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ORIGINAL ARTICLE

Common injuries among Brazilian Jiu Jitsu practitioners in Medan City

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ABSTRACT

Brazilian Jiu Jitsu (BJJ) is a martial art that focuses on floor fighting and was first popularized in Brazil. The BJJ originally focused on entertainment, health, and self-development. These goals changed when practitioners began participating in competitions in which there was a significant increase in the number of BJJ injuries. A pre-survey in the field indicated that many jiu jitsu practitioners were affected by common injuries. The type of research in this study is a descriptive survey with a cross-sectional approach conducted at Ryu Dojo Martial Arts Center, Musi Jiu Jitsu, and PBJI Medan City in March 2024. Data were collected in the form of questionnaires, interviews, and medical records of practitioners diagnosed with injuries who were sampled. Univariate analysis was used to obtain the frequency distribution of respondents for each variable, namely age, gender, belt level, weight, training frequency, and competitor status. The results of the study were analyzed using SPSS version 27.0. The results showed that the highest number of practitioners was in the late teenage group (53.8%), the highest gender was male (92.3%), and the highest number of practitioners was white belt (69.2%). Based on body weight, the highest number of practitioners was in the Light Feather category (< 64 kg/141 lbs) with a percentage of 26.9%, and the most training hours were 3-5 hours 16 (30.8%). Lower Back Pain was the most common injury with a total of 25 practitioners. A total of 75% of the practitioners stated that their daily activities were disrupted because of their injuries. It can be concluded that the majority of BJJ participants were in their late teens, male was the most common gender, and white belts were the most common practitioners. The most common injury was lower back pain due to the amateur competitor status. Most respondents stated that their injuries interfered with their daily activities.

Keywords: Brazilian Jiu Jitsu, practitioner, injury

Introduction

Martial arts sports, with their high intensity and physical contact, are inevitably associated with a risk of injury. Injury in this context is not just a temporary nuisance but a complex issue that has a significant impact on an athlete's health, performance, and career sustainability.[1,2] Injuries in this context can be divided into two broad groups: acute and chronic injuries. Acute injuries are the type of injuries that occur suddenly due to impact or physical trauma. Broken bones, sprains, or muscle strains are common examples of acute injuries experienced by martial arts practitioners. On the other hand, chronic injuries develop slowly due to repetitive use. Tendonitis, bursitis, or shin splints are examples of chronic injuries that are often experienced by martial arts athletes.[3–5]

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Brazilian Jiu Jitsu (BJJ) is a popular martial art that has experienced rapid growth in Indonesia.[6] Originally recognized as a sport that prioritizes health and self-development, BJJ has undergone a transformation along with the increasing popularity of competition. The pressure to win matches often pushes practitioners to take higher risks, thereby increasing the likelihood of injury.[7] Studies have shown that injuries to BJJ practitioners, especially those who actively compete, are becoming more common. The identified injury rate of 9.2 per 1000 exposures indicates a substantial risk of injury for BJJ participants during matches. The majority of injuries sustained were orthopaedic in nature, emphasizing the physical demands and potential for musculoskeletal damage in BJJ. The elbow joint is particularly vulnerable, with the arm bar being a common mechanism of injury. This finding suggests that BJJ-specific techniques can result in unique injury patterns.[8] Other studies have consistently reported high injury rates among BJJ practitioners in both training and competition settings. The most common injury sites identified in these studies included the knee, upper extremity, neck, elbow, hand, fingers, foot, and toes. This suggests that BJJ, as a contact sport involving grappling and submitting, can lead to a variety of musculoskeletal injuries.[9,10]

Although there are a number of studies on martial arts injuries, there are limited studies that specifically address BJJ injuries in Medan City. This study aims to fill this gap by providing empirical data on the most common types of injuries. The results of this study are expected to contribute to the development of sports and health science, as well as provide practical recommendations for coaches, athletes, and managers of BJJ sports facilities in Medan.

Method

This study used a descriptive survey design and cross-sectional approach. That is, data regarding risk factors and injuries were collected at a specific point in time from the entire study population. This research was conducted at three BJJ gyms in Medan City in March 2024: Ryu Dojo Martial Arts Centre, Musi Jiu Jitsu, and PBJI Medan City. The study population consisted of all BJJ practitioners in Medan. As the population was less than 100, all members of the population were used as research samples. Data were collected using questionnaires, interviews, and medical records. The variables analyzed included age, sex, belt level, body weight, training frequency, competition status, and injury type. Data analysis was performed using SPSS version 27.0 software. A univariate analysis was performed to describe the frequency distribution of each variable.

Results

Table 1 shows that 53.8% of the total BJJ practitioners are late adolescents (17-25 years old). This shows that BJJ is popular among teenagers. The older the age range, the lower is the number of practitioners. This suggests that interest in BJJ tends to decline with age. The early elderly group (46-55 years old) had the least number of practitioners (only 3.8 %). Of the total number of BJJ practitioners, 92.3% were male. This shows that BJJ was still dominated by men. Only 7.7% of the BJJ practitioners were female. This figure shows that female participation in the BJJ is still relatively low.

Table 1. Frequency distribution of BJJ practitioners by age and gender

Category	n=52	%
Age		
Late adolescents (17-25 years)	28	53.8
Early Adulthood (26-35 years)	17	32.7
Late Adults (36-45 years)	5	9.6
Early Elderly (46-55 years)	2	3.8
Gender		
Male	48	92.3
Female	4	7.7

Table 2 shows the frequency and percentage distribution of the BJJ practitioners based on their belt levels. These data provide an overview of the structure and hierarchy of the BJJ community. Most practitioners (69.2%) had a white belt at the beginner belt level. This indicates that most of the BJJ population was still in the early stages of learning. The higher the belt level, the lower the number of practitioners. This

suggests that it is becoming increasingly difficult to reach higher belt levels. Only 1.9% of practitioners had a black belt, which is the highest belt level. This shows that achieving a black belt is very rare.

Table 2. Frequency distribution of BJJ practitioners by belt level, weight, and exercise intensity

Category	n=52	%
Belt level		
White	36	69.2
Blue	10	19.2
Purple	3	5.8
Brown	2	3.8
Black	1	1.9
Weight		
Rooster (<57.5kg/126.5lbs)	6	11.5
Light Feather (<64kg/141lbs)	14	26.9
Feather (<70kg/154lbs)	11	21.2
Light (<76kg/167lbs)	9	17.3
Middle (<82.3kg/181lbs)	4	7.7
Medium Heavy (<88.3kg/195lbs)	6	11.5
Super Heavy (<97.5kg/215lbs)	1	1.9
Ultra Heavy (no maximum)	1	1.9
Exercise Intensity per Week		
0-2 hours	11	21.2
3-5 hours	16	30.8
6-8 hours	13	25.0
9-11 hours	7	13.5
> 12 hours	5	9.6

Most practitioners (69.6%) were in the lightweight categories of roosters, light feathers, and feathers. This shows that BJJ is more popular among practitioners with lower body weights. The higher the weight category, the lower the number of practitioners. This suggests that the number of BJJ practitioners with higher body weights tended to be lower. Only 3.8% of the practitioners were in the super-heavy and ultra-heavy categories. This suggests that BJJ is less popular among very heavyweight practitioners. Most practitioners (52%) train between 3-8 hours per week. This suggests that most practitioners have a fairly regular and consistent training schedule. There was considerable variation in training intensity, ranging from very little (0-2 hours) to very intensive (more than 12 h). The more the hours of practice, the fewer the number of practitioners. This may indicate that the higher the intensity of the practice, the fewer people are able to maintain consistency.

Table 3. Injuries by body part per competitor group (n=52)

Injury	Class (n (%))			Total
	Non-Competitor	Amateur	Professional	
Low back pain	9 (36.0)	11 (44.0)	5 (20.0)	25 (100.0)
Neck	4 (33.3)	7 (58.3)	1 (8.3)	12 (100.0)
Knee	3 (15.8)	10 (52.6)	6 (31.6)	19 (100.0)
Shoulder	6 (25.0)	14 (58.3)	4 (16.7)	24 (100.0)
Finger	6 (35.3)	8 (47.1)	3 (17.6)	17 (100.0)
Elbow	1 (14.3)	4 (57.1)	2 (28.6)	7 (100.0)

Table 3 provides an overview of the distribution of injuries to specific body parts broken down by competitor groups (non-competitors, amateurs, and professionals). The amateur group had the highest number of injuries to almost all body parts. This suggests that insufficient training intensity and experience may have contributed to the higher injury rate in this group. Neck and shoulder injuries were common in all groups, particularly in the amateur and professional groups. This may be related to improper techniques or excessive training load in these areas. Injuries to the knees and wrists were also common, especially in the

amateur and professional groups. This may be related to repetitive movements typical of this sport, or muscle imbalances.

Table 4. Impact of injury on daily activities

Does the injury affect with daily activities?	n=52	%
No	13	25.0
Yes	39	75.0

Table 4 provides a clear picture of the extent to which injuries affect BJJ practitioners' daily activities. A total of 75% of BJJ practitioners reported that injuries interfered with their daily activities. This suggests that injuries have a significant impact on practitioners' quality of life. This high number indicates that injuries not only impact sporting activities but also daily activities such as working, studying, or doing household chores.

Discussion

The current study indicates that 53.8% of BJJ practitioners are late adolescents aged 17-25 years, highlighting the significant interest in BJJ among teenagers. This trend is consistent with earlier findings suggesting a high participation rate among younger individuals. BJJ has gained popularity among various age groups, particularly adolescents and young adults.[11] Research indicates that BJJ practice can positively impact practitioners' physical and psychological development. Experienced BJJ practitioners demonstrate superior isometric strength endurance and dynamic balance compared to beginners.[12,13] However, as age increased, the number of practitioners tended to decline sharply. The current study noted that only 3.8% of practitioners were in the early elderly group (46-55 years old).

A striking finding from the current study is the overwhelming male dominance in BJJ participation, with 92.3% of practitioners identifying themselves as male. This statistic mirrors earlier studies that reported similarly low female participation rates; for example, a survey indicated that only 11.4% of the respondents were female. The current data's figure of 7.7% female practitioners suggests that while there are efforts to promote inclusivity, female participation remains relatively low compared to their male counterparts. Recent studies on BJJ have revealed significant gender disparities in participation, with females comprising only 7.7-11.4% of practitioners.[8,14] This focus on mastery goals is associated with adaptive behavior in challenging situations for both genders. Injury rates in the BJJ are high, with 308 injuries per 1000 athletes annually, predominantly affecting the lower and upper extremities.[8] Notably, female practitioners have a higher lifetime prevalence of BJJ-related concussions than male practitioners.[14] The low percentage of female practitioners could be attributed to various factors, including cultural perceptions of martial arts, lack of female role models within the sport, and potentially unwelcoming environments in the predominantly male classes.

The frequency and percentage distribution of BJJ practitioners based on their belt levels reveals significant insights into the structure and hierarchy within the BJJ community. As indicated in result, a substantial majority of practitioners, 69.2%, hold a white belt, which represents the beginner level in the BJJ ranking system. This high percentage underscores that most participants are still in the initial stages of their martial arts journey, focusing on fundamental techniques and concepts essential for progression. BJJ is a rapidly evolving combat sport with a strict belt promotion system.[15] Practitioners predominantly focus on mastery-approach goals, which may contribute to adaptive behavior when facing challenges.[16]

A striking observation is that 69.6% of practitioners fall within the lightweight categories, including light feathers and feathers. This trend suggests a preference or greater participation among individuals with lower body weights, indicating that BJJ may be more appealing or accessible to this demographic. Conversely, only 3.8% of practitioners are classified in the super-heavy and ultra-heavy categories, highlighting a notable decline in participation as body weight increases. This disparity may reflect physical and psychological barriers faced by heavier individuals when engaging in a sport that often emphasizes agility and technique over sheer strength. Most practitioners (52%) train between 3-8 hours per week, suggesting a consistent training regimen that allows for skill development without overwhelming the body. The variation in training intensity is significant, with some practitioners training as little as 0-2 hours weekly while others engage in more intensive schedules exceeding 12 hours. This variability raises questions about sustainability; as training hours increase, the number of participants tends to decrease. This phenomenon

could indicate that higher intensity training may lead to burnout or injuries, making it difficult for practitioners to maintain their commitment over time.

In analyzing the distribution of injuries across different competitor groups in sports, particularly focusing on non-competitors, amateurs, and professionals, significant trends emerged that highlight the relationship between training intensity, experience, and injury prevalence. The results indicated that the amateur group exhibited the highest number of injuries across nearly all body parts. This observation suggests that insufficient training intensity and lack of experience may contribute to the elevated injury rates observed in this demographic.

Neck and shoulder injuries were prevalent in all groups but were particularly pronounced among amateurs and professionals. The commonality between these injuries can be attributed to several factors. Inadequate training often leads to poor techniques that can increase the risk of injury. For instance, neck sprains and whiplashes are frequent in sports involving abrupt movements or collisions, where athletes may not have mastered the proper form. Research indicates that higher neck strength is associated with a lower risk of concussion, and injury reduction programs incorporating neck exercises can decrease the incidence of head and neck injuries.[17] Overtraining without adequate recovery can exacerbate stress on the neck and shoulders, leading to injuries such as sprains or strains. The vulnerability of the cervical spine during high-impact activities is well documented, with studies indicating that abrupt movements can result in significant neck injuries.[18] Injuries to the knees and wrists were also notably common among the amateurs and professionals. Sports often involve repetitive motion that can lead to overuse injuries. For example, athletes engaged in activities that require extensive use of their wrists or knees may develop conditions such as tendonitis or ligament strain. A lack of balanced strength training can lead to muscle imbalances around these joints and increase susceptibility to injuries. This is particularly relevant for athletes, who may focus heavily on one aspect of their training while neglecting others.[19,20]

Injuries in BJJ are a significant concern, affecting not only the sport itself but also practitioners' daily lives. A striking statistic reveals that 75% of BJJ practitioners report that injuries interfere with their daily activities, indicating a profound impact on their quality of life. The prevalence of injuries among BJJ practitioners is alarmingly high. Studies indicate that approximately 90% of practitioners sustain at least one injury during their training.[10] The most common injuries involve the upper extremities, particularly the fingers and hands, which account for about 78.6% of reported injuries, followed closely by knee injuries at 61.5% . These injuries often occur during practice rather than competition, with 85.3% of reported injuries happening in training sessions.[21]

Conclusion

It can be concluded that Brazilian Jiu-Jitsu (BJJ) is primarily popular among young male practitioners with lower body weights. Although sports are growing in popularity, they still face challenges in attracting older practitioners, women, and heavier individuals. Most BJJ practitioners are still in the early stages of learning, and achieving higher belt levels is a significant challenge. Injuries are a common occurrence in the BJJ, particularly among amateurs and professional competitors, and can have a significant impact on daily life.

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