

Articles

Influence of Physical Activity on Anxiety During Pregnancy in a 21-Year-Old Woman

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Abstract: The present research, titled "Influence of Physical Activity on Anxiety During Pregnancy in a 21-Year-Old Woman: Case Study," aimed to determine the influence of a physical activity program on the anxiety levels of a pregnant woman. A mixed-methods nested design (quantitative dominant) was employed during the participant's third trimester of pregnancy.

In the initial evaluation (pre-test), the woman presented with a very severe anxiety level with a mean score of 3.5 on the Hamilton Anxiety Rating Scale (HAM-A), and a low level of physical activity, measured at 438 MET-min/week by the IPAQ. Following the implementation of an adapted eight-week physical activity program, the intervention demonstrated a positive bifocal change. Anxiety was reduced by 45.7%, moving from a "very severe" level to a moderate level (mean score of 1.9). Simultaneously, the level of physical activity increased by 36.5%, reaching 598 MET-min/week, which corresponds to the moderate level. The triangulation of this data, along with qualitative perceptions of well-being and effort self-regulation (Borg Scale), confirmed the program's efficacy.

It is concluded that supervised physical activity is an effective, safe, and non-pharmacological strategy to significantly reduce gestational anxiety, improving the emotional and physical well-being of the participant.

Keywords: Physical activity; gestational anxiety; pregnancy; non-pharmacological strategy; clinical case.

Introduction

Pregnancy is a very important stage in a woman's life, as numerous physical, hormonal, emotional, and social changes occur during this period. These changes can generate feelings of worry, stress, or anxiety that, if not managed, can affect both the mother's health and the baby's development. During this period, physical activity plays a fundamental role, as it not only contributes to physical well-being but also to emotional balance. According to Sánchez et al. (2021), performing moderate and adequate physical activity during pregnancy helps reduce anxiety levels, improves mood, and promotes an overall sense of well-being.

The WHO (2022) defines physical activity as any bodily movement produced by skeletal muscles that involves energy expenditure, carried out in social contexts. This approach contextualizes physical activity as a comprehensive phenomenon that influences health and emotional well-being not only at the individual level but also socially, promoting benefits such as improved physical condition, reduced anxiety levels, disease prevention, and social interaction—key elements for human development in different cultural settings.

According to the American Psychological Association (2021), anxiety is a complex emotional state characterized by an anticipatory response of apprehension and tension in the face of real or perceived threats, with cognitive, physiological, and behavioral manifestations. This implies that anxiety is not just a simple momentary reaction, but a process involving different levels such as anticipatory thoughts (cognitive), physical body reactions (physiological), and changes in behavior (behavioral). This multifaceted nature of anxiety explains why it affects both the mind and the body, and how its manifestations can vary among individuals. Furthermore, understanding anxiety from this perspective facilitates its identification and management in clinical, social, and everyday contexts.

The influence of physical activity on anxiety in pregnant women has become a topic of growing interest in research. This life stage involves physical, hormonal, and emotional changes that can generate worry, stress, or anxiety, affecting both the mother and the baby.

anxiety is understood as the feeling of restlessness or nervousness in the face of difficult or uncertain situations. During this period, physical activity presents itself as an effective non-pharmacological method for managing anxiety during gestation, offering benefits without the risks associated with medications. From this perspective, Rodríguez-Blanque et al. (2020) state that regular practice of adapted exercise for pregnant women significantly contributes to reducing anxiety levels and improving the emotional well-being of women during pregnancy.

The World Health Organization (2022) recommends that pregnant women engage in regular physical activity, always under medical supervision, due to its multiple physical and emotional benefits. Physical activity not only favors bodily health but also contributes to psychological well-being and the reduction of anxiety levels during gestation. Recent research, such as that by Sánchez-Polán et al. (2021), has shown that pregnant women who maintain a moderate physical activity routine present significantly lower levels of anxiety compared to those with sedentary habits, highlighting the importance of promoting physical activity as a non-pharmacological strategy to improve emotional state and quality of life during pregnancy.

Numerous studies have demonstrated that physical activity has a positive impact on reducing anxiety during pregnancy. For example, Smith et al. (2020) showed that pregnant women who engage in moderate physical activity experienced a 30% reduction in anxiety levels.

Within the framework of this research, various sources from indexed journals, Scielo, Dialnet, and Google Scholar are incorporated. The most relevant studies related to the topic are presented below.

In Canada, Mottola (2021), in his research on "Effects of Physical Activity on Anxiety During Pregnancy," conducted an experimental study involving 120 participants. Standardized tests were applied, including the Beck Depression Inventory (BDI) and the Hamilton Anxiety Scale (HAM-A). The results indicate that pregnant women who practice physical activity reduce anxiety symptoms by 30%. According to Mottola, moderate physical activity significantly reduces anxiety symptoms in pregnant women.

Similarly, in the United Kingdom, Wilson and Carter (2019), in a study on "Physical Activity and Depression During Pregnancy," conducted a randomized controlled trial involving 120 participants. Standardized tests were applied, including the EPDS and the Physical Activity Questionnaire. The results indicate that women who practice physical activity during the gestational stage reduce depression symptoms by 30%. According to Wilson and Carter, regular physical activity helps mitigate depression symptoms during pregnancy.

Likewise, in the United States, Smith et al. (2020) analyzed the "Effects of Moderate Physical Activity on Reducing Anxiety During Pregnancy." Smith conducted a longitudinal study including 150 pregnant women in their second trimester. Standardized tests such as the Hamilton Anxiety Scale (HAM-A) and physical activity records were applied. The findings showed that women who engaged in moderate physical activity experienced a 30% reduction in anxiety levels. According to Smith, moderate physical activity is an effective tool for managing anxiety during pregnancy.

Similarly, in South Korea, Lee et al. (2022), in a study on the "Influence of Physical Activity on Anxiety and Stress in Pregnant Women," conducted a longitudinal study involving 250

pregnant women. Standardized tests were applied, including the General Health Questionnaire (GHQ-28) and the physical activity questionnaire (IPAQ). The results indicate that pregnant women who practice moderate physical activity reduce anxiety and stress levels by 40%. According to Lee, physical activity is an effective strategy for improving mental health during pregnancy.

Finally, in Brazil, Silva et al. (2019) analyzed the "Impact of Physical Activity on Anxiety and Self-Esteem in Pregnant Women." Silva conducted a cross-sectional study involving 20 pregnant women. Standardized tests were applied, including the Hamilton Anxiety Scale and self-esteem questionnaires. The results indicate that women who practice regular physical activity have lower levels of anxiety and higher self-esteem. According to Silva, physical activity has a positive impact on mental and emotional health during pregnancy.

Pregnancy is a complex biological and psychological process spanning approximately forty weeks, during which women experience significant physiological, hormonal, and emotional transformations necessary for proper fetal development. According to Cunningham et al. (2022), this process is divided into three trimesters, each with particular characteristics that influence both the physical and mental health of the pregnant woman. The first trimester comprises weeks 1 through 13 and involves the greatest hormonal changes, generating symptoms such as nausea, emotional sensitivity, and fatigue. The second trimester, spanning from week 14 to week 27, is usually characterized by greater physical and emotional stability, being considered the period of greatest well-being during gestation.

In turn, the third trimester, "from week 28 until the end of pregnancy, is associated with a

significant increase in physical discomfort, increased abdominal load, sleep alterations, and concern about childbirth and the baby's health" (p.145). Recent research indicates that this last trimester is when higher levels of gestational anxiety are reported, due to factors such as fear of childbirth, uncertainty about fetal well-being, and the proximity of the delivery process.

Venkatesh et al. (2021) point out that, as the time of delivery approaches, anxiety levels tend to increase, which can modify how the pregnant woman experiences and perceives pain during birth. During the third trimester of pregnancy, the main hormones that present significant changes are estrogens, progesterone, prolactin, oxytocin, relaxin, and cortisol, all essential for maternal adaptation and fetal development (Dukic & Ehlert, 2023).

Estrogens and progesterone increase progressively, favoring uterine growth, muscle relaxation, and breast preparation, although they can generate fluid retention, fatigue, and emotional changes.

Prolactin elevates milk production, oxytocin facilitates uterine contractions, and relaxin contributes to joint flexibility, while cortisol plays a fundamental role in regulating maternal metabolism, fetal maturation, and preparation for childbirth, although elevated or dysregulated levels can be associated with stress, sleep alterations, and risk of complications such as preterm birth or low birth weight. These hormonal changes are reflected in common pregnancy symptoms such as anxiety, heartburn, constipation, low back pain, and fatigue, making prenatal care and professional follow-up essential to guarantee maternal-fetal health and adequate physiological adaptation during this critical stage.

Anxiety during pregnancy is defined as an

emotional response marked by excessive and persistent worry related to aspects of fetal development, childbirth, and maternal health, which can manifest through physical and cognitive symptoms. Fallon et al. (2020) indicate that anxiety during pregnancy represents a significant risk for both mother and baby, as it can be related to complications such as preterm birth, low birth weight, and an increased likelihood of postpartum depression. This emotional state is influenced by endocrine changes, increasing physical demands, and psychosocial factors, making its identification and proper management essential. According to Venkatesh et al. (2021), anxiety during pregnancy tends to be more intense in the third trimester, mainly due to fears associated with the upcoming birth and the protection and well-being of the newborn.

In this context, physical activity is positioned as a key tool for promoting comprehensive health during pregnancy. The World Health Organization (2020) describes physical activity as any body movement generated by skeletal muscles that involves energy expenditure, highlighting its relevance both for disease prevention and mental well-being. It is classified according to intensity as light, moderate, and vigorous. Light activity comprises gentle movements or mobility exercises without a considerable increase in heart rate; moderate activity produces moderate increases in heart and respiratory rate, such as brisk walking or gentle aerobics; while vigorous activity causes greater cardiovascular demand, including activities such as running or functional training. Furthermore, Tremblay et al. (2017) emphasize that maintaining an active lifestyle is essential, as sedentary behavior characterized by low-energy-demand activities performed in a seated or reclined position constitutes a risk factor for health during pregnancy, and its presence is associated with increased risks of obesity, gestational diabetes, and metabolic complications.

The benefits of physical activity during pregnancy have been extensively documented by recent research. In particular, Nascimento et al. (2021) highlight that performing moderate-intensity exercises regularly contributes to reducing anxiety and stress, in addition to improving sleep quality and emotional regulation. Complementarily, Davenport et al. (2020) indicate that exercise during pregnancy helps reduce risks such as gestational diabetes, pregnancy-induced hypertension, and excessive weight gain, while also improving cardiorespiratory condition. In this context, the World Health Organization (WHO, 2020) recommends that pregnant women engage in at least 150 minutes of moderate physical activity per week, while Souza et al. (2022) highlight that structured programs supervised by professionals present greater adherence and better results, facilitating progression toward adequate levels of physical activity.

To measure the level of physical activity in research and clinical contexts, the International Physical Activity Questionnaire (IPAQ) is used, which allows quantifying the weekly time dedicated to light, moderate, and vigorous activities, classifying individuals into low, moderate, or high levels, and is especially useful in pregnant women due to its ease of application (Craig et al., 2003). Complementarily, the Hamilton Anxiety Scale (HAM-A) is widely recognized for evaluating the severity of somatic and cognitive symptoms associated with anxiety, allowing the identification of clinical changes before and after interventions, which is relevant in studies on the impact of physical activity on emotional well-being (Maier et al., 2020).

The relationship between physical activity and anxiety has been extensively studied, and it has been demonstrated that exercise constitutes an effective intervention to reduce anxiety levels during pregnancy. According to Davenport et al. (2020), pregnant women who regularly participate in physical activity programs present a significant reduction in anxiety, an effect attributed to the release of neurotransmitters such as endorphins and serotonin, as well as the decrease in sympathetic nervous system activation. Furthermore, physical activity favors a greater sense of control over one's own body, improves the perception of self-efficacy, and generates benefits for emotional health in general, which is especially relevant to ensure a healthier pregnancy and a better experience during childbirth (Nascimento et al., 2021).

The justification for the present research seeks to contribute new knowledge about how physical activity influences the reduction of anxiety in pregnant women, by analyzing its effects on stress, anxiety, and mood during gestation. This study will benefit the general population, with special emphasis on pregnant mothers, by significantly contributing to the improvement of their quality of life through physical activity via accessible, safe, and evidence-based strategies. Likewise, it will have a positive impact on the family environment, as it will provide parents, siblings, and other family members with knowledge about the favorable effects of physical activity during pregnancy. In this way, active family participation in the gestational process will be encouraged, strengthening the bonds of support, understanding, and emotional accompaniment that are essential for the comprehensive well-being of the pregnant woman.

The research is grounded in the biopsychosocial model of well-being, as well as

the theory of self-determination, which holds that physical exercise improves emotional state by satisfying the basic needs of autonomy, competence, and relatedness. According to Davenport et al. (2020), moderate physical activity acts as a natural antidepressant, promoting the release of endorphins, which are hormones responsible for feelings of happiness and emotional well-being. Meanwhile, Rodríguez-Blancue (2021) highlights the efficacy of physical activity as a non-pharmacological strategy to improve anxiety in pregnant women.

Physical activity during pregnancy is a topic of growing interest in the community, as it has been observed to have a significant impact on the anxiety of pregnant women. According to the World Health Organization (WHO), moderate physical activity reduces symptoms of anxiety and depression, contributing to a more positive mood and better self-esteem. According to Lindsay (2020), women who engage in physical activity during pregnancy report a significant reduction in anxiety symptoms, improving their emotional well-being and satisfaction with their pregnancy experience.

The causes of this problem lie in hormonal changes, the different trimesters of pregnancy, fear of childbirth, insecurity about motherhood, and negative thoughts. The consequences of this inactivity are increased anxiety, stress, and a greater risk of complications during childbirth and postpartum, affecting both the physical and emotional health of the mother, which in turn negatively influences the baby's development. The motivation to research this topic lies in improving the quality of life of young women during pregnancy, providing scientific evidence through the results obtained in the research on the importance of physical activity.

Materials and Methods

The methodological design selected for this research corresponds to a mixed methods nested (embedded) design with quantitative dominance, which is pertinent due to the nature of the research problem and the objectives set. This design allowed for the integration of quantitative and qualitative data within a single research process, providing greater interpretive robustness to the findings. As Hernández Sampieri, Fernández, and Baptista (2020) point out, nested mixed designs are characterized by including a secondary approach within a predominant one, with the purpose of complementing and enriching the understanding of the phenomenon under study, maintaining a clear hierarchy between both. In this study, the dominant approach is quantitative, as the central purpose is to measure the influence of a physical activity program on anxiety levels in a pregnant woman.

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Research Techniques and Instruments

For the development of the research, psychometric techniques, self-recording methods, and clinical interviews were employed, organized according to their quantitative and qualitative components. Regarding the quantitative component, firstly, the International Physical Activity Questionnaire (IPAQ, short version) was used to quantify the baseline weekly physical activity level and the estimated energy expenditure in MET-minutes/week of the pregnant woman. Its application technique consisted of a self-report survey administered at pre- and post-intervention moments, this being a standardized instrument with broad international validity and adequate internal consistency in adult populations (Craig et al., 2003).

Secondly, to evaluate the severity and evolution of the somatic and psychic symptoms of anxiety, the Hamilton Anxiety Scale (HAM-A) was applied.

Its application technique was structured through a semi-structured clinical interview pre- and post-intervention; to guarantee the rigor of the procedure and avoid bias, the assessment was carried out by an external clinical psychologist linked to the participant's emotional support center. This instrument presents satisfactory psychometric properties and is highly recommended for intervention studies (Maier et al., 1988).

Finally, the Borg Rating of Perceived Exertion (RPE 6-20) Scale was employed for the continuous monitoring and quantification of the physical workload intensity in each training session. The technique consisted of a visual and numerical self-report record, which the patient completed immediately following the conclusion of the exercise blocks. This procedure was grounded in the scale's established properties for regulating exercise intensity in special populations and its consistent correlations with physiological indicators (Borg, 1998).

Regarding the qualitative component, data were gathered through in-session micro-interviews, aimed at longitudinally capturing the emotional sensations, perceived well-being, and situational factors affecting the pregnant woman's mood. These were administered as brief qualitative interviews, structured as natural conversations at the outset and closure of each session. Furthermore, the spontaneous verbal descriptions provided by the participant when registering her score on the Borg Scale were also incorporated; these served as embedded qualitative data, complementing and enriching the interpretation of the subjective perceived effort throughout the process.

Participants

Patient Data

The patient presents the anthropometric data and vital signs evaluated during the third trimester of pregnancy. A height of 1.48 m was recorded, a

weight of 60 kg, and a body mass index (BMI) of 27.39, corresponding to the overweight range. Regarding vital signs, the patient showed oxygen saturation of 95%, heart rate of 97 beats per minute, pulse of 78 bpm, respiratory rate of 17 rpm within physiological parameters, and blood pressure of 100/60 mmHg. Taken together, these values allow for the description of the pregnant woman's general condition, with BMI standing out as a relevant parameter for clinical follow-up during the intervention process.

Procedure and Data Analysis

Phase 1: Initial evaluation. The participant received information about the study and signed the informed consent form. The quantitative instruments (IPAQ, HAM-A, and Borg) were applied, and the first micro-interviews were conducted to explore her initial perception of anxiety and physical activity.

Phase 2: Physical activity intervention. A structured and safe program for pregnancy was implemented, with intensity controlled by the Borg Scale and direct supervision. During all sessions, subjective responses and behavioral observations were recorded and incorporated into the qualitative analysis.

Phase 3: Final evaluation. The quantitative instruments were again applied to measure changes, along with interviews and qualitative observations, allowing the documentation of the evolution of anxiety and the perception of

physical activity.

Phase 4: Data integration. Quantitative data were analyzed to identify changes and trends, while qualitative data were thematically coded to contextualize and explain numerical results, following the nested mixed model of Hernández Sampieri et al. (2020).

The patient is a 21-year-old pregnant woman in her third trimester of gestation who presents a very severe state of anxiety. An adapted physical activity program will be applied with the objective of reducing her anxiety levels and promoting better physical and emotional well-being. This intervention aims not only to contribute to anxiety control but also to promote physiological and psychological benefits that facilitate a normal delivery, improving the comprehensive preparation of the pregnant woman for this process.

Results

The pregnant woman is in the third trimester of pregnancy. Following the application of the Hamilton Anxiety Scale and the analysis of the results obtained, a very severe state of anxiety was evidenced. Likewise, through the application of the International Physical Activity Questionnaire (IPAQ) and the corresponding analysis, it was determined that she does not reach the recommended minimum level of 600 MET-min/week, thus being classified within the low physical activity level.

Table 1.
International Physical Activity Questionnaire (IPAQ)

Type of Activity	Days/Week	Minutes/day	ME T	MET- min/week	Observation
Vigorous physical activity (e.g., aerobics, weight lifting)	1	10	8	80	Low frequency and intensity
Moderate physical activity (e.g., regular cycling, carrying light weight)	2	20	4	160	Low level
Walking ≥ 10 min/day	3	20	3.3	198	Low level
Total weekly physical activity				438 MET- min/week	Physical activity level: Low

Note: Own elaboration (2025).

According to Table No. 2, following the application of the International Physical Activity Questionnaire (IPAQ) and the corresponding analysis of the responses, the weekly physical activity level in MET-min/week was calculated using the formula: $\text{MET} \times \text{minutes per day} \times \text{days per week}$. The patient does not reach the recommended minimum level of 600 MET-min/week, presenting a low level of physical activity. This indicates that before the intervention, her activity level was insufficient to obtain the physical and psychological benefits associated with exercise, which justifies the application of the supervised physical activity program.

Table 2.

Hamilton Scale Results

Item	Anxiety Symptom	Response	Anxiety Level	Observation
1	Anxious mood	Very severe	4	Intense alteration
2	Tension	Severe	3	High bodily tension
3	Fears	Severe	3	Pronounced fears
4	Insomnia	Severe	3	Significant sleep problems
5	Intellectual-cognitive	Very severe	4	Concentration difficulties
6	Depressed mood	Very severe	4	Intense emotional alteration
7	General somatic symptoms (muscular)	Severe	3	Physical discomfort
8	Somatic symptoms (sensory)	Very severe	4	Intense physical manifestations
9	Cardiovascular symptoms	Moderate	2	Mild physiological alteration
10	Respiratory symptoms	Severe	3	Perceptible respiratory difficulty
11	Gastrointestinal symptoms	Very severe	4	Significant digestive discomfort
12	Genitourinary symptoms	Moderate	2	Mild affectation
13	Autonomic symptoms	Severe	3	Notable physiological activation
14	Behavior during interview	Very severe	4	Intense observable reactions
Total / Mean			3.5	Anxiety level: Very severe

Note. Own Elaboration (2025).

Table 3 presents the results obtained through the application of the Hamilton Anxiety Scale. The total mean of 3.5 indicates that the patient presented very severe anxiety before the intervention, with multiple dimensions significantly affected, especially anxious mood, cognitive, somatic, and behavioral aspects. This result evidences the need for an intervention to reduce anxiety levels and improve emotional well-being during pregnancy.

Intervention

The physical activity program is designed for a 21-year-old pregnant woman in her third trimester, with the main objective of reducing anxiety levels through systematic practice of adapted, controlled, and safe physical activity. The plan covers a period of eight weeks, distributed in three phases: adaptation, improvement, and maintenance, progressively increasing weekly exercise time and maintaining intensities within a safe range of 35% to 65%, in accordance with recommendations for pregnant women.

The program combines different types of exercises with physical, respiratory, and psychological approaches, also integrating periodic evaluations (IPAQ, Hamilton, and Borg) to monitor the patient's evolution in both physical condition and anxiety level.

PHYSICAL ACTIVITY PROGRAM FOR A 21-YEAR-OLD PREGNANT WOMAN IN THE 3rd TRIMESTER																														
PROGRAM OBJECTIVE: To reduce anxiety levels through adapted and controlled physical activity in the 21-year-old pregnant woman.																														
PATIENT: Pregnant woman																														
PATIENT'S NAME: Dominga																														
TRAINER: Jhonny Vidal Corpus																														
START DATE: 09/15/25													END DATE: 11/07/25																	
STAGES		EV.PH	Adaptation phase									Improvement Stage									Maintenance phase			EVA. PHASE						
Month/Week	SEPTEMBER									OCTOBER																NOVEMBER				
	WEEK 1			WEEK 2			WEEK 3			WEEK 4			WEEK 5			WEEK 6			WEEK 7			WEEK 8								
Days	Mon	Wed	Fri	Mon	Wed	Fri	Mon	Wed	Fri	Mon	Wed	Fri	Mon	Wed	Fri	Mon	Wed	Fri	Mon	Wed	Fri	Mon	Wed	Fri	Mon	Wed	Fri			
Date	15	17	19	22	24	26	29	1	3	6	8	10	13	15	17	20	22	24	27	29	31	3	5	7						
Minutes/Weekly	90'			90'			120'			150'			150'			150'			150'			150'			150'			150'		
Minutes/Daily	420'									570'																				
Directions	35-40%			45-55%			60-65%			60-65%			60-65%			60-65%			60-65%											
Functional Exercises	x	x	x	x	x	x	x	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
Breathing and Relaxation Exercises				x	x	x		x	x			x	x		x		x		x	x		x	x		x	x				
Aquatic exercises						x				x			x			x			x						x					
Kegel exercises and relaxation techniques					x		x					x			x		x				x									
Psychological quiz		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
IPAQ quiz	x																									x				
Hamilton Anxiety Scale	x																										x			
Borg Scale	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
Medical Evaluation	x																										x			

Table 3.
Physical Activity Level in Post-Test

Type of Activity	Days/Week	Minutes/Day	ME T	MET-min/week	Observation
Vigorous physical activity (e.g., aerobics, weightlifting)	1	10	8	80	Low frequency, slight increase in intensity
Moderate physical activity (e.g., regular cycling, carrying light weight)	2	40	4	320	Longer duration, significant improvement
Walking ≥ 10 min/day	3	20	3.3	198	Slight increase in frequency and duration
Total weekly physical activity				598 MET-min/week	Physical activity level: Moderate

Note. Own elaboration (2025).

According to Table No. 4, after the intervention, the patient increased her physical activity level from 438 MET-min/week to 598 MET-min/week, approaching the recommended threshold of 600 MET-min/week. This indicates a significant improvement in physical activity behavior, with increased duration and frequency of moderate activity, reflecting adherence to the program and greater functional capacity.

Table 4.
Hamilton Anxiety Scale

Item	Anxiety Symptom	Response	Anxiety Level	Observation
1	Anxious mood	Moderate	2	Notable improvement
2	Tension	Mild	1	Significant reduction
3	Fears	Moderate	2	Decrease in fears
4	Insomnia	Mild	1	Better sleep quality
5	Intellectual-cognitive	Moderate	2	Better concentration
6	Depressed mood	Moderate	2	Reduction of depressive symptoms
7	General somatic symptoms (muscular)	Mild	1	Less physical discomfort
8	Somatic symptoms (sensory)	Moderate	2	Decrease in physical manifestations
9	Cardiovascular symptoms	Moderate	2	Mild reduction of symptoms
10	Respiratory symptoms	Mild	1	Better breathing and relaxation
11	Gastrointestinal symptoms	Moderate	2	Less digestive discomfort
12	Genitourinary symptoms	Moderate	2	Mild improvement
13	Autonomic symptoms	Moderate	2	Less physiological activation
14	Behavior during interview	Mild	1	Observed improvement in behavior
Total / Mean			1.9	Anxiety level: Moderate

Note. Own elaboration (2025).

Table No. 5 indicates the results according to the Hamilton Anxiety Scale (HAM-A). The total mean decreased from 3.5 (very severe) to 1.9 (moderate), representing a 45.7% reduction in anxiety levels. Improvement is observed in all dimensions, especially in tension, insomnia, and somatic symptoms, showing that the physical activity intervention had a significant and positive effect on the patient's emotional regulation and well-being.

Table 5.
Data Triangulation

Hamilton Anxiety Scale			Theoretical Support
Pre-test	Post-test	Inference	
In the pre-test, very severe scores were recorded for anxious mood, intellectual-cognitive functioning, depressed mood, sensory somatic symptoms, respiratory symptoms, gastrointestinal symptoms, and behavior during the interview; while tension, fears, insomnia, general somatic symptoms were rated as severe. Cardiovascular and genitourinary symptoms	The patient presented a moderate level in anxious mood, fears, intellectual-cognitive functioning, depressed mood, somatic symptoms (sensory and general), cardiovascular, gastrointestinal, genitourinary, and autonomic symptoms. Tension, insomnia, respiratory symptoms, and behavior during the interview were rated as mild. These results determine that the patient presents a moderate level of	The comparison between pre- and post-test evidences a significant decrease in anxiety symptoms. The patient went from a very severe level characterized by intense alterations in anxious mood, somatic symptoms, cognitive functioning, and autonomic manifestations to a moderate level, where several dimensions were reduced to moderate or mild intensities. This demonstrates that the	The Hamilton Anxiety Scale (HAM-A) is a widely validated clinical instrument for assessing anxiety severity and changes produced after an intervention. Hamilton (1959) provides evidence that techniques such as diaphragmatic breathing, progressive muscle relaxation, and physical activity contribute to decreasing physiological activation and

reached a moderate level. These results determine that the patient presents a very severe level of anxiety.	anxiety.	applied intervention generated a positive impact, favoring clear emotional and physiological Improvement.	improving emotional regulation, favoring the reduction of anxiety symptoms.
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The comparison between pre-test and post-test in Table No. 6 shows significant changes in the patient's anxiety. Initially, she presented a very severe level of anxiety, with high scores in anxious mood, cognitive functioning, and somatic symptoms. In the post-test, her anxiety level was reduced to moderate, with symptoms classified as moderate or mild. This indicates a positive impact of the intervention, improving both her emotional and physiological well-being. The Hamilton Anxiety Scale (HAM-A) supports these results, confirming the effectiveness of techniques such as breathing and relaxation in reducing anxiety.

Table 6.
Statistical Data Triangulation

Instrument	Pre-test	Post-test	% Change	Qualitative Data	Inference
Hamilton Anxiety Scale (HAM-A) - total level	3.5 (Very severe)	1.9 (Moderate)	45,7% ↓	The patient reports less tension, less fear, greater relaxation, and concentration in daily activities.	The physical activity intervention significantly decreased anxiety, confirming the subjective perception of well-being.
IPAQ - MET-min/week (total physical activity)	438	598	36.5% ↑	The patient expresses greater energy, confidence, and motivation to exercise, and a sense of achievement.	Physical activity increased considerably, agreeing with the improvement in perception of well-being and reduction of anxiety.
Borg Scale - effort perception (session average)	Light (0-3)	Light to heavy (3-6)	N/A	The patient expresses satisfaction and control over exercise intensity; adapts effort according to bodily sensation.	The perception of effort reflects progressive adaptation and self-regulation, contributing to emotional and physical well-being.

Note: Borg does not require %, as it is qualitative/ordinal and is complemented by the description of subjective experience.

According to Table No. 7, on the triangulation of quantitative and qualitative results, a comprehensive understanding of the impact of physical activity on the patient's anxiety is observed. According to the Hamilton Anxiety Scale (HAM-A), total anxiety decreased from a mean of 3.5 (very severe) in the pre-test to 1.9 (moderate) in the post-test, representing a 45.7% reduction. This decrease is also reflected in the participant's testimonies, who reported less tension, reduced fear, and greater relaxation and concentration in her daily activities. In relation to physical activity measured by IPAQ, the patient went from 438 MET-min/week in the pre-test to 598 MET-min/week in the post-test, corresponding to an increase of 36.5%. This increase in physical activity was accompanied by qualitative comments that evidenced greater energy, motivation, and confidence in the execution of the exercises, as well as satisfaction with the achievement. The Borg Scale, used both as a quantitative instrument and a qualitative source, showed that the patient's effort perception evolved from light levels (0-3) to light to heavy (3-6), reflecting progressive adaptation to the physical load. This perception was complemented by expressions of self-regulation and enjoyment during the sessions, indicating that the patient learned to control the intensity of exercises according to her bodily sensations. Overall, the triangulation evidences that the supervised physical activity program produced significant improvements in the patient's anxiety and general well-being, confirming the convergence between objective indicators and subjective experience.

At the beginning of the study, the 21-year-old patient in her third trimester of gestation presented a low level of physical activity, with 438 MET-min/week according to the International Physical Activity Questionnaire (IPAQ). During the supervised physical activity program, the level increased to 598 MET-min/week, representing

an increase of 36.5%.

Qualitatively, the participant expressed greater energy, confidence, and motivation to perform the exercises, also indicating satisfaction with the improvement achieved:

"Now I can do the exercises for longer and I feel calmer after each session."

This demonstrates that the intervention positively impacted both the objective level of physical activity and the subjective experience of well-being (Craig et al., 2003).

The Hamilton Anxiety Scale (HAM-A) indicated that the patient initially presented a very severe level of anxiety, with high scores in anxious mood, depressed mood, intellectual-cognitive functioning, and somatic symptoms. After the intervention, the post-test showed a decrease to a moderate level, with a 45.7% reduction in the total anxiety mean (from 3.5 to 1.9).

The patient also expressed qualitative improvements in her emotional state:

"After doing the exercises I feel more relaxed and less worried about everything."

These results evidence that supervised physical activity contributed to the reduction of anxiety and greater psychological well-being during pregnancy (Hamilton, 1959).

The Borg Scale allowed the evaluation of subjective effort perception and adjustment of intensity in an individualized manner. During sessions, effort perception fluctuated between "light" (0-3) at the beginning and "light to heavy" (3-6) in intermediate sessions, reflecting progressive adaptation and self-regulation of exercise (Table 3).

Qualitatively, the patient reported:

"I can control how I exert myself and I enjoy the exercises more."

This indicates that intensity adaptation contributed both to physical safety and emotional well-being.

Discussion

The general objective of this research was to determine the influence of a physical activity program on anxiety during pregnancy in a 21-year-old woman in her third trimester of gestation. The results obtained through the single case study design and data triangulation confirm the alternative hypothesis (H_a), categorically demonstrating that the implementation of a supervised physical activity program significantly reduced anxiety levels in the participant. This central finding validates adapted physical activity as an effective and non-pharmacological strategy for managing gestational anxiety, which is a common psychosocial risk factor in the advanced gestational period.

The success of the intervention is evidenced by the positive bifocal change experienced by the patient throughout the eight weeks of the program. Initially, the participant presented a diagnosis of very severe anxiety, with a total mean of 3.5 according to the Hamilton Anxiety Scale (HAM-A), and a low level of physical activity, recording 438 MET-min/week through the International Physical Activity Questionnaire (IPAQ). After the intervention, anxiety was notably reduced to a moderate level (mean of 1.9), representing a total reduction of 45.7% in anxiety levels. Simultaneously, physical activity increased to 598 MET-min/week, being classified as a moderate level and approaching the minimum threshold recommended by the World Health Organization (WHO) of 600 MET-min/week. This improvement process is grounded in the biopsychosocial model of well-being and the theory of self-determination, which explain how exercise acts as a natural antidepressant by promoting the release of endorphins and serotonin, thus improving emotional state and perception of control.

The results of this case study are in full agreement with the international scientific literature. The reduction in anxiety is consistent with previous studies, such as those by Mottola (2021) in Canada, Smith et al. (2020) in the United States, and Lee et al. (2022) in South Korea, which consistently reported that moderate-intensity physical activity reduces anxiety symptoms in pregnant women, with reduction percentages ranging between 30% and 40%. The finding that regular physical activity is associated with lower levels of anxiety and higher self-esteem is also supported by research such as that of Silva et al. (2019) in Brazil. The current study, by documenting the evolution from a case of severe clinical anxiety to a manageable state, reinforces this global consensus and underscores the importance of moderate intensity in symptom reduction.

The robustness of the research is due to the mixed-methods nested (embedded) design with quantitative dominance, which allowed the integration of objective and subjective data for a complete understanding of the effect. The quantitative component measured the magnitude of change in anxiety (HAM-A) and physical activity (IPAQ). The qualitative component, obtained through micro-interviews and the use of the Borg Rating of Perceived Exertion (RPE) Scale, was fundamental for contextualizing and interpreting the numerical results. The use of the Borg Scale facilitated the control of exercise intensity in a safe manner for the pregnant woman, and the patient's expressions, such as "less tension, less fear, greater relaxation and concentration" and that "she feels calmer after each session," confirmed that the objective improvement corresponded with the subjective perception of well-being. In addition to anxiety reduction, the program contributed to the improvement of physical condition and effort self-regulation, factors that significantly contribute to the general emotional well-being of the pregnant woman.

In conclusion, the rigorous triangulation of data validates the implementation of structured and controlled programs as a fundamental practice for improving the quality of life of pregnant women, especially in cases of elevated anxiety, demonstrating that physical activity is an essential component for comprehensive care during pregnancy.

Conclusions

The general objective of this research was to determine the influence of a physical activity program on anxiety during pregnancy in a 21-year-old woman. The results obtained through rigorous data triangulation (quantitative and qualitative) robustly confirmed the efficacy of the program, demonstrating that adapted and controlled physical activity during the third trimester of gestation has a positive and significant influence on the reduction of the participant's anxiety levels.

It was determined that the patient presented a low level of physical activity before the intervention. Based on the detailed data from the International Physical Activity Questionnaire (IPAQ), an initial value of 438 MET-min/week was recorded, which was notably below the minimum threshold of 600 MET-min/week recommended for health.

It was concluded that the participant, evaluated with the Hamilton Anxiety Scale (HAM-A) in the pre-test, presented a very severe level of anxiety. This initial diagnosis evidenced intense alterations in multiple dimensions, including anxious mood, intellectual-cognitive functioning, depressed mood, and various somatic symptoms.

The post-test results demonstrated a significant reduction in anxiety. The patient presented a moderate level of anxiety, with a 45.7% reduction in the total mean (from 3.5 to 1.9), and her symptoms were predominantly classified as moderate or mild, indicating clear

emotional and physiological improvement.

The comparison of pre- and post-intervention values reveals a positive bifocal change: The patient went from a "low" level of physical activity (438 MET-min/week) to a "moderate" level (598 MET-min/week), reflecting a 36.5% increase in her total physical activity. Simultaneously, anxiety decreased from a "very severe" level to "moderate." Additionally, the use of the Borg Scale evidenced a progressive improvement in the patient's ability to recognize and self-regulate her physical effort (fluctuating between "light" and "light to heavy"), which contributed to safe, efficient practice and her emotional well-being.

This research validates physical activity as an accessible, safe, and evidence-based strategy to mitigate gestational anxiety in the third trimester. The effectiveness of structured and controlled programs is confirmed, demonstrating that physical activity is fundamental for improving emotional, physical well-being, and quality of life for young women during pregnancy.

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