



PREVALENCE, PATTERN, AND RISK FACTORS OF MUSCULOSKELETAL INJURIES AMONG WHEELCHAIR ATHLETES IN LAGOS, NIGERIA

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ABSTRACT

Purpose. Participation in elite sporting competition for athletes with a disability has seen significant growth in recent years. There are relatively few studies on sports-related injuries in this population of athletes. Thus, detailed understanding of musculoskeletal injury in this complex area of sport remains poor. The aim of this study was to determine the prevalence, pattern, and perceived risk factors of musculoskeletal injuries among wheelchair athletes in Lagos State, South West, Nigeria.

Methods. The study was a cross-sectional survey involving 63 wheelchair athletes, recruited from various stadia in Lagos State. Data on musculoskeletal injuries were collated by using an adapted questionnaire. Frequency and percentages were applied to summarize data. The chi-squared test served to find associations between variables.

Results. The career, 12-month, and point prevalence of musculoskeletal injuries among the wheelchair athletes were 93.7%, 61.9%, and 3.2%, respectively. The shoulder (66.7%) and forearm (31.7%) were the most common sites of injury. The most frequent perceived risk factors of musculoskeletal injury were fatigue (30.2%) and contact with other athletes (28.6%). No significant connections were found between the injured body parts and the 12-month injury prevalence in the wheelchair athletes ($p \geq 0.05$).

Conclusions. There is a high prevalence of musculoskeletal injuries among wheelchair athletes. The upper extremities are the major site of injury owing to their continuous use to propel wheelchairs during sports activities and activities of daily living, which makes them vulnerable to injury.

Key words: Paralympic, epidemiology, developing countries, disability, sports injuries and wounds

Introduction

Physical activity and exercise are essential for the optimal physical, social, and emotional development of the individual [1]. More recently, emphasis has been put on physical activity and sports in individuals with disabilities owing to the immense benefits derived from engaging in sport-related activity [2, 3]. Such benefits include a reduction in the effect of sedentary lifestyle, which these individuals are predisposed to, and an improvement in their physical health, self-esteem, and quality of life [4, 5]. Participation of people with disabilities in organized sports events has greatly increased within the past decade [6].

Over the years, wheelchair sport has involved a growing number of participants because of its popularity in Para-sports events, from 16 athletes who participated in the first Stoke Mandeville Games in 1948 to over 4000 competing in the London Paralympic Games in 2012 [7]. Currently, there are over 15 wheelchair sports which are organized at the recreational and competitive levels; these include wheelchair basketball, volleyball, tennis, and track and field events [8].

A major challenge in optimal sports participation is injury. With the increase in development and participation in wheelchair sports, there is an increase in sports-related injuries and complaints in addition to injuries resulting from daily wheelchair use [9]. These

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can result in reduced participation in training and competition [10]. Furthermore, sports injuries may have more devastating effects on the individual as they may severely affect work or school activity [11]. A prevalence of 28–79%, risk factors, cause, and nature of musculoskeletal injury have been reported in various retrospective studies in wheelchair sports [9, 12].

Mateus and Pillay [13] demonstrated in a retrospective study that 58% of the population of South African wheelchair basketball players had experienced musculoskeletal pain within the previous 12-month period, which was attributed to injuries occurring during training and competition. The shoulder was most frequently affected. Thompson et al. [12] reported an injury prevalence of 28% during a 12-month period and a career prevalence of 59% in a retrospective study among 71 wheelchair athletes in New South Wales. The most often observed injuries were muscle strains (32%), commonly affecting the shoulder (25%) and majorly caused by contact (48%). Warm-ups and stretches constituted the most reported injury prevention strategy. Taylor and Williams [14] retrospectively assessed the injury prevalence among 53 British wheelchair racers. The most common disability was spinal cord injury, followed by spina bifida. As many as 72% of the racers had experienced at least one injury within the previous year. Overuse and traumatic injuries in hand, wrist, shoulder, and upper arm were the most frequently reported injuries. Time off training owing to injuries ranged from 1 day to a year, with a median of 14 days. Medical help was not sought in most of the injured cases. McCormack et al. [15] retrospectively surveyed 90 Canadian wheelchair athletes participating in 18 different wheelchair sports. The most common disability was spinal cord injury, and the largest percentage of athletes were involved in track and field, followed by basketball and field events. In total, 346 injuries were reported. The upper extremity was mostly affected by blisters, abrasions, and muscular strains. The high frequency of upper extremity injuries was suggested to be probably due to wheelchair propulsion. The majority of the study respondents used protective equipment while participating in sports. However, fewer than 30% of the athletes sought medical advice for their injuries.

Research into the mechanisms, causes, and management of sports injuries in developing countries is increasing. Studies on the prevalence, incidence, risk factors, and treatment of sports injuries in able-bodied athletes are abundant in the Nigerian environment [16–20]. Nevertheless, this is not the case among ath-

letes with disabilities. This is a pertinent issue in view of the low funding and development of sports in Nigeria [21, 22]. The development of preventive programs and effective treatment will require an understanding of the mechanisms and nature of injuries in wheelchair athletes in Nigeria. This study therefore attempted to determine the nature, prevalence, risk factors, and preventive strategies of musculoskeletal injuries among wheelchair athletes in Lagos State, South West, Nigeria.

Material and methods

Study design and recruitment

This was a cross-sectional study which comprised 63 wheelchair athletes who participated in local and international competitions. The purposive sampling technique was used to enrol the participants. They were recruited from the National Stadium, Surulere; Teslim Balogun Stadium, Surulere; and Yaba College of Technology, Sports Centre, Yaba – all in Lagos, South West, Nigeria. Wheelchair athletes who had injuries not related to sports training or competition were excluded from the study.

Data collection

The prevalence and pattern of body injury, as well as prevention strategies in wheelchair athletes were assessed by using a questionnaire adapted from the daily report on injuries and illnesses, code and classification [23], and the injury and illness definitions and data collection procedures for epidemiological studies in athletics [24]. The questionnaire consisted of 5 sections and 39 questions regarding the physical characteristics, sports profile, body parts injured, injury prevalence, perceived risk factors, and preventive strategies. Section A referred to the physical characteristics of wheelchair athletes; section B – to their sports profile, which comprised the sport they participated in, type of wheelchair used, and the level of sports participation; section C – to the injury prevalence, injury pattern, and pain severity; section D – to the perceived risk factors among wheelchair athletes; section E – to the prevention strategies.

Physiotherapists knowledgeable about sports injury treatment reviewed the developed questionnaire. Eligible wheelchair athletes participated in a pilot study and provided feedback, which was used to improve the content of the questionnaire. The pilot study participants were not included in the final study. The aims

of the study were clearly explained to the athletes. The athletes were also assured of the confidentiality of their responses. The questionnaires were self-administered and collected after completion.

Statistical analyses

The obtained data were analysed with the Statistical Package for the Social Sciences (SPSS), version 22. The descriptive statistics of mean, standard deviation, and percentages were used to summarize the data. The inferential statistics of chi-squared served to determine the association between variables. Statistical significance was set at $p < 0.05$.

Ethical approval

The research related to human use has complied with all the relevant national regulations and institutional policies, has followed the tenets of the Declaration of Helsinki, and has been approved by the Health Research and Ethics Committee of the Lagos University Teaching Hospital (ADM/DCST/HREC/APP/2890).

Informed consent

Informed consent has been obtained from all individuals included in this study.

Results

Physical characteristics of participants

A total of 100 questionnaires were administered to wheelchair athletes in this study. However, 37 questionnaires were returned either not filled or with in-

Table 2. Causes of wheelchair use among the participants

Reason for using wheelchair	n	%
Trauma	2	3.2
Amputation	15	23.8
Spinal cord injury	2	3.2
Poliomyelitis	44	69.8
Total	63	100.0

complete responses. Therefore, 63 questionnaires were duly completed and valid for analysis, giving a response rate of 63%. The athletes presented an age range of 16–48 years, with a mean age of 30.79 ± 7.29 years. A total of 34 (54%) of the athletes were 30 years old or below, 22 (34.9%) were 31–40 years old, and 7 (11.1%) were 41–50 years old. There were 37 (58.7%) male and 26 (41.3%) female wheelchair athletes (Table 1). Poliomyelitis resulting in lower limb weakness was the cause of wheelchair use in most, 44 (69.8%) of the investigated athletes (Table 2).

Sports profile of participants

The types of wheelchair sport and levels of participation are shown in Table 3. The majority of the athletes – 45 (71.4%) – had been participating in various wheelchair sports for 1–10 years, 13 (20.6%) for 11–15 years, and 5 (8%) for 16 years or above. Overall, 35 (55.6%) participants were engaged in wheelchair basketball, while 46 (73%) were involved in organized competitions within their state locality. A total of 58 (92.1%) participated in competitions once or twice a year and 5 (7.9%) in 3 or more competitions.

Table 1. Physical characteristics of the wheelchair athletes and association with injury prevalence

Characteristics	12-month prevalence		Total n (%)	Chi-squared	p
	Yes n (%)	No n (%)			
Age of participants (years)					
15–20	1 (2.6)	1 (4.2)	2 (3.2)	9.73	0.72
21–30	22 (56.4)	10 (41.7)	32 (50.8)		
31–40	12 (30.8)	10 (41.7)	22 (34.9)		
41–50	4 (10.3)	3 (12.5)	7 (11.1)		
Total	39 (61.9)	24 (38.1)	63 (100)		
Sex of participants					
Male	25 (64.1)	12 (50.0)	37 (58.7)	1.22	0.27
Female	14 (35.9)	12 (50.0)	26 (41.3)		
Total	39 (61.9)	24 (38.1)	63 (100)		

Table 3. Sports participation profile of the wheelchair athletes and association with injury prevalence

Sports participation characteristics	Total <i>n</i> (%)	12-month prevalence		Chi-squared	<i>p</i>
		Yes <i>n</i> (%)	No <i>n</i> (%)		
Duration of participation (years)					
1–5	23 (36.5)	11 (28.2)	12 (50.0)	4.29	0.37
6–10	22 (34.9)	17 (43.6)	5 (20.8)		
11–15	13 (20.6)	8 (20.5)	5 (20.8)		
16–20	2 (3.2)	1 (2.6)	1 (4.2)		
> 20	3 (4.8)	2 (5.1)	1 (4.2)		
Total	63 (100)	39 (61.9)	24 (38.1)		
Level of participation					
Social/recreational	4 (6.3)	2 (3.2)	2 (3.2)	0.257	0.61
State	46 (73.0)	23 (36.5)	14 (22.2)	0.01	0.96
National	30 (47.6)	19 (30.2)	11 (17.5)	0.50	0.83
International	28 (44.4)	15 (23.8)	13 (20.6)	1.48	0.22
Type of wheelchair sport					
Basketball	35 (55.6)	22 (34.9)	13 (20.6)	0.03	0.86
Racing	25 (39.7)	15 (23.8)	10 (15.9)	0.06	0.80
Tennis	24 (38.1)	16 (25.4)	8 (12.7)	0.37	0.54
Volleyball	3 (4.8)	1 (1.6)	2 (3.2)	1.09	0.30
Karate	6 (9.5)	4 (6.3)	2 (3.2)	0.06	0.80

Injury prevalence in wheelchair athletes

A total of 59 (93.7%) wheelchair athletes reported having injuries since they had started wheelchair sports, 39 (61.9%) in the previous 12 months, while 2 (3.2%) were currently injured. The injuries sustained by the wheelchair athletes are presented in Table 4. Most of the participants – 51 (81%) – experienced injuries during training sessions, 5 (7.9%) during competitions, and 7 (11.1%) both during training and competitions. There was blood loss associated with injuries in 8 (12.7%) individuals. Overall, 53 (84.1%) athletes reported mild and moderate pain.

Table 5 shows the pattern of injured body parts and severity of musculoskeletal injury in the examined

Table 4. Nature and type of injury among the wheelchair athletes

Nature/type of injury	<i>n</i>	%
Fracture	6	9.6
Dislocation/subluxation	6	9.5
Bruise/contusion	13	20.6
Muscle cramps/spasm	36	57.1
Sprain	9	14.3
Muscle strain	13	20.6
Cartilage/meniscal injuries	1	1.6

wheelchair athletes. The shoulder, forearm, wrist/hand, and fingers were the most often injured body parts. Shoulder injuries accounted for the highest number of training and competition days missed owing to injuries.

Fatigue, overwork, overuse, overtraining, and collision with other athletes were the self-perceived causes or contributing factors of injuries among most wheelchair athletes (Table 6). The majority of the participants – 43 (68.3%) – trained on concrete, 22 (34.9%) on synthetic track, 5 (7.9%) on grass, and 1 (1.6%) on woodland trail.

There was no significant association between the injury prevalence and age, sex of the participants, duration of sports participation, or injury risk factors (Tables 1, 3, and 6). The association between finger injuries and the 12-month injury prevalence was assessed as close to the margin of statistical significance (Table 7).

Treatment of injuries and injury prevention strategies in wheelchair athletes

A total of 50 (79.4%) wheelchair athletes reported that they kept on training despite sustaining injuries and 13 (20.6%) stopped training. For treatment of injuries, 34 (54.0%) practised self-medication, 9 (14.3%)

Table 5. Body parts affected and severity of musculoskeletal injuries in the wheelchair athletes

Body part	n	%	S I n (%)	S II n (%)	S III n (%)	S IV n (%)	S V n (%)
Face	2	3.2	2 (3.2)	-	-	-	-
Head	2	3.2	-	2 (3.2)	-	-	-
Neck	1	1.6	1 (1.6)	-	-	-	-
Upper back	1	1.6	1 (1.6)	-	-	-	-
Pectoral area	1	1.6	1 (1.6)	-	-	-	-
Lumbar area	5	7.9	5 (7.9)	-	-	-	-
Abdomen	1	1.6	1 (1.6)	-	-	-	-
Shoulder	42	66.7	28 (44.4)	7 (11.1)	4 (6.3)	3 (4.8)	-
Elbow	15	23.8	8 (12.7)	4 (6.3)	3 (4.8)	-	-
Forearm	20	31.7	16 (25.4)	2 (3.2)	1 (1.6)	-	-
Wrist/hand	19	30.2	12 (19)	5 (7.9)	2 (3.2)	-	-
Finger	17	27.0	13 (20.6)	4 (6.3)	-	-	-
Quadriceps area	3	4.8	3 (4.8)	-	-	-	-
Hamstrings area	1	1.6	1 (1.6)	-	-	-	-
Knee	3	4.8	3 (4.8)	-	-	-	-
Ankle	2	3.2	2 (3.2)	-	-	-	-
Foot	2	3.2	2 (3.2)	-	-	-	-

S – severity: I – no missed training sessions, II – minor injury (1–7 training days missed), III – moderately severe injury (8–28 training days missed), IV – severe injury (29 days to 6 months of training missed), V – long-term injury (> 6 training months missed)

Table 6. Contributing factors of injuries in the wheelchair athletes and association with injury prevalence

Factor	Total n (%)	12-month prevalence		Chi-squared	p
		Yes n (%)	No n (%)		
Fatigue/overwork	19 (30.2)	9 (14.3)	10 (15.9)	2.44	0.12
Contact with other athletes	18 (28.6)	14 (22.2)	4 (6.4)	2.69	0.10
Overuse/overtraining	17 (27.0)	9 (14.3)	8 (12.7)	0.79	0.37
Wrong playing technique	14 (22.2)	11 (17.5)	3 (4.8)	2.12	0.15
Unsuitable playing ground	13 (20.6)	12 (19.0)	1 (1.6)	6.42	0.07
Wrong training program	11 (17.5)	8 (12.7)	3 (4.8)	0.66	0.42
Insufficient warm-up	10 (15.9)	6 (9.5)	4 (6.3)	0.02	0.89
Inappropriate wheelchair	8 (12.7)	4 (6.3)	4 (6.3)	0.55	0.46
Lack of appropriate equipment	6 (9.5)	5 (7.9)	1 (1.6)	1.29	0.26
Reoccurrence of previous injuries	4 (6.3)	4 (6.3)	0 (0)	2.63	0.11
Contact with a moving object	3 (4.8)	2 (3.2)	1 (1.6)	0.03	0.86
Contact with an immobile object	3 (4.8)	3 (4.8)	0 (0)	1.94	0.16
Environmental factor	2 (3.2)	1 (1.6)	1 (1.6)	0.12	0.73
Lack of protective equipment	2 (3.2)	0 (0)	2 (3.2)	3.36	0.07
Non-contact injury	1 (1.6)	1 (1.6)	0 (0)	0.63	0.43

received treatment from medical doctors, 8 (12.7%) from physiotherapists, 2 (3.2%) from nurses and pharmacists each, 1 (1.6%) from masseurs and traditional bone setters; 5 participants did not receive any treatment for their injuries.

As for the reaction to warning signs of injury, the majority – 47 (74.6%) – took preventive steps, 14 (22.2%) sought professional help, and 2 (3.2%) told someone else

(coach or other athletes). Most participants – 47 (74.6%) – considered injury prevention as the sole responsibility of the medical personnel or physiotherapist. A total of 60 (95.2%) reported that they did not have medical personnel working with their sports teams. However, 1 (1.6%) athlete stated that they had a medical doctor, while 2 (3.2%) described that physiotherapists worked with their sports teams. In the absence of

Table 7. Injured body parts of the wheelchair athletes and association with injury prevalence

Body part	Total <i>n</i> (%)	12-month prevalence		Chi-squared	<i>p</i>
		Yes <i>n</i> (%)	No <i>n</i> (%)		
Face	2 (3.2)	1 (1.6)	1 (1.6)	0.12	0.73
Head	2 (3.2)	1 (1.6)	1 (1.6)	0.12	0.73
Neck	1 (1.6)	0 (0)	1 (1.6)	1.65	0.20
Upper back	1 (1.6)	0 (0)	1 (1.6)	1.65	0.20
Pectoral area	1 (1.6)	0 (0)	1 (1.6)	1.65	0.20
Lumbar area	5 (7.9)	2 (3.2)	3 (4.8)	1.11	0.29
Abdomen	1 (1.6)	1 (1.6)	0 (0)	0.63	0.43
Shoulder	42 (66.7)	25 (39.7)	17 (27.0)	0.30	0.56
Elbow	15 (23.8)	11 (17.5)	4 (6.3)	1.09	0.30
Forearm	20 (31.7)	13 (20.6)	7 (11.1)	0.12	0.73
Wrist/hand	19 (30.2)	12 (19.0)	7 (11.1)	0.18	0.89
Finger	17 (27.0)	7 (11.1)	10 (15.9)	4.24	0.05
Quadriceps area	3 (4.8)	2 (3.2)	1 (1.6)	0.03	0.86
Hamstrings area	1 (1.6)	1 (1.6)	0 (0)	0.63	0.43
Knee	3 (4.8)	2 (3.2)	1 (1.6)	0.03	0.86
Ankle	2 (3.2)	1 (1.6)	1 (1.6)	0.12	0.73
Foot	2 (3.2)	1 (1.6)	1 (1.6)	0.12	0.73

a medical personnel to administer first aid and further treatment, 32 (50.6%) participants applied hot balm to the injured part, 26 (41.3%) used pain relieving drugs and vigorous massage, 25 (39.7%) used ice/cold spray, 9 (14.3%) had to immobilize and rest the injured part of the body, while 3 (4.8%) ignored the injury.

Overall, 39 (61.9%) athletes did not use protective sports gears. The reasons given for not using protective wears were as follows: feeling that they were not required for the sport (28, 44.4%), financial constraints (5, 7.9%), restricting movements (3, 4.8%), dislike of wearing them (2, 3.2%), and feeling that they were not important (1, 1.6%). The majority of participants – 49 (77.8%) – recovered from their injuries within 14 days, 13 (20.6%) within 15–90 days, and 1 (1.6%) within more than 6 months.

Discussion

The increase in the number of injuries places physically challenged athletes at a high risk of injury occurrence as a result of their raised participation in organized sports and of the popularity of Paralympic games around the world. This study was designed to improve the understanding of injuries and risk factors among wheelchair athletes in order to help physiotherapists and sports physicians adopt better preventive and treatment protocols.

The average age of the participants in this study was 30.79 years, which is quite low compared with 48 years and 32 years observed in research among Hong Kongese [25] and Turkish [26] wheelchair athletes, respectively. McCormack et al. [15] reported a mean age of 28 years, while Curtis and Dillon (27) determined 29.25 years among American wheelchair athletes. This might have been caused by the variance in the level of sports participation among the study samples. Studies including mainly elite athletes usually present lower ages. There were more male than female wheelchair athletes in this study. This is consistent with the results of similar research [28, 29]. This implies that wheelchair Paralympic sports in this environment is dominated by younger male individuals. Most of the wheelchair athletes in this study had undergone poliomyelitis or lower limb amputation. Spinal cord injury athletes were the least in this study, which is in line with a study by Huzmeli et al. [26]. However, previous research in other environments showed that wheelchair sports included mostly spinal cord injury individuals [14, 15]. Poliomyelitis was previously endemic [30] in Nigeria and this could have accounted for the high number of participants with poliomyelitis engaging in sports.

In this study, wheelchair athletes were mostly involved in wheelchair basketball and track events, although an important observation is that most athletes

competed in more than one sport. These findings corroborate the studies by Curtis and Dillon [27] and McCormack et al. [15], who observed that the majority of the wheelchair athletes were involved in track and basketball events and participated in multiple sports. Most wheelchair athletes participated in local and interstate competitions, usually held twice in a year. This may mean that most of the athletes in this environment are based locally, with little international exposure. They also participate in few competitions.

The findings of this study reflect a high lifetime (93.7%), 12-month (66.7%), and point (9.3%) injury prevalence among wheelchair athletes. Taylor and Williams [14] reported an injury prevalence of 72% during a 12-month period in a retrospective study among a population of 53 British wheelchair athletes. Thompson et al. [12], in their study of 71 wheelchair athletes, observed a lifetime prevalence of 59% and a 12-month prevalence of 28%. Huzmeli et al. [26], while studying 15 wheelchair athletes, revealed a life prevalence of 26.6%. Curtis and Dillon [27] stated that as many as 72% of the 286 athletes studied reported having been injured at some time during their career. The low level of development and funding of sports for the physically challenged in this environment may have led to the high number of injured athletes in wheelchair sports since most of the athletes use old and worn out wheelchairs and seldom apply preventive strategies in the sport. The high participation of injured athletes in training sessions compared with competitions shows that the athletes spend more time in training sessions than competitions. Derman et al. [31] revealed a higher injury occurrence during competitions, which may be due to the higher rate of participation in competition in other climes.

Muscle cramps, spasm, muscle strain, bruises, and contusion of the upper limbs were the most reported injuries among the wheelchair athletes. This could be as a result of repetitive training and frequent high-intensity muscle work, which often lead to overuse injuries [12, 25, 28, 31]. Previous studies on the sites of musculoskeletal injury among wheelchair athletes have reported the upper limbs as the region with the highest occurrence of injuries [9, 28, 32]. Owing to the repetitive nature of propulsion, wheelchair athletes are at a higher risk of developing upper extremity injuries, in addition to peripheral nerve entrapments, repetitive strain injuries, premature osteoporosis, and pressure sores, which also may limit their level of participation in sports [33]; other activities and playing techniques such as throwing, passing, lifting, especially in wheelchair basketball and wheelchair track,

in which most of the athletes are involved, are also affected.

The study revealed that the shoulder was the most frequently injured body part, followed by the forearm, elbow, wrist/hand, and finger. This correlates with the findings of other studies [9, 12, 13, 34]. The predominant use of the upper limbs in wheelchair sports increases the risk of acute and overuse injuries of the upper limbs. Injury prevalence and finger injuries were closely associated; however, the relationship was not statistically significant. This may imply that finger injuries may be related to wheelchair sports in this environment, which may be due to the use of the wrist and fingers in pushing the wheelchair tyres, the hands getting trapped between the wheel and the body of the seat rest, and the lack of use of protective gloves when manoeuvring the wheelchair. Fatigue, overwork, contact with other athletes or wheelchairs, overuse, and overtraining were the major self-perceived risk factors or causes of the reported injuries. This is consistent with previous studies [35–37]. Long hours of training and lower skill levels negatively impact on the performance of wheelchair athletes. Collisions with other athletes on wheelchairs are also frequently reported as a cause of injury in wheelchair sports [12]. There was no significant association between the age or sex or years of participation in sport and the injury prevalence of the participants, which is in line with a study by Curtis and Dillon [27]. The perceived risk factors were also not significantly associated with injury prevalence. This means that injuries in wheelchair sports in this environment may not be influenced by age, sex, or years of participation. Besides, there is no predominant risk factor of injuries among wheelchair athletes.

Most of the wheelchair athletes in this study perceived that they spent adequate time for warm-up, training, and cool-down exercises. However, the majority trained on concrete floors and did not wear protective gears such as gloves, helmets, and belts. They trained on concrete owing to the lack of adequate training venues and did not wear protective equipment because of financial constraints and the conviction that they were unnecessary. Training on concrete increases the amount of friction between the wheelchair tyres and the floor, thereby increasing the effort needed to propel the wheelchair. This could result in a higher risk of injuries. Advocacy on the benefits of wearing protective gears while engaging in wheelchair sports may be required. Wheelchair athletes should be educated on injury prevention strategies as most of them do not take responsibility for the issue, considering it a domain of the medical personnel or physiotherapist.

The majority of the investigated athletes practised self-medication and applied vigorous massage with deep heat/hot balm to the injured part of the body. This implies that they have limited knowledge on injury prevention and ways of managing sports injuries. Furthermore, this study revealed that most participants took their own prevention steps as a way to react to warning signs of injury, and few sought professional help, which might be due to the lack of medical personnel cooperating with the wheelchair athletic teams. The pattern of treatment and self-medication usually results in poor management and a higher percentage of reoccurring injuries.

A major limitation of this study is the retrospective design. This may have resulted in a recall bias. This design had to be employed owing to the lack of competitions, sports clubs for the physically challenged athletes, and formal venues for continuous training. A small sample size was another limitation that we encountered in the process of data collection, with the reasons previously stated. However, adequate effort was made to obtain most accurate data possible.

Conclusions

On the basis of the study findings, medical personnel should be provided for wheelchair athletic teams for proper treatment, management, and rehabilitation of athletes. There should be awareness, advocacy, and support of sports medicine practitioners and the Nigerian Paralympic Committee, in the context of a high prevalence of injuries among wheelchair athletes in Lagos State, to develop appropriate measures to prevent and manage injuries in wheelchair sports.

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Disclosure statement

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Conflict of interest

The authors state no conflict of interest.

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