in books to clarify the questions raised by the problem-posing situations. It was observed that the stages of problem posing, research, and discussion included in the inquiry-based teaching methodology contribute to the progressive construction of knowledge. Scarpa and Campos (2018) highlight that solving problem-posing situations provides students with benefits such as developing motivation and interest in scientific topics, building knowledge based on their experiences and information, enhancing argumentative reasoning and critical thinking, and also adopting an investigative mindset. These skills enable students to understand the role of science in society and to make informed decisions on ethical, social, and environmental issues. Seeking to solve the problem-posing situation through investigation fosters the ability to reflect on the topics covered in the classroom. It was also observed that the students actively participated in sharing their hypotheses, which is consistent with the findings of Scarpa and Campos (2018).

In the fourth stage, which focused on integrating education and health promotion, it was evident that the psychologist's biopsychosocial approach was relevant to the students, who remained attentive to her remarks. The psychologist's emphasis on the need to seek help based on recognizing the signs and symptoms of anxiety reinforced the approach taken in the second stage.

During the fifth stage, which involved a presentation to the school community, it became clear it is important to implement initiatives that foster interaction among students, teachers, and other school staff. When the psychologist addressed the importance of talking about the topic and its impact on health, the teachers acknowledged that they also experience anxiety and also that in most cases they do not seek help, which has a negative impact on their personal and professional lives. Furthermore, it became clear that teachers are not always aware of the behaviors exhibited by students. It was a very important moment for everyone present because it provided an opportunity for reflection on the work carried out at the school and on the importance of emotional health.

## FOCUS GROUP

Based on the questions posed and the support provided by the researcher, the 12 students participating in the focus group discussed their ideas on various aspects related to the development of the IBTS on anxiety disorders. After transcription and multiple readings, the following themes were identified.

### Recognizing the Topic and the Importance of Addressing It in School

Focus group participants expressed a positive assessment of the implementation of the IBTS on anxiety disorders. They justified this importance by acknowledging that they recognize anxiety disorders in their daily experiences.

*Student 1: "It's something that's present in society today, and it's especially prevalent among young people. That's why I think it's necessary to talk about it."*

*Student 2: "I also agree [...]. For a person to really see it, to know it, and to check if they fit into these categories that you explained to us, and then, if they realize it, to seek help. I think it's very important."*

*Student 3: "I thought it was really good and important."*

*Student 4: "Because we learned something, and it sparked most people's interest."*

*Student 5: "I found it productive; we could relate to it."*

Some participants identified challenges in addressing the topic at school:

*Student 7: "It's because, like, there've been a lot of lectures, but a classmate ends up distracting us, and we feel uncomfortable. In smaller groups, with people we know, everyone feels more comfortable and have more freedom. I really prefer it that way over a lecture for a large number of students."*

*Student 9: "Because in a lecture, you raise your hand, and a lot of your classmates make fun of you, and you feel embarrassed to speak up."*

Difficulty expressing oneself in larger groups reflects challenges in peer relationships and within the school environment as well. This highlights the need to promote practices of respect and tolerance in schools.

Participants thus highlight the health-promoting potential offered by addressing mental health-related issues in schools. This finding aligns with other studies on mental health education in the school context. According to Oliveira *et al.* (2024), Mental Health Promotion practices in schools are described in the international literature as having proven effectiveness, however Brazilian studies on the subject are still scarce. Silva *et al.* (2025) discuss the prevention of suicidal behavior in schools and highlight the school environment as conducive to identifying emotional distress and implementing mental health promotion initiatives. Fonseca *et al.* (2025) emphasize the importance of school environments that promote care, listening, and the strengthening of human bonds. Furthermore, the implementation of teaching sequences based on real and pressing problems, which were identified by the students themselves, enables them to develop not only scientific concepts but also the agency needed to take action on their own reality (Silvério *et al.*, 2026)., 2026). In the case of Taparuba, the incorporation of such a sensitive topic through IBTS enabled knowledge to move beyond the school environment and become a tool for promoting health in the school community.

### Mastery of prior knowledge

The participants reported having prior knowledge, mainly gained through observing everyday situations and through other health education initiatives.

Student 1: “Yes, absolutely! Even about our lives. As you were speaking, we could relate to it, and we've also heard a lot about these things. Because when we study more deeply, we start to understand what is really going on.”

This account demonstrates the student's reflection as they recognized situations and contexts typical of anxiety disorders within their own experiences. Other students stated that they had already been introduced to the topic in lectures. Thus, we can conclude that prior knowledge and experiences were important in sparking their interest in taking part in the IBTS. Prior knowledge serves as a guide for inquiry-based biology instruction. Santos *et al.* (2022) support this idea, stating that identifying prior knowledge is a strategy through which the teacher can foster more productive and meaningful learning for students as they encounter problem-solving situations, and it facilitates the stages of formulating hypotheses, conducting research, presenting arguments, and constructing explanations. In this process, it became evident that IBTS fostered a safe environment for raising questions. This approach is characterized as epistemic practices, in which students not only receive information but also engage in the construction of knowledge through dialogue and argumentation (Motokane, 2015). Furthermore, the deconstruction of taboos surrounding mental health is facilitated when an inquiry-based environment allows students to compare their common sense beliefs with scientific evidence discussed collectively, which is one of the cornerstones of inquiry-based learning (Moura; Fireman, 2025).

## Questioning and Expanding Knowledge

Although they recognized the topic and had prior knowledge about it, the focus group participants indicated that the approach taken in the IBTS provided them with different perspectives on the subject. Some participants drew contrasts between the knowledge developed through the IBTS and their prior knowledge.

Student 6: *"It was good, because on the one hand, we think anxiety is one thing, but when we get to learn about it, it's totally different—there's a lot more to it."*

Student 2: *"And there are also people who think they don't have it because they think they only have an occasional episode or reach extreme anxiety, but when they look into it carefully, they realize that there are several signs."*

Student 1: *"I myself used to think that anxiety wasn't a health issue. Anxiety affects your entire body; it's not just a feeling."*

Student 6: *"Especially because when you talk about anxiety, most people think that anxiety is just a psychological episode, but it affects the whole body."*

Student 1: *"Your body also sends you signals when you're not mentally well."*

These statements show that the students were aware of the construction of new knowledge that enabled them to gain a different understanding of the topic, distinct from their previous understanding and those of others. This topic highlights the importance of addressing health in science education, as it can help educate individuals to distinguish between reliable and unreliable information.

## Impact of Anxiety Disorders on School Life

Participants stated that they understood that anxiety disorders negatively impact school performance in various aspects, such as the ability to concentrate, interpersonal relationships, and the likelihood of continuing in the school system.

Student 2: *"You keep thinking about other things; you can't pay attention in class or concentrate."*

Student 4: *"Most of the time, it's not even at school. It's actually at home. They have family problems, so they go to school and can't concentrate."*

Student 8: *"I think anxiety, in the school environment, needs to be studied. Bring in psychologists, yes! Bring them in for talks. Because it's very important. It's about the students' performance. And if students don't have the ability to read a text, to try to learn, the factors that cause [anxiety] in school or at home [may] create a lot of problems, and the student can't achieve their life goals, like going to college or developing other skills they possess. It's important and essential in the school settings."*

Student 3: *"Anxiety causes a lot of stress for people. There are people who really can't even have a conversation with someone. For example, if I have an attack here right now, I won't be able to have a conversation with a friend of mine, because no matter how I express myself, she'll think I'm being rude."*

Students' observations regarding the various factors associated with anxiety and their impacts on academic performance can also be found in other studies.

Horn, Silva, and Patias (2021) report a correlation between academic performance, anxiety, and depression among students from public schools in a city in northern Rio Grande do Sul. The authors draw attention to the need for further studies related to issues surrounding adolescents' academic performance, particularly in secondary education, due to the complexity of the various factors involved in this issue.

### Importance of Contact with Healthcare Professionals

The participants agreed on the importance of the SSC psychologist's participation. They indicated that the psychologist's work and her presence at school at various times can provide an opportunity for students to approach her or another health professional to talk about their distress.

*Student 2: "I thought it was important, because, for example, there are usually a lot of people who don't like to talk about it, who see it as a negative thing, and who feel embarrassed. And since it [the topic] was covered a lot and we had several classes on it, I also think that if a person really wanted to, they would know that they could, for example, count on the teacher and the school for help, because sometimes at home they can't even talk to their parents. So, in addition to being able to recognize who has it and realizing that we also have it, I think it has helped us seek more help and feel more confident about addressing this issue, because for a lot of people, it's taboo to talk about it."*

*Student 1: "Definitely, as support for those who can't get help from their own family."*

*Student 9: "Because there are a lot of people who understand, but they don't feel comfortable enough to talk to their father, mother, or friend. In that case, it's good to have the help of a psychologist."*

*Student 7: "Like she said (referring to the psychologist), anxiety can bring a lot of problems. It's better to treat anxiety now than to put it off until later."*

Therefore, a promising possibility for the interface between health education and science education is the establishment of partnerships with institutions or public agencies involved in health promotion, which may encourage the participation of health professionals.

The analysis of the students' statements in the focus group complements the observations made by the researcher during the implementation of the inquiry-based sequence (IBS) and allows us to conclude that the students positively evaluate the IBST on anxiety disorders. They believe that it brought a relevant and necessary discussion to the school environment, bridging knowledge in biology with the challenges faced by adolescents both inside and outside school. However, there is a need to readjust the IBTS to better address the integration of the nervous and endocrine systems in relation to anxiety, particularly regarding the complexity of the biological phenomena involved in the homeostasis of these systems.

### FINAL CONSIDERATIONS

Emotional health is an aspect that should be taken into account in the educational context, and addressing it in science education can lead to initiatives that align with students' interests. Inquiry-based biology teaching is an appropriate

approach to facing this challenge, as it enables students to understand mental health in an integrated and contextualized way, fostering an investigative mindset so that they can address the problems they face.

Teachers play a key role in helping to develop students' critical and investigative thinking. By fostering curiosity and creating an inclusive learning environment, educators can contribute to the emotional and cognitive development of adolescents. Establishing partnerships and consequently strengthening the ties between schools and other public management structures are essential for developing policies and programs that prioritize mental health in the school environment.

Understanding students' evaluations of a teaching sequence in this context makes it possible to implement adjustments and improvements to address the specific needs of each group. The construction of partnerships and the continuous evaluation and adaptation of educational strategies are essential to create a school environment that not only develops knowledge but also promotes students' overall well-being, preparing them to face challenges throughout their lives.

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### NOTES

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