Exploring Choke Holds in Brazilian Jiujitsu Athletes: A Demographic Study William Harrington1, Patrick Fugler2, Tatiana Madkiff3, Stephen Christensen4, Eric Miller4

Introduction:

- Brazilian Jiu Jitsu is a relatively new spe which has grown exponentially in popu since the early 1990's.
- Choke holds are one of the most comm submission type in both competition and recreational jiu jitsu.¹
- There have been several case reports o jitsu athletes suffering carotid or vertel artery dissection after being placed in a jitsu choke hold.¹
- There is no literature which discusses incidence of internal carotid or vertebr artery dissection in jiu jitsu athletes.¹
- Previously, there is no published literat describing jiu jitsu training regiments.¹
- For our manuscript, we referred to inte carotid and vertebral artery dissection cervical artery dissection (CAD).
- This study evaluated how frequently chokes happen in jiu jitsu athletes and if they ever experienced symptoms of arterial dissection.

Methods:

- Designated as an IRB exempt study from Liberty University IRB.
- An anonymous survey study was distributed through social media which asked both qualitative (1) and quantitative questions (28) regarding how athletes trained, submission preference, and symptoms of arterial dissection.
- Analysis was completed using SAS software and included one sample t-test along with descriptive statistics.
- As there was only one qualitative question, there was not adequate date for formal qualitative analysis, however data was still coded by 3 independent authors and 3 themes were created (cognitive/physical impairment, cognitive/physical improvement, and pain.

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ort	Characteristics
ularity	Age
	Training length (years)
	Sex (male)
lon	Number of training sessions per week:
nd	-Average time drilling per class (minutes)
	Participates in sparring:
.f::	-Average time sparring per class (minutes)
JI JIU	Favorite submission:
ebral	-Choke
a jiu	-Upper extremity submission
,	-Lower extremity submission
the ral ture	-Other
	Number of times submitted by a choke per class
	Number of times submitting someone with a choke per cla
	Number of participants who have been choked unconscio
	-If yes, how many times
	Number of participants who has choked someone uncons
-	-If yes, how many times
ernal	Number of participants with CVA dissection symptoms po
as as	Table 1. Baseline training demographics

p-value Had been choked unconscious vs not Choked someone unconscious vs not -1.48 0.1386 Training length (years) < 0.0001 Number of training sessions per week 2.38 0.0177 Length of drilling 0.0009 3.35 0.1390 Length of sparring 1.48 Favorite submission is a choke 0.14 0.8913 0.0005 Average class length 3.50 Average time training per week 3.90 0.0001

Table 2. Descriptive statistics to determine if there may be a reason why younger individuals were more likely to experience symptoms consistent with cervical artery dissection.



	N (%)	Mean	Median
		37.1	37
		6.7	4
	355 (84.7%)		
		3.9	4
		43.3	40
	520 (99.8%)		
		34.4	30
	312 (62.3%)		
	155 (30.9%)		
	28 (5.5%)		
	6 (1.2%)		
		1.7	1
ISS		3.1	2
us	173 (33.2%)		
		3.4	2
cious	189 (36.3%)		
		3.5	2
st training	290 (55.7%)		

for study participants.

Group 1 mean (stvd)	Group 2 mean (stvd)
31% (0.46)	36% (0.48)
33% (0.47)	40% (0.49)
4.7 years (4.1)	8.9 years (8.0)
4.0 (1.38)	3.8 (1.3)
46.9 min (30.3)	39.3 min (19.4)
35.4 min (16.4)	33.3 min (15.9)
62.8% (0.48)	62.2% (0.49)
81.12 min (36.1)	72.3 min (26.4)
338.5 min (217.3)	274.6 min (145.5)

Results:

- symptoms consistent with CAD.
- headache,".

Conclusion:

Next steps:

imagining.

References:

PMCID: PMC11182763.

• Survey was distributed between July-August 2022. • 521 out of 573 responses were included for analysis. • Participants who were 37 years of age or younger were 1.5337 (95% CI: 1.0827-2.1727) times the odds of a participant over 37 to experience symptoms consistent with CAD. 290 (55.7%) of participants have experienced

• Athletes that were 37 years of age or younger have been training for fewer years (4.7 vs 8.8) but train more days per week (4.03 vs 3.76), drill for a longer amount of time (46.8 minutes vs 38.3 minutes), attend longer classes (81.12 minutes vs 72.3 minutes), and train for a longer lightheaded per week (338.5 minutes vs 274.6 minutes). • 69 participants response to "train brain" were included for qualitative analysis. Out of the 69, 58 (84.1%) reported train brain as cognitive/physical impairment. Several themes were "bit foggy, hard to find words after training, a little light headed," "disoriented," "can't think, put together sentences," just foggy and tired," "fogginess," trouble "finding words," trouble concentrating,

• Athletes are routinely subjected to the mechanical stresses of a chokehold on cervical vasculature. • It is not uncommon for athletes to have experienced symptoms of cervical artery dissection.

• We will be conducting a study aimed to evaluate the long-term effect of repetitive stress caused by choke holds on the arteries of the cervical spine through

1. Harrington WB, Fugler PR, Midkiff T, Christensen SJ, Miller E. Exploring Choke Holds in Brazilian Jiujitsu Athletes: A Demographic Study. Cureus. 2024 May 19;16(5):e60618. doi: 10.7759/cureus.60618. PMID: 38894780;