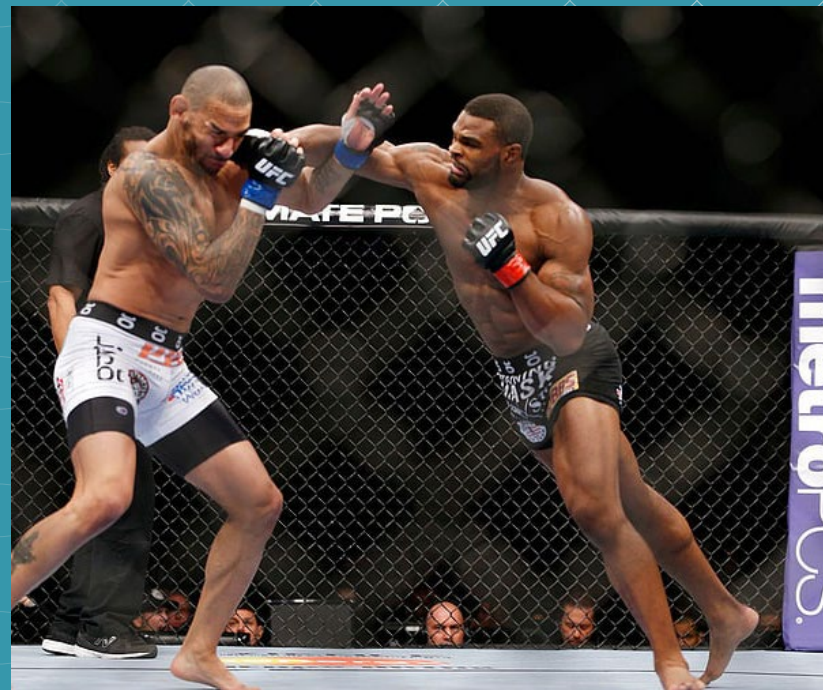


The Mental Fight: Depression and Resilience in Youth MMA athletes

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Background

- **Mixed Martial Arts (MMA) rapidly growing as a sport**
- **Youth participation controversial**
 - California first of two states to regulate Youth MMA (2014)
- **No current research on Youth MMA, particularly on cognitive risks and benefits**



Objective:

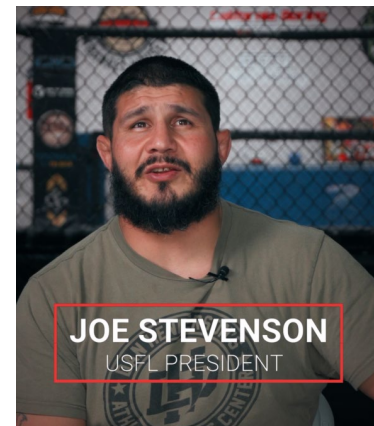
Study rates of depression and resilience in Youth MMA athletes

Hypothesis:

Youth MMA athletes have lower rates of depression and higher resilience scores than comparative norms

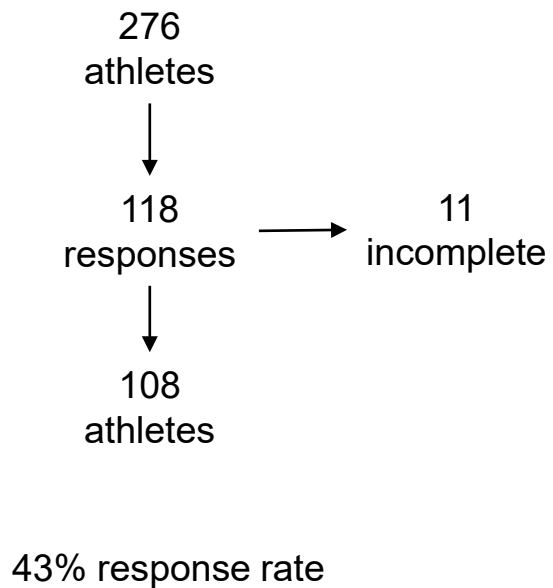
Methods

- Cross-sectional survey of Youth MMA athletes registered with the United States Fight League (USFL) in 2023
- Outreach via 5 email campaigns over 5 weeks, promotional video, and in-person reminders at 2024 USFL Nationals
- Surveys:
 - Demographics (age, gender, race)
 - MMA background*
 - Depression screening – Short Mood and Feelings Questionnaire (SMFQ)
 - Resilience screening – Connor Davidson Resilience Scale 2 (CD-RISC 2)



*Years of USFL competition, participation in other combat sports, weekly hours of MMA or combat sport practice, weight cutting for MMA (yes/no), parent as coach (yes/no), injuries that prevented competition or practice

Results

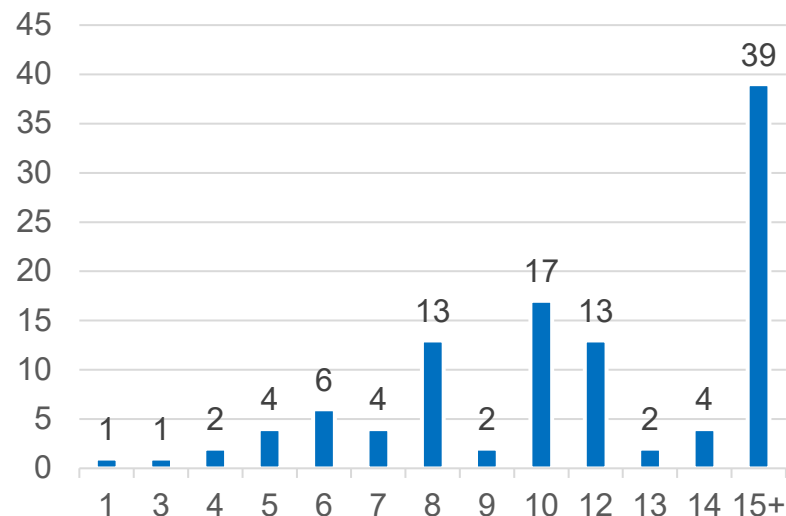


Demographics	
Age	13.4 (range 8 – 17)
Gender	
Male	76 (70%)
Female	32 (30%)
Race	
White	71 (66%)
American Indian or Alaska Native	11 (10%)
Asian	2 (2%)
Black or African American	4 (4%)
Native Hawaiian or Other Pacific Islander	1 (1%)
Prefer not to say	19 (18%)

Results

MMA Background	
Years of competition (USFL)	
1	56 (52%)
2	30 (28%)
3	14 (13%)
4	4 (4%)
5	1 (1%)
7	3 (3%)
Participation in other combat sports	
Wrestling	77 (71%)
Jiu-Jitsu	104 (96%)
Muay Thai	57 (53%)
Sambo	1 (1%)
Karate	12 (11%)
Taekwondo	10 (9%)
Judo	19 (18%)
Capoeira	1 (1%)
Pankration	1 (1%)
Sanda	1 (1%)
Vale Tudo	1 (1%)

Weekly Practice Hours (MMA + Other Sports)



Results

MMA Background	
Do you cut weight to compete in MMA?	
Yes	24 (22%)
Not for MMA, but for other sports	10 (9%)
No	74 (69%)
Does your parent coach you?	
Yes	14 (13%)
Sometimes	45 (42%)
No	49 (45%)
2023 injury	
Yes (most severe kept me out less than 8 days)	10 (9%)
Yes (most severe kept me out for 8-21 days)	4 (4%)
Yes (most severe kept me out more than 21 days)	7 (6%)
No	87 (81%)

Depression Screening

Short Mood & Feelings Questionnaire (SMFQ)

			p-value
Mean	1.3	Age	0.75
Standard Error	0.2	Gender	0.32
Median	0.0	Race	0.80
Mode	0.0	Years of USFL Competition	1.00
Standard Deviation	2.4	Weekly Practice Hours (MMA + Other Combat Sports)	0.43
Range	0-15	Weight Cutting for Competition	0.50
Screening Positive	4 (3.7%)	Parent as coach	0.36
		Injuries	0.06

SMFQ Population Comparisons

- 10,582 Australian youth athletes (all sports): 4.06-7.52¹
- 10,904 UK Adolescents: 2.5 (males), 4.6 (females)²
- 521 Seattle-based middle school children: 5.92 - 6.29³
- 167,783 US adolescents: 15.8% rate of depression⁴

Notes (SMFQ):
13 questions total (each ? scores 0-2)
No cumulative cutoff for depression, but
many use 8 or 12 as cutoff

Resilience Screening

CD-RISC 2 Questionnaire

Mean	6.97
Standard Error	0.11
Median	7
Mode	8
Standard Deviation	1.10
Range	4-8

	p-value
Age	0.25
Gender	0.12
Race	0.66
Years of USFL Competition	0.91
Weekly Practice Hours (MMA + Other Combat Sports)	0.55
Weight Cutting for Competition	0.96
Parent as coach	0.33
Injuries	0.72

CD-RISC 2 Population Comparisons

- Singapore adolescents: 5.76¹
- Korean adolescents: 5.6²
- German online student sample: 6.14³

Notes (CD-RISC 2):
2 questions total (Each ? scores 1-4)
No cumulative cutoff for resilience

95% Agree or Strongly Agree that they are more resilient because of participation in MMA

Discussion

Youth MMA participation may have many unrecognized mental health benefits

- Our study finds that Youth MMA athletes have lower depression scores and higher scores of resilience than adolescent peers
 - No differences when stratified by age, race, weekly hours of practice, weight cutting, having a parent as a coach, and recent injury history
- Limitations include small sample size and marginal response rate, lack of pre-participation and longitudinal data, recruitment bias

Next Steps

Outstanding questions:

- Verify statistical analyses and whether they are appropriately done
- Will not proceed with solicitation for additional responses
- Target journal and conferences
 - JPO or J Children's Orthopedics
 - PRiSM (July 1), AMSSM (November)
- Work for next fellow (longitudinal assessment?)

Appendix

Survey - Demographics and Background

What is your age?

- 8 9 10 11
 12 13 14 15
 16 17

What is your gender identify?

- Male
 Female
 Prefer not to answer
 Other

Please specify:

What is your race?

- American Indian or Alaska Native
 Asian
 Black or African American
 Native Hawaiian or Other Pacific Islander
 White
 Prefer not to say

How many years have you competed in the USFL?

- 1
 2
 3
 4
 5
 6
 7
 8
 9
 10

Do you participate in other combat sports? (Select all that apply)

- Wrestling
 Jiu-jitsu
 Muay thai
 Kickboxing
 Boxing
 Sambo
 Karate
 Taekwondo
 Judo
 Other

Please specify:

How many total hours per week do you practice mixed martial arts or other combat sports?

- 1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15+

Do you cut weight to compete in MMA?

- Yes
 No
 Not for MMA but for other combat sports

Does your parent coach you?

- Yes
 No
 Sometimes

Did you have any injuries in 2023 related to MMA participation that kept you out from competition or practice?

- Yes, the most severe injury kept me out for less than 8 days
 Yes, the most severe injury kept me out for 8-21 days
 Yes, the most severe injury kept me out for more than 21 days
 No

Survey – SMFQ and CD-RISC 2

For each question, please check how you have been feeling or acting in the past two weeks.

If a sentence was not true about you, check NOT TRUE.

If a sentence was only sometimes true, check SOMETIMES.

If a sentence was true about you most of the time, check TRUE.

	Not true	Sometimes	True
1) I felt miserable or unhappy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) I didn't enjoy anything at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) I felt so tired I just sat around and did nothing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) I was very restless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) I felt I was no good anymore	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6) I cried a lot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7) I found it hard to think properly or concentrate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8) I hated myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9) I was a bad person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10) I felt lonely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11) I thought nobody really loved me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12) I thought I could never be as good as other kids	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13) I did everything wrong	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For each item, please mark the response that best indicates how much you agree with the following statements as they apply to you over the last month. If a particular situation has not occurred recently, answer according to how you think you would have felt.

	Not true at All	Rarely true	Sometimes true	Often true	True nearly all the time
1) I am able to adapt when changes occur.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) I tend to bounce back after illness, injury, or other hardships.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate the degree to which you agree with the following statements.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
3) I am more resilient because of my participation in MMA	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) I am in better physical health because of my participation in MMA	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>