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Research Article

School Injuries in Children with Mild Intellectual Disabilities

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Abstract

Background: There are few studies in Saudi Arabia investigate the common injuries in children with intellectual disability. Thus, this cross-sectional study started as a first step to explore the common injuries among Saudi children with mild intellectual disability (MID) in middle school to build up a prevention strategy to help them for better life.

Aim: The main aim of this study was to determine the most common injuries including types, injured body parts and primary external causes of injury for Saudi children with MID during one school semester. **Methods:** the present study was a cross-sectional study conducted descriptive survey method. Total of 65 children (males,13.4yrs + 1.3) with MID from 13 middle schools. All data were collected using a questionnaire that has been developed from the injury surveillance guidelines, World Health Organization (Holder et al. 2004). Participants were selected in the manner deliberate from middle school that use educational integration system in Riyadh, Saudi Arabia. All physical measurements were taken by PE teachers in the school. Then the questionnaire was distributed to the teachers to fill them out and returned them back in the same day. The questionnaire includes four sections, subject's information and physical characteristics, type of injury, body part injury and primary external causes of injuries. **Results:** data of the present study showed that the common injury types were bruises (100%), abrasions 95.4% and pinches 92.3%, most injury body parts were in face 100%, ankle 87.7% and elbow 84.6%, and the primary external cause of injuries were fall 100%, collision 92.3%, injuries by other students 87.7% and obstruct 80.0%. **Conclusion**: More investigations are strongly recommended to develop injury prevention strategies. The Ministry of education in Saudi Arabia should improve antiquate physical education and sports activity programs that meet the needs of children with MID to play and exercise safely.

Keywords: School injury; Intellectual disabilities; Adolescents; School age.

Introduction

Disability has been defined as "long-term reduction in ability to conduct social role activities, such as school or play, because of chronic physical or mental condition" [1]. American Association on Intellectual and Developmental Disabilities (AAIDD) defines the intellectual disability as "a disability characterized by significant limitations both in intellectual functioning (reasoning, learning, problem solving) and in adaptive behavior, which covers a range of everyday social and practical skills. This disability originates before the age of 18" [2]. In Saudi Arabia, there are lack of studies that investigate the common injury in children with intellectual disability (ID) such as mild level of intellectual disability (MID). There are number of Saudi children with MID studying in schools using educational integration system. Therefore, it is important to explore their health status including physical injury that may occur to them during school time. In a previous study, investigators indicated that children with disabilities have lower level of the physical fitness components such as cardio-respiratory fitness, impaired motor coordination, limited muscle strength and movement efficiency which may cause different types of injuries. Moreover, children with disabilities are more likely to be injured comparing to children without disability [3]. Moreover, children with mental/developmental or intellectual disability have been found to be significantly poorer health status than the matched normal group [4]. The absence of studies that investigate the

common injuries among Saudi children with MID in Saudi Arabia will not help to improve the educational system for them. Thus, Saudi schools that using the educational integration system in need to explore the common injuries among Saudi children with MID to improve their educational and health strategies for them. Therefore, the main aim of the cross-sectional study was to explore the most common injuries among Saudi children with MID in middle school using the educational integration system during one semester.

Methods

Sixty fife children (males) (13.4yrs +1.3) with mild intellectual disability were selected from middle school to participate in the cross-sectional study. They were selected in the manner deliberate from 13 middle school that use educational integration system in Riyadh, Saudi Arabia. The present study aimed to investigate the common injuries in male children because the education system in Saudi Arabia separate genders in schools. All children participated in this study have been provided along with their parents with an information sheet that explain the purpose of the study and their parents signed a consent form for their children to take part in present study. This study has been approved by the research ethics committee at the college of Sport Sciences and Physical Activity, King Saud University.

All data were collected using a questionnaire that has been developed from the injury surveillance guidelines, World Health Organization [5]. The developed questionnaire was examined in terms of validity and reliability. A comprehensive explanation of the study procedures was given to the children along with their teachers and all questions about their participation were fully answered. Physical characteristics were taken including weight (at nearest 0.5kg) and height (at nearest 0.5cm) as well as body mass index (BMI) (weight (kg)/height $(m)^2$). Body mass index percentile for age were calculated using the UK 1990 reference chart for children and adolescents (boy chart) [6]. Then the questionnaire was distributed to the teachers to fill them out and returned them back in the same day. The questionnaire includes four sections, subject's information and physical characteristics, type of injury, body part injury and primary external causes of injuries. All data of the present study were completed by the direct observers to the children including physical education teachers as well as medical care staff in the school during one school semester.

Results

The physical characteristics of the participants are presented in (Table1). Although children in the present study were apparently healthy, the main BMI percentile for age showed that they were classified as obese [6].

Physical characteristics	Main	(+SD)
Age (yrs)	13.46	+ 0.80
Weight (kg)	60.4	+10.44
Height (cm)	151.93	+11.50
Body Mass Index (BMI) (kg/m^2)	26.21	+3.89
BMI percentile for age (boys)	➢ 98^{th*}	

Table 1: Physical characteristics children with intellectual disabilities, (n=65); *BMI percentile was calculated from the UK 1990 reference chart for children and adolescents (boy chart) [6].

The most common injury types were bruises 100%, abrasions 95.4% and pinches 92.3%. All other types of injuries are presented in. On the other hand, fracture 16.9% occurred less than any other types of the investigated injuries. The presented results in (Table 2) indicated that most participants get most types of injuries in one semester.

Injury type	Students injured	Percentage
Bruises	65	100%
Abrasions	62	95.4%
Cuts	57	87.7%
punctures	42	64.6%
bleeding	50	76.9%
pinches	60	92.3%
laceration	52	80.0%
Fracture	11	16.9%

Table 2*:* Injury types, (n =65); results are number **.(%)**

In terms of injured body parts, the results showed that participants have physical injuries in most body parts. Moreover, most of the participants got injured several times during only one semester. The results showed that the most frequent injuries were recorded in face 100%, ankle 87.7% and elbow 84.6%. However, thigh was the lowest body part have injury. About two third of the participants get injury in most body parts, (Table 3).

Injury body locations	Students injured	Percentage
Face	65	100%
Neck	34	52.3%
Chest	45	69.2%
Hand	44	67.7%
Elbow	55	84.6%
Thigh	16	24.6%
Leg	50	76.9%
Ankle	57	87.7%

Table 3: Injured body parts, (n =65); results are number **.(%)**

The primary external causes of injuries were more common in fall 100%, collision 92.3%, injuries by other students 87.7% and obstruct 80.0%. However, playground/athletic play room found to be the lowest cause of injury 40.0%, (Table 4)

Primary external cause	Students injured	Percentage
Falls	65	100%
Collision	60	92.3%
Obstruct	52	80.0%
Injuries by other students	57	87.7%
Game type	47	72.3 %
Unorganized play	37	56.9%
Playground/athletic play room	26	40.0%
equipment and tool	42	64.6%
Bad warm up	34	52.3%

Table 4: Primary external cause of injuries, (n =65); results are number (%).

In general, the results of the present study indicated that children with mild intellectual disability have different physical injuries in most of their body parts and mainly because of fall, collision, other students or obstruct.

Discussion

The present study is a cross-sectional study that aimed to explore the most common injuries among Saudi children with mild intellectual disability. The results of this study found that the most common type injury in Saudi children with MID were bruises 100%, abrasions 95.4% and pinches 92.3%. In terms of injured body parts, Table 3 shows that most injuries were to the face (100%), ankle (87.7%) and elbow (84.6%). The results concur with some previous studies [7,8]. For instant, Ramirez and colleagues (2004), found that bruises, abrasions and cuts were almost three fourths of all injuries; and about half of these injuries were to the face (48,2%). On the other hand, they found that the most common external causes of these injuries due to falls and insults by other students [8,9].

White and colleagues (2018) found that falls accounted for the highest single mechanism of injury adolescents (19.0%) with the majority (73.2%) of injuries involving either upper or lower limbs. Similar findings were observed in another study. The Investigators indicated that bruises and pinches were the most common injuries in children with disability [7]. The results of the present study found that the primary external causes of injuries were due to fall 100%, collision 92.3%, injuries by other students 87.7% and obstruct 80.0%. similar results were recorded in several previous studies [8-10]. Furthermore, Limbos and others (2004) confirmed that falls and injuries by other students were the most common external reasons for physical injuries among children with mental or intellectual disability [7]. The results of the previous studies including the present study insure that most of children with disability get different types of injuries in most body limbs including the sensitive parts such as the face or the head.

Actually, the reason behind that could be explained by multiple factors. One of the important factors are obesity and lower fitness level particularly muscle strength, coordination and balance. Additionally, children with mental/developmental or intellectual disability were found to have significantly poorer health status than the matched comparison group [4]. Furthermore, comparing to normal peers, children with mental/intellectual disabilities have greater rates of obesity, lower levels of cardio-respiratory fitness and lower levels of muscular endurance [12]. Lack of locomotor skills may play major roll in controlling body movement especially in children with intellectual disability.

In a recent study, investigators found that children with mild intellectual disability have lower levels on almost all specific gross motor skills comparing to the typical developing children [13]. Thus, Action programs should be taken to children with MID in Saudi schools in order to protect them from getting injury. This claim has been emphasised previously. Vuijk and colleagues (2010) concluded that it is important to improving motor skill performance in children with mild intellectual disability to help them especially from getting injury from playing [14]. Moreover, sufficient intensity of muscular strength and endurance were found to be associated with increased bone mass, reduction in injury from falls, as well as helping children with intellectual disability to enjoy and complete activities of daily living [15]. Furthermore, Physical activity and sports programs that is of lower intensity, longer duration and more frequency for typically developing children has been recommended [16]. Recent study reported that children with intellectual disabilities has more susceptible to injury compared to children without intellectual disability [17]. Moreover, KILINÇ and colleagues (2022) concluded that mothers of the children with intellectual disability can learn the necessary knowledge, skills, and gain a positive attitude to keep their children safe in the home environment. Futhermore, they recommend more intervention studies focus on the prevention of falls in children with intellectual disabilities and to examine mothers' attempts at safety measures through home visits [18].

All the previous evidence research studies recommend that children with intellectual disability are need to develop an adequate physical education and sports programs for them considering safe play and decreasing the number and level of the injuries that may occur during their free-living activity. Although the educational

integration system in schools has been started in Saudi Arabia for more than one-decade, physical education programs are still need to be improved so that the children with MID can integrate in these programs safely.

Conclusion

In conclusion, the present study found that children with mild intellectual disability have different physical injuries in most of their body parts and mainly because of fall, collision, other students or obstruct. Developing prevention strategies (especially for falls and collision) particularly in classroom and playground should be taken. Ministry of education in Saudi Arabia should improve the physical education and sports activity so that it becomes suitable for students with disability especially children with MID. More investigations are strongly recommended in order to develop safety educational environment including physical education and sports activity programs for children with disability.

Limitations and future research direction suggestions

The present study was conducted as first step for a future research in the field of physical injury in children with MID in Saudi Arabia. However, there are some limitations of the present study that researchers will consider in the future studies. The main limitation could be summery as follows:

1. The present study did not cover the level and timing of the studied injuries. Thus, further studies should look at the level, timing, and actions that were taken by schools for each injury in terms of prevention and treatment.
2. This study focused on one type of disability in children. More investigation may be needed to cover all types and levels of mental and physical disabilities that study in the schools with educational integration system in Saudi Arabia.
3. One of the important stages to prevent injury in children with disability is to examine the resent programs of physical education and sports activity in order to improve adequate programs for them.

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Ethical approval and consent to participate

The present study was approved by the Research Center at the College of Sport Sciences and Physical Activity, King Saud University. A consent form has been signed by each child's parent after reading and understanding all parts of the study including their right to withdraw from the study at any time without giving an excuse.

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