

Effects of Mat Pilates on the Quality of Life of Health Sciences Students: A Randomized Clinical Trial*

* Article stemming from the doctoral dissertation entitled “Effects of a mat Pilates exercise protocol on the mental health and quality of life of university students: a randomized clinical trial”, submitted to the Graduate Program in Health Care at the Federal University of Triângulo Mineiro, Brazil, in February 2025.

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Theme: Promotion of health, well-being, and quality of life

Contribution to the course: This study contributes to strengthening integrative care by highlighting the positive effects of mat Pilates on the quality of life of health sciences students. The findings support the incorporation of complementary practices in promoting physical, psychological, and social well-being in the university setting, emphasizing healthy behaviors and disease prevention. The research expands knowledge on non-pharmacological interventions and encourages interdisciplinary actions aimed at health promotion and improving the academic experience, with particular relevance for the training of future healthcare professionals.

Abstract

Introduction: Pilates has been proven effective in promoting physical and mental health, emerging as a promising strategy in the university setting. **Objective:** To assess the effects of mat Pilates on the quality of life of health sciences students. **Materials and Methods:** This is a randomized clinical trial conducted with 93 participants, randomly assigned to the experimental ($n = 46$) and the control groups ($n = 47$), with the sample size calculated based on a previous pilot study. Participants were individuals aged ≥ 18 years, enrolled in health-related courses, who had not practiced Pilates within three months prior to the study, and who had no recent history of pregnancy or childbirth. The intervention consisted of 16 sessions of mat Pilates, held twice a week, each lasting 40 minutes. Quality of life was assessed using the WHOQOL-BREF. For data analysis, paired and independent t-tests were used for parametric variables, and the Wilcoxon and Mann-Whitney tests were used for non-parametric variables. The protocol was registered in the Brazilian Registry of Clinical Trials under code RBR-8xzpdbc. **Results:** In the intragroup analysis, the experimental group showed significant improvement in the physical ($p = 0.002$) and psychological ($p = 0.001$) domains, and the control group in the social domain ($p = 0.003$). In the intergroup comparison, significant improvements were observed in the physical ($p = 0.001$), psychological ($p = 0.011$), and social ($p = 0.003$) domains, with moderate effects (Cohen's d : physical = 0.69; psychological = 0.54; social = 0.53). **Conclusion:** Mat Pilates has proven to be effective in improving the quality of life for health sciences students. In the nursing field, such strategies expand the range of health promotion initiatives, enabling more sensitive, humanized, and effective interventions in the university setting.

Keywords (Source: DeCS)

Exercise and movement techniques; quality of life; health promotion; health sciences students; students' health.

4 Efectos del Pilates suelo en la calidad de vida de los estudiantes del área de la salud: un ensayo clínico aleatorizado*

* Artículo derivado de la tesis doctoral “Efeitos de um protocolo de exercícios do método Pilates solo sobre a saúde mental e qualidade de vida de estudantes universitários: um ensaio clínico randomizado” (“Efectos de un protocolo de ejercicios del método Pilates suelo sobre la salud mental y la calidad de vida de estudiantes universitarios: un ensayo clínico aleatorizado”), presentada al Programa de Posgrado en Atención a la Salud de la Universidade Federal do Triângulo Mineiro, Brasil, en febrero de 2025.

Resumen

Introducción: Se ha demostrado que el Pilates es eficaz para promover la salud física y mental, configurándose como una estrategia prometedora en el contexto universitario. **Objetivo:** evaluar los efectos del Pilates suelo en la calidad de vida de estudiantes del área de la salud. **Materiales y método:** Este es un ensayo clínico aleatorizado con 93 participantes, distribuidos aleatoriamente en los grupos experimental ($n = 46$) y control ($n = 47$). El cálculo del tamaño muestral se basó en un estudio piloto previo. Se incluyeron personas de ≥ 18 años, matriculadas en cursos del área de la salud, sin práctica previa de Pilates en los tres meses anteriores al estudio y sin antecedentes recientes de embarazo o parto. La intervención consistió en 16 sesiones de Pilates suelo, realizadas dos veces por semana, de 40 minutos de duración. La calidad de vida se evaluó utilizando el WHOQOL-BREF. Para el análisis de datos, se utilizaron pruebas t pareadas e independientes para variables paramétricas, y las pruebas de Wilcoxon y Mann-Whitney en variables no paramétricas. El protocolo fue registrado en el Registro Brasileño de Ensayos Clínicos, bajo el código RBR-8xzpdbc. **Resultados:** En el análisis intragrupo, el grupo experimental mostró una mejora significativa en los dominios físico ($p = 0,002$) y psicológico ($p = 0,001$), mientras que el grupo control presentó mejora en el dominio social ($p = 0,003$). En la comparación entre grupos, se observaron mejoras significativas en los dominios físico ($p = 0,001$), psicológico ($p = 0,011$) y social ($p = 0,003$), con efectos de magnitud moderada (d de Cohen: físico = 0,69; psicológico = 0,54; social = 0,53). **Conclusión:** El Pilates suelo demostró ser eficaz para mejorar la calidad de vida de estudiantes del área de la salud. En el ámbito de la enfermería, estas estrategias amplían el repertorio de acciones orientadas a la promoción de la salud, permitiendo intervenciones más sensibles, humanizadas y efectivas en el contexto universitario.

Palabras clave (Fuente DeCS)

Técnicas de ejercicio con movimientos; calidad de vida; promoción de la salud; estudiantes de ciencias de la salud; salud estudiantil.

Efeitos do *mat* Pilates na qualidade de vida de estudantes da área da saúde: ensaio clínico randomizado*

* Artigo derivado da tese de doutorado intitulada “Efeitos de um protocolo de exercícios do método Pilates solo sobre a saúde mental e qualidade de vida de estudantes universitários: um ensaio clínico randomizado”, apresentada ao Programa de Pós-Graduação em Atenção à Saúde da Universidade Federal do Triângulo Mineiro, Brasil, em fevereiro de 2025.

Resumo

Introdução: O Pilates tem se mostrado eficaz na promoção da saúde física e mental, configurando-se como uma estratégia promissora no contexto universitário. **Objetivo:** avaliar os efeitos do *mat* Pilates na qualidade de vida de estudantes da área da saúde. **Materiais e método:** Trata-se de ensaio clínico randomizado com 93 participantes, distribuídos aleatoriamente nos grupos experimental ($n = 46$) e controle ($n = 47$), cujo cálculo amostral foi baseado em estudo-piloto prévio. Foram incluídos indivíduos com idade ≥ 18 anos, matriculados em cursos da área da saúde e sem prática de Pilates nos três meses anteriores ao estudo, bem como sem histórico recente de gestação ou parto. A intervenção consistiu em 16 sessões de *mat* Pilates, realizadas duas vezes por semana, com duração de 40 minutos. A qualidade de vida foi avaliada por meio do WHOQOL-BREF. Para a análise de dados, utilizaram-se os testes t pareado e independente para variáveis paramétricas, e os testes de Wilcoxon e Mann-Whitney para as não paramétricas. O protocolo foi registrado no Registro Brasileiro de Ensaio Clínicos, sob o código RBR-8xzpdbc. **Resultados:** Na análise intragrupo, o grupo experimental apresentou melhora significativa nos domínios físico ($p = 0,002$) e psicológico ($p = 0,001$), e o grupo controle no domínio social ($p = 0,003$). Na comparação entre grupos, observou-se melhora significativa nos domínios físico ($p = 0,001$), psicológico ($p = 0,011$) e social ($p = 0,003$), com efeitos médios (d de Cohen: físico = 0,69; psicológico = 0,54; social = 0,53). **Conclusão:** O *mat* Pilates demonstrou ser eficaz para a melhora da qualidade de vida de estudantes da área da saúde. No campo da enfermagem, tais estratégias ampliam o repertório de ações voltadas à promoção da saúde, possibilitando intervenções mais sensíveis, humanizadas e efetivas no contexto universitário.

Palavras-chave (Fonte DeCS)

Técnicas de exercício e de movimento; qualidade de vida; promoção da saúde; estudantes de ciências da saúde; saúde do estudante.

Introduction

The quality of life (QoL) of college students has been widely discussed in the health field, given the importance of this group in both social and public health contexts (1). During their academic journey, these students face multiple challenges that can negatively impact their physical and mental health, with a high prevalence of symptoms of psychological distress; this conditions are consistently associated with impairments in QoL domains in this population (2), which requires care strategies that consider the complexity of this life stage. Among the main factors contributing to psychological distress and the overload experienced by students are the extensive workload, the accumulation of academic tasks, the demands of mandatory clinical rotations, and early exposure to intensive care settings, such as hospitals and primary care services. These contexts involve a variety of patient profiles and require students to experience potentially stressful situations, including facing the process of death and dying (3).

Scientific evidence suggests that regularly practicing physical exercise, including mind-body activities, leads to significant improvements in QoL, encompassing physical, mental, and social aspects. In the context of higher education, interventions based on physical activity have been associated with positive outcomes in mental health and QoL, highlighting the role of these practices as strategies for promoting well-being among university students (4).

In addition, studies point to consistent benefits across multiple groups, such as older people and patients undergoing post-stroke rehabilitation, with positive effects on physical function, mental health, perceived social support, and psychological resilience (5-7). In this sense, the practice of Pilates can be considered the independent variable, acting on mediators such as balance, strength, flexibility, body awareness, and emotional regulation, which, in turn, impact the dependent variable, that is, the QoL of students.

In the healthcare context, professionals perform an essential role in promoting healthy habits, including physical exercise. Therefore, it is essential that health sciences students incorporate this practice into their daily routines, not only to improve their own QoL but to reinforce healthy behaviors that may influence their future patients (8).

Among several modalities of physical exercise, the Pilates method has stood out for its integrative approach, which combines muscle strengthening, stretching, balance, and mindful breathing. Its focus on the mind-body connection, through principles such as control, precision, fluidity, and centering, promotes not only physical performance but also emotional regulation and increased body awareness, broadening its applicability as a self-care practice, which contributes significantly to physical and mental well-being (9).

Among university students, interventions such as Pilates have shown positive effects on relevant outcomes, such as improved

sleep quality and reduced fatigue following eight-week programs (10). Furthermore, a study indicates that the method was effective in reducing pain, alleviating symptoms of depression, and improving the QoL of these students (11). However, clinical trials specifically targeting health sciences students remain limited, underscoring the need for further research in this context. These results strengthen the evidence of its potential as a low-cost, integrative therapeutic intervention and highlight its feasibility and applicability in health and wellness promotion programs within the academic setting.

In light of this scenario, the present study aimed to evaluate the effects of mat Pilates on the QoL of health sciences students. Based on previous evidence and the identified background, the hypothesis formulated was that practicing the Pilates method over an eight-week period would lead to a significant improvement in the participants' QoL, compared to the control group.

Materials and Methods

This study followed a randomized, single-blind clinical trial design, in compliance with the Consolidated Standards of Reporting Trials (CONSORT) (12) and Standard Protocol Items: Recommendations for Interventional Trials (SPIRIT) (13) guidelines. The protocol was duly registered at the Brazilian Registry of Clinical Trials under code RBR-8xzpdbc.

Participant Selection

The study participants—university students in the field of health sciences—were recruited through posters displayed at the university and announcements shared on WhatsApp groups and social media.

The sample size calculation was based on the results of a pilot study conducted with 33 participants, divided into the experimental group (EG $n = 13$) and the control group (CG $n = 20$). Considering a statistical power of 80% and an alpha significance level of 0.05, it was determined that the main study should include 46 participants per group. To compensate for possible sample losses of 20%, the total number of participants to be included in the randomization was adjusted to 58 per group ($46/0.8$).

The inclusion criteria were being currently enrolled in a health-related program, being 18 years of age or older, having no recent history of pregnancy or childbirth, and having no prior experience with Pilates within three months prior to the study. Participants with clinical conditions that had contraindications or limited the safe performance of the proposed exercises were excluded, such as musculoskeletal injuries, structural abnormal-

ities of the spine or limbs that compromised movement execution, uncontrolled systemic diseases, and acute pain. Participants who did not complete the eight-week intervention or who had an attendance rate below the minimum percentage established for participation were also excluded.

The randomization was performed using the website www.randomization.com, employing a simple random sequence with a 1:1 allocation ratio between groups. The sequence was generated by an independent researcher who did not participate in the recruitment, assessments, or delivery of the intervention.

The allocation was concealed using opaque, sequentially numbered, and sealed envelopes, prepared in advance by the researcher responsible for generating the random sequence. After completing the baseline assessment and confirming eligibility criteria, the researcher responsible for recruitment opened the envelope corresponding to the participant's enrollment order and assigned them to a group.

Recruitment and assessments were conducted by trained researchers who were not involved in sequence generation or the implementation of the intervention. The intervention was conducted by a qualified professional who was not involved in the assessments. The screening process is shown in Figure 1.

Data Collection

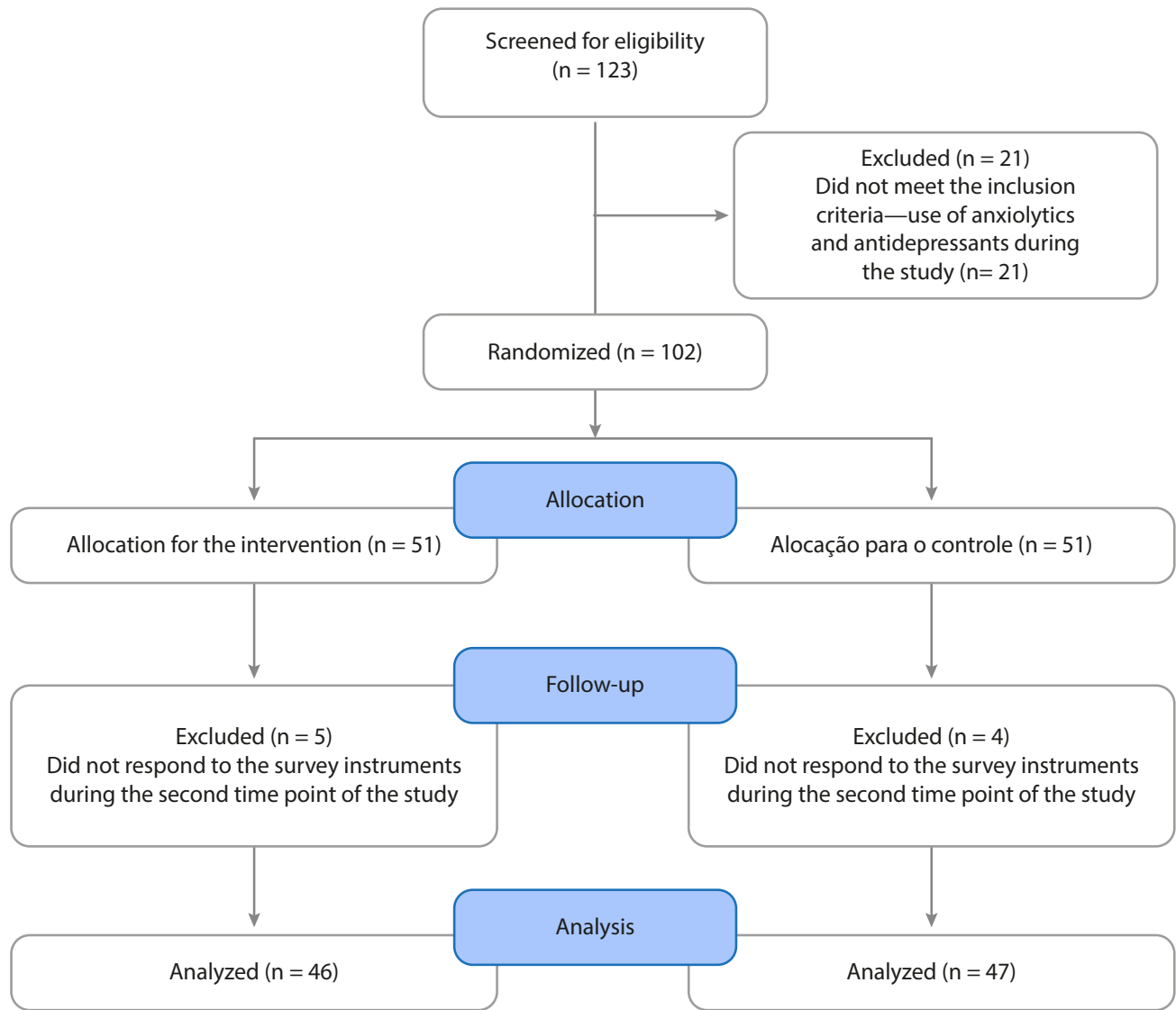
Data collection was conducted at two time points: one week before the start of the intervention (T₁—baseline) and one week after the completion of the eight-week intervention (T₂—post-intervention). The assessments were conducted on site in a dedicated room at the university, using a printed questionnaire, under the supervision of pre-trained evaluators.

A sociodemographic and clinical questionnaire was used, including the following items: age, gender, marital status, self-reported race, monthly income, religion, occupation, physical activity, academic course, and academic term. To assess QoL, the World Health Organization Quality of Life (WHOQOL-BREF) instrument was used, consisting of 26 questions distributed across four domains—physical, psychological, social relationships, and environment—as well as a self-assessment and overall assessment of QoL. Each domain includes questions with response scores ranging from 1 to 5, based on participants' experiences during the two weeks prior to the interview (14). The instruments were completed individually and self-administered by all participants in the EG and CG.

To minimize the risk of bias in the evaluation and interpretation of the results, the study was conducted as a single-blind trial, in which only the independent evaluators and data analysts were blinded to the group assignments. The researcher responsible for the inter-

vention did not have access to the participants' randomization, and participants were instructed to not disclose their group assignment to the evaluators during data collection at the start (T1) and end (T2) of the study.

Figure 1. Sample Flowchart



Source: Prepared by the authors.

Intervention

The intervention using the Pilates method was conducted between May 2023 and September 2024, under the supervision of a physical therapist with training and experience in the method. The study was organized into five cohorts, beginning in May and October 2023, and January, April, and July 2024, in line with the current academic calendar.

The participants were recruited in April, September, and December 2023, as well as in March and June 2024, preceding the start of each cohort. Publicity was accomplished through informa-

tional posters displayed at the educational center and on the university's Campus I, through a post on the institutional website, and by sending invitations via email and WhatsApp to class representatives. The baseline assessment (first measurement) was conducted one week prior to the start of the interventions, using the previously established instruments.

The EG group participated in the mat Pilates program for eight consecutive weeks. Each cohort consisted of 10 to 15 students, and the sessions were held during the regular academic term, respecting the academic break periods. The intervention was conducted exclusively using mats, without any accessories, given their accessibility and low cost.

The CG did not receive any type of intervention during the eight-week study period; participants did not participate in Pilates sessions, receive exercise guidance, or undergo any other structured intervention related to the study. After data collection was completed at the second assessment time point (T2—post-intervention), the Pilates protocol was offered to the CG participants, in compliance with the recommendations of the Research Ethics Committee, ensuring equity and respect for ethical principles.

In the week following the end of the intervention, the second assessment (post-intervention) was conducted, using the same instruments as those used at baseline.

Based on a review of the effects of Pilates on mental health, which indicated benefits from sessions lasting at least 30 minutes over a period of eight to 12 weeks (15), an eight-week intervention was proposed, consisting of a total of 16 sessions held twice a week, each lasting 40 minutes.

The mat Pilates exercise protocol was designed in an effort to employ the method within its traditional principles (physical and mental) and was evaluated by five judges (researchers and/or faculty members) in the field of study, selected based on their résumés on the Lattes Platform. It consisted of 12 exercises: shoulder bridge, clamshell exercise, side kick front and back, book opening, swimming, swan dive, hundreds, single leg stretch, spine stretch, mermaid, hound dog (four-legged), and leg pull front.

Each session lasted approximately 40 minutes, divided into a five-minute warm-up, 30 minutes of mat Pilates exercises, and concluded with five minutes of breathing and relaxation exercises. In the first session, an orientation was conducted, during which participants were instructed on the principles (concentration, centering, precision, breathing, control, and fluidity).

After the fourth week, the protocol was progressed, with an increase in difficulty for four exercises through intermediate variations: one-leg shoulder bridge, hundreds progression with legs extended, double leg stretch, and front leg pull.

Data Analysis

Data were coded and entered using double-entry into an Excel spreadsheet. For categorical and quantitative variables, measures of absolute and relative frequencies were applied, as well as the syntax proposed by the WHOQOL-BREF instrument for calculating QoL domains.

Statistical analysis was conducted via the SPSS 20.0 software; the normality of the distribution of the WHOQOL-BREF domain scores was verified via the Shapiro-Wilk test ($\alpha = 0.05$). The physical, psychological, and environmental domains showed a distribution consistent with normality, which allowed for the use of parametric tests. Thus, for intragroup comparisons (T1 vs. T2), the paired t-test was used; and for intergroup comparisons (IG vs. CG), the independent t-test was employed. The social relations domain showed a non-parametric distribution; for this variable, the Wilcoxon test was used in intragroup comparisons and the Mann-Whitney test in intergroup comparisons.

In addition to statistical significance ($p \leq 0.05$), the effect size (Cohen's d) was calculated to estimate the clinical magnitude of the differences observed between the groups in the domains assessed, classified as small (≤ 0.2), moderate (0.3-0.8), or large (≥ 0.8) (16).

This study was approved by the Research Ethics Committee of the proposing institution, under ethical review application number 58603622.8.0000.5154. All participants received the necessary information and provided their written consent by signing the informed consent form, of which they also received a copy, in compliance with Resolution 466/2012 of the Brazilian National Health Council.

Results

The study included 93 health sciences students, divided into two groups: 46 participants in the EG and 47 in the CG. All allocated participants were analyzed according to the protocol; no follow-ups were lost. The sample consisted predominantly of young adults aged 18 to 25 years (94.6%), with a mean age of 21.82 ± 4.73 years. The comparison between the groups at baseline (T1), performed using the t-test for independent samples, showed no statistically significant difference in age (mean difference = -0.52 years; $p = 0.59$), which indicates initial age homogeneity between the groups.

Table 1 presents the sociodemographic and clinical characteristics of the participants by group and in total. In terms of profile, the participants were predominantly women, single, and self-identified as white. Most participants did not reconcile their studies with work and engaged in some form of physical exercise.

Table 1. Sociodemographic, Clinical, and Occupational Characteristics of the Sample in the EG (n = 46), CG (n = 47), and Total (n = 93). Uberaba, Minas Gerais, Brazil, 2023-2024

Variables	Characteristics	EG n (%)	CG n (%)	Total n (%)
Gender	Female	41 (89.1)	45 (95.8)	86 (92.5)
	Male	5 (10.9)	2 (4.2)	7 (7.5)
Marital status	Single	45 (97.8)	44 (93.7)	89 (95.8)
	Married/In a common-law union	1 (2.2)	1 (2.1)	2 (2.1)
	Other	0 (0.0)	2 (4.2)	2 (2.1)
Self-reported skin color	White	25 (54.3)	28 (59.6)	53 (57.0)
	Brown	12 (26.1)	16 (34.0)	28 (30.1)
	Black	7 (15.2)	3 (6.4)	10 (10.7)
	Asian	2 (4.4)	0 (0.0)	2 (2.1)
Monthly income	Up to 1 minimum wage	3 (6.5)	8 (17.0)	11 (11.9)
	Above 1 to 3 times the minimum wage	17 (37.0)	15 (32.0)	32 (34.4)
	Above 3 to 5 times the minimum wage	19 (41.3)	15 (32.0)	34 (36.5)
	Above 5 times the minimum wage	6 (13.0)	9 (19.0)	15 (16.1)
	No response	1 (2.2)	0 (0.0)	1 (1.1)
Religion	Atheist	1 (2.2)	2 (4.2)	3 (3.2)
	Catholic	19 (41.3)	19 (40.4)	38 (40.9)
	Spiritualist	5 (10.9)	5 (10.6)	10 (10.7)
	Evangelical	2 (4.4)	6 (12.9)	8 (8.6)
	No defined religion	15 (32.6)	8 (17.0)	23 (24.8)
	Other	4 (8.6)	7 (14.9)	11 (11.8)
Course	Biomedicine	1 (2.2)	2 (4.2)	3 (3.2)
	Physical Education	1 (2.2)	0	1 (1.1)
	Nursing	16 (34.7)	17 (36.1)	33 (35.5)
	Physical Therapy	2 (4.4)	8 (17.0)	10 (10.7)
	Medicine	9 (19.6)	5 (10.7)	14 (15.2)
	Nutrition	2 (4.4)	0	2 (2.1)
	Occupational Therapy	15 (32.6)	15 (32.0)	30 (32.2)
Working	Yes	3 (6.5)	5 (10.6)	8 (8.6)
	No	43 (93.5)	42 (89.4)	85 (91.4)
Physical exercise	Yes	25 (54.3)	25 (53.1)	50 (53.8)
	No	21 (45.7)	22 (46.9)	43 (46.2)
Health problems	Yes	9 (19.6)	7 (14.9)	16 (17.2)
	No	37 (80.4)	40 (85.1)	77 (82.8)

Source: Prepared by the authors.

The previously established primary outcome was the physical domain of the WHOQOL-BREF, as it represents the component most directly related to the physical and functional nature of the intervention. The psychological, social, and environmental domains were considered secondary outcomes.

Table 2 presents the intragroup comparison between time points T1 and T2, based on the paired t-test for the physical, psychological, and environmental domains and the Wilcoxon test for the social domain. The EG showed significant improvements in the physical and psychological domains after the intervention, as well as a trend toward improvement in the social domain, although not statistically significant. In the environmental domain, no relevant changes were observed. The CG, on the other hand, showed no improvements in the physical, psychological, and environmental domains, and presented a significant worsening in the social domain.

Table 2. Intragroup Comparison of WHOQOL-BREF Domain Scores at Pre-Intervention (T1) and Post-Intervention (T2) Time Points—mean, standard deviation (Mean $\pm$ SD), and p-values obtained from the paired t-test and Wilcoxon test (EG: n = 46, CG: n = 47). Uberaba, Minas Gerais, Brazil, 2023–2024

WHOQOL-BREF	Groups	Mean $\pm$ DP	Mean $\pm$ DP	p*	p**
Domains		T1	T2		
Physical	Experimental	66.69 $\pm$ 13.61	72.36 $\pm$ 12.91	0.002***	--
	Control	63.91 $\pm$ 12.47	62.01 $\pm$ 13.68	0.215	--
Psychological	Experimental	57.78 $\pm$ 14.45	63.31 $\pm$ 15.28	0.001***	--
	Control	55.23 $\pm$ 16.42	54.78 $\pm$ 14.71	0.793	--
Social	Experimental	67.93 $\pm$ 16.28	71.19 $\pm$ 17.18	--	0.070
	Control	70.74 $\pm$ 20.69	65.25 $\pm$ 18.17	--	0.003***
Environment	Experimental	64.54 $\pm$ 11.50	66.98 $\pm$ 12.90	0.107	--
	Control	63.63 $\pm$ 15.85	62.10 $\pm$ 16.87	0.333	--

Source: Prepared by the authors.

Note: * p = paired t-test; ** p = Wilcoxon test; *** values lower than 0.05 are statistically significant.

Table 3 presents the mean, standard deviation, and p-value for the differences between time points T2 and T1 (Dif T2-T1) in the physical, psychological, and environmental domains. The results showed the intervention conducted with the EG had a significant positive impact on the physical, psychological, and social domains of QoL compared to the CG. There was an improvement in the mean differences between the post- and pre-intervention time points (T2-T1) in the physical and psychological domains for the EG, with a statistically significant difference between the groups. In the social domain, the results also indicated a significant benefit for the group that participated in the intervention.

In turn, in the environmental domain, although the EG showed an improvement in the mean difference between time points, this change was not statistically significant compared to the CG. Nevertheless, the effect size analysis revealed a medium effect in the physical, psychological, and social domains, and a small effect in the environmental domain, suggesting that the intervention was more effective in dimensions related to the participants' physical and emotional well-being and social relations (Table 3).

Table 3. Intergroup Comparison of the Mean Scores for the WHOQOL-BREF Domains between the T1 and T2 Time Points, and p-Values from the Independent t-Test and the Mann-Whitney Test. Uberaba, Minas Gerais, Brazil, 2023-2024

WHOQOL-BREF	Groups	Mean ± SD	p*	p**	Cohen's d
Domains		DIF T2-T1			
Physical	Experimental	5.66 ± 11.65	0.001***	--	0.69
	Control	-1.90 ± 10.36			
Psychological	Experimental	5.52 ± 10.61	0.011***	--	0.54
	Control	-0.44 ± 11.50			
Social	Experimental	3.26 ± 15.26	--	0.003***	0.53
	Control	-5.49 ± 17.82			
Environment	Experimental	2.44 ± 10.07	0.069	--	0.38
	Control	-1.52 ± 10.70			

Source: Prepared by the authors.
Note: *p = independent t-test; **p = Mann-Whitney test; *** values lower than 0.05 = statistically significant.

Discussion

The prevalence of participants aged 18 to 25 reveals a young demographic, characteristic of studies conducted with health sciences students, who typically begin their programs during the transition from adolescence to adult life, a period marked by intense psychosocial changes and high academic, emotional, and social demands, which reinforces the need for care strategies aimed at promoting well-being and QoL. These data are consistent with the mean age of 24.4 years among university students in Brazilian public institutions (17).

The sample also consisted predominantly of women who were single, self-identified as white, had a monthly income between three and five times the minimum wage, were Catholic, unemployed, engaged in regular physical activity, and had no health complaints. The prevalence of women in the sample corroborates previous findings regarding greater adherence to the Pilates method among women, particularly due to its focus on body awareness, preventive health, and postural aesthetics (18). This finding may guide healthcare professionals to recognize the potential of physical practices as therapeutic resources with greater acceptability among certain groups.

In terms of monthly family income, most participants in this study reported having an income of between three and five times the minimum wage. This finding contrasts with data from a survey conducted by the National Association of Heads of Federal Higher Education Institutions, which found that most students in public universities had a family income of between one and two times the minimum wage (23.5%), while only 11.9% had an income of more than three and up to four times the minimum wage (17).

Regarding physical exercise, it was found that most participants in this sample reported engaging in it regularly, which is significant given the adverse effects of a sedentary lifestyle on the physical and mental health of university students. Although high adherence to physical exercise and an absence of health complaints were found among the participants, these conditions do not negate the importance of interventions aimed at promoting comprehensive care. The literature indicates that regular physical exercise can yield significant benefits, including improvements in academic performance, cognitive functions, subjective well-being, and emotional regulation (19, 20). Corroborating this perspective, a recent systematic review showed that more than half of the included studies ($n = 36$) demonstrated efficacy in improving mental health or QoL in university students. The authors suggest that effective interventions in this context should include moderate- to vigorous-intensity exercises, such as dancing or Pilates, highlighting the potential of these practices to promote mental health and well-being among the student population (4). These findings highlight the importance of institutional strategies that encourage the adoption of healthy habits, capable of contributing to the prevention of health problems and the strengthening of psychosocial aspects, especially in academic contexts characterized by high demands and constant pressure.

In the physical domain of QoL, which encompasses variables such as pain, discomfort, energy, fatigue, sleep, mobility, performance in activities of daily living, and medication use (21), a significant effect of the intervention was found, indicating significant improvements in these aspects following the practice of the method. These results can be attributed to the recognized properties of the Pilates method in promoting physical fitness, including muscle strengthening, increased flexibility, and improved balance and agility (22). These attributes directly contribute to bodily functionality and pain reduction, promoting greater autonomy and QoL.

Another relevant aspect within this domain refers to sleep quality, which is directly improved by Pilates' emphasis on diaphragmatic breathing, one of its key principles (23). A meta-analysis that included six randomized clinical trials with 477 participants has shown a positive effect of Pilates exercises on overall sleep quality scores (24). Furthermore, evidence indicates that, after

eight weeks of practice, there was an improvement in both sleep quality components and fatigue levels (10), aspects which are essential for physical recovery and well-being. Corroborating these findings, a recently published systematic review with a meta-analysis reinforces the benefits of the Pilates method in alleviating depressive symptoms and improving sleep quality in adults, highlighting its relevance as a non-pharmacological strategy in comprehensive healthcare (25).

Furthermore, the improvement seen in the physical domain may be related to the method's positive impact on mobility and muscle strength, which are factors that directly affect activities of daily living and overall physical well-being. One study reinforces this understanding by showing that, even after a single Pilates session, young adults reported a significant reduction in levels of fatigue, anxiety, and mood disorders, followed by an increase in energy and vitality (26). In this sense, the positive effects seen in the physical domain highlight the potential of Pilates as a gentle care modality, capable of promoting not only improved bodily function but also sleep regulation and fatigue relief. These benefits, by fostering greater autonomy and well-being, reinforce the importance of holistic care as a strategy for health promotion in the academic context.

Regarding the psychological domain, which encompasses positive and negative emotions, self-esteem, concentration, body image, and personal beliefs (21), data indicated that Pilates provided significant benefits in this sphere, reflecting improvements in the participants' mental and emotional health. Integrative practices that involve both body and mind, such as Pilates, have proven effective in promoting healthy behaviors and fostering positive beliefs toward subjective well-being, which contributes to the formation of a virtuous cycle of emotional reinforcement (27). Regular practice of Pilates can favor improvements in self-esteem and self-perception, factors that strengthen psychological well-being and encourage continued participation in the activity. This consistency, in turn, reinforces the positive feelings associated with the practice, enhancing its effects on mental health.

The improvement of body image also stands out as one of the beneficial psychological effects, especially among women, as shown in a study in which participants reported significant improvements in the perception of their own bodies after 16 weeks of practice (28). The body awareness promoted by the method, combined with postural alignment, contributes to a sense of control over one's own body, which, in turn, strengthens self-esteem and psychological well-being. Thus, the benefits seen in the psychological domain reinforce the idea that Pilates is not limited to improving physical health but acts in an integrated way, promoting emotional balance, improving self-esteem, strengthening body image, and enhancing the positive perception of QoL. These findings point to the relevance of care practices that consider the person as a whole, in line with the paradigm of advanced health practices.

Regarding the social relations domain, which assesses perceived social support, the quality of interpersonal relations, and satisfaction with relationships (21), the results show that Pilates also led to significant improvements. Group practice, conducted in welcoming and quiet environments, promotes both concentration and socialization among participants. In this context, the instructor assumes a central role by offering emotional support and encouraging the formation of interpersonal bonds (29). The interaction among individuals with common goals, such as the pursuit of health and well-being, creates an environment conducive to exchange, mutual support, and the strengthening of social networks. The literature indicates that such interactions contribute to motivation and enjoyment in the practice, elements that are intensified when experienced collectively (30). Thus, regular participation in the sessions may have fostered a sense of belonging and enhanced the perception of acceptance and satisfaction in relationships, promoting the strengthening of social connections and emotional well-being, which are constituent elements of healthcare.

In contrast, the environment domain, which encompasses external factors such as housing conditions, transportation, access to services, and leisure (21), showed no significant changes. This result can be attributed to the intrinsic nature of this domain, whose influence depends largely on structural determinants external to physical activity. The Pilates method, as a mind-body approach, tends to primarily impact internal aspects and factors directly controllable by the individual (31). In this sense, a study comparing the effects of resistance training and Pilates on QoL in older women found that, after 12 weeks of intervention, the environment domain retained the lowest mean scores, with no significant differences between the groups (32). Previous studies have shown a positive association between an income exceeding five times the minimum wage and better scores in the environment domain, particularly in older populations (33, 34).

These findings highlight the inherent complexity of promoting change in areas heavily influenced by socioeconomic and environmental factors, which often extend beyond the scope of individual interventions. Thus, although interventions such as Pilates may be effective in various aspects of health and QoL, their capacity to significantly influence the environmental domain remains limited in the face of existing structural barriers. This finding highlights the need for intersectoral actions and the strengthening of public policies, broadening the perspective of care beyond the individual and promoting sustainable transformations in social reality.

Based on the study's findings, the general hypothesis was partially confirmed: The practice of mat Pilates promoted significant improvements in the physical, psychological, and social domains

of the students' QoL, while the environmental domain showed no statistically significant changes. The absence of a significant effect in the environmental domain may reflect the influence of factors beyond the control of the intervention, such as infrastructure, academic context, and socio-environmental conditions, which were not modified by the mat Pilates program.

Future studies should consider more heterogeneous samples, including students from different fields of study, a better gender balance, and longitudinal follow-up to verify whether the effects are sustained over time. Research exploring varying intensities, modalities, or combinations of the Pilates method, as well as its association with other health promotion strategies, may also enhance the understanding of its impacts on QoL.

Study limitations

Among the limitations of the present study, the composition of the sample stands out—it was predominantly female and restricted to students in the health sciences. Although this characteristic limits the generalizability of the results to more heterogeneous populations in terms of gender, age group, and academic background, the findings remain relevant to the specific context researched, which contributes to an understanding of the effects of Pilates on this population.

Some methodological limitations are also acknowledged, such as the lack of detail regarding allocation concealment, the inability to blind participants, and the absence of systematic monitoring of other physical activities, which may represent potential confounding variables. However, it should be noted that the evaluators and data analysts remained blinded, thereby reducing potential detection biases.

In addition, the analysis was conducted based on participants who completed the protocol, rather than using an intention-to-treat analysis, a factor that should be considered when interpreting the results.

Nevertheless, the results of this study provide significant contributions to the field of healthcare by highlighting the benefits of mat Pilates as an integrative, low-cost, accessible, and easy to implement strategy. These characteristics confer the method with the potential to be incorporated into initiatives aimed at promoting health, enhancing well-being, and improving QoL for young populations. The findings reinforce the viability of Pilates as an accessible and complementary intervention, opening up prospects for future research that explores its effects in varying contexts, population groups, and health conditions.

Conclusions

The results of this study indicate that the practice of the Pilates method can have positive effects on the physical, psychological, and social domains of QoL, highlighting its potential as an integrative strategy for healthcare and promotion. No significant changes were found in the environmental domain, a result that is consistent with its structural nature and dependence on determinants external to the individual. These findings reinforce the importance of incorporating body-based approaches into the routines of health sciences students, especially in academic contexts permeated by emotional challenges and cognitive demands.

In the context of care, Pilates can be understood as a gentle approach that promotes bonding, active listening, emotional self-regulation, and the strengthening of autonomy. By integrating physical and subjective dimensions, the method aligns with a holistic perspective on care, which contributes to more sensitive and effective practices in addressing contemporary health challenges. Furthermore, as it is low-risk and well-accepted by participants, the method demonstrates viability as a complementary strategy in educational settings.

The addition of physical practices such as Pilates to the university routine represents a viable, low-cost, and easy to implement alternative with the potential to reduce risk factors associated with physical and mental health issues. By encouraging the adoption of healthy habits and emotional self-regulation through movement, the method establishes itself as a valuable therapeutic resource for promoting QoL in young people and students.

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