

ORIGINAL ARTICLE

An Observational Study on Extent of Functional Limitations Following Injuries amongst Skateboarders

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ABSTRACT

Injuries can have a significant impact on the functional abilities of skateboarders, affecting their performance of activities of daily living (ADLs). Studying the extent of functional limitations post injuries in skateboarders is of paramount importance. To Assess Upper Extremity Functional Index and Lower Extremity Functional Index for activities of daily living A cross-sectional observational study was conducted with 100 skateboarders who answered a questionnaire addressing demographic, sports practice, and Upper Extremity Functional index and Lower Extremity Functional Scale. The study is to verify the functional limitation seen in daily activities of upper extremity and lower extremity post injury in skateboarders. In this study we could see that maximum difficulty was faced in the upper limb for performing recreational activities, hobbies or sporting activities. 24% and while lifting a bag of groceries above head 19% In the lower limb maximum difficulty was seen while squatting 21% performing heavy household activities 27% and hopping 21% The practice of skateboarding presents a high prevalence of functional limitation in squatting, hopping, lifting a bag of groceries above waist level and resuming recreational sports activities. The findings may contribute to the planning of preventive strategies

Keywords: Prevalence; functional limitations, skateboarder

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INTRODUCTION

Skateboarding is a thrilling action sport that attracts a large number of participants worldwide. The extreme sport of skateboarding which has its roots in California has experienced intermittent phases of popularity. (1)(2) Skateboarding is a sport in which a person rides standing balancing on a small board mounted on wheels. While skateboarding offers numerous physical and mental benefits it also exposes individuals to the risk of injuries. With the growth in skate boarding's popularity advances in technology are allowing for use of lighter materials that are more durable, maneuverable, and capable of speeds between 60-80 kilometers per hour.(3)The probability of injuries rises with this growth in speed. In addition there may be reluctance to the use of protective gear which increases threat of damage.(4) These injuries can have a significant impact on the functional abilities of skateboarders, affecting their performance of activities of daily living (ADLs). Studying the extent of functional limitations post injuries in skateboarders is of paramount importance. It provides valuable insights into the impact of injuries on the daily lives and functional abilities of skateboarders, guiding personalized treatment and rehabilitation plans. It helps identify specific areas of impairment, supports the development of targeted interventions, and promotes independence and functional recovery. Additionally, it contributes to injury prevention strategies and adds to the existing body of knowledge on skateboarding injuries and rehabilitation. By focusing on the extent of functional limitations, we can enhance the overall well-being and quality of life for skateboarders recovering from injuries.

The primary objective of this study is to assess the upper extremity functional limitations among skateboarders in performing ADLs. Skateboarding injuries are typically acute in nature⁽⁵⁾ and they vary from cuts to fractures.⁽⁶⁾ Most of the injuries they suffer are acute injuries which include fractures, sprains, ligament injuries, contusions, abrasions and lacerations.⁽⁷⁾ Skateboarding injuries often affect the upper extremity including the wrist, forearm and shoulder. When a player falls, it usually hits their outstretched hand, which can result in inflammation, arthralgia, instability, or a fracture, and the shoulder is the most frequently affected upper limb.⁽⁸⁾ Fractures, sprains and strains can impair an individual's ability to carry out essential tasks such as dressing, grooming, eating and writing. By assessing the Upper Extremity Functional Index (UEFI), we can obtain valuable insights into the impact of these injuries on the functional abilities of skateboarders.

The second objective of this study is to evaluate the lower extremity functional limitations in performing ADLs. Sprains and fractures are the most frequent injuries in the ankle and foot. Femoral fracture, abrasion, and contusion are present in the hip. Knee trauma consisting of patellofemoral arthralgia and inflammation, hyperextension, meniscal and chondral lesions, and cruciate ligament injuries are also seen. These injuries can significantly restrict an individual's ability to walk, climb stairs, and engage in other lower extremity-dependent activities. The Lower Extremity Functional Index (LEFI) will be employed to assess the functional limitations experienced by skateboarders in the performance of these ADLs.⁽⁹⁾ Skateboarding injuries are expected to rise with the increasing number of participants, encouraged by the high-tech equipment development, and renewed advertising. Of greater concern is the underestimation of trauma because of the limited body of knowledge currently available in this sport. By examining the functional limitations resulting from skateboard injuries, this study aims to provide valuable insights into the long-term impact on skateboarders' daily lives. Understanding the extent of functional limitations can guide the development of targeted rehabilitation programs and interventions to improve the quality of life for skateboarders during their recovery process

MATERIAL AND METHODS

Participants:

The study will involve recruiting a sample of skateboarders who have experienced injuries. Participants will be selected from skateboarding clubs, sports medicine clinics, and skateboarding events. Inclusion criteria will include skateboarders of various skill levels and ages who have sustained injuries during skateboarding activities. Participants should have sufficient cognitive and communication abilities to complete the assessment tools.

Ethical Considerations:

Ethical approval will be obtained from the relevant institutional review board before the commencement of the study. Participants' privacy and confidentiality will be strictly maintained throughout the study. They will be assured of their right to withdraw from the study at any time without facing any negative consequences. Participants will be provided with detailed information about the study, including its purpose, procedures, and potential risks and benefits. Informed consent will be obtained from each participant or their legal guardians if they are minors.

The Upper Extremity Functional Index (UEFI) and Lower Extremity Functional Index (LEFI) will be utilized to evaluate the functional limitations experienced by skateboarders in performing activities of daily living (ADLs).

Demographic information:

Participants will be asked to provide basic demographic information such as age, gender, skateboarding experience, and details of their skateboarding-related injuries.

Upper Extremity Functional Index (UEFI): The UEFI is a validated questionnaire specifically designed to assess the functional limitations of the upper extremities in ADL performance. Participants will complete the UEFI questionnaire, which consists of items related to ADLs involving the upper extremities. The UEFI assesses functional limitations in various domains, including self-care, work, and recreational activities. Participants will rate their level of difficulty in performing each activity on a Likert scale, with higher scores indicating greater functional limitations.

Lower Extremity Functional Index (LEFI): The LEFI, on the other hand, is a validated tool used to assess the functional limitations of the lower extremities in ADLs. Participants will complete the LEFI questionnaire, which comprises items assessing the functional limitations of the lower extremities in ADL performance. Similar to the UEFI, participants will rate the level of difficulty in performing various activities on a Likert scale.

Inclusion Criteria:

1. Skateboarders having more than 12 months of skateboarding experience

- 2. Willingness of the subject to participate in the study
- 3. Training time of skateboarder should be greater than 2 hours/day

Exclusion Criteria:

- 1. Individuals with any medical history such as BP, diabetes
- 2. Individuals with cognitive impairment
- 3. Children under the age of 12 years old
- 4. Individuals unwilling to participate in the study

Data Analysis:

The data collected from the UEFI and LEFI questionnaires will be analyzed to determine the extent of functional limitations experienced by skateboarders following injuries. Descriptive statistics, such as means and standard deviations, will be calculated to summarize the data. Inferential statistical analyses, such as t-tests or analysis of variance (ANOVA), may be conducted to explore any significant differences in functional limitations based on injury types or other relevant factors.

RESULT

Figure 1. Gender demographic

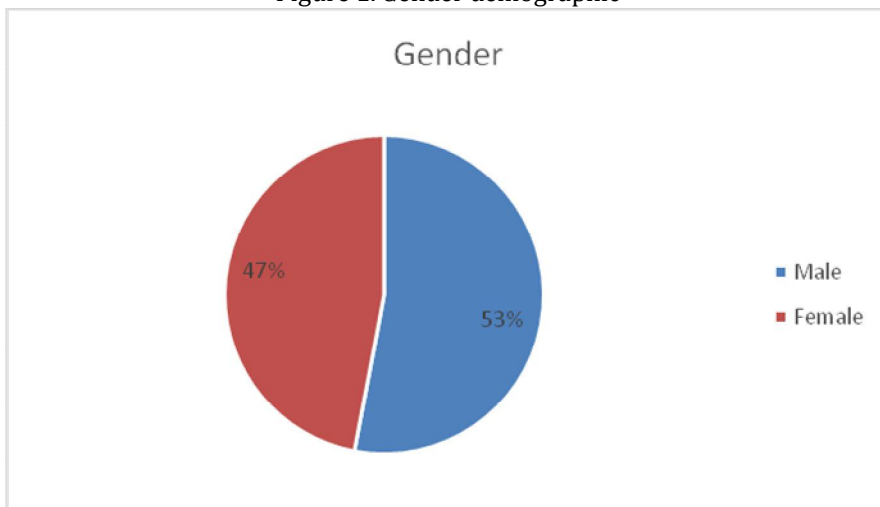


Figure 2. Areas of practice.

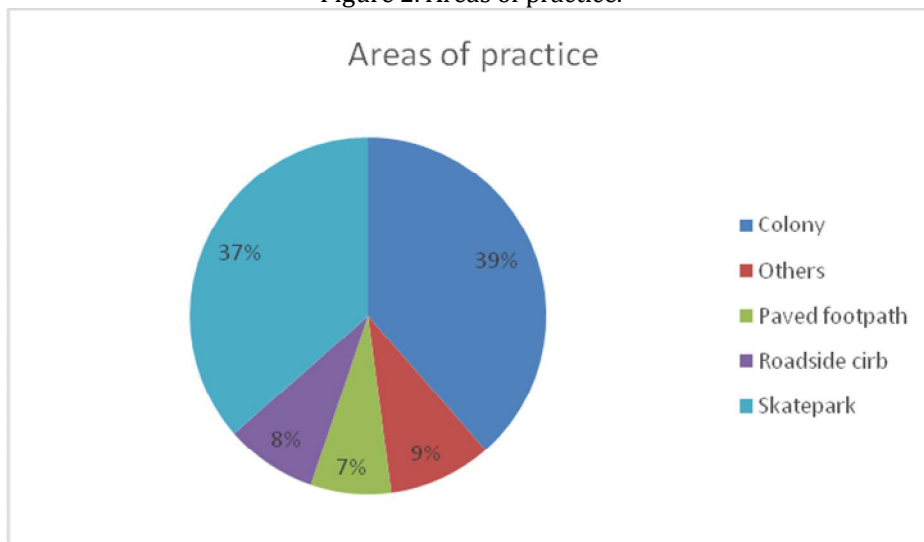


Table 1. Describes the functional limitations in lower extremity

Tasks (scoring out of 40)	Extreme Difficulty	Quite a bit of Difficulty	Moderate Difficulty	Little bit of Difficulty	No difficulty
Any of your usual work, housework or school activities.	2	5	8	19	29
Your usual hobbies, recreational or sporting activities.	3	6	12	17	25
Getting into or out of the bath.	1	2	5	7	47
Walking between rooms.	1	2	2	6	50
Putting on your shoes or socks.	2	1	6	12	41
Squatting.	2	11	12	17	19
Lifting an object, like a bag of groceries from the floor.	1	3	7	18	33
Performing light activities around your home.	1	1	3	11	46
Performing heavy activities around your home.	0	5	14	17	26
Getting into or out of a car.	0	2	4	10	46
Walking 2 blocks.	0	2	6	6	48
Walking a mile.	2	6	7	13	34
Going up or down 10 stairs (about 1 flight of stairs).	1	2	10	16	33
Standing for 1 hour.	1	8	10	14	29
Sitting for 1 hour.	0	5	4	9	43
Running on even ground.	1	4	10	12	34
Running on uneven ground.	3	8	11	15	25
Making sharp turns while running fast.	2	9	7	13	30

Table 2. Describes the functional limitations in lower extremity

Tasks (scoring out of 40)	Extreme Difficulty	Quite a bit of Difficulty	Moderate Difficulty	Little bit of Difficulty	No difficulty
Any of your usual work, housework, or school activities?	1	4	13	20	24
Your usual hobbies, recreational or sporting activities	1	5	16	17	32
Lifting a bag of groceries to waist level	0	6	5	27	37
Lifting a bag of groceries above your head	4	10	14	18	26
Grooming your hair	0	2	3	12	55
Pushing up on your hands (eg, from bathtub or chair)	0	1	2	14	54
Driving	0	2	5	13	50
Dressing	1	1	3	15	51
Doing up buttons	0	0	2	8	61
Using tools or appliances					
Vacuuming, sweeping or raking	0	2	7	22	40
Preparing food (eg, peeling, cutting)	0	1	2	14	54
Opening doors	0	0	4	5	62
Tying or lacing shoes	0	1	4	14	49
Sleeping	1	6	11	7	45
Laundering clothes (e.g., washing, ironing, folding)	0	0	3	14	50
Opening a jar	0	0	0	8	59
Throwing a ball	0	2	5	12	51
Carrying a small suitcase with your affected limb	33	7	11	18	32

Table 3. Age group of subjects

Age(average age)	23.02 + 4.514801695
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Table 4. Distribution of subjects

Total no of subjects	Male	Female
N= 100	53	47

Table 5.description of level of disability

Task	Level of disability				
	Extreme Difficulty or Unable to Perform Activity	Quite a Bit of Difficulty	Moderate Difficulty	A Little Bit of Difficulty	No Difficulty
Your usual hobbies, recreational or sporting activities	1	5	17	16	32
Lifting a bag of groceries above your head	4	10	14	18	26
Squatting	2	11	13	17	19
Performing heavy activities around your home.(lower limb)	0	5	14	17	26
Hopping	3	4	13	12	29

DISCUSSION

The present study aimed to investigate the extent of functional limitations experienced by skateboarders following injuries. The findings obtained through the Upper Extremity Functional Index and Lower Extremity Functional Index questionnaires provide valuable insights into the impact of injuries on functional abilities of skateboarders. Previous studies that analyzed different factors like age, sex, skateboarding experience were also assessed.(1)According to data collected the average age group that took part in this study was 23.02+/- 4.5 years. (Table 3) There were close to none responses in the 40-50 years category. This could be because illness and ageing both cause many structural and functional alterations in human body rendering elderly people liable to overloading of musculoskeletal and cardiovascular systems. The safety margin of an exercise dose tends to decline with age.(2) Studies have shown that bone mineral mass increases in children who are physically active and engage in activities that generate high impact forces. These high impact forces produce greater gains in bone mass.(3) Hence as per our study children who have been practicing skateboarding their bones are accustomed to such high impact forces and therefore don't complain of pain that easily or face injuries. The results of the study indicate that skateboarders experience varying degrees of functional limitations post injuries. The UEFI and LEFI scores reflect the challenges faced by participants in performing activities of daily living (ADLs) that involve the upper and lower extremities. These findings align with previous research on sports related injuries including skateboarding which have shown that injuries can lead to functional impairments that affect ADL performance. (4) The area of practice for skateboarding also played a role in determining the extent of functional limitations post injuries. (Figure 2) In the current study conducted skateboarders were asked whether they practice at a skatepark, roadside, curb, colony or a paved footpath. Maximum population practiced at a skatepark (37%) which also indicates towards lesser incidence of injury. The absence or lesser incidence of injury reported is also due to the awareness of a good warmup and cooldown session before after each skateboarding session. Studies have found that skateboarders are exposed to bad weather, unstable surfaces, safety concerns, skatepark troubles and equipment failures which may cause serious injuries. Studies in USA have found that skateboarders usually prefer skating on the road and they skate without a helmet or any protective equipment thus leading to trauma.(5) It was noted that the study conducted in Mumbai, Navi Mumbai and Thane skateparks skateboarders always wore protective gear before beginning their session. In terms of upper extremity functional limitations participants reported difficulties in tasks such as lifting groceries above head level, performing recreational activities, hobbies or sports activities.(Table 5) These findings are consistent with studies that have identified upper extremity injuries such as wrist fractures, shoulder strains as common among skateboarders.(6)The functional limitations observed in this study emphasize the importance of targeted interventions and rehabilitation programs that address specific need of skateboarders with upper extremity injuries.(7) Regarding lower extremity functional limitations participants reported challenges in squatting, hopping and performing heavy household activities. This is in line with previous research highlighting ankle sprains, fractures and knee ligament tears as common lower extremity injuries in skateboarders.(8) The functional limitations identified in this study

underscore the need for comprehensive rehabilitation techniques that focus on restoring mobility, strength and balance of lower extremity.(9)The findings of this study have important implications for healthcare professionals, rehabilitation specialists and skateboarders themselves. Healthcare professionals can use information from this study to develop targeted treatment plans and rehabilitation strategies tailored to specific functional limitations observed in skateboarders. Rehabilitation specialists can incorporate exercises, physical therapy techniques, and assistive devices that aim to improve functional outcomes and enhance independence in performing ADLs.

Furthermore, the findings can inform skateboarders about the potential consequences of injuries and the importance of seeking appropriate medical care and rehabilitation. By understanding the extent of functional limitations, skateboarders can better appreciate the significance of adhering to recommended treatment protocols and engaging in post-injury rehabilitation to optimize recovery and minimize long-term functional impairments.

It is important to acknowledge the limitations of this study. The cross-sectional design limits the ability to establish causal relationships between injuries and functional limitations. Additionally, the use of self-report questionnaires may introduce response biases and may not capture the full extent of functional limitations experienced by skateboarders. Future research could employ longitudinal designs and objective measures of functional abilities, such as physical performance tests, to further enhance the understanding of functional limitations in skateboarders. In conclusion, this study sheds light on the extent of functional limitations experienced by skateboarders following injuries. The findings highlight the challenges faced by skateboarders in performing ADLs that involve the upper and lower extremities. The results underscore the importance of targeted interventions and rehabilitation strategies aimed at addressing the specific functional limitations observed in skateboarders. There is a severe limitation of understanding this sport which can be broken by conducting more detailed research studies so that the extreme sport of skateboarding gains recognition in our country and sportsmen gain their deserved respect in this field. By considering these findings, healthcare professionals and rehabilitation specialists can optimize recovery outcomes and improve the functional abilities of skateboarders, ultimately enhancing their overall quality of life.

Several limitations may be associated with this study. Firstly, the sample size and characteristics of participants may impact the generalizability of the findings. Additionally, the study's cross-sectional design may limit the ability to establish causal relationships between injuries and functional limitations. Furthermore, self-report questionnaires may be subject to response biases and may not capture the full extent of functional limitations experienced by skateboarders.

Despite these limitations, this study's methodology, utilizing the UEFI and LEFI questionnaires, will provide valuable insights into the functional limitations experienced by skateboarders following injuries. The findings can contribute to the development of targeted interventions and rehabilitation strategies aimed at optimizing recovery and improving functional outcomes for skateboarders.

CONCLUSION

From this study we can conclude that post injury maximum skateboarders have difficulty in lower extremity activities of daily living such as squatting. They also face difficulty in returning to their sporting or recreational activities post injuries.

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