

The Health Economics of Professional Wrestling

Smith, D., PhD¹
¹Evidera, Waltham, MA, United States

Introduction

Professional wrestling in its current state is commonly practiced in the United States, Mexico (la lucha libre), Japan (プロレス [puroresu]), and other parts of the world. Despite its choreographed nature, professional wrestlers are athletes who sustain numerous injuries during their careers, some of which are severe and require surgery.¹

Objective

The main objective of this targeted literature review was to evaluate the clinical, humanistic, and economic burden associated with professional wrestling.

Methods

This targeted literature review examined PubMed-, Embase-, and Cochrane-indexed literature using key words related to professional wrestling as search terms. The search was limited to English-language publications published between January 1, 2000 and December 31, 2021. In addition, the ISPOR Presentations Database was searched from 1998 to 2021 using similar strategies. No geographic limits were placed on the searches, but narrative review articles and editorials were excluded.

The targeted literature review focused on information related to the clinical, humanistic, and economic burden associated with professional wrestling.

- Studies reporting outcomes for professional wrestling in adults were included.
- Studies reporting outcomes for children or adolescents or other types of wrestling (e.g., amateur, sumo, canarian, ssireum, Kurash, sambo, Olympic, Greco-Roman, freestyle, folk style, high school, and collegiate) were excluded.

Results



Clinical burden related to head injuries

Head injuries can lead to headaches, dizziness, amnesia, brain swelling, acute subdural hematomas, and other outcomes.² As shown in **Table 1**, the most common symptom/finding in a study of female Japanese professional wrestlers was headache.²

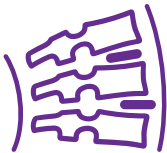
Results (Cont'd)

Table 1. Reports of symptoms/findings related to head injuries in adult female Japanese professional wrestlers

Symptom/Finding	Immediate (n=15)	Chronic (n=15)	Findings at Emergency Outpatient Clinic (n=5)
Retrograde amnesia	3 (20.0%)		
Transient unconsciousness	1 (6.7%)		
Headache		3 (20.0%)	4 (80.0%)
Dizziness		1 (6.7%)	
Nausea			2 (40.0%)
Laceration			1 (20.0%)
Diplopia			1 (20.0%)
Numbness of hands			1 (20.0%)
Transient unconsciousness			1 (20.0%)
Brain swelling*			1 (20.0%)
Acute subdural hematoma*			1 (20.0%)

* Identified after imaging. Source: Nomoto et al, 2007.²

Repeated head trauma can lead to chronic traumatic encephalopathy (CTE).^{3,4} It is difficult to determine exactly what percentage of professional wrestlers may develop CTE since this outcome has only been presented in case reports and case series.^{3,4,5,6} The case series that contained the greatest number of professional wrestlers (n=4) identified CTE in two (50%) of the individuals examined.⁶



Clinical burden related to spinal injuries

In addition to head injuries, trauma to the spinal cord also occurs.^{7,8,9} Spinal stenosis is a commonly reported injury among professional wrestlers.^{7,8,9} Studies have also reported neck pain, muscle weakness, spinal cord compression, spinal epidural hematomas, and vertebral fractures in professional wrestlers (**Table 2**).^{7,8}

Table 2. Reports of Spinal Injuries/Symptoms in Professional Wrestlers

Symptom/Injury	Prospective Study of Male Professional Wrestlers in Japan (n=27)	Retrospective Chart Review of Professional Wrestlers (n=8)
Spinal stenosis	16 (59.3%)	6 (75.0%)
Osteogenic lesions	12 (44.4%)	
Cervical spine injury*	2 (7.4%)	
Spinal cord compression	2 (7.4%)	
Thoracolumbar spine injury	2 (7.4%)	
Herniated nucleus pulposus		8 (100.0%)
Upper extremity pain		6 (75.0%)
Neck pain		5 (62.5%)
Weakness of the triceps		5 (62.5%)
Upper extremity numbness		2 (25.0%)
Weakness of the biceps		2 (25.0%)

* Identified retrospectively. Source: Sasaki et al, 2018.⁷ Maroon et al, 2013.⁸



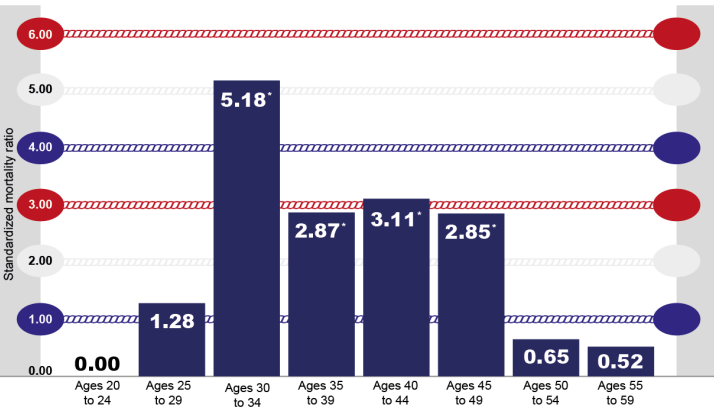
Other injuries

While injuries to the head and spine are common, other less commonly reported injuries, such as tears of the latissimus dorsi tendon and medial collateral ligament, appear in case studies.^{10,11}

Mortality

A high mortality rate has been reported in male professional wrestlers; the increased mortality rate is largely due to cardiovascular disease.¹² As shown in **Figure 1**, Male professional wrestlers 30 to 49 years of age had significantly higher mortality rates compared to rates published by the Centers for Disease Control and Prevention (CDC).¹²

Figure 1. Standardized mortality ratio for observed deaths vs. expected deaths in male professional wrestlers



* p<0.05. Source: Herman et al, 2014.¹²

Conclusions



Case reports and larger studies have identified a clear clinical burden and high mortality rate and reported numerous injuries that are sustained by professional wrestlers. While these injuries are likely associated with decreased quality of life, high costs, and high resource utilization, these outcomes are not well-characterized in the literature.

References

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