



ORIGINAL SCIENTIFIC ARTICLE

## THE INJURY INCIDENCE AND TREATMENT EXPERIENCE AMONG ELITE AND BEGINNER THAILAND BODYBUILDERS

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### Abstract

**Background.** Bodybuilding is a sport where a person should do a lot of weight training while in the same time having a strict diet control. Due to this, they are believed to have higher chances of getting injured. However, lack of research has been conducted on the incidence of injuries and the treatment history among bodybuilders in Thailand. Therefore, the purpose of this study was to investigate and compare the incidence of injuries and treatment experience between elite and beginner Thailand bodybuilders.

**Material and methods.** 157 bodybuilders who were registered as members of the Thailand Bodybuilding and Physique Sports Association (since 2020-2021) were recruited as participants in this study. They were divided in to two groups, namely elite (more than 5 years of sports training) and beginner (less than 5 years of sports training). A valid and reliable questionnaire was used to collect the data from the participants.

**Results.** There was no significant difference in the most common period of injury between the beginner and elite groups. The most common period of injury for both groups was found to be during diet period (beginner 55.43%; elite 55.38%) followed by bulk period, off season and competition period, respectively. For the injury area, there was no difference between the groups, with the lower back (beginner 63.04%; elite 52.31%) being the most common area of injury, followed by shoulder, chest, finger and wrist. There was also no significant difference in treatment between the groups in the first 48 hours after injury. Most of the athletes in both groups had rest (beginner 80.43%; elite 81.53%) and applied cold (beginner 61.96%; elite 73.85%) to their injury area. Additionally, the beginner group of Thai bodybuilders visited the physical therapist more often than the elite group did ( $p < 0.01$ ). At the same time, there was no significant difference in medical doctor, sports scientist, coach and self-treatment and rehabilitation between both groups. However, most of athletes from both groups mainly resorted to self-treatment.

**Conclusions.** The study findings are expected to be valuable for the bodybuilding association, coaches and athletes to take extra precautions regarding injury in the future.

**Keywords:** bodybuilder, injury, treatment, athlete status, rehabilitation.

### Introduction

Bodybuilding is a sport that relies on resistance training especially weight training with appropriate diet control for building muscles and burning fat. Bodybuilders must follow their strict training and nutrition orders in order to make

sure they can achieve the best physical condition during competition. In all around the world, including Thailand specifically, there are competitions at different levels around the world every year. In addition to training for competitions, there are also quite a few practicing for recreation and health so bodybuilders were at risk for various injuries from training programme (Lewis, Purushotham, & Power, 2005). Athletes who train with high levels of resistance were at risk for both acute and chronic injuries during training and competition. These includes injuries to the lower back, shoulders, upper

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arms, knees, with up to 38 per cent of the muscles and 23 per cent of the ligaments involved (Winwood, Hume, Cronin, & Keogh, 2014). In addition, the risk factors and incidence of injury in athletes undergoing high-intensity training were also studied. The risk was reported to occur up to 7.1 times per person per 1,000 hours of training, and experienced athletes were 3.77 times more likely to injure than novices, with most occur in the shoulder and lumbar region (Teixeira et al., 2020).

Bodybuilding is a sport that requires resistance training to increase muscle mass and decrease fat mass to generate muscle definition. There was research report that elite bodybuilders had larger muscle group and lesser fat mass when compare to novice group (Sukwong et al., 2022). The bodybuilding athletes from clubs in Germany got injury from training at the shoulder, elbow, lumbar and knee (Siewe et al., 2014). Injury from resistance training caused by an intrinsic factor from the muscle contraction mechanism to develop acute muscle, tendon, and ligament damage. However, it can lead to chronic injuries when not treated properly and eventually bring to problems for training program and daily life (Lavallee & Balam, 2010). There have been reports that injured bodybuilders take self-treatment more than any other method (Winwood et al., 2014) but self-treatment must be carried out properly according to the principles of sports medicine in order to recover from re-injuries or chronic injuries lead to future medical expenses. However, self-treatment methods have not been reported.

Despite being a popular sport across many levels, lack of research has been conducted especially among Thailand bodybuilders. The incidence of injury in bodybuilders and the treatment history will be crucial information that can be used by bodybuilding associations, officials, coaches and athletes to take more extra precautions in the future. The purpose of this study were to investigate and compare the incidence in injuries and treatment between elite and beginner Thailand bodybuilders.

## Materials and Methods

### Study Participants

The population of this study was 257 bodybuilders who were registered as members of the Thailand Bodybuilding and Physique Sports Association (from 2020-2021). We recruited 157 individuals who had the competition organized by the association during February 2021 – February 2022 by volunteer sampling. This sample size was used as a calculation method for prevalence study provided by Naing et al. (2006) which a precision of 0.05 and bodybuilding injury rate data from previous study (Keogh & Winwood, 2017). The participants were divided into elite (over 5 years of bodybuilding experience) and beginner groups (less than 5 year for bodybuilding experience) (Sukwong et al., 2022). All participants read and signed inform consent that approved by Institutional Review Board (No. 030/2564).

### Instrument and Data Collection

The questionnaire was conducted to collect the data. It was developed by the researcher and adapted from previous studied (Siewe et al., 2014) to determine the injury incidence and treatment experience. Content validity of questionnaire

was examined by 5 sports medicine experts (IOC = 0.68) and reliability was examined by Cronbach's alpha coefficient ( $\alpha = 0.73$ ) from the results of 60 bodybuilders who were registered as members of the Thailand Bodybuilding and Physique Sports Association but did not participate in the competition that organized by the association during February 2021 February 2022. The researchers asked for the permission from Thailand Bodybuilding and Physique Sports Association to perform the data collection.

### Statistical Analysis

Descriptive (Frequency, percentage, mean and standard deviation) and Inferential (Chi-square test at statistical significance at 0.05) statistics were used for analyzing the data. All the data analysis was conducted using Statistical Package for Social Science (SPSS) version 23.

## Result

Table 1 showed the characteristics of 157 Thai bodybuilders which were divided into beginner group (92 subjects) and elite group (65 subjects).

**Table 1.** Characteristics of Thai bodybuilders

Characteristics	Beginners (n = 92)		Elite (n = 65)	
	mean	SD	mean	SD
Age (Years)	24.36	4.53	28.06	5.77
Weight (kg)	76.20	10.80	77.48	9.95
Height (cm)	172.47	5.03	170.38	6.95
BMI (kg/m <sup>2</sup> )	25.55	3.11	26.63	2.67
Experience (Years)	3.04	0.98	5.93	2.87

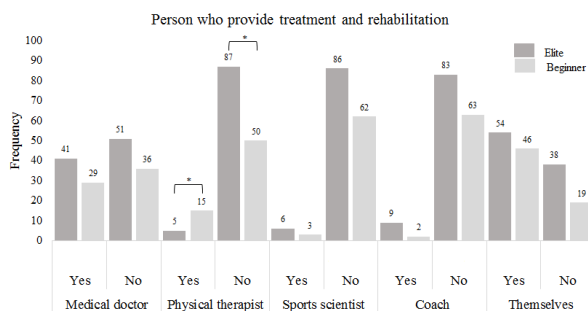
**Table 2.** The comparison of injury incidence between elite and beginner Thailand bodybuilders

Incidence	Beginners (n = 92)	Elite (n = 65)	$\chi^2$	P
	Frequency (%)	Frequency (%)		
The most period of injury				
Bulk period	23 (25.00)	17 (26.15)	0.28	0.96
Diet period	51 (55.43)	36 (55.38)		
Competition period	6 (6.52)	3 (4.62)		
Off season	12 (13.04)	9 (13.85)		
Injury site				
Shoulder	24 (26.09)	23 (35.38)	2.83	0.41
Finger and wrist	6 (6.52)	3 (4.62)		
Lower back	58 (63.04)	34 (52.31)		
Chest	4 (4.35)	5 (7.69)		
Body structure of injury				
Bone	2 (1.27)	3 (4.62)	4.36	0.35
Muscle	38 (41.30)	23 (35.38)		
Ligament/Tendon	41 (44.57)	34 (52.31)		
Joint	4 (4.35)	0 (0)		
Others	7 (7.61)	5 (7.69)		
Current symptoms				
Recovered	59 (64.13)	38 (58.46)	0.51	0.47
Injured	33 (35.87)	27 (41.54)		

**Table 3.** The comparison of treatment between elite and beginner Thailand bodybuilders

Treatment	Beginner (n= 92)	Elite (n=65)	χ <sup>2</sup>	p
	Frequency (%)	Frequency (%)		
<b>The first 48 hours after injury</b>				
<b>Rest</b>				
Yes	74 (80.43)	53 (81.53)	0.03	0.86
No	18 (19.57)	12 (18.46)		
<b>Cold</b>				
Yes	57 (61.96)	48 (73.85)	2.43	0.11
No	35 (38.04)	17 (26.15)		
<b>Massage</b>				
Yes	12 (13.04)	15 (23.08)	2.69	0.10
No	80 (86.96)	50 (76.92)		
<b>Medication</b>				
Yes	4 (4.35)	3 (4.62)	0.006	0.93
No	88 (95.65)	62 (95.38)		
<b>No treatment</b>				
Yes	22 (23.91)	11 (16.92)	1.12	0.28
No	70 (76.09)	54 (83.08)		
<b>See the medical doctor/ Physical therapist</b>				
Yes	26 (28.26)	26 (40.00)	2.36	0.12
No	66 (71.74)	39 (60.00)		
<b>Surgery</b>				
Yes	0 (0)	0	-	-
No	92 (100)	65 (100)	-	-
<b>After 48 hours of treatment</b>				
<b>HEAT technique</b>				
Yes	41 (44.57)	26 (40.00)	0.32	0.56
No	51 (55.43)	39 (60.00)		
<b>Massage technique</b>				
Yes	64 (69.57)	44 (67.69)	0.06	0.80
No	28 (30.43)	21 (32.31)		
<b>Medication</b>				
Yes	39 (42.39)	25 (38.46)	0.24	0.62
No	53 (57.61)	40 (61.54)		
<b>Others technique</b>				
Yes	16 (17.39)	10 (15.38)	0.11	0.73
No	76 (82.61)	55 (84.62)		

Using Chi-squared test. \*Significant difference (p<0.01)



**Fig. 1.** Person who provide treatment and rehabilitation

Table 2 showed the comparison of injury incidence between elite and beginner Thailand bodybuilders. There was no significant difference of the most period of injury between beginner and elite group. We found that the most period of injury from both group was diet period (beginner 55.43%; elite 55.38%) followed by bulk period, off season and competition period respectively. Like the injury site, there was no difference between groups, with the lower back (beginner 63.04%; elite 52.31%) being the most common site of injury, followed by shoulder, chest, finger and wrist. While, ligament/tendon was the most commonly injured body structure in both group (beginner 44.57%; elite 52.31%), followed by muscle, bone, joint and others (skin). Most of them could recovered from their injuries (beginner 64.13%; elite 58.46%), but some remain.

Table 3 showed the comparison of treatment between elite and beginner Thailand bodybuilders. There was no significant difference between groups in the first 48 hours after injury for treatment. Most of the athletes in both groups get rest (beginner 80.43%; elite 81.53%) and used cold (beginner 61.96%; elite 73.85%) on their injury site. A small percentage of both groups were found to use massage, take pills, see the medical doctor or physical therapist after injury. We also found that all of them never get surgery when they injured. After 48 hours of treatment, they mainly used massage techniques (beginner 69.57%; elite 67.69%). Some of them use HEAT technique, medication, and others technique (PT and Thai traditional medicine) respectively.

The results from figure 1 showed the person who provide treatment and rehabilitation after injury. We found that beginner Thailand bodybuilders met the physical therapist more than elite athletes group (p<0.01). While most of the elite Thailand bodybuilders did not meet a physical therapist when compared to a beginner group (p<0.01). At the same time, medical doctor, sports scientist, coach and themselves treatment and rehabilitation were not significant difference between both groups however, most of athletes from both group mainly took self-treatment.

## Discussion

This study aims to investigate and compare the incidence of injuries and treatment between elite and beginner Thailand bodybuilders. The findings showed diet period followed by bulk period were frequently found to be injured in both groups. This is the period that requires resistance training at different levels of intensity and others training such as cardiovascular training (Helms, Fitschen, Aragon, Cronin, & Schoenfeld, 2014), but the diet may affect the energy system used in the muscle contraction during training that effect mechanism of micro-tears and generated in the muscle fibers as protein synthesis, repairs, and rebuilds result in muscles return larger and stronger.

For the injury sites, it was found that lower back injury occur most frequently followed by shoulder. The selection of exercises and its biomechanics might be the reason for these, as most exercises will involve the activation of these parts (Fares et al., 2020; Mostaham & Salehia, 2019). Besides that, muscle, ligament and tendon are the most common structure of injuries. This is in line with what was found by Keogh and Winwood (2017) with reported that strain, tendinitis and sprains were the most common injury in bodybuilders. Our finding also similar to previous study

which report that muscle, ligament, and tendon were injured frequently (Xiaojun & Taotao, 2008; Xie, 2022).

We also found that most of the injured participants did not see medical doctor and completely not severe until surgery after injury. The findings differ from those in Saudi bodybuilders who found about 6 percent of surgery after injury (Almalki et al., 2022) and most of them received treatment by physiotherapy.

For the treatment during the first 48 hours after injury, most athletes take a rest from training and apply a cold compression to the injury site. This is consistent with the application of PRICE principles (Bleakley, Glasgow, & MacAuley, 2012). In addition, most of the athletes in both groups did not have themselves massaged, did not use medication, did not see a medical doctor, and did not undergo surgery. High level of confidence to recover and did not want to spend time for these might be the reason of their action. After the first 48 hours, both groups of bodybuilders used massage techniques. However, the injury of the bodybuilder group may not be a serious injury. Therefore, it can be massaged for rehabilitation purposes.

Most of the person who provide cured were self-treatment, they did not meet doctors, physical therapists, sports scientists or even a coaches. In contrast, young Saudi bodybuilders received medication, physiotherapy and surgery (37%, 57%, and 6% respectively) (Almalki et al., 2022). We couldn't find the exact reason for this condition in previous literature, but this condition can be contributed by the costs and time that would be spent, which might cause them to chose self-treatment. Besides, there are many websites and books found on the internet regarding self-treatment that they can refer. A more critical studies need to be conducted in the future.

## Conclusion

Although many of the comparison made were found not to be significantly difference, the each data in this study should be used carefully to become the reference point for the coaches and athletes. More care should be given to the diet period as most of the injuries happened at that time. Besides, selection of exercises and the exercise techniques should also be given attention on the most injury part to reduce the injury cases. Coaches and athletes should be educated on the first aid, treatment and rehabilitation methods so that it will not disturb their competition planning. Findings of this study is expected to be valuable for the bodybuilding association, coaches and athletes to take extra precautions regarding injury in the future.

## Acknowledgement

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## Conflict of interest

Authors declare that there are no conflict of interest exist in this study.

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## РІВЕНЬ ТРАВМАТИЗМУ ТА ДОСВІД ЛІКУВАННЯ СЕРЕД ТАЙЛАНДСЬКИХ БОДІБІЛДЕРІВ ВИСОКОГО ТА ПОЧАТКОВОГО КЛАСІВ

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Авторський вклад: А – дизайн дослідження; В – збір даних; С – статаналіз; D – підготовка рукопису; E – збір коштів

Реферат. Стаття: 5 с., 3 табл., 1 рис., 15 джерел.

**Історія питання.** Бодібілдинг – це такий вид спорту, у якому людина має багато тренуватися з обтяженнями, водночас суворо контролюючи дієту. Через це у них, як вважають, вищі шанси отримання травм. Однак досліджень щодо частоти травм та історії лікування серед бодібілдерів у Таїланді було проведено недостатньо. Таким чином, метою цього дослідження було вивчення та порівняння рівня травматизму та досвіду лікування між тайландськими бодібілдерами високого та початкового класів.

**Матеріали та методи.** Учасниками цього дослідження були 157 бодібілдерів, зареєстрованих членами Таїландської спортивної асоціації бодібілдингу та атлетизму (з 2020-2021 року). Їх розділили на дві групи: високого класу (понад 5 років занять спортом) і початкового класу (менше 5 років занять спортом). Для збору даних учасників використовували валідну та надійну анкету.

**Результати.** Статистично значущої різниці в найпоширенішому періоді травмування між групами початкового та високого рівнів не було. Встановлено, що найбільш поширеним періодом травмування для обох груп був період дієти (група початкового рівня – 55,43%; група високого рівня – 55,38%), за яким слідував період масового навантаження, міжсезоння та період змагань відповідно. Що стосується зони травми, між групами не було різниці, причому найпоширенішою зоною травми була нижня частина спини (група початкового рівня – 63,04%; група високого рівня – 52,31%), за якою йшли плече, грудна клітка, палець і зап'ястя. Також між групами не було статистично значущої різниці в лікуванні в перші 48 годин після травми. Більшість спортсменів в обох групах відпочивали (група початкового рівня – 80,43%; група високого рівня – 81,53%) і прикладали холод (група початкового рівня – 61,96%; група високого рівня – 73,85%) до зони травми. Крім того, група тайландських бодібілдерів початкового рівня частіше зверталася до фізіотерапевта, ніж група спортсменів високого класу ( $p < 0,01$ ). Водночас, між обома групами не було статистично значущої різниці в лікарях, спортивних учених, тренерах і самолікуванні та реабілітації. Проте більшість спортсменів в обох групах переважно вдавалися до самолікування.

**Висновки.** Очікується, що результати цього дослідження будуть цінними для асоціації бодібілдингу, тренерів і спортсменів, щоб уживати додаткових запобіжних заходів щодо травм у майбутньому.

**Ключові слова:** бодібілдер, травма, лікування, стан спортсмена, реабілітація.

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