

THE RELATIONSHIP BETWEEN EMOTIONAL EATING, EMOTIONAL REGULATION AND ANXIETY IN BODYBUILDERS

A RELAÇÃO ENTRE COMER EMOCIONAL, REGULAÇÃO EMOCIONAL E ANSIEDADE EM PRATICANTES DE MUSCULAÇÃO

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Abstract

This study investigated the relationship between emotional eating, emotion regulation, and anxiety levels in weightlifters in the Vale do Rio dos Sinos region, Rio Grande do Sul. The research involved 75 individuals, men and women aged between 18 and 56 years, who regularly practice weightlifting. Instruments such as the Sociodemographic Questionnaire, the Emotional Eating Questionnaire (EEQ), the Difficulties in Emotion Regulation Scale (DERS), and the Anxiety Scale (DASS-21) were applied. The results revealed a significant correlation ($p < 0.05$) between emotional eating and difficulties in emotion regulation, especially in impulse control and emotional clarity. Moreover, anxiety also showed a moderate and significant ($p < 0.05$) correlation with emotional eating, suggesting that high levels of anxiety are associated with increased food consumption driven by emotions. The study highlights the importance of interventions focused on emotion regulation strategies to reduce the incidence of maladaptive eating behaviors in weightlifters. These interventions may contribute to improving mental health and quality of life in this population.

Keywords: Emotional eating; Emotion regulation; Anxiety; weightlifting.

Resumo

O presente estudo investigou a relação entre comer emocional, regulação emocional e níveis de ansiedade em praticantes de musculação na região do Vale do Rio dos Sinos, Rio Grande do Sul. Participaram da pesquisa 75 indivíduos, homens e mulheres com idades entre 18 e 56 anos, que praticam musculação regularmente. Foram aplicados instrumentos como o Questionário Sociodemográfico, a Escala de Comer Emocional (EEQ), a Escala de Dificuldades na Regulação Emocional (DERS) e a Escala de Ansiedade (DASS-21). Os resultados revelaram uma correlação significativa ($p < 0,05$) entre comer emocional e dificuldades na regulação emocional, especialmente no controle de impulsos e na clareza emocional. Além disso, a ansiedade também se mostrou moderadamente e significativamente ($p < 0,05$) correlacionada ao comer emocional, sugerindo que níveis elevados de ansiedade estão associados a um maior consumo alimentar impulsionado por emoções. O estudo destaca a importância de intervenções focadas em estratégias de regulação emocional para reduzir a incidência de comportamentos alimentares desajustados em

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praticantes de musculação. Essas intervenções podem contribuir para a melhoria da saúde mental e qualidade de vida dessa população.

Palavras-chave: Comer emocional; Regulação emocional; Ansiedade; Musculação.

1 INTRODUCTION

This study addresses the relationship between emotional eating, emotional regulation, and anxiety levels in adult bodybuilders in the Vale do Rio dos Sinos region. It is understood that food choices are influenced by cultural factors, social systems, and psychological aspects, which play a crucial role in eating behavior (Jomori; Proença; Calvo, 2008; Hamilton; Mcilveen; Strugnell, 2000).

In this context, the concept of emotional eating stands out, characterized by a lack of adaptive skills to cope with emotions, stress, and emotional dysregulation (Czepczor-Bernat; Bryket-Matera, 2021). This practice can occur as a response to negative emotions, in which food is used to temporarily reduce feelings of discomfort and distress. However, emotional eating can become a risk factor for the development of eating disorders, as individuals resort to this strategy to avoid contact with aversive emotional experiences, functioning as a temporary distraction (Litwin; Lavender; Anton, 2017).

In contrast, emotional regulation emerges as an essential process for coping with experiences and processing emotions in a healthy way. This process involves identifying, understanding, and accepting emotions, contributing to the control of impulsive behaviors and the adaptation of emotional responses in different contexts (Leahy; Tirch; Napolitano, 2013; Gouveia; Canavarro; Moreira, 2018). Emotional regulation makes it possible to redirect the spontaneous flow of emotions, influencing how emotional responses are manifested and facilitating the modification of specific emotional states (Koolé, 2009). Furthermore, strategies for monitoring and reassessing situations can promote more adaptive emotional responses, resulting in productive functioning and the pursuit of valued goals (Mcrae; Gross, 2020).

Physical activity, especially strength training, plays an important role in emotional regulation. Studies show that anaerobic exercise not only promotes muscle hypertrophy and increased body mass but also contributes to overall health and the prevention of physical and chronic diseases (Nahas, 2001; Barbosa, 2006). Individuals who practice strength training report improvements in self-esteem and the ability to

cope with stress, in addition to finding social support through new friendships (Barros *et al.*, 2015). Physical activity has been shown to be effective in reducing symptoms of anxiety and depression, in addition to improving mood and well-being (Gordon *et al.*, 2017; Smith; Merwin, 2018), (Klaperski; Von Haaren; Stadler, 2014).

On the other hand, anxiety is characterized as an emotional state of worry, apprehension, and nervousness, often associated with physiological activation. Cognitive anxiety occurs when there is a heightened state of alertness, influencing the perception of potential threats. Although it is a natural emotion and important for preparing the individual for threatening situations, anxiety can become maladaptive when it manifests itself disproportionately, frequently, and persistently, generating significant distress and discomfort (Barlow, 2002; Castillo *et al.*, 2000; Clark; Beck, 2012; Craske. *et al.*, 2017; Weinberg, Gould, 2014).

Given the aspects discussed, the objective of this study is to investigate the relationship between emotional eating, emotional regulation, and anxiety in bodybuilders. Understanding these factors is essential to promoting an integrated and effective approach to caring for individuals' mental and physical health.

2 METHOD

2.1 Participants

This study involved 75 individuals, 59 females (79.7%) and 16 males (20.3%), over the age of 18, who practiced weight training at least once a week in the Vale dos Sinos region of Rio Grande do Sul. The participants' ages ranged from 18 to 56 years, with a mean of approximately 29 years and a standard deviation of 7.47. Regarding educational level, 54.7% of the participants had higher education, 24% had high school education, 20% had postgraduate education, and 1% had elementary education. Regarding marital status, 60% were single, 13.3% were married, 22.7% were in a stable relationship, and 4% were divorced.

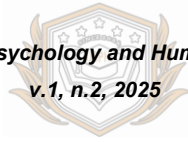
Regarding the length of time they had been training at the gym, 24% of participants had been training for less than a year, 40% for 1 to 3 years, 18.7% for 4 to 6 years, 6.7% for 7 to 9 years, and 10.7% for more than 10 years. Regarding training frequency, 4% of participants trained once a week, 36% 2 to 3 times a week, 50.7% 4 to 5 times a week, and 9.3% more than 5 times a week. Regarding the daily time

dedicated to gym practice, 10.7% of participants reported training for less than 1 hour, 24% for 1 hour, 57.3% between 1 hour and 1.5 hours, 6.7% for 2 hours, and 1.3% for more than 2 hours.

2.2 Instruments

The instruments used to carry out the research were:

- a) Sociodemographic questionnaire: This questionnaire was developed by the author specifically for this research, considering the study's objective. The questionnaire consists of objective and sociodemographic questions related to weight training.
- b) Emotional Eating Scale (EEQ) - The Spanish version of the *Emotional Eating Questionnaire Eater The Emotional Eating Questionnaire* (EEQ) in its Portuguese version measures emotional eating, aiming to understand the impact of emotions on eating behavior. There are 10 questions, with four answers: 1) Never, 2) Sometimes, 3) Usually, and 4) Always. Each answer is scored from 1 to 4; the lower the score, the more appropriate and healthier the behavior (Garaulet *et al.*, 2012).
- c) Emotion Regulation Difficulties Scale - *Difficulties in Emotion Regulation Scale* – DERS (Gratz; Roemer, 2004) This self-administered questionnaire assesses elements involved in emotional regulation difficulties and is intended for adults. It has six subscales: Non-Acceptance of Emotional Response, Lack of Emotional Clarity, Limited Access to Emotional Regulation Strategies, Difficulty Controlling Impulses, Difficulty Maintaining Goal-Directed Behavior, and Lack of Emotional Awareness. The sum of the subscale scores generates a total score, and higher scores indicate greater difficulty in Emotion Regulation. The original version demonstrated high internal consistency ($\alpha = 0.93$).
- d) *Depression Anxiety Stress Scales* (DASS-21; Vignola; Tucci, 2014) is a 21-item scale that assesses the severity of symptoms of depression, anxiety, and stress in the past week. Items are scored on a 4-point Likert scale ranging from 0 (not at all) to 3 (very or most of the time). The version of the DASS-21 used in this study was adapted by Vignola and Tucci (2014) and has high reliability ($\alpha = 0.95$). Only items assessing anxiety were used.



2.3 Data collection procedures

This study followed ethical procedures, in accordance with Resolution No. 510/2016 of the National Health Council and was approved by the Research Ethics Committee of Feevale University, under opinion number 7.006.534 (CAAE: 81692024.1.0000.5348). Data collection took place online; participants were contacted through social media, such as Instagram and WhatsApp, along with a message containing a link to Google Forms, containing all the explanations and objectives of the research.

Participants who agreed to participate in the research after signing the ICF were directed to the questionnaires. If they stated that they did not agree with the research or did not practice weight training, the survey automatically ended with a thank you message.

2.4 Procedures for data analysis

The data were analyzed using the IBM SPSS Statistics 27.0 spreadsheet. Descriptive analyses of central tendency (mean), dispersion (standard deviation, minimum and maximum), and distribution (normality, using the Shapiro-Wilk test) were performed. Correlational analyses were performed based on Spearman's rho coefficient (since the distributions were shown to be non-parametric) (Pestana; Gageiro, 2014).

3 RESULTS

Descriptive analyses of the study variables were conducted to provide an overview of the sample's characteristics regarding the Emotional Eating, Anxiety, and Difficulty in Emotion Regulation subscales. The results are presented in Table 1.

Table 1 - Descriptive statistics of the variables Emotional Eating, Anxiety and the Difficulty in Emotion Regulation subscales

Variables	Average	Standard Deviation	Minimum	Maximum
Emotional Eating	22,473	7,046	11,000	40,000
Anxiety	11,635	4,406	7,000	25,000
DCLA	10,811	3,666	5,000	20,000
DNA	10,973	5,029	6,000	28,000
DMT	12,446	4,567	5,000	23,000
DIM	11,081	4,033	6,000	25,000
DCOM	14,446	5,118	6,000	26,000
DEST	14,905	5,099	8,000	35,000
DERS	73,784	18,280	39,000	135,000

Note: DERS = sum of the total score of the difficulties in emotional regulation scale; DNA = non-acceptance of emotional responses subscale; DMT = difficulty in engaging in goal-directed behavior; DIM = impulse control difficulties; DCON = lack of emotional awareness; DEST = limited access to emotion regulation strategies; DCLA = lack of emotional clarity.

Source: Prepared by the authors, 2025

The mean score for Emotional Eating was 22.47 (SD = 7.05), with scores ranging from 11 to 40, indicating a moderate range of responses. Regarding anxiety, the mean observed was 11.64 (SD = 4.41), with scores ranging from 7 to 25. Although on average anxiety was relatively low, these results suggest that participants had varying levels of anxiety, with some reporting substantially elevated levels.

The Difficulty in Emotional Regulation subscales also revealed significant variations. The Lack of Emotional Clarity subscale had a mean of 10.81 (SD = 3.67), with a minimum of 5 and a maximum of 20, suggesting that some participants have difficulty identifying and understanding their emotions. The Non-Acceptance of Emotional Responses subscale had a mean of 10.97 (SD = 5.03), with a range of 6 to 28, indicating a wide range of emotional responses that are not accepted by individuals.

For the Difficulty Engaging in Goal-Directed Behaviors subscale, the mean was 12.45 (SD = 4.57), with responses ranging from 5 to 23. This result suggests that many

participants reported difficulties maintaining focus and direction in goal-directed behaviors, which may be related to Emotional Eating. The Difficulty Controlling Impulses subscale had a mean of 11.08 (SD = 4.03), ranging from 6 to 25, indicating significant difficulty controlling impulses in emotional situations.

The Limited Access to Emotion Regulation Strategies subscale had a mean of 14.91 (SD = 5.10), with a range of 8 to 35, suggesting that many participants have difficulty accessing effective strategies to regulate their emotions.

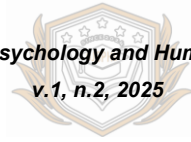
In order to investigate the relationship between Emotional Eating, Anxiety and Difficulties in Emotion Regulation, Spearman correlation analyses were conducted due to the non-normality of the data, confirmed by the Shapiro-Wilk test ($W = 0.960$; $p < 0.001$). The results can be seen in Table 2.

Table 2 - Spearman's rho correlations for the study variables

Variable	1	2	3	4	5	6	7	8
1. DNA	—							
2. DMT	0.358	**	—					
3. DIM	0.412	**	0.559 ***	—				
4. DCOM	0.044	-0.020	0.068	—				
5. DEST	0.530	**	0.721 ***	0.587 ***	0.057	—		
6. DCLA	0.219	0.363 **	0.480 ***	-0.041	0.336 **	—		
7. DERS	0.651	**	0.676 ***	0.643 ***	0.428 ***	0.784 ***	0.353 **	—
8. Emotional Eating	0.218	0.379 ***	0.493 ***	-0.012	0.348 **	0.947 ***	0.379 ***	—
9. Anxiety	0.371	**	0.476 ***	0.534 ***	-0.051	0.581 ***	0.219	0.499 ***
								0.26 *

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; DERS = sum of the total score of the difficulties in emotion regulation scale; DNA = non-acceptance of emotional responses subscale; DMT = difficulty in engaging in goal-directed behavior; DIM = impulse control difficulties; DCON = lack of emotional awareness; DEST = limited access to emotion regulation strategies; DCLA = lack of emotional clarity.

Source: Prepared by the authors, 2025



Correlations between Emotional Eating and the Difficulty with Emotion Regulation subscales varied widely. There was a moderate positive correlation between Emotional Eating and Difficulty with Impulse Control ($\rho = 0.493$; $p < 0.001$), suggesting that individuals with greater difficulty controlling impulses tend to exhibit more Emotional Eating-related behaviors.

Similarly, the Difficulty Engaging in Goal-Directed Behaviors subscale showed a moderate positive correlation with Emotional Eating ($\rho = 0.379$; $p < 0.001$), indicating that the inability to maintain focus on goals may also be associated with emotional eating patterns.

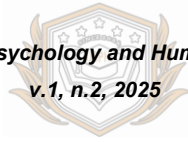
The Lack of Emotional Clarity subscale stands out, as it showed a very strong and significant correlation with Emotional Eating ($\rho = 0.947$; $p < 0.001$). This result suggests that individuals who have difficulty understanding and identifying their own emotions may be particularly susceptible to Emotional Eating.

Furthermore, Anxiety showed a positive and significant correlation with Emotional Eating ($\rho = 0.260$; $p < 0.05$), suggesting that higher levels of anxiety may be associated with a greater propensity to eat emotionally. Although the magnitude of this correlation is smaller compared to the emotion regulation subscales, the finding indicates that anxiety is a contributing factor to dysregulated eating.

Regarding the correlation between the Difficulty in Emotion Regulation subscales and Anxiety, the correlations ranged from moderate to strong. The Limited Access to Emotion Regulation Strategies dimension showed a strong correlation with Anxiety ($\rho = 0.581$; $p < 0.001$), suggesting that the greater the difficulty in accessing effective emotion regulation strategies, the greater the anxiety. The Difficulty in Impulse Control dimension also showed a significant positive correlation with Anxiety ($\rho = 0.534$; $p < 0.001$), indicating that the inability to control impulses can exacerbate anxiety levels.

4 DISCUSSION

The objective of this study was to evaluate the relationships between Emotional Eating, Anxiety, and Emotion Regulation Difficulties in bodybuilders. Results were obtained, and the findings of this study should now be discussed. A moderate positive correlation was observed between Emotional Eating and Impulse Control Difficulties. This result indicates that individuals with greater difficulty regulating their impulses tend



to exhibit greater emotional eating behaviors. It was found that those more likely to turn to food in situations of emotional stress and negative emotions have poorer impulse control (Nederkoorn *et al.*, 2010).

In this context, food is used as a coping strategy to deal with emotions, so that individuals have difficulty delaying the immediate gratification provided by eating (Heatherton; Wagner, 2011). According to Gross (1998), impulsivity can result in difficulties in emotional regulation, as individuals who face challenges in dealing with their emotions may be more likely to act impulsively to seek immediate relief or gratification.

Additionally, the "Difficulty Engaging in Goal-Directed Behaviors" subscale showed a moderate positive correlation with emotional eating, indicating that the inability to maintain goal focus may be associated with emotional eating patterns. Van Strien (2018) emphasizes that emotional eating refers to food consumption in response to emotions, especially in situations of frustration and stress, which are related to low emotional regulation capacity, also influencing the development of obesity.

Motivation can involve engaging in actions aimed at obtaining external rewards, with satisfaction being fundamental to engagement in activities and well-being (Balbinotti; Balbinotti; Barbosa, 2009; Deci; Ryan, 2017; Saldanha, 2008). Therefore, linked to emotional eating, when an individual faces stressful situations, they may turn to food as a relief mechanism, deviating from their goals and commitments.

It was also observed that the "Lack of Emotional Clarity" subscale showed a very strong and significant correlation with emotional eating. This indicates that individuals who have difficulty understanding and identifying their own emotions may eat as a way to relieve emotional discomfort. According to Barrett (2017), people who have difficulty labeling their emotions face challenges in managing emotional experiences, which can lead to inappropriate behaviors such as emotional eating.

Promoting emotional clarity can result in improvements in psychological well-being and behavioral modulation, including improved eating habits. Lindquist, Maccormack and Shablack (2015) argue that emotions are intrinsically linked to language, playing a fundamental role in shaping emotional experiences. Language helps structure how we name emotions, as well as understand and process them. Thus, understanding and interpreting emotions impacts emotional eating, as a lack of understanding of what one feels can lead to dysfunctional eating behaviors (Barrett, 2012).

Furthermore, anxiety showed a positive and significant correlation with emotional eating, suggesting that higher levels of anxiety may indicate a greater propensity to eat for relief. Although this correlation is lower compared to the emotion regulation subscales, anxiety remains a contributing factor to emotional eating. There is a relationship between anxiety symptoms and increased dysfunctional eating behaviors, including emotional eating, as eating can be a maladaptive strategy for regulating negative emotional states, especially anxiety (Sander; Moessner; Bauer, 2021).

The literature also suggests that anxiety is one of the most common emotional factors associated with increased appetite and the desire to consume foods that generate an immediate pleasure response (Polivy; Herman, 2002). This can be understood in light of the theory of negative reinforcement, according to which food consumption temporarily relieves the unpleasant sensations caused by anxiety, which ultimately reinforces dysfunctional eating behavior. This pattern can contribute to a vicious cycle, in which chronic anxiety states lead to repetitive episodes of emotional eating, potentially contributing to health risks such as weight gain and the development of eating disorders (Evers *et al.*, 2018).

Regarding the subscales of difficulty regulating emotions and anxiety, moderate to strong correlations were found. A strong correlation was found between "Limited access to emotional regulation strategies" and anxiety. Thus, individuals who have difficulty determining which strategies to use to manage emotions tend to have higher levels of anxiety.

Individuals who use dysfunctional emotion regulation strategies, such as emotion suppression - in which they try to ignore or block the experience of negative feelings rather than dealing with the emotion - and rumination, which refers to repeatedly thinking about past events, end up worsening anxiety symptoms (Aldão; Nolek; Schmidt, 2010). On the other hand, those who use cognitive reappraisal and distancing strategies can reduce emotional reactivity, decreasing the intensity and duration of symptoms, in addition to improving anxiety management (Guendelman; Medeiros; Rampes, 2017).

When individuals lack effective coping techniques for stress and negative emotions, they may turn to food as a comfort mechanism. Anxiety, a particularly intense emotion that involves hypervigilance to perceived threats, can trigger the

search for a quick and easily accessible reward, such as foods high in fat and sugar (Van Strien, 2018).

Regarding the "Difficulty controlling impulses" and anxiety dimension, a significant correlation was observed, indicating that individuals who have difficulty controlling impulses also face challenges in managing anxiety levels. Studies show that anxious patients often resort to impulsive behaviors in response to negative emotional experiences, such as uncertainty or negative affect.

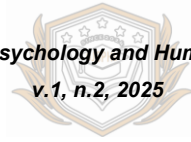
Thus, impulsive actions can provide momentary relief from internal states or aggravate anxiety symptoms (Pauluk; Koerner, 2013; Swann, 2003). Another study corroborates that decision-making under uncertainty links anxiety to impulsive decision-making, as people with anxiety symptoms are more likely to make hasty decisions. This is because such decisions are often a response to situations of risk and uncertainty, which can intensify anxiety symptoms (Tversky; Kahneman, 1974).

Impulsivity manifests as a tendency to act quickly without considering the consequences, so that risky behaviors and decisions are often associated with emotional stress and anxiety (Moeller *et al.*, 2001). Research in the emotional field shows that negative emotional states are related to increased impulsivity, evidencing that impulsive behaviors often arise in contexts of anxiety and anger (Tice; Bratslavsky; Baumeister, 2001).

5 FINAL CONSIDERATIONS

This study investigated the relationships between Emotional Eating, Anxiety, and Emotion Regulation Difficulties in bodybuilders, revealing important insights into the psychological factors that may influence eating behaviors in this population. The results indicate that greater difficulties in emotional regulation, especially impulse control and emotional clarity, are significantly associated with greater Emotional Eating. These findings suggest that individuals who have difficulty identifying and understanding their emotions, as well as controlling their impulses, may be more likely to use eating as an emotional coping strategy.

Furthermore, anxiety was moderately related to Emotional Eating, corroborating the literature that identifies anxiety as an important factor in the development of dysregulated eating behaviors. However, the stronger correlations between anxiety and emotion regulation subscales suggest that difficulty regulating emotions may



mediate the relationship between anxiety and Emotional Eating. In other words, bodybuilders with difficulty regulating emotions, particularly in times of stress or anxiety, may be more vulnerable to Emotional Eating.

These results have practical implications for interventions targeting bodybuilders, indicating that developing more effective emotion regulation strategies may be a promising approach to reducing the incidence of Emotional Eating in this group. Furthermore, mental health programs in gyms could benefit from addressing anxiety and teaching coping mechanisms that do not involve the use of food as emotional regulators.

Despite the relevance of the findings, this study has some limitations that should be considered. First, the cross-sectional design impedes causal analysis, limiting the understanding of how emotion regulation and anxiety influence Emotional Eating over time. Future studies with a longitudinal design are recommended to examine the direction of these relationships and identify potential causal mechanisms. Second, the sample consisted exclusively of gym members, which may reduce the generalizability of the results to other populations or sports. Future research should include different types of sports and a more diverse sample to explore how these psychological factors manifest in different physical activity contexts.

Another limitation is related to the self-reported nature of variables, which may be subject to response biases, such as social desirability. The use of objective measures or multiple data sources, such as third-party assessments or psychophysiological techniques, could increase the robustness of the findings. Furthermore, it would be interesting to investigate whether intervention programs focused on emotional regulation and anxiety management could reduce levels of Emotional Eating in bodybuilders, offering a more effective coping alternative for dealing with emotional stressors. Future studies that address these limitations could contribute to a deeper understanding of these interactions and the development of more effective interventions.

Furthermore, another challenge highlighted is the scarcity of articles and studies in Portuguese that specifically address the relationship between emotional eating, emotional regulation, and anxiety in bodybuilders. Although international literature has contributed significantly to the theoretical foundation and support of discussions, the lack of more in-depth research in Portuguese has limited the direct contextualization of the topic within the Brazilian context.

The scarcity of studies in Portuguese directly impacts the practical applicability of the findings, considering that cultural, social, and behavioral issues can influence how these phenomena manifest in different contexts. Weight training, for example, is a widespread activity in Brazil, but studies correlating this practice with emotional and nutritional aspects are scarce in national publications, revealing a deficit in local scientific production on the topic.

This limitation hinders the development of psychological and educational interventions more tailored to the Brazilian context, as many of the theoretical frameworks used to support the discussion were taken from studies conducted in other countries, whose cultural characteristics may differ significantly from Brazil's. This context highlights the importance of encouraging scientific production in the field of sports psychology and emotional nutrition in Brazil, in order to provide more applicable and contextualized data for professionals working in the field of mental health and well-being among physical activity practitioners.

Therefore, the lack of scientific articles in Portuguese highlights the need for more research in this area in Brazil, so that the development of intervention strategies and the understanding of eating behavior can be explored more specifically and effectively in the Brazilian context. Long-term research conducted in Portuguese and focusing on the Brazilian context could significantly contribute to the debate and broaden the scope of findings on these topics in Brazil.

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