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YOGA PRACTICE IN MENTAL HEALTH

AN INNOVATIVE LOW-COST SOLUTION FOR THE PORTUGUESE AIRFORCE

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Keywords: Mindfulness; occupational health; ashtanga vinyasa yoga; military health; exercise program.

Background

- Military aviation demands cognitive performance, emotional stability, and resilience under pressure (1).
- Yoga's capacity to reduce stress and enhance mindfulness makes it a promising intervention for aviation pilots (2).
- Despite these potential benefits, research on yoga's impact in military aviation remains limited.

<u>This study investigates the incorporation of yoga into the training regimen of Portuguese military aviation pilots for enhancing mindfulness, reducing stress and improving mental health</u>.

Methods

A randomized controlled trial with Portuguese Military Aviation Pilots

Control Group (n = 8)
- ✓ followed standard military aviation training

Intervention Group (n = 10)
- ✓ followed standard military aviation training
- ✓ received additional yoga training twice a week for 12 weeks

Cognitive assessments included:

- Five Facet Mindfulness Questionnaire (3)
- Multidimensional Assessment of Interoceptive Awareness (4)
- Aviation Safety Attitude Scale (5)
- Risk Perception To Self (6)
- Trail Making Test (7)

Data analysis used Jamovi v2.6.13.

Methods

Five Facet Mindfulness Questionnaire (FFMQ) (3)

FFMQ: Evaluates mindfulness practice effectiveness and its relation to mental health

Multidimensional Assessment of Interoceptive Awareness (MAIA) (4)

MAIA: individual's ability to perceive internal body sensations and interoceptive awareness

Aviation Safety Attitude Scale (ASAS) (5)

ASAS: cultural and individual factors that influence safety behaviours

Risk Perception To Self (RPTS) (6)

RPTS: individual's perception of personal risk and how it influences their behaviour/decision making

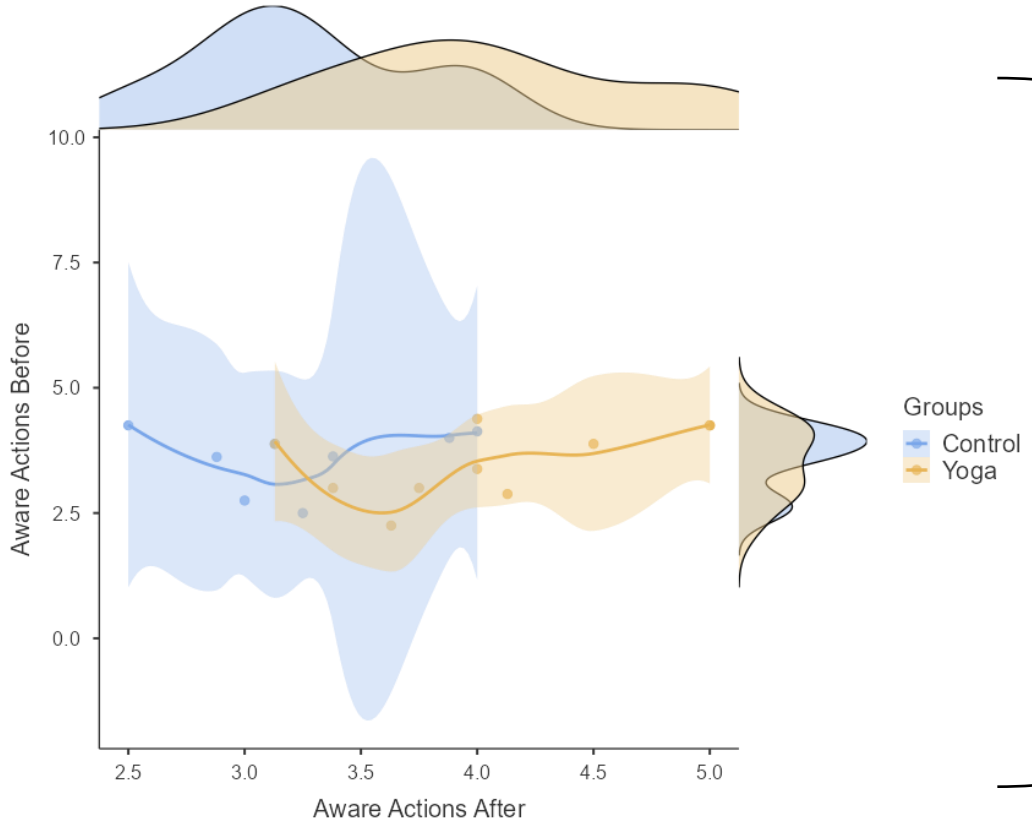
Trail Making Test version B (TMT-B) (7)

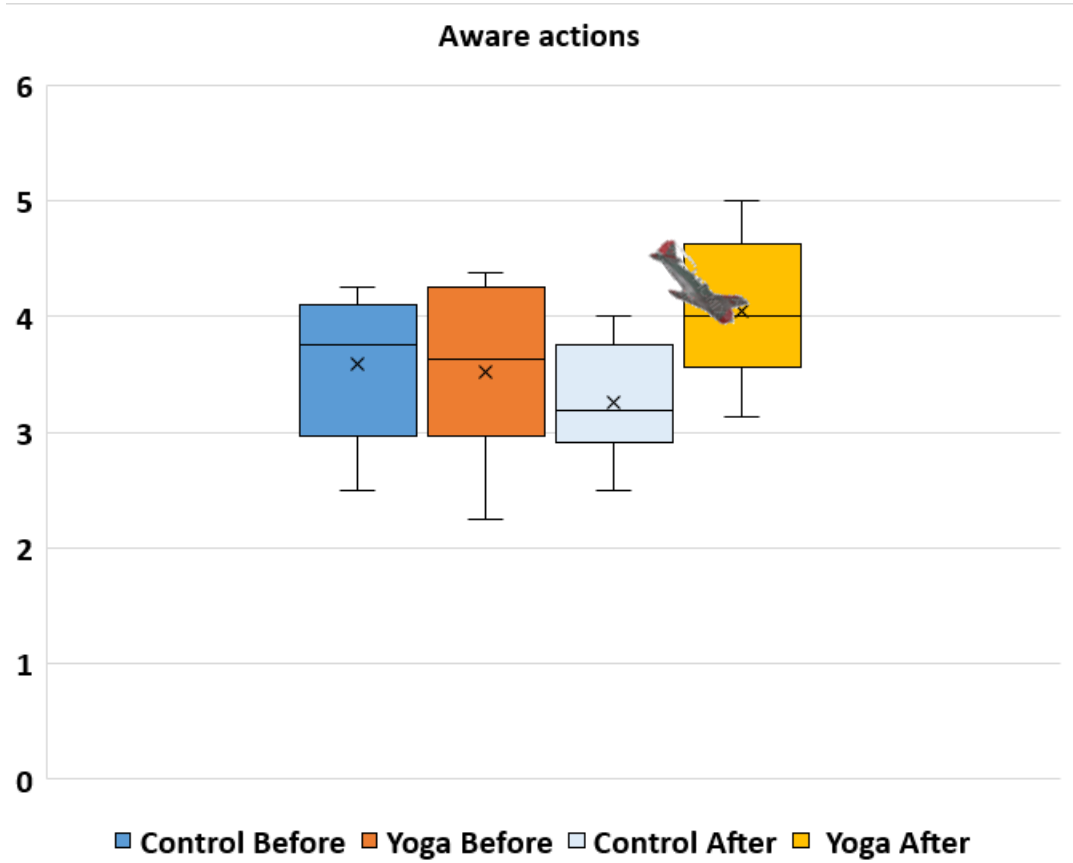
TMT-B: executive functions, including task-switching, cognitive flexibility, and working memory

Results

- Significant changes were found in FFMQ (Aware Actions), within the yoga group and between groups, after intervention, using Student's t and Cohen's d after Shapiro-Wilk testing:

				Statistic	P	Effect Size
Aware actions	Whithin group	Control group before	Control group after	1.29	0.238	0.456
		Intervention group before	Intervention group after	-2.58	**0.030**	-0.817
	Between group	Control group before	Intervention group before	0.246	0.809	0.117
		Control group after	Intervention group after	-2.919	**0.010**	-1.385

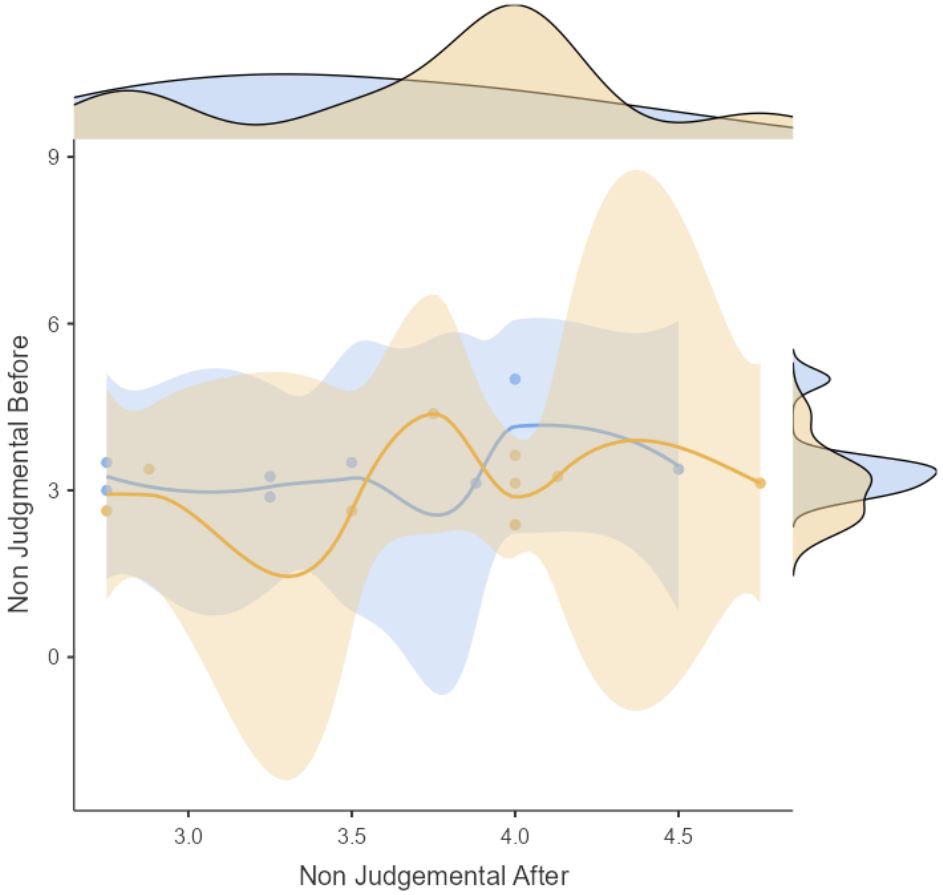




Results

- Significant changes were found in FFMQ (Non-Judgmental Inner Critic) within the yoga group, using Student's t and Cohen's d after Shapiro-Wilk testing:

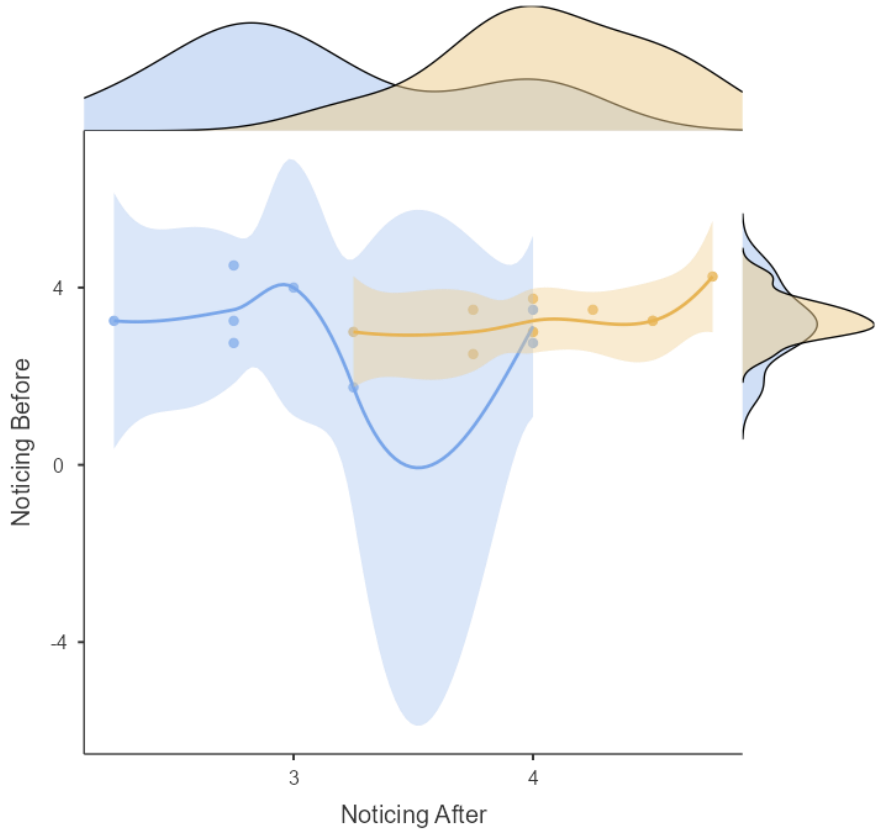
				Statistic	p	Effect Size
Non-judgmental inner critic	Whithin group	Control group before	Control group after	-0.119	0.909	-0.042
		Intervention group before	Intervention group after	-2.589	**0.029**	-0.819



Results

- Significant changes were found in MAIA (Noticing) within the yoga group and between groups, using Wilcoxon and Rank Biserial Correlation after Shapiro-Wilk testing:

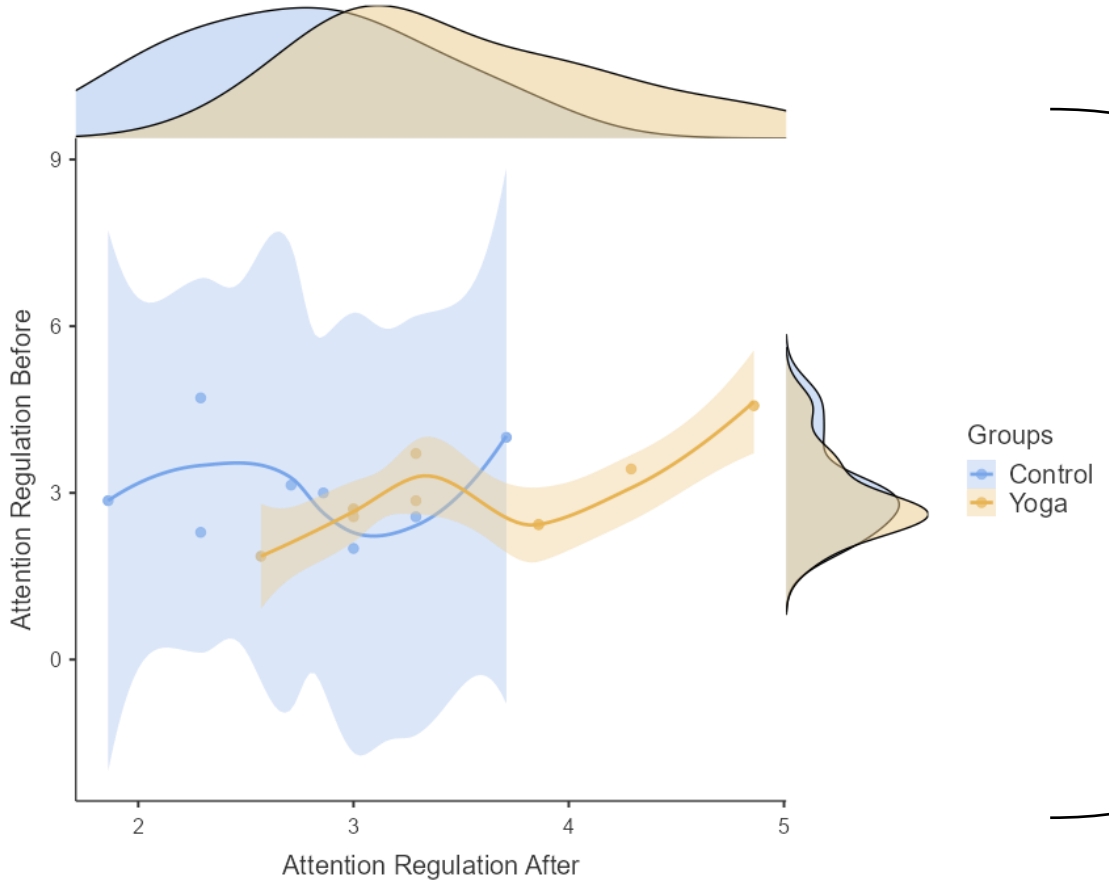
				Statistic	p	Effect Size
Noticing (awareness of body sensations)	Whithin group	Control group before	Control group after	15.50	0.865	0.107
		Intervention group before	Intervention group after	0.00	**0.006**	-1.00
	Between group	Control group before	Intervention group before	18.00	1.000	0.00
		Control group after	Intervention group after	1.50	**0.024**	-0.917

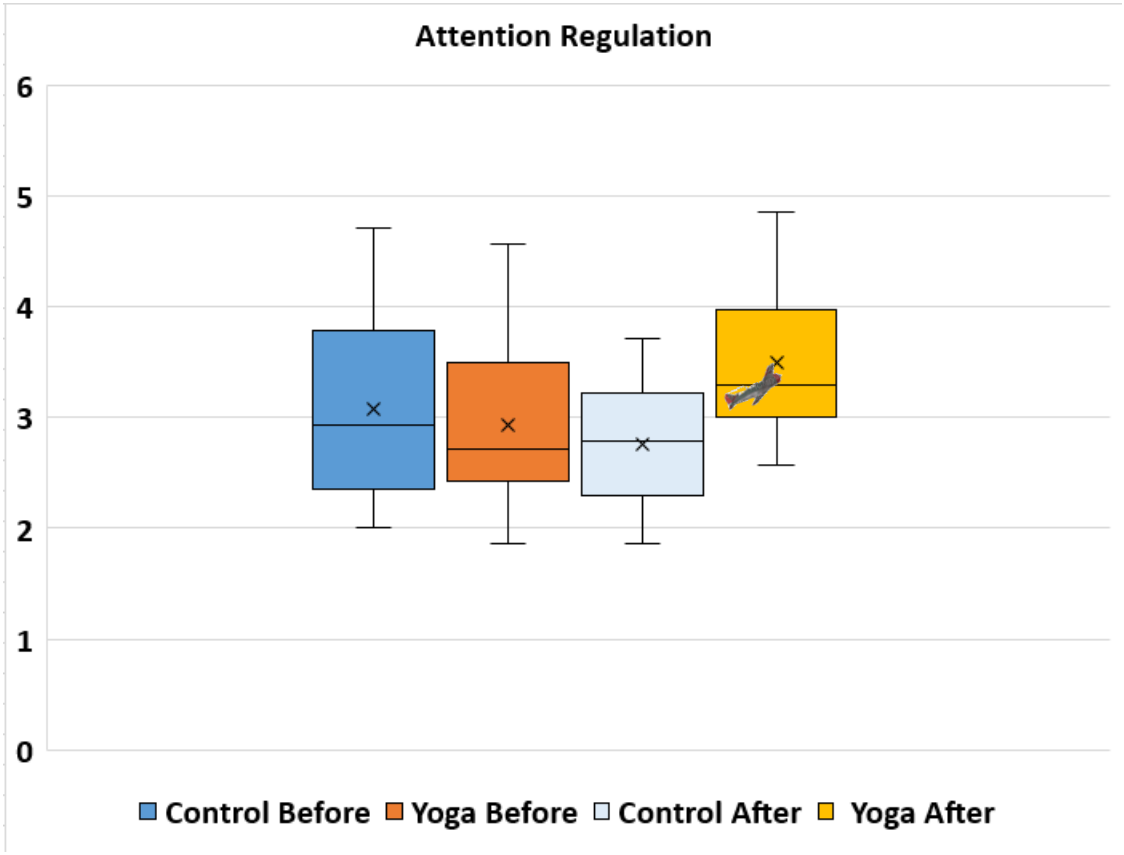


Results

- Significant changes were found in MAIA (Attention Regulation) within the yoga group, using Wilcoxon and Rank Biserial Correlation after Shapiro-Wilk testing:

				Statistic	p	Effect Size
Attention Regulation	Whithin group	Control group before	Control group after	18.00	0.554	0.286
		Intervention group before	Intervention group after	4.00	**0.019**	-0.855

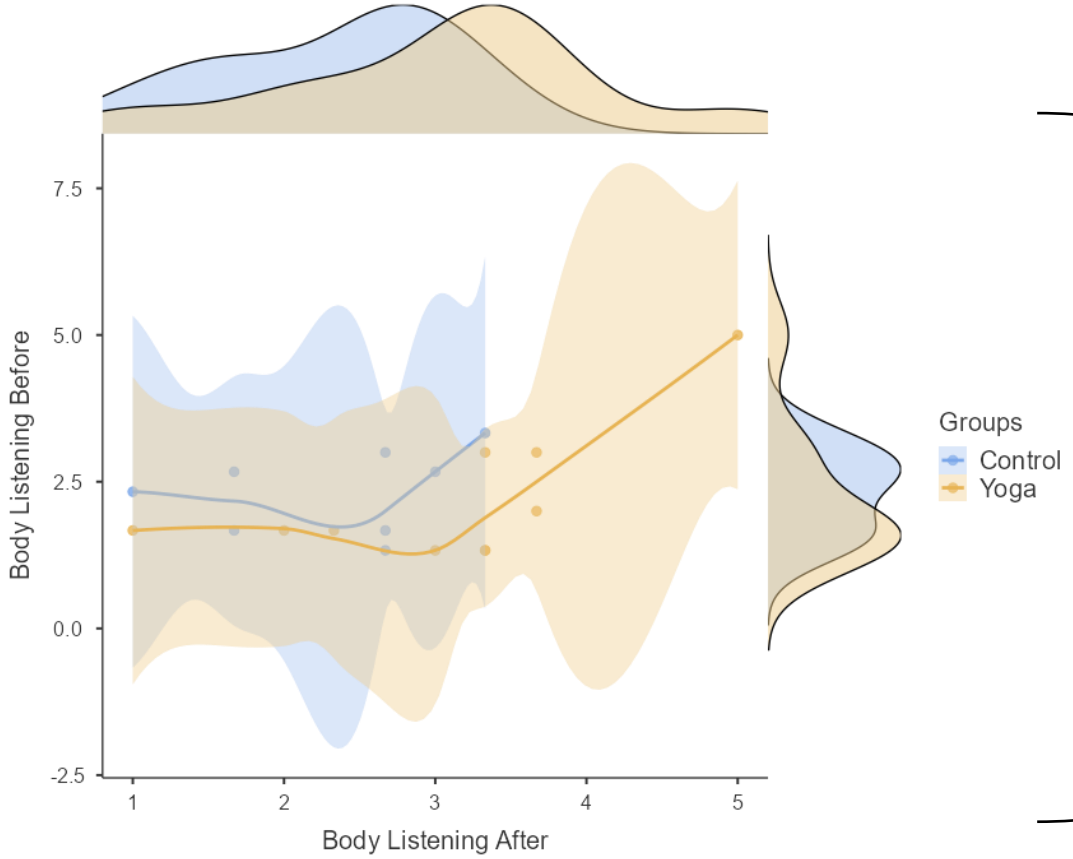


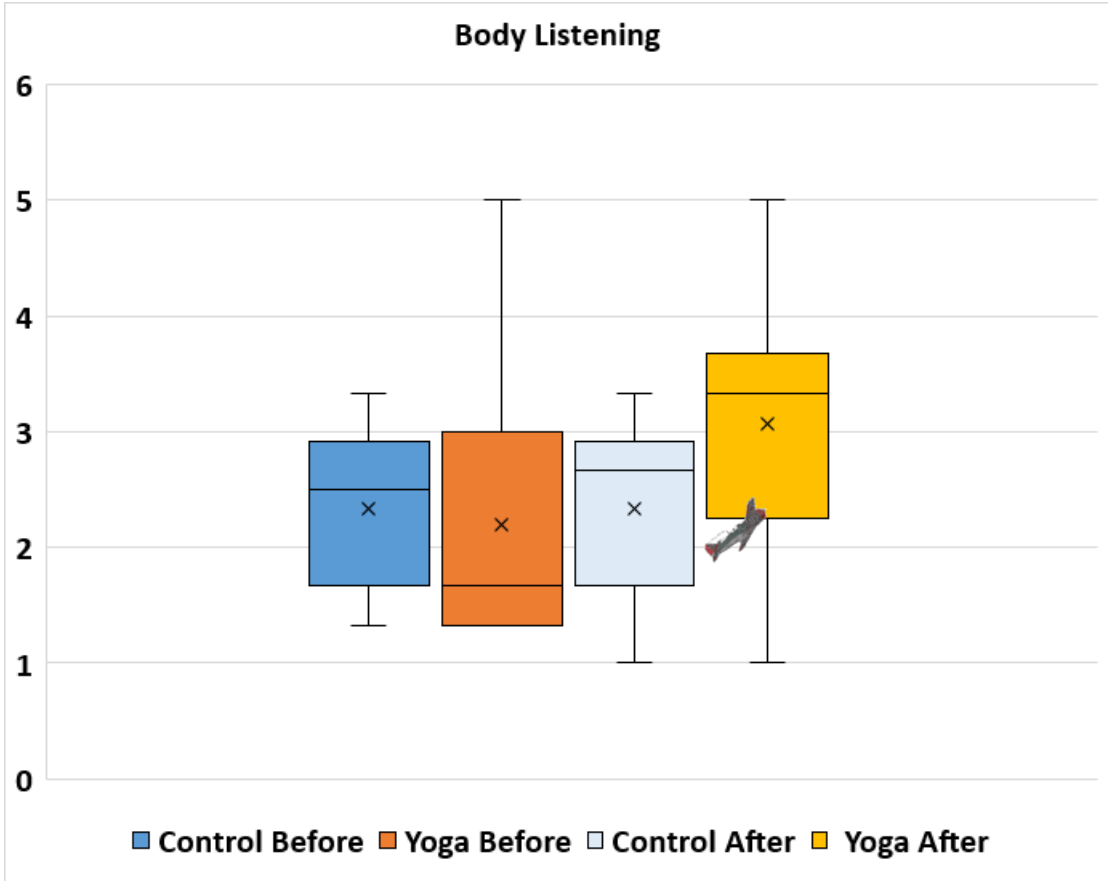


Results

- Significant changes were found in MAIA (Body Listening) within the yoga group, using Wilcoxon and Rank Biserial Correlation after Shapiro-Wilk testing:

				Statistic	p	Effect Size
Body Listening (active listening to signals for decision-making)	Whithin group	Control group before	Control group after	10.00	1.000	-0.048
		Intervention group before	Intervention group after	4.50	**0.037**	-0.800

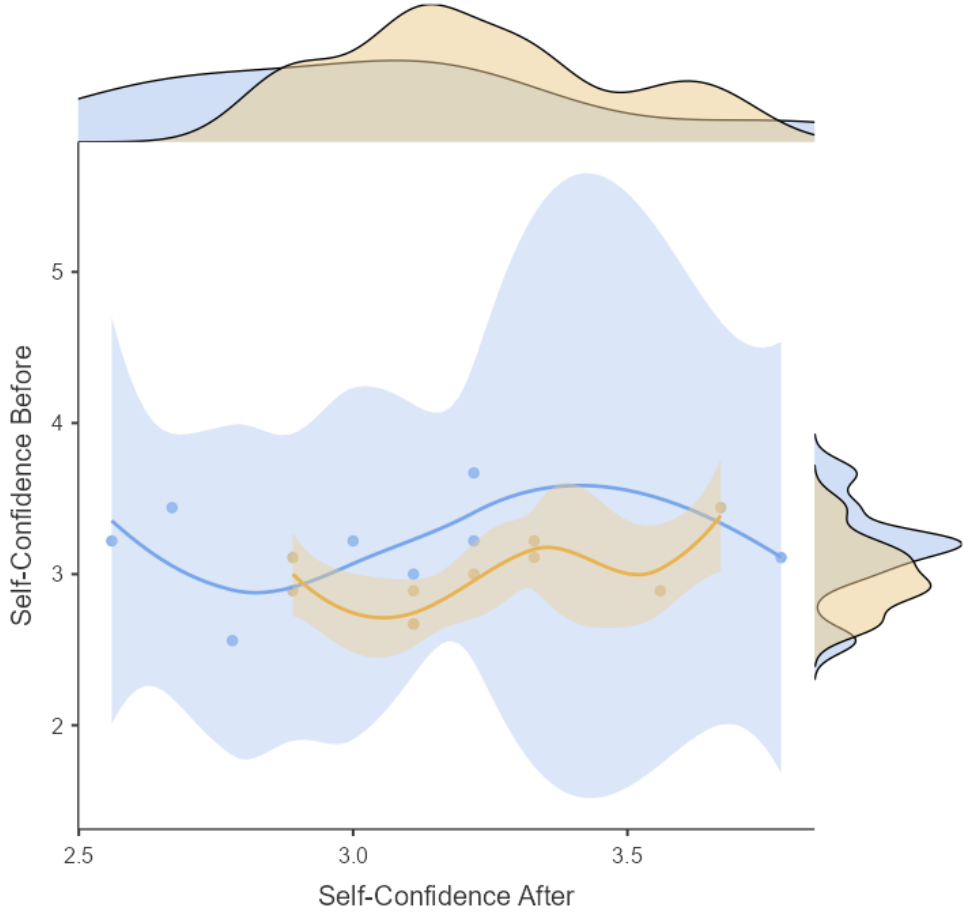


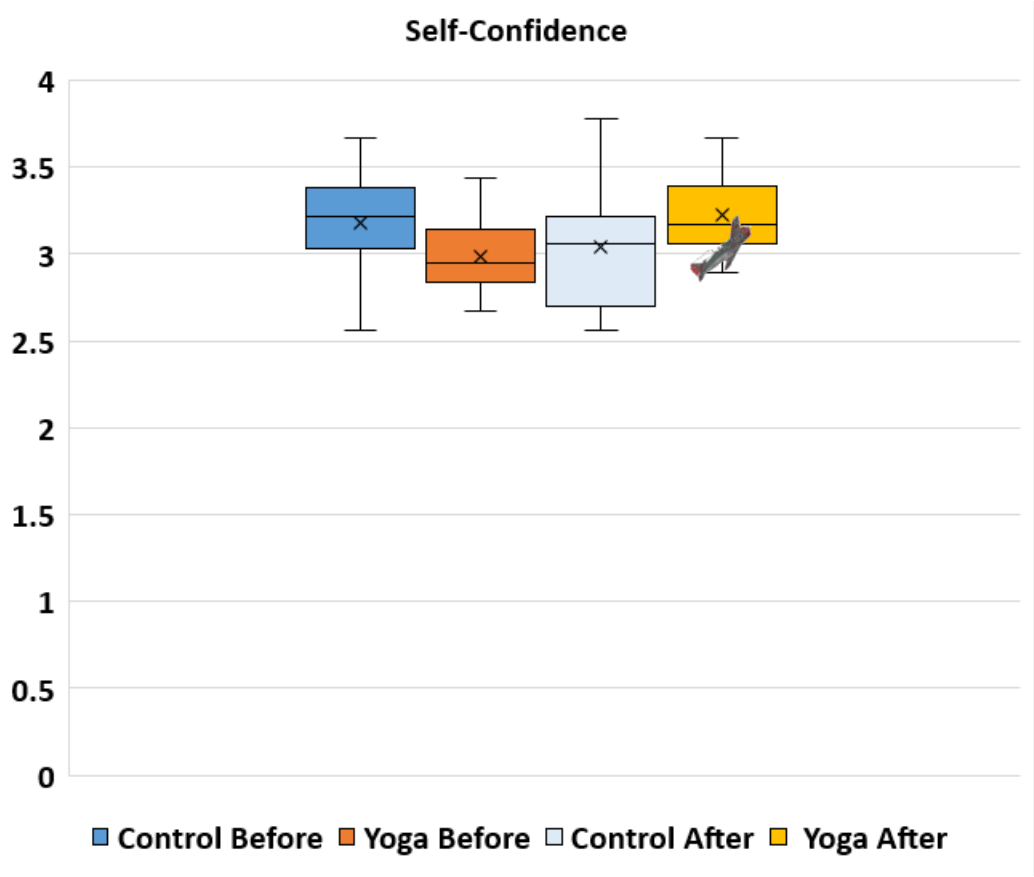


Results

- Significant changes were found in ASAS (Self-Confidence) within the yoga group, using Wilcoxon and Rank Biserial Correlation after Shapiro-Wilk testing:

				Statistic	p	Effect Size
Self-Confidence	Whithin group	Control group before	Control group after	19.00	0.447	0.357
		Intervention group before	Intervention group after	2.50	**0.021**	-0.889

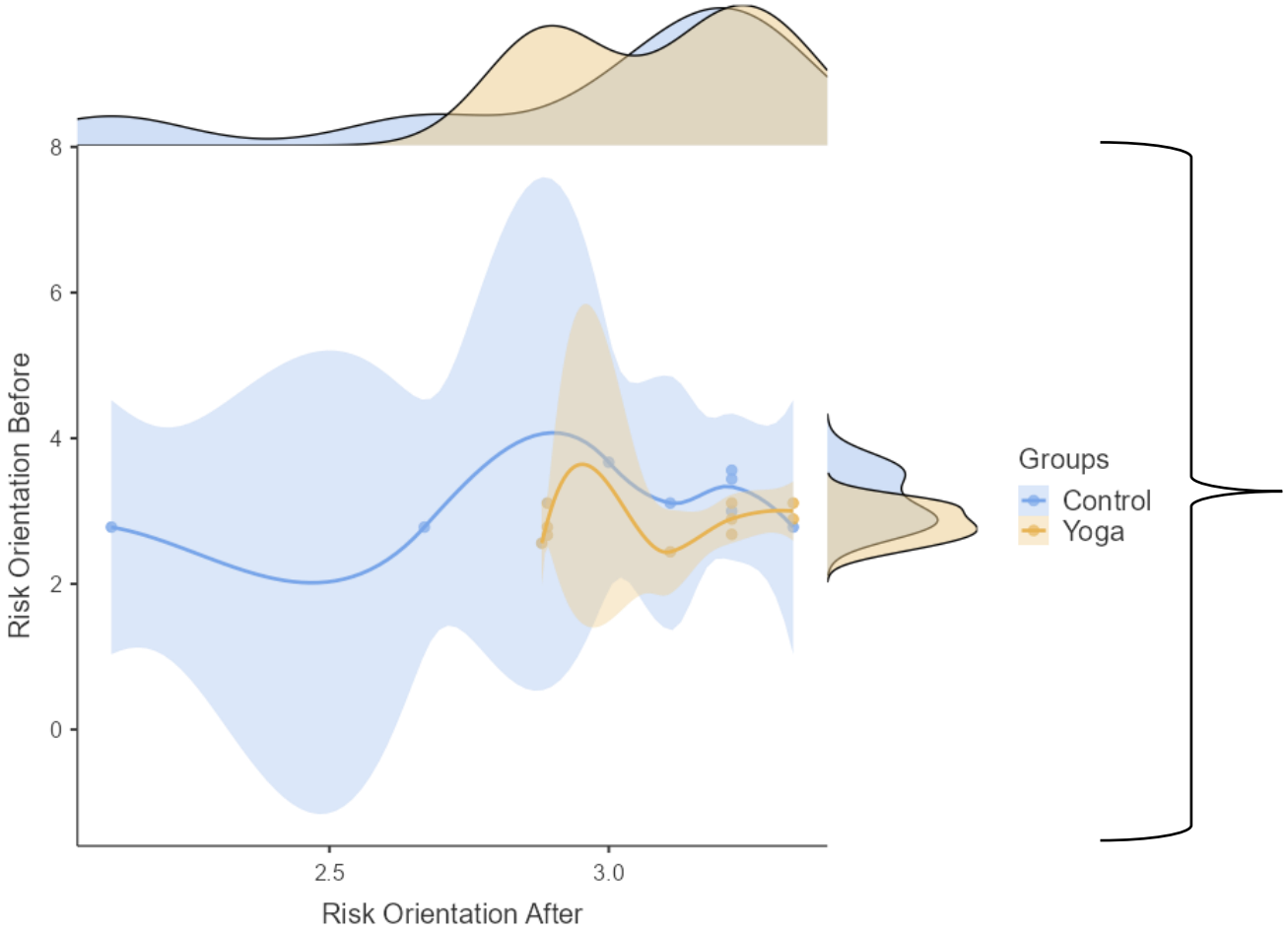




Results

- Significant changes were found in ASAS (Risk Orientation) within the yoga group, using Wilcoxon and Rank Biserial Correlation after Shapiro-Wilk testing:

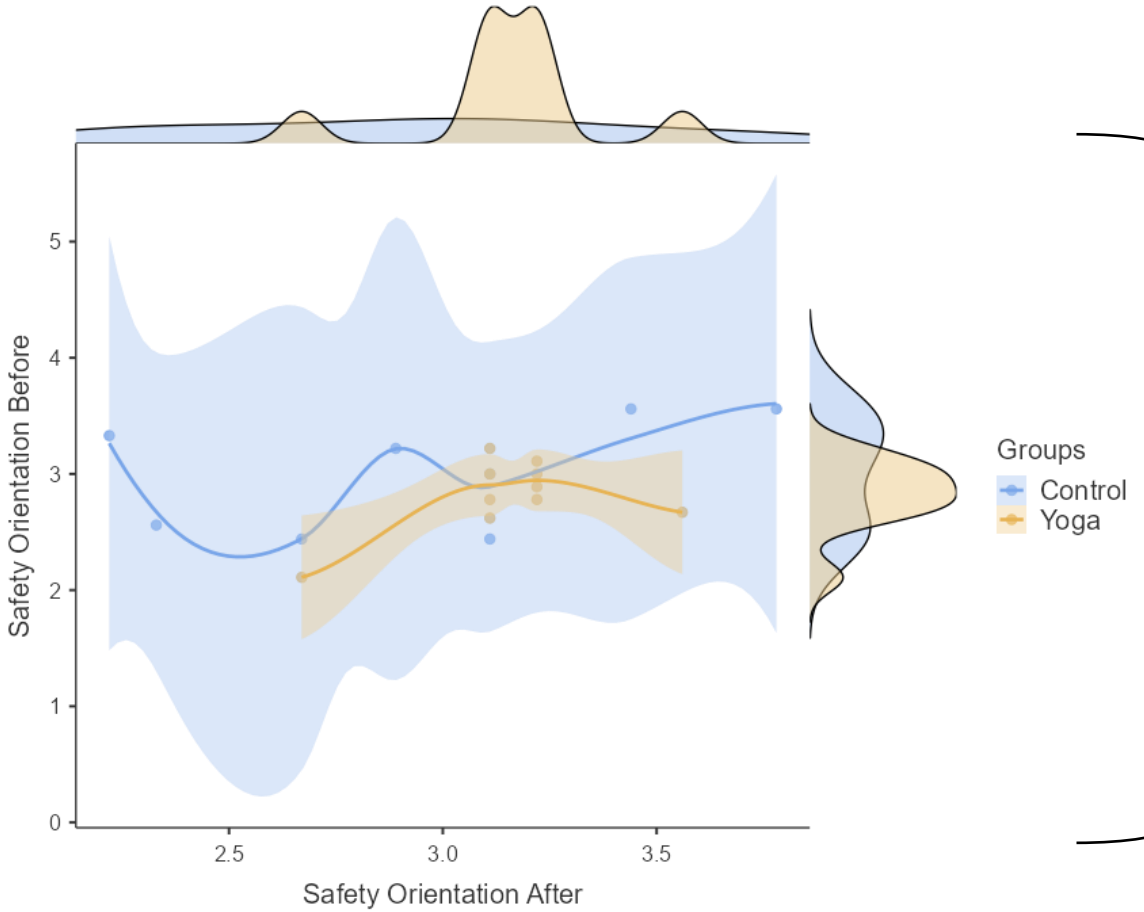
				Statistic	p	Effect Size
Risk Orientation	Whithin group	Control group before	Control group after	20.00	0.352	0.429
		Intervention group before	Intervention group after	3.00	**0.014**	-0.891



Results

- Significant changes were found in ASAS (Safety Orientation) within the yoga group, using Wilcoxon and Rank Biserial Correlation after Shapiro-Wilk testing:

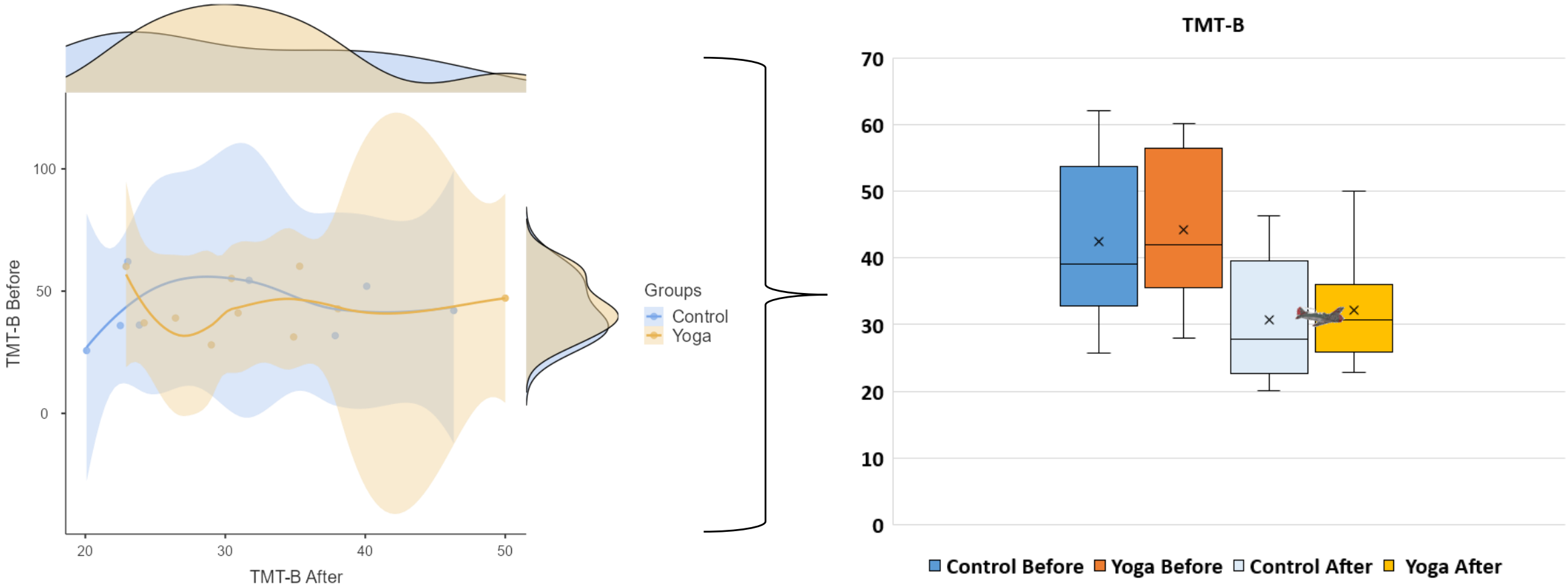
				Statistic	p	Effect Size
Safety Orientation	Whithin group	Control group before	Control group after	20.50	0.779	0.139
		Intervention group before	Intervention group after	2.50	**0.011**	-0.909



Results

- Significant changes were found in TMT (B) within the yoga group, using Student's t and Cohen's d after Shapiro-Wilk testing:

				statistic	p	Effect Size
TMTB	Whithin group	Control group before	Control group after	2.3017	0.055	0.814
		Intervention group before	Intervention group after	2.7879	**0.021**	0.882



Discussion

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What did the yoga practice change?

FFMQ ⇨ Pilots improved their **ability to stay present and attentive to their actions** rather than functioning on autopilot/being distracted and their **ability to observe their thoughts and emotions without self-criticism** or negative judgment

MAIA ⇨ Pilots improved their **sensitivity to perceive internal physical signals** without necessarily reacting to them, as well as their **ability to voluntarily shift and maintain attention on specific physical sensations**, and they improved their ability to **use bodily awareness for real time adjustments in self-care, emotional regulation, and decision-making**

ASAS ⇨ Pilots got greater **confidence in their own abilities, decision-making, and performance** under pressure, they also got **more comfortable with uncertainty and more willing to take risks** in flight, as well as **more aware of potential hazards and willing to take preventive actions** like following safety procedures and regulations

RPTS ⇨ Pilots kept their individual's perception of personal risk, and it didn't influence their behaviour/decision making

TMT-B ⇨ Pilots **improved the ability to shift between different sets of information** (cognitive flexibility), got **better planning and working memory** (executive functioning), got **faster at completing the task** (processing speed) and **improved the ability to focus on multiple elements at once** (divided attention).

Discussion

- The integration of low-cost, minimally time-consuming yoga programs into the Portuguese Air Force's training regimen could **enhance pilots' cognitive and emotional resilience**, ultimately improving flight performance, operational safety, **and overall mental health**.
- By **addressing stress management**, cognitive flexibility, and risk-awareness, yoga **may serve as a preventive strategy** against mental fatigue, burnout, and aviation-related psychological stressors.

Conclusion

- This research offers a unique contribution: studying the hard-to-access population of military aviation pilots, due to security and workload constraints.
- In the Portuguese Air Force, where decision-making under pressure, resilience, and stress tolerance are critical, mind-body interventions like yoga may represent a future-forward strategy for enhancing mental health, flight safety, and performance.
- **Investing in such programs could bridge the gap between physical training and psychological well-being, ensuring that pilots and air personnel operate at their highest potential while maintaining long-term health**.
- Results could influence policymakers to implement mandatory exercise programs, enhancing work safety, with low cost and minimally time-consuming interventions.
- These insights are also applicable to Airforce teams in other nations, commercial and civil aviation sectors, as well as high stress/high-performance sports performance settings.

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Thank you

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