

Common Sports Injuries among Physical Activities Practitioners at the Physical Fitness Centers in Jordan (Comparative Study)

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Abstract

The aim of the study was to investigate the common sports injuries among physical activities practitioners at the physical fitness centers in Jordan. Study sample consisted of (272) volunteered male (n=221) and female (n=51) (age 30±3). Researchers used a special form used to evaluate athletic injuries. After collecting and analyzing the data. Results showed that the most common sports injuries among sample of the study was muscular tears 27.7%, muscle spasm 20.7%, and tears ligament 20.2%. And the most exposed parts of the body to injury is the lumbar area 26.8%, elbows 16.9%, followed by shoulders 8.9%. Also the study results revealed that the most causes of injuries was over training 24.14%. Poor warm-up 22.1% and bad technic 11.3%. Bodies-building was the most type of activities subjects to injury with 18.8%. Physical Fitness 6.6% and weight loss 27.7. Results also showed that physical therapy was the most means of treating injuries 54.14%, drugs therapy 33.3% and surgical intervention 4.2%. Also the study shows that males are more exposed to injuries than females.

Conclusions: These finding indicate that sports injures is part of physical

Activities participations, preventive measures should be taken by participant's the researchers recommended the need for physical and medical checkup before participation in physical activity at the physical fitness centers.

Keywords: athletic injuries, sport injuries, physical activities

1. Introduction

Physical activity has multiple health benefits, The health benefit of regular physical activity across a variety of chronic disease area, including cardiovascular disease, diabetes, hypertension, osteoporosis, cancer, obesity, and stroke, are now well established (Mujallie et al., 2010; Makarove, 2004; Wong, 2005). A drawback of participation in activity and sports is the increased risk of sport-related injuries, this is well documented in all age categories, among both genders, in a wide variety of activities, and as well at the professional as at the recreational level (Frisch, 2009; Hergenroder, 2001). Sports related injuries are detrimental to an injured athlete's health, may cause permanent disability, or even terminate the athlete's sport career. Injuries also burden the health care system as the treatment of sports injuries is often demanding and expensive (Twomey, 2014; Jordan, 2014; Less, 2006; Meliokova, 2003).

The patterns of injury in the physically active population and the factors that influence these patterns, and how these events related to gender, place of injury, and time, was the main interest of the research, and to provide a basis for developing and evaluating programs to prevent injuries and in the treatment and rehabilitation of injuries (Jordan, 2014; DeHaven, 1986). Although the overall injury patterns in many activities have been established, many aspects of the injury process, mechanisms of injury, location, time, the nature of the activity, and the environment in which they occur still have not been studied systematically and remain largely unexplored (Jordan, 2014; Weisenthal, 2014; Nikolas, 2007). The aims of the study were to provide reliable estimate of sport injuries at physical fitness centers in Jordan and to compare sports injuries between various physical activities for both male and female.

2. Methods

272 male (n=221) and female (n=51) subject's (30±5) years of age Table (1) were participate in the study.

Individuals who participated in this study were volunteers and were not given any kind of remuneration. The subjects were informed about study procedures. Written informed consents were obtained.

Table 1. Physical characteristics' of study subjects

	Mean	S D
Age / year	30.79	7.91
Height/ m	1.77.62	7.72
Weight/ Kg	78.92	14.88
Training units/ unit	6.0	2.21
Training days/day	4.30	1.06
Training Age/ year	2.93	3.40
Sex	Males	221
	Females	51
	Total	272
Mode of Activity	Body-building	151
	Physical Fitness	73
	Weight-lost	48
	Total	272

2.1 Study Procedures

The researchers used surveying descriptive method. A valid and reliably form with coefficient of (95%) was used in this study to process and analyze data.

2.2 Statistical Analysis

All data were analyzed using SPSS statistical package (copy 10), with level of significant set at $P \leq 0.05$. Numerical values are expressed as means and standard deviations, Kei-square, and percentages were used.

3. Results

All subjects, 262 male and female completed the form. Data are expressed as means \pm SD. Table 2 presented values of sports injuries and other selected variables.

Table 2. Most common types of injuries related to gender

Types of Injuries	Males (N=221)		Females (N=51)		Total (N=272)		Kei Square	Indicat. Level
	Repet.	%	Rept.	%	Rept.	%		
Fractures	1	0.5	0	0.0	1	0.5	0.22	0.641
Tear ligament	19	8.9	3	1.4	22	10.3	0.27	0.607
Tear muscles	46	21.6	13	6.1	59	27.7	0.71	0.400
Tear tendons	35	16.4	8	3.8	43	20.2	0.02	0.896
Dislocation	4	1.9	0	0.0	4	1.9	0.87	0.351
Bones bruises	4	1.9	0	0.0	4	1.9	0.87	0.351
Muscles bruises	6	2.8	0	0.00	6	2.8	1.30	0.254
Nerves bruises	6	2.8	0	0.00	6	2.8	1.30	0.254
Wounds laceration	0	0.0	1	0.5	1	0.5	4.61	0.031
Strain Muscles	37	17.4	7	3.3	44	20.7	0.11	0.738
sprain	10	4.7	4	1.9	14	6.6	1.10	0.294
Other Injuries	7	3.3	2	0.9	9	4.2	0.12	0.731
Total	175	82.2	38	17.8	213	100.0		

Table 2 shows that tear muscles was the most common type of injuries 27.7% followed by strain muscle 20.7% and tear ligaments 20.2%. The study also shows that the fewest common injuries were fractures and wounds 0.50%.

The study results also show that the most common types of injuries related to gender was muscles tears 21.6% for male and 6.1% for female, followed by strain muscle 17.4% for male and 3.3% for female, and teared ligament 16.4% for male, but for females it was 3.8%.

Meanwhile the fewest of female's injuries were wounds and laceration 0.50%.

There was no statistical significant difference ($P \geq 0.05$) between male and female injurie's related to type of injurie's.

Table 3 shows the most common Locations of injuries, according to gender. The rustles of the study show that lumbar area were the most common places of injury 26.8% (20.2% for male and 6.6% for females) elbow 16.9% (15.5% male but neck injury was second for female 1.9%) then the shoulder 8.9% (8.5% male and 1.4% female) meanwhile the least injuries were head, hummers, ribs, pelvis, ACL and PCL. There was no statistical significant deference's $p \geq (0.05)$ between male and female according to place of injurie's, except for the head and PCL.

Table 3. The most common locations of injuries, according to gender

Places of injuries	Males (N=221)		Females (N=51)		Total (N=272)		Ker square	Level indicated
	T.	%	T.	%	T.	%		
Head	0	0.0	1	0.5	1	0.5	4.61	0.032
Neck	10	4.7	4	1.9	14	6.6	1.10	0.294
Shoulder Joint	18	8.5	1	0.5	19	8.9	2.05	0.152
Collarbone	0	0.0	0	0.0	0	0.0	0.00	1.000
Humerus	1	0.5	0	0.0	1	0.5	0.22	0.641
Elbow Joint	33	15.5	3	1.4	36	16.9	2.22	0.136
Forearm	5	2.3	0	0.0	5	2.3	1.09	0.297
Wrist Joint	10	4.7	2	0.9	12	5.6	0.01	0.915
Metacarpuses	0	0.0	0	0.0	0	0.0	0.00	1.000
Phalanges	0	0.0	0	0.0	0	0.0	0.00	1.000
Breastbone	0	0.0	0	0.0	0	0.0	0.00	1.000
Ribs	1	0.5	0	0.0	1	0.5	0.22	0.641
Belly	9	4.2	1	0.5	10	4.7	0.42	0.517
Thoracic Vertebras	8	3.8	0	0.0	8	3.8	1.74	0.188
Lumbar area	43	20.2	14	6.6	57	26.8	1.76	0.185
sacrum	1	0.5	0	0.0	1	0.5	0.22	0.641
Pelvis	1	0.5	0	0.0	1	0.5	0.22	0.641
Hip Joint	0	0.0	0	0.0	0	0.0	0.00	1.000
Thigh	11	5.2	2	0.9	13	6.1	0.05	0.817
Knee Joint	3	1.4	0	0.0	3	1.4	0.65	0.420
ACL	4	1.9	1	0.5	5	2.3	0.02	0.900
PCL	0	0.0	1	0.5	1	0.5	4.61	0.032
M CL	1	0.5	0	0.0	1	0.5	0.22	0.641
LCL	1	0.5	1	0.5	2	0.9	1.41	0.235
Meniscus.	2	0.9	1	0.5	3	1.4	0.49	0.483
leg	3	1.4	2	0.9	5	2.3	1.68	0.196
ankle	5	2.3	3	1.4	8	3.8	2.11	0.146
Ankle ACL	0	0.0	0	0.0	0	0.0	0.00	1.000
Ankle BCL	1	0.5	0	0.0	1	0.5	0.22	0.541
Foot phalanges	0	0.0	0	0.0	0	0.0	0.00	1.000
Total	175	82.2	83	17.8	213	100.0	27.30	0.000

ACL, anterior cruciate ligament PCL, posterior cruciate ligament, MCL medial collateral ligament, LCL lateral collateral ligament.

Table 4 shows the most common type of treatment of sport injuries at physical fitness centers. The study results show that physical therapy was the most used form of treatment 54.14% followed by drugs therapy 33.3% and surgical intervention 4.2%

There was a statistical significant deference's between the physical therapy treatment and the surgical intervention (0.000) in favor of physical therapy.

Table 4. The most common methods of treatments

Type of therapy	T.	%	Kei-square	Level of Indication
PT	133	52.4	54.14	0.000
Drugs therapy	71	33.3	-	-
Surgical intervention.	9	4.2	54.14	0.000
Total	213	100.0	108.28	0.000

PT: physical therapy.

The results of the study also revealed that the most leading causes of injuries Table (5) is over-training 24.4% followed bad warm-up 22.1% and bad technic 11.3%

Table 5. The most common causes of injuries

No.	Reason	Rept.	%
1.	Bad warm-up	47	22.1
2.	Over- training	52	24.4
3.	Bad behavior	20	9.4
4.	Bad filed	4	1.9
5.	Bad technic	24	11.3
6.	Training with injury	16	7.5
7.	Unfit clothes	2	0.9
8.	Random training	5	2.3
9.	bad equipment's	0	0.0
10.	Absence of trainer's	5	2.3
11.	Breach of safety and security rules	7	3.3
12.	Bad weather	0	0.0
13.	Bad choice of training methods	1	0.5
14.	No supervision	1	0.5
15.	Not enough rest	9	4.2
16.	Player return to training before complete recovery	3	1.4
17.	Non-relaxation after the exercise	1	0.5
18.	Lack of protective equipment's	2	0.9
19.	Lack of using sport rehabilitation technic.	1	0.5
20.	Time of training	0	0.0
21.	Medical examination	2	0.9
22.	Bad diet	0	0.0

23.	Individual differences (individuality)	0	0.0
24.	Bad psychological condition	0	0.0
25.	Unawareness of science of sport injuries and causes of their occurrence and methods of prevention	0	0.0
26.	Bad activity choices.	1	0.5
27.	Dis- applying Principles of training	9	4.2
28.	Other causes	1	0.5
	Total	213	100.0

Table 6 shows the most common types of injuries according to mode of activities. Body building was the most common type of activity with the highest rate of injuries, tear muscles with the highest type of injury 18.8% nerve bruises 11.7% and tear ligament 8.0% and the least common types of injuries was dislocation 0.9%. The second type of activities was physical fitness, and the most type of injuries in this department was muscles strain 6.6%, followed by tear ligament 5.2% and tear muscles 4.7%.

Meanwhile the least injuries of this group were fractures, bone-bruises, and muscles bruises 0.50%. The third type of activities was weight loss and the most common injuries among them was tear muscles 27.7%, followed by muscle strain 20.7%, and tear ligament 20.2%. The least occurring injuries were tear tendon and nerve bruises .50%. There was no statistical significant differences $P>0.05$ in all type of injuries'. Except for the bone and muscles bourses.

Table 6. The most common types of injuries according to mode of training

Types of Injuries	Body Build	N=(151)	Fitness Impr	N=73	Weight Loss.	N=48	Total	N=272	Kei-sq	indic level
	Rept.	%	Rept.	%	Rept.	%	Rept.	%		
Fracture	0	0.0	1	0.5	0	0.0	1	0.5	73.41	0.000
Tear ligament	17	8.0	4	1.9	1	0.50.5	22	10.3	20.19	0.000
Tear Muscles	40	18.8	10	4.7	9	4.2	59	27.7	24.10	0.000
Tear Tendons	25	11.7	11	5.2	7	3.3	43	20.2	8.14	0.017
Dislocation	2	0.9	2	0.9	0	0.0	4	1.9	384.55	0.000
Bone bruises	3	1.4	1	0.5	0	0.0	4	1.9	1.78	0.411
Muscles bruises	2	0.9	1	0.5	3	1.4	6	2.8	1.10	0.511
Nerves bruises	5	2.3	0	0.0	1	0.5	6	2.8	6.78	0.034
Wounds & Laceration	0	0.0	0	0.0	0	0.0	1	0.5	36.38	0.000
Strain muscles	24	11.3	14	6.6	6	2.8	44	20.7	44.00	0.000
Sprain	10	4.7	4	1.9	0	0.0	14	6.6	69.25	0.000
Other Injuries	4	1.9	2	0.9	2	0.9	9	4.2	6.22	0.045
Total	10	62.4	51	23.9	29	13.6	213	100.0		

Table 7 Shows of the most common places of injuries related to Mode of training. Individuals who trained body-building, we find lumbar area were the most common injuries 14.6%, followed by the elbow joint 12.7%, and shoulder joint of 5.6%. The least common injuries among them were the hummers, the scrum, and the knee ligament (except the PCL 0.5%).

The most comment injury among physical fitness activist was the lumbar area 6.6%, followed by the neck 4.2%, and shoulder joint 2.3%. Meanwhile the least common injuries were, head, forearm, chest vertebras, pelvis, thigh and both enterer and posturer ligament 0.5%.

For the Losing weight group lumber area was the most common injuries 5.6%, followed by elbow joint 2.3%,

and then shoulder and the wrist joint 0.9%, the fewest injuries were the forearm, ribs, belly, PCL, cartilage, leg, and the ankle Pesterer ligament 0.5%.

Overall the study show that Body-buildings is the most exposed activity to injuries and lumbar area is the most exposed area to injury. The increased injuries maybe related to high burden on this area at carrying heavy weights Mjullie (2007). Also over training and bad technic play a role in increasing the chances of injuries to the lumbar area.

Table 7. The most common place of injury according to mode of training

Places of injuries	bodybuilding (N=151)		Fitn.Impr. (N=73)		Weight decr (N=48)		Total (N=272)		Kei square	Level indicated
	Repet.	%	Repet	%	Repet	%	Repet	%		
Head	0	0.0	1	0.5	0	0.0	1	0.5	44944.00	0.000
Neck	5	2.3	9	4.2	0	0.0	14	5.6	12.30	0.002
Shoulder Joint	12	5.6	5	2.3	2	0.9	19	8.9	10.91	0.004
Collarbone	0	0.0	0	0.0	0	0.0	0	0.0	-	-
Humerus	1	0.5	0	0.0	0	0.0	1	0.5	1.00	0.607
Elbow Joint	27	12.7	4	1.9	5	2.3	36	16.9	34.04	0.000
Forearm	3	1.4	1	0.5	1	0.5	5	2.3	216.59	0.000
Wrist Joint	8	3.8	2	0.9	2	0.9	12	5.6	4.16	0.125
Metacarpuses	0	0.0	0	0.0	0	0.0	0	0.0	-	-
Phalanges	0	0.0	0	0.0	0	0.0	0	0.0	-	-
Breastbone	0	0.0	0	0.0	0	0.0	0	0.0	-	-
Ribs	0	0.0	0	0.0	1	0.5	1	0.5	1.00	0.607
Belly	6	2.8	3	1.4	1	0.5	10	4.7	8.73	0.013
Thoracic area	7	3.3	1	0.5	0	0.0	8	3.8	0.82	0.663
Lumbar area	31	14.6	14	6.6	12	5.6	57	26.8	42.45	0.000
Sacrum	1	0.5	0	0.0	0	0.0	1	0.5	3302.29	0.000
Hip	0	0.0	1	0.5	0	0.0	1	0.5	0.60	0.740
Hip Joint	0	0.0	0	0.0	0	0.0	0	0.0	-	-
Thigh	12	5.6	1	0.5	0	0.0	13	6.1	13.00	0.002
Knee Joint	3	1.4	0	0.0	0	0.0	3	1.4	55.26	0.000
ACL	1	0.5	3	1.4	1	0.5	5	2.3	1.88	0.390
PCL	0	0.0	1	0.5	0	0.0	1	0.5	37.53	0.000
MCL	1	0.5	0	0.0	0	0.0	1	0.5	3.18	0.204
LCL	1	0.5	1	0.5	0	0.0	2	0.9	0.80	0.670
Meniscuse	2	0.9	0	0.0	1	0.5	3	1.4	0.93	0.629
leg	2	0.9	2	0.9	1	0.5	5	2.3	1.75	0.417
ankle	6	2.8	2	0.9	0	0.0	8	3.8	1.81	0.405
Enterer ligament	0	0.0	0	0.0	0	0.0	0	0.0	-	-
Posters ligament	0	0.0	0	0.0	1	0.5	1	0.5	1.00	0.607
phalangette	0	0.0	0	0.0	0	0.0	0	0.0	-	-
	4	1.9	0	0.0	1	0.5	5	2.3	5.00	0.082
Total	133	62.4	51	23.9	29	13.6	213	100.0		

4. Discussion

The aim of the study was to investigate the common sports injuries among physical activities practitioners at the physical fitness centers in Jordan.

The results of this study show that the most common sports injuries among sample of the study was muscular tears, muscle strain and tears ligament. Previous studies reported similar results (Doral, 2015; Khleif, 2007; Lari & Aleson, 1997).

The finding of this study indicate that the most exposed parts of the body to injury are the lumbar area, elbows, followed by shoulders. Our finding consistent with those reported by Carolyn (2005). A recent review by Lauersen (2014) found that strain muscle, sprain and contusion was the most comment type of injuries. Our finding suggested that the lumber area is most injured body part. Sudden movements, weight lifting, and bad technic placed a heavy burden and a high effort on those areas. All may contribute to increased incidence of injuries to those area (Finch, 2012; Mujalli, 2006). It has been shown in our research that the most cusses of injuries were over training, poor warm-up and bad technic. Which consistent with the finding of Weisenthal (2014) and Meliokova (2003). A recent review by Breuner (2015) found that overtraining was consistently associated with 55% increase of sport related injurie's. In our study overtraining and bad technic was the most common cusses of injuries. The risk for overtraining injuries are multifactorial. Coaches, trainers, and physicians encounter a dilemma in developing a training program that enables performance yet avoids burn-out or overtraining. Physical activates should concentrate on overloading the musculoskeletal system, allowing gradual adaptation. However, all types of activates are accompanied by both mental and physical fatigue (Khreibet, 2008). Injury may occur if an imbalance exists between training and recovery. Considerable empiric evidence suggests that overtraining may be reduced in both number and severity by enhanced flexibility, conditioning and muscles strength. Muscles that are weak, inflexible, or both are more susceptible to injury (Rosa, 2014; Walker, 2013).

Our finding suggested that Body-building was the most type of activities subjects to injury followed by Fitness, and weight loss. Factors such as too much training and lack of commitment to training principles, training errors, poor performance, and poor techniques may contributed to increase incidence of injuries within bodybuilding participant (Jayauthia, 2015; Mujalli, 2010; Khlef, 2007; Mujalli, 2007; Carolyn, 2005). Muscle that are capable of producing a greater force, a faster contraction speed and subjected to greater stretch are more likely to become injured (Brenner, 2015; Pescatello, 2014; Erric, 2001). Many factors have been associated with muscular injury. From current research, some conclusions and recommendations for muscle injury prevention can be made. Overall, muscular conditioning and nutrition are important. Proper training and balance strengthening are key factors in prevention of musculotendinous injuries (Lauersen, 2014; Renstrom, 2002; Hergenroder, 2001).

Also our study shows that there were gender differences on sport injuries. Our investigation used a self-report of injury from a baseline questionnaire for an investigation for lower and upper extremity injuries. Our findings agree with the previous investigations reporting gender difference in sport injuries. Harmon (2000) especially for the general population at the recreational level. In our study male workout harder with higher intensity, and that maybe the cause of higher rate of sport injuries within male subjects compare to female's who work out with less stress and lower intensity. In a study by (Mujalli et al., 2006) they reported that female subjects have more sport injuries than male, the gender difference found in this study may be influenced by the increased reporting of injuries in female compared with males. Furthermore, gender socialization is another factor that may play into the increased reporting of musculo-skeletal injuries by female. Previous research has reported that males are discouraged from reporting injuries and illnesses at an early age, but girls are taught that reporting injuries and illnesses is acceptable and should be done to take care of one's body (Almeida, 1999). Previous investigations have reported that with respect to male military recruits, female military recruits are significantly more likely to have a reported musculo-skeletal injury than an unreported musculo-skeletal injury (Almeida et al., 1999). However, since women began competing in organized sports in large numbers. There was concern that women would have significantly higher injury rates than men. For the most part, these fears were unfounded. Sport injury rates between men and women are similar and, in general, seem to be sport-specific rather than gender specific (Harmon, 2009; Prodromos, 2007; Decker, 2003; Sallias, 2001). National Collegiate Athletic Association Injury Surveillance System data from 1989-1993, 1989-1997, 1989-2002, and 1989-2004, respectively show that sport injury rates between men and women are similar and, in general, its sport-specific rather than gender-specific. (Decker, 2003) suggested that at the competitive organized sports there was also no gender disparity. The risk of injury is one of the few adverse effects of a physical active lifestyle (Brenner, 2015). These injuries apparently may be avoided or lessened in severity by a combination of several methods. Good conditioning and technic, efficient warm-up, enough rest between workouts, and physical and medical checkup

before participation in physical activity all my contributed to decrease incident of sport injuries (American Academy of Pediatrics, 2015; Doral, 2015; Hergenroder, 2001).

5. Conclusions

In the present study, we investigated the common sports injuries among physical activities practitioners at the physical fitness centers in Jordan. The most common sports injuries was muscular tears, muscle strain and tears ligament.

Participant should pay more attention to conditioning and technic during physical activity. Our finding supports the recommendation that the need for physical and medical checkup before participation in physical activity at the physical fitness centers. Future research should focus on prevention strategies in sports with high participation and injury rates to maximize population health impact.

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