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## **Relação entre Exercício Resistido, Ansiedade Traço-Estado e Bem-Estar Subjetivo**

*Relationship between Resistance Exercise, State-Trait Anxiety and Subjective Well-being*

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### Resumo

As evidências sugerem que o exercício pode promover o bem-estar e diminuir os níveis de ansiedade. No entanto, a relação específica entre o exercício resistido e os diferentes domínios de ansiedade e do bem-estar permanece pouco compreendida. O objetivo do presente estudo foi avaliar a relação entre exercício resistido e ansiedade traço-estado, afeto positivo e negativo e satisfação com a vida em adultos. Os participantes foram 302 indivíduos (faixa etária entre 18 e 73 anos;  $M = 34,31$ ,  $DP = 11,55$ ), 112 homens e 189 mulheres. Os instrumentos psicométricos Inventário de Ansiedade Traço-Estado, Escala de Bem-Estar Subjetivo e Escala de Satisfação com a Vida foram aplicados no local de treinamento dos participantes. Os resultados mostraram que a prática de exercícios resistidos foi associada à diminuição da ansiedade e ao aumento do bem-estar subjetivo. Um Modelo de Equações Estruturais mostrou que a associação entre o número de meses de experiência de prática de exercício físico e o bem-estar subjetivo é mediada pela ansiedade estado e traço, após controle por sexo e idade. Este estudo fornece mais evidências de que a prática de exercícios resistidos é benéfica para a saúde mental.

**Palavras-chave:** *Exercício resistido; Ansiedade traço-estado; Bem-estar subjetivo; Satisfação com a vida*

### Abstract

Evidence suggests that exercise may promote well-being and decrease anxiety levels. However, the specific relationship between resistance exercise and different domains of anxiety and well-being remains poorly understood. The aim of the present study was to evaluate the relationship between resistance exercise and state-trait anxiety, positive and negative affect, and life satisfaction in adults. The participants consisted of 302 individuals (age range between 18 and 73 years;  $M = 34.31$ ,  $SD = 11.55$ ), 112 males and 189 females. The psychometric instruments State-Trait Anxiety Inventory, Subjective Well-Being Scale and Satisfaction With Life Scale were applied at the participants' training place. The results showed that resistance exercise practice was associated with decreased anxiety and increased subjective well-being. A Structural Equation Model showed that the association between the number of months of exercise practice experience and subjective well-being is mediated by state and trait anxiety, after controlling for sex and age. This study provides further evidence that the practice of resistance exercise is beneficial for mental health.

**Keywords:** *Resistance exercise; State-trait anxiety; Subjective well-being; Life satisfaction.*

### Resumen

La evidencia sugiere que el ejercicio puede promover el bienestar y disminuir los niveles de ansiedad. Sin embargo, la relación específica entre el ejercicio de resistencia y los diferentes dominios de la ansiedad y el bienestar sigue siendo poco comprendida. El objetivo del presente estudio fue evaluar la relación entre el ejercicio de resistencia y la ansiedad estado-rasgo, el afecto positivo y negativo y la satisfacción con la vida en adultos. Los participantes estuvieron compuestos por 302 individuos (rango de edad entre 18 y 73 años;  $M = 34,31$ ,  $DE = 11,55$ ), 112 hombres y 189 mujeres. En el lugar de capacitación de los participantes se aplicaron los instrumentos psicométricos Inventario de Ansiedad Estado-Rasgo, Escala de Bienestar Subjetivo y Escala de Satisfacción con la Vida. Los resultados mostraron que la práctica de ejercicios de resistencia se asoció con una disminución de la ansiedad y un mayor bienestar subjetivo. Un modelo de ecuaciones estructurales mostró que la asociación entre el número de meses de experiencia de práctica de ejercicio y el bienestar subjetivo está mediada por el estado y el rasgo de ansiedad, después de controlar el sexo y la edad. Este estudio proporciona más evidencia de que la práctica de ejercicios de resistencia es beneficiosa para la salud mental.

**Palabras clave:** *Ejercicio de resistència; Ansiedad estado-rasgo; Bienestar subjetivo; Satisfacción con la vida.*

## Introduction

Mental illness a significant global health problem. According to the World Health Organization (2020), nearly one billion people worldwide are impacted by psychiatric disorders, which represent 13% of all illnesses. While several pharmacotherapies exist for these different disorders, identifying an effective treatment can be challenging (Allameh & Orsat, 2023). Accumulating evidence suggests that alternative complementary and preventive strategies can be useful in managing mental illnesses.

Studies suggest that physical activity can be used as an alternative and/or complementary treatment for psychiatric disorders (Souza et al., 2023). Researchers propose that physical activity represents an effective and accessible strategy to promote subjective well-being (Bottaccioli et al., 2021). Two recent meta-analysis studies concluded that physical activity plays a role in primary prevention and treatment of a variety of mental illnesses, including anxiety and depression (Ashdown-Franks et al., 2020; Firth et al., 2020; Martland et al., 2022).

Specifically, aerobic exercise has been shown to be as effective as the selective serotonin reuptake inhibitor/antidepressant sertraline in decreasing anxiety scores (Blumenthal et al., 2021; Singh et al., 2023). Similar findings have been obtained for resistance exercise and anxiety, with an 8-week resistance exercise training program leading to significant reductions in anxiety and worry-related symptoms (Gordon et al., 2021). Resistance exercise also positively impacts subjective well-being and life satisfaction (Cho & Cheon, 2023). Of note, different exercise modalities can have distinct effects on mental health, suggesting that this relationship may be complex. For instance, while moderate physical activity has a positive effect on subjective well-being (Chen et al., 2020; Zhou et al., 2023), vigorous physical activity reduces levels of subjective well-being (Zhang et al., 2022).

The relationship between anxiety and subjective well-being is also complex, with studies suggesting a positive correlation, while others showing opposing effects (Fernandes et al., 2012). Therefore, understanding the relationship between anxiety and subjective well-being in response to physical exercise becomes extremely important to fully understand the beneficial effects of physical activity on mental health.

## Objectives

The aim of the present study was to investigate the effects of resistance exercise practice on state-trait anxiety, positive and negative affect, and life satisfaction, and the influence of number of months of exercise practice experience on these measures. We also conducted a structural equation model to evaluate potential relationships between these measures. We predicted that resistance exercise would have a significant effect on the levels of state-trait anxiety, positive and negative affect, and life satisfaction, and that the relationship between resistance exercise and subjective well-being would be mediated by anxiety.

## Material and Methods

### Participants

The study was cross-sectional, relational and ex post facto. The sample was non-probabilistic and intentional. A priori sample calculation was performed using the G Power 3.1.9.7 software, adopting an effect size of .30, alpha value for probalistic error of .05, power ( $1 - \beta$  err prob) = .95. A minimum number of 220 subjects was identified so that the findings could be inferred for the population, however, the total sample of the present study consisted of 302 individuals, aged between 18 and 73 years ( $M = 34.31$ ,  $SD = 11.55$ ), 112 males and 189 females. Participants had an average of 46.21 months of resistance exercise practice ( $SD = 63.29$ ). As for the practice of physical activity or resistance exercise, the following distribution was obtained: subjects who did not practice physical exercise or resistance exercise ( $n = 111$ ) and subjects who practiced resistance exercise ( $n = 191$ ). Finally, 166 individuals practiced resistance exercise associated with aerobic exercise, and 25 practiced resistance exercise only.

### Instruments

To verify state-trait anxiety, the Brazilian version (Fioravanti et al., 2011) of the State-Trait Anxiety Inventory (STAI) was applied, which consists of twelve items grouped into two factors. Items 1 through 6 evaluate state anxiety, and items 7 through 12 evaluate trait anxiety. The questions were answered on a four-point Likert scale (1=not at all to 4=very much; 1=almost never to 4=almost always). The scores were calculated

as the sum of the responses to the items divided by the number of items in the factor, and can vary from 1 to 4. Prior to the statistical analysis, the score of the “positive” items was inverted: 1, 3 and 5 (state anxiety); 7, 9 and 12 (trait anxiety).

To measure subjective well-being, the individuals answered two questionnaires. To measure positive and negative affect, the respective dimensions (47 items) of the Subjective Well-Being Scale (SWBS) were used (Albuquerque & Tróccoli, 2004). Items are grouped as follows: items 3, 4, 6, 7, 10, 11, 14, 16, 18, 19, 21, 22, 24, 25, 26, 29, 37, 39, 41, 42 and 43 comprise the positive affect factor; 1, 2, 5, 8, 9, 12, 13, 15, 17, 20, 23, 27, 28, 30, 31, 32, 33, 34, 35, 36, 38, 40, 44, 45, 46 and 47 comprise the negative affect factor. The statements were answered according to a five-point Likert-type scale (1 = not at all to 5 = extremely). The score for each dimension was calculated by adding the responses to the items for that factor divided by the number of items in the factor, with values varying between 1 and 5.

To measure life satisfaction, athletes responded to the Brazilian version (Gouveia et al., 2009) of the Satisfaction With Life Scale (SWLS) (Diener et al., 1984). This instrument consists of a single dimension with five items. The statements were answered according to a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree). The scores were calculated by adding the numbers corresponding to the responses to the items chosen by the subject and divided by the number of items, ranging from 1 to 5.

## **Procedure**

The research project was approved by the Institutional Review Board of Santa Cruz State University (UESC), in accordance with Resolution CNS/MS No.1510/2016, with approval CAAE: 09016919.3.0000.5526.

Initially, the project was discussed with gym managers. Specific days for data collection were established days, during which the project’s aims and purpose were explained to volunteers. Those willing to participate in the study completed an Informed Consent Form (ICF), in which anonymity and confidentiality were guaranteed. Participants completed three questionnaires at the gyms. This completion took an average of 20 minutes per participant, and was completed individually by the subjects themselves, under the guidance of a project coordinator before participants training sessions.

### Statistical analysis

Data analysis was divided into four stages. First, we analyzed the assumptions of normality, linearity, multicollinearity and homogeneity of the variance-covariance matrix using frequency, scatter plots and Box's M test. Second, we examined the reliability of the dimensions of the Brazilian versions of STAI, SWBS and SWLS by calculating Cronbach's alpha. In the third stage, univariate and multivariate analysis of variance (MANOVA) procedures were applied to verify the effects of resistance exercise practice and the number of months of exercise practice experience on state-trait anxiety, positive and negative affect, and life satisfaction. Additionally, effect sizes were verified with cutoff points of .20, .50 and .80 representing small, medium and large effect sizes, respectively (Cohen, 1988). These analyzes were performed in SPSS 21.0, with the level of significance being maintained at 5% ( $p < .05$ ). For MANOVAs, the sample was divided into those practicing resistance exercise (group 1) and those not practicing resistance or physical exercise (group 2). Similarly, the data were separated based on resistance exercise practice experience: up to three months (group 1); from three months to six months (group 2); and more than six months (group 3).

Finally, in the fourth stage, the path analysis technique was employed using the AMOS v21.0 program, with the objective of testing the hypothetical models that explain the relationship between months of resistance exercise practice experience, anxiety and subjective well-being. This method of structural equation modeling has been used in studies that aim to test the relationship between psychological variables (Fernandes et al., 2012; Pineda-Espejel et al., 2021) allowing for the development and testing of complex social theories. Structural equation modeling has the advantage over regression analysis of allowing the simultaneous testing of the relationship between two or more variables in the presence and potential influence of other variables.

Thus, models were specified and estimated, and their suitability was evaluated by a set of fit/fitness indices. The value of  $\chi^2$  (Chi-square) indicates adjustment when the value is not significant ( $p > .05$ ). However, this test is sensitive to sample size and is usually significant in large samples, although the model may be adjusted to the data. Jöreskog and Sörbom (1989) suggested a ratio of chi-square to degrees of freedom (df), represented by  $\chi^2/df$ , so Ullman (2001) suggested values below 3.0 as acceptable. Additionally, the following adjustment indices were used: a) CFI (Comparative Fit Index)

and GFI (Goodness of Fit Index) and their values can vary from 0 to 1. According to Bentler and Bonett (1980), values above .90 represent a suitable fit for the model. More recently, Hu and Bentler (1999) suggested a cut-off point of .95 as an indication of a good fit of the model; b) RMSEA (Root Mean Square Error of Approximation), in which values lower than .08 indicate an acceptable adequacy (Browne & Cudeck, 1993), although Hu and Bentler (1999) have suggested a cut-off point of .06; and, c) AIC (Akaike Information Criterion) which indicates the parsimony and simplicity of the model through the lowest value among the tested models.

## Results

### Preliminary data analysis

The assumptions of normality, linearity, multicollinearity, as well as the homogeneity of the variance-covariance matrix ( $p > .05$ ), were not violated according to the recommendations of Tabachnick and Fidell (2001). Means and standard deviations, analysis of asymmetry/kurtosis and internal consistency of the dimensions of the instruments used are presented. The internal consistency of the dimensions of responses of the instruments was calculated using Cronbach's alpha and the revealed indices were above the criterion  $\alpha > .70$  (Hair et al, 2014).

The data described regarding the sample are: for state anxiety an average of 2.03, standard deviation of  $\pm 0.61$ , asymmetry of 0.635 and kurtosis of -0.041; for anxiety it has a mean of 2.28, standard deviation of  $\pm 0.63$ , asymmetry of 0.429 and kurtosis -0.561; for positive affect an average of 3.20, standard deviation of  $\pm 0.80$ , asymmetry of -0.491 and kurtosis of -0.346; for negative affect an average of 1.96, standard deviation of  $\pm .79$ , asymmetry of 1.077 and kurtosis of .683 and for life satisfaction an average of 4.59, standard deviation of  $\pm .31$ , asymmetry of -.491 and kurtosis of -.525.

The Pearson's correlations between the STAI, SWBS and SWLS dimensions. As expected, trait anxiety is positively correlated with state anxiety and with negative affect, and is negatively correlated with positive affect and with life satisfaction. In addition, state anxiety is positively correlated with negative affect and negatively correlated with positive affect and with life satisfaction. Positive affect correlates negatively with

negative affect and positively with life satisfaction. Finally, negative affect and life satisfaction are negatively correlated.

**Analysis of the relationships between resistance exercise, trait and state anxiety, positive affect, negative affect and life satisfaction**

To verify whether the practice of resistance exercise would have a significant effect on anxiety and subjective well-being, MANOVA was used. In general, the practice of resistance exercise had a significant effect [ $F(5.296) = 7.814; p < .01; \eta^2 = .117$ ] on anxiety and subjective well-being. Based on the partial eta squared value ( $\eta^2$ ), the effect size was medium (Figure 1).

**Figure 1.**

*Comparative analysis of State-Trait Anxiety Inventory (STAI), Subjective Well-Being Scale (SWBS) and Satisfaction With Life Scale (SWLS) factors as a function of resistance exercise practice. Data are shown as Mean  $\pm$  SD. \* $p < .05$  compared to the no Exercise Practice group*

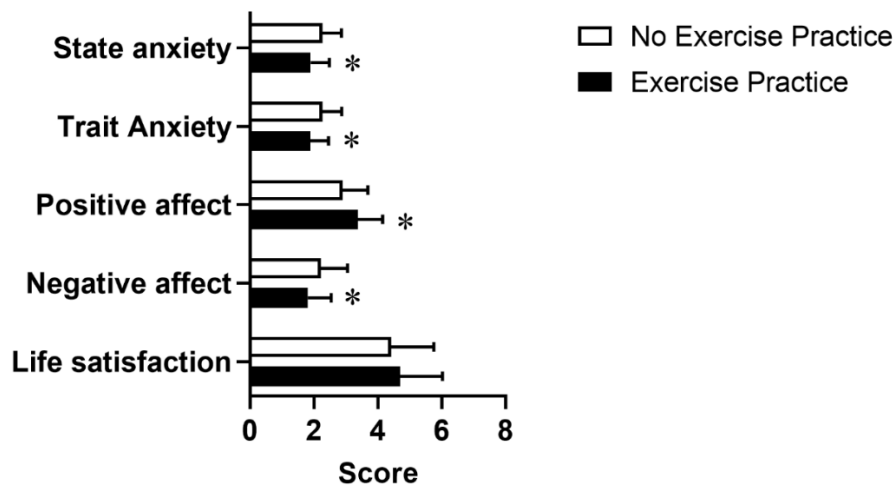


Figure 1 presents a comparative analysis of the STAI, SWBS and SWLS factors as a function of resistance exercise. A univariate analysis showed that exercise (groups 1 and 2) had a significant effect on state anxiety [ $F(1.300) = 29.556, p < .01 \eta^2 = .090$ ], on trait anxiety [ $F(1.300) = 11.633, p < .05 \eta^2 = .037$ ], on positive affect [ $F(1.300) = 26.608, p < .01 \eta^2 = .081$ ] and on negative affects [ $F(1.300) = 19.919, p < .01 \eta^2 = .062$ ]. Specifically, physical exercise was associated with lower levels of state and trait anxiety and negative affect, and higher levels of positive affect. There was no significant

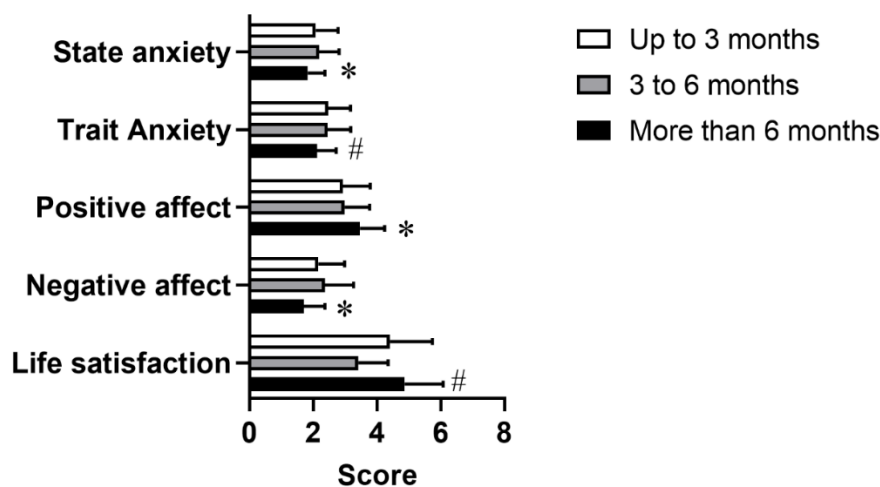


effect on life satisfaction [ $F(1,300) = 3.425, p > .05 \eta^2 = 0.011$ ]. A MANOVA also showed that, in general, the variable length of time practicing exercise had a significant effect [ $F(10,366) = 3.670; p < .01; \eta^2 = .091$ ] on anxiety and subjective well-being. Based on the partial eta squared value ( $\eta^2$ ), the effect size was medium.

Figure 2 represents a comparative analysis of the factors of STAI, SWBS and SWLS as a function of the number of months of exercise practice experience. A univariate analysis showed that the number of months of exercise practice experience (groups 1, 2 and 3) had a significant effect on state anxiety [ $F(2,187) = 4.255, p < .05 \eta^2 = .044$ ], trait anxiety [ $F(2,187) = 5.095, p < .01 \eta^2 = 0.052$ ], positive affect [ $F(2,187) = 7.345, p < .01 \eta^2 = 0.073$ ], negative affect [ $F(2,187) = 9.713, p < .01 \eta^2 = 0.073$ ] and life satisfaction [ $F(2,187) = 11.582, p < .01 \eta^2 = .094$ ]. Specifically, those who had practiced exercise for more than 6 months (Group 3) had lower scores for state anxiety, as well as higher scores for positive affect and life satisfaction compared to those who had practiced resistance exercise for 3 to 6 months (Group 2). Participants who had exercised for more than 6 months (Group 3) also had lower trait anxiety scores and higher life satisfaction scores compared to those who had exercised for up to 3 months (Group 1).

**Figure 2.**

*Comparative analysis of State-Trait Anxiety Inventory (STAI), Subjective Well-Being Scale (SWBS) and Satisfaction With Life Scale (SWLS) factors as a function of the number of months of exercise practice experience. Data are shown as Mean  $\pm$  SD. \* $p < .05$  compared to the 3 to 6 months group; # $p < .05$  compared to the up to 3 months group.*



### **Path Analysis**

To test the hypothesis that there would be an association between the number of months of exercise practice experience (exogenous or explanatory variable) and subjective well-being (endogenous or explained variables), and that this association would be mediated by the variables trait anxiety and state anxiety (controlling for sex and age), we conducted a Structural Equation Model.

Model 1 contained a direct relationship between the number of months of exercise practice experience and all dependent variables (trait and state anxiety, positive affect, negative affect, and life satisfaction). This model presented two acceptable adjustment indices (CFI and GFI); however, two other indices,  $\chi^2/df$  and RMSEA, indicated that the model needed to be improved. After observing that there were no significant direct effects between number of months of exercise practice experience and subjective well-being (positive affect, negative affect and life satisfaction), we tested Model 2, suppressing these relationships. The adjustment indices showed a notable improvement; however, the  $\chi^2/df$  and the RMSEA, although approaching the cut-off point, continued to indicate a need for improvement. In Model 3, we tested the hypothesis that anxiety would mediate the relationship between number of months of exercise practice experience and subjective well-being, controlling for sex as a covariate because of studies suggesting sex differences in anxiety (Fernandes et al., 2021). Adjustment indices showed improvement over the previous model, but some indices could still be improved. Finally, in Model 4, age was also included as a covariate (Fernandes et al., 2019). Based on the premise that sex and age can play an important role in the anxiolytic effects of resistance exercise (Ofosu et al., 2023), specifications (relationships) of sex and age with state and trait anxiety were included. Significant correlations were found between dimensions of the same level (STAI variables and dimensions of subjective well-being). Therefore, we allowed measurement errors of these variables to be correlated at the same level of the model. Model 4 showed excellent adjustment indices, revealing an explanatory model of the relationships between number of months of exercise practice experience, anxiety and subjective well-being, as can be seen in Table 1.

**Table 1.**

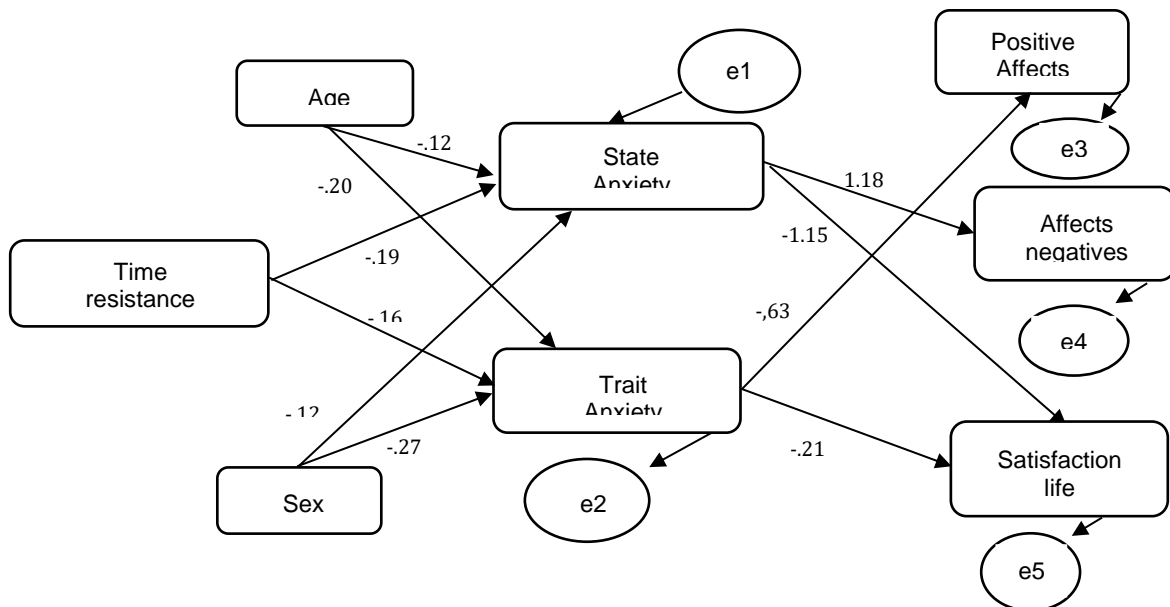
*Fit Indices of the tested models.*

	$\chi^2$	$\chi^2/df$	CFI	GFI	RMSEA	AIC
Model 1	45.069	45.069	.956	.946	.383	85.069
Model 2	48.034	12.058	.952	.945	.192	82.234
Model 3	30.351	2.668	.980	.979	.075	78.882
Model 4	26.882	2.335	.987	.979	.075	61.943

Figure 3 represents the Final Model of the relationship between number of months of exercise practice experience and subjective well-being, including anxiety as the mediating variable and considering the effects of sex and age.

**Figure 3.**

*Final Model of the relationship between number of months of exercise practice experience and subjective well-being, including anxiety as the mediating variable and considering the effects of sex and age.*



*Note.* All path analysis parameters are significant at  $p < .05$  and were not presented correlations between measurement errors.

## Discussion

Findings from the present study suggest that resistance exercise can decrease anxiety and promote subjective well-being, specifically on domains of positive and negative affect. Our findings showing that resistance exercise can decrease anxiety levels corroborate previous studies (Blumenthal et al., 2021; Broman-Fulks et al., 2015; Gordon et al., 2017, 2021; Ofofu et al., 2023; Panza et al., 2020). Previous studies also had shown that resistance exercise can promote subjective well-being (Chen et al., 2022; Zhang et al., 2022; Zhou et al., 2022). Our findings suggest significant effects of resistance exercise on different domains of subjective well-being, including state anxiety, trait anxiety, positive affect and negative affect. On the other hand, resistance exercise had no significant effects on life satisfaction.

To further understand factors influencing the relationship between resistance exercise and subjective well-being, we then investigated whether the number of months of exercise practice experience could influence any of the observed effects. Our findings show that the longer a person has been practicing resistance exercise, the stronger are the effects on mental health. Specifically, those who exercised for more than 6 months had lower scores for state anxiety, trait anxiety, and higher scores for positive affect and life satisfaction compared to those who had exercised for 3 months or less. Significant positive effects on life satisfaction were already be observed with 3 months of resistance exercise, suggesting that the effects of resistance exercise on subjective well-being may emerge quickly. These findings are corroborated by studies showing increased life satisfaction with 4 weeks of resistance exercise training (Zhang et al., 2022), and decreased anxiety levels after an 8-week training program (Gordon et al., 2021).

This study were also able to demonstrate that the association between the number of months of exercise practice experience and subjective well-being is mediated by state and trait anxiety, after controlling for sex and age. These results are in agreement with previous studies showing that resistance exercise training was associated with a decrease in anxiety levels (Blumenthal et al., 2021; Gordon et al., 2021; Ofofu et al., 2023; Panza et al., 2020). Our results also corroborate previous findings by Fernandes et al. (2012), who investigated the relationships between motivational orientation (task orientation and ego orientation), competitive anxiety (cognitive anxiety and somatic anxiety), self-

confidence and subjective well-being (positive and negative affect, and life satisfaction) among Brazilians who practice competitive sports. These authors concluded that the best explanatory model showed that anxiety exerted a mediating effect in the relationship between ego orientation and subjective well-being (Fernandes et al., 2012).

Of note, the number of months of exercise practice experience, sex and age all showed significant correlations with state and trait anxiety, and together these variables explained 8.6% of the variability in state anxiety and 16.1% in trait anxiety. The influence of sex and age in our findings is supported by studies showing that these variables influence the effects of resistance exercise on anxiety levels (An et al., 2020). In our study, anxiety levels were significantly higher among younger participants and recent studies have also shown higher levels of anxiety among younger individuals (Cho & Cheon, 2023). In a recent study by Losada-Baltar et al., (2020), among a sample of 1,501 volunteers 18-88 years old, younger people reported higher levels of anxiety, sadness and loneliness.

The path analysis model also showed that state anxiety positively predicted negative affect and negatively predicted life satisfaction. In other words, the higher the state anxiety levels, the higher the negative affect scores and the lower the life satisfaction scores. Similarly, trait anxiety negatively predicted positive affect and life satisfaction, with higher the trait anxiety levels being associated with lower positive affect and life satisfaction scores. These findings corroborate previous studies showing that life satisfaction scores are higher among adolescents (Meyer et al., 2023) with lower levels of state anxiety (Meyer et al., 2021; Weidi & JeeChing, 2023), as well as older adult (Meyer et al., 2023). Also, Figueiredo and colleagues (2018) have shown that cognitive and trait anxiety were the only statistically significant predictor of life satisfaction out of four anxiety variables considered (trait, state, somatic and cognitive). Finally, Gouveia et al. (2019) showed that higher anxiety levels were associated with lower positive affect and higher with negative affect.

## **Conclusion**

According to this study, the practice and the time of practice of resistance exercise are associated with better levels of anxiety and subjective well-being. Thus, this study

provides more empirical evidence that the practice of resistance physical exercise is beneficial for the mental health of individuals as it attenuates both the state of anxiety, which is a more transitory emotional state, characterized by varying levels of apprehension and fear that may vary over time, as well as the personal disposition to be anxious, that is, it may mitigate a personality trait. In addition, there is a direct predictive effect of the time of practicing resistance exercise on anxiety, which was revealed in the tested and validated model, as a mediator for the subjective well-being.

The practical implications of the results indicate that resistance exercise can be seen as a complementary treatment to reduce the levels of anxiety and, therefore, increase people's levels of subjective well-being, especially women and older people. On the other hand, they indicate that Public Policies must also be directed towards younger men and younger people, of both sexes, so that this audience is encouraged to continue practicing physical exercise and learn about other preventive measures to help with anxiety symptoms.

According to the Surveillance Survey of Risk and Protective Factors for Chronic Diseases by Telephone Survey (VIGITEL) in 2017, developed by the Ministry of Health of Brazil, bodybuilding (resistance exercise) occupies the second place in the rank of preference for the Brazilian population (17.7%), second only to walking (33.6%), and being ahead of preference for football (11.7%). This suggests that to develop public policies for the practice of this modality must be encouraged, as well as investing in the construction of public academies, outdoors, as already exists in some Brazilian cities.

The present study has two limitations that need to be considered: i) the sample was intentional and not probabilistic, and it may not be representative of the general population; ii) this was a cross-sectional study, and experimental and randomized investigations are needed to further understand these effects. Regardless, our findings clearly indicate that the length of time a person has been exercising for mediates resistance exercise-induced decreases in anxiety and increases in subjective well-being. This study provides further empirical evidence that the practice of resistance physical exercise is beneficial for mental health, and suggests that resistance exercise may represent an important complementary treatment to reduce anxiety levels and increase subjective well-being, especially among women and older individuals.

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