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Epidemiology of Physical Activity-Related Injuries in Chinese University Students

Running head: Physical Activity-Related Injuries in youths

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Abstract

Knowledge gaps of the physical activity-related injury (PARI) problem among general undergraduates exist. We conducted a study in four universities, where 1421 students graded 1-3 were interviewed face-to-face during April and May after their completion of the baseline survey in March and April, 2017, aiming to describe the incidence and characteristics of PARI. PARI experience and physical activity (PA) participation in the past 12 months were collected. Injury incidence density (IID) and risk, and injury characteristics were evaluated for the overall sample and by gender. Pearson chi-square or Fisher's exact tests and independent-sample *t* tests were used to test between-group differences. We found that 486 PARIs were reported totally by 289 participants**,** with an overall IID of 0.57 per 1000 hours of exposure (males: 1.07, females: 0.45) and an injury risk of 0.34 injuries/student/year (males: 0.52; females: 0.28)**.** Higher IIDs were found in roller skating, football and basketball. The majority of injuries occurred outdoors and involved the lower extremities, with sprain and strain being the primary injury types. Moreover, most injuries were new, acute, and happened in non-contact situations. Of all injuries, 52.1% required medical attention and 64.6% resulted in inactivity of one or more days. Some significant differences were observed between males and females. Our study indicates that PARI is a public health concern among Chinese university students, which can provide direction for targeted prophylactic interventions to underpin the sex-specific injury mechanism to reduce PARI.

Keywords: injury incidence, injury characteristics, sports injury, young adults

Introduction

The health benefits of physical activity (PA) participation have been well documented (1-3), contributing to the current global campaign to promote public involvement in PA (4-6). However, an adverse consequence of PA engagement is

exposed to the potentially increased risk of getting injured (7-9). This is confirmed in various age groups, between both sexes, in different kinds of PAs, and at the professional as well as the recreational level (7, 9, 10). In fact, physical activity-related injury (PARI) contributes significantly to non-fatal injury, ranking as one of the leading causes of mortality and morbidity to relatively active school-aged adolescents and young adults in many countries (11, 12). It can pose substantially negative financial consequences and cause other disadvantageous influences (e.g., physical discomfort, psychological fear, and social implications) (9, 13, 14). Apart from the future restriction of PA involvement, in a long term, a history of PARI is identified as an important predictor of injury susceptibility (15, 16).

Regardless of the negative effects of PARI, researchers firmly believed that many injuries could be prevented underlying the effectiveness of preventive strategies (17). Based on the "Sequence of prevention" model, in order to develop injury-prevention measures, we first need to have a good understanding of the injury characteristics especially for the target population (18). Owing to their release from heavy academic burdens for college admission, university students might be more physically active than those in secondary schools given that the Chinese government has advocated PA participation among the youth in the past decades (4). Moreover, they also become more independent from their parents and thus have more opportunities to take part in relatively risky sports activities which are not allowed before (19). We therefore hypothesized that the incidence and characteristics of PARI for this specific population have changed. In comparison with children and adolescents, the inherent

risk for injury resulting from PA participation among adults is higher (20). However, evidence in PARI occurrence and its characteristics among young adults is scarce. Furthermore, compared with the adequate evidence for collegiate athletes (21-23), few studies have been addressed the epidemic of PARI among the general population. Collectively, there are knowledge gaps of the PARI problem among general university students though this population may have a higher possibility to suffer from PARI.

Our baseline survey revealed that about 22.7% of Chinese general university students had experienced PARI in the past 12 months, indicating that PARI is prevalent among Chinese undergraduates (24). To further verify the PARI experience and understand the detail of each PARI episode reported in this population, we carried out this study. The research purpose of our study was to describe the problem of PARI in general university students, in terms of incidence, characteristics (i.e., activity, mechanism, localization, type, circumstance, and severity), and treatment.

Materials and methods

Study participants

This two-stage study was conducted in four universities in two Chinese cities, namely Shantou and Jinan. In the first stage, we conducted a baseline survey among 3390 students in grades 1 to 3 during March and April, 2017. Of them, 1421 students (41.9%) consented to be followed up and completed face-to-face interviews in the second stage in April and May. There were no significant differences in basic demographics (including gender, age, and study year) between the samples in two stages (all $P > 0.05$).

Data collection

A structured questionnaire was used in all interviews to collect participants' information of basic demographics (i.e., university, study major, gender, age, and study year), time of exposure (TOE) to various kinds of PAs, injury experience in the past 12 months and its characteristics.

At present, there is no appropriate PA questionnaire specifically for the general college students. Hence, from a practical perspective, we chose an effective method—students' habitual involvement in PA were evaluated using a series of standardized questions adapted from the revised and reliability-validated Children's Leisure Activities Study Survey (CLASS) Chinese version (25) and the short version of the Minnesota Leisure Time Physical Activity Questionnaire (MLTAQ) (26). It has sound reliability (Cronbach's $\alpha = 0.772$) in our study. Students were asked whether they participated in any PA (e.g., basketball, tennis, volleyball, hiking, swimming, and dancing) each week during the past 12-month periods. If yes, they were requested to provide information on their average TOE to this PA that they had taken part in per week in the past 12 months, including the frequency (total cumulative times) and duration (total cumulative minutes) on both a weekday and a weekend, respectively. On the basis of these questions, PA volume (total cumulative minutes per week) was calculated by the total cumulative minutes on a weekday plus that on a weekend. Therefore, the overall TOE to different categories of PAs in a year was estimated.

The term PARI is defined as "any injury suffered from during periods of participation in physical education (PE) class, sports activities, or leisure time PA, for

example, sprains, strains, fracture, and heat stroke" and a countable PARI episode must occur in the past 12 months and meet at least one of the following consequences: the student 1) has to immediately stop the PA and/or 2) is not able to fully engage in the next planned PA and/or 3) is absent from class the next day and/or 4) needs to seek medical aid (i.e., from providers ranging from first aid personnel to general physicians or physiotherapists etc.) (20, 27).

Participants were also inquired about all PARI events they experienced during the past 12-month period. The injured respondents were requested to describe the detailed information for each PARI episode, including 1) the setting of injury, 2) the cause of injury, 3) activity in which the injury occurred, 4) the part of the body that was injured, 5) the type of injury, 6) the injury was recurrent or newly occurred (i.e., whether the injury part was the same as the previous one or not), 7) the injury was acute or overuse (i.e., the injury occurred in a sudden event or gradually developed), 8) the injury was contact or non-contact (i.e., whether the injury occurred in collision with other person or activity surface/apparatus). In addition, subjects were further asked to provide information about the time and place of the injury occurrence, where they sought medical attention, and whether they missed any days from class or PA participation due to injuries.

The data of this stage collected by face-to-face interviews were validated and reliability-tested against the data taken by telephone interviews among 50 students one week after their completion of the earlier interview survey (average kappa coefficient = 0.775 ± 0.262).

Ethics approval

The study was strictly carried out based on the Declaration of Helsinki. Informed consent was obtained from participants and the study protocol was approved by Shantou University Medical College Ethics Committee (SUMC-2016-22) and Shandong University Ethics Committee (20161101). The purpose of the study was verbally explained to the consenting subjects by our trained personnel prior to the interviews.

Statistical analysis

Injury risk was calculated as the total number of injuries per number of students every year, while injury incidence density (IID) was calculated as the total amount of injuries per 1000 exposure hours of PA participation, i.e., any types of PA hours combined (9). The 95% confidence intervals (CIs) of the IIDs were calculated assuming a Poisson distribution (28). Two IIDs are significantly different from each other when their 95% CIs show no overlap. Continuous and categorical variables were described as mean (standard deviation, SD) and number (percentage), and tested for between-gender differences via independent-sample *t* tests and Pearson chi-square tests (when more than 20% of the cells contained less than five subjects, a Fisher's exact test was used), respectively. Statistical significance was set at two-sided $P < 0.05$. All statistical analyses were performed using SPSS 23.0 (SPSS Inc. Chicago, IL, USA).

Results

As presented in Table 1, a total of 1421 students (377 males and 1044 females,

respectively) in grades 1-3 participated into our interviews, who aged from 18 to 24 years old, with a mean age of 20.09 (SD = 1.15). Among the whole sample, 486 PARI episodes (males: 195, females: 291) were reported by 289 students (males: 95, females: 194), resulting in an overall injury risk of 0.34 injuries/student/year (males: 0.52; females: 0.28; $P < 0.001$). Students reported a mean TOE of 691.21 min/week (i.e., 11.52 h/week; males: 12.32; females: 11.23). This equals an overall IID of 0.57 injuries per 1000 hours of exposure (95% CI: 0.52, 0.62). Furthermore, there was a significant difference in IID between males (1.07, 95% CI: 0.93, 1.23) and females (0.45, 95% CI: 0.40, 0.50).

Among the places of injury, 414 PARI episodes (85.2%) occurred outdoors. More injuries were found in playing basketball (n = 117), followed by running (n = 87) and walking (n = 38). The IIDs per 1000 hours of TOE to different kinds of PAs are presented in Table 2, where roller skating (3.31/1000 hours), football (2.72/1000 hours), and basketball (2.28/1000 hours) are the top three risky sports items.

Overall, 599 injured parts of body were reported by 289 injured students. Nearly two-third (66.4%, 398/599) of all injuries were located at the lower extremities, 16.2% occurred to the upper extremities, 12.7% happened to trunk, head and neck, and the rest 28 (4.7%) were heat stroke (Table 3). A significantly gender difference in body part-specific injury rates was observed ($\chi^2 = 11.036$, $P = 0.026$). Moreover, sprain (43.0%), strain (23.6%), and abrasion or laceration (16.1%) were the most frequently injured types reported by injured subjects (Table 4), and a comparable distribution in different genders was found ($\chi^2 = 17.282$, $P = 0.027$).

There were nearly three-fold as many newly occurred (73.7%) as recurrent (26.3%) injuries (males: 63.1% vs. 36.9%; females: 80.8% vs. 19.2%; $\chi^2 = 18.810$, $P < 0.001$). A similar distribution was seen with respect to non-contact (77.2%) and contact (22.8%) injuries (males: 65.6% vs. 34.4%; females: 84.9% vs. 15.1%; $\chi^2 = 24.522$, $P < 0.001$). Additionally, another similar distribution was also observed with reference to acute (78.4%) and overuse (21.6%) injuries, but there was no significant difference between different genders (males: 76.4% vs. 23.6%; females: 79.7% vs. 20.3%; $\chi^2 = 0.757$, $P = 0.384$). About one third (33.1%) of all injuries occurred during leisure time PAs, 21.6% during extracurricular training activities, nearly one fifth (20.4%) during organizational sports activities in function of university PE classes, 11.5% during intracurricular PE classes, and 4.5% during match. Totally, 8.8% happened during their transportation (i.e., walking and bicycling). For males, more injuries occurred during leisure time PAs and organizational sports activities (60.5%), but more injuries occurred during leisure time PAs and training in females (48.8%). This difference was proven statistically significant ($\chi^2 = 20.349$, degree of freedom (df) = 5, $P = 0.001$) (Figure 1).

For 52.1% of all cases, medical attention was required, and over half of which visited university infirmary, followed by hospitals and clinic of orthopedics. A significant difference was found in medically treated injuries between males and females (males: 37.4%; females: 61.9%, $\chi^2 = 32.174$, df = 5, $P < 0.001$). In 35.4% of all injuries, the injured students were able to persevere attendance at PA. Nearly 28.4% had a withdrawal time of 1-4 days, and about one fifth (19.8%) of the injured

participants experienced an inactivity of 5-7 days. Only 16.5% of all cases led to an inactivity of one or more weeks (Table 5). No significant difference was observed between males and females ($\chi^2 = 8.924$, $P = 0.178$). With reference to class absence, more male cases involved no time loss compared with female injuries (90.3% vs. 81.8%). Moreover, female injured students had a larger proportion of class absence of 1-4 days (13.7% vs. 3.6%), while males had a slightly greater portion to experience time loss of at least five days (6.2% vs. 4.5%) (Table 6). A significant difference was found between different genders (Fisher's exact = 15.376, df = 6, $P = 0.004$).

Discussion

PA is vitally beneficial for us to achieve and maintain individual optimal well-being, but it carries with the risk of injury (7, 29). This study—the first study to describe the incidence and characteristics of PARI among Chinese general university students—revealed an overall IID of 0.57 injuries per 1000 hours of exposure (males: 1.07; females: 0.45) and an injury risk of 0.34 injuries/student/year (males: 0.52; females: 0.28). Given that few studies had revealed the problem of PARI and described its characteristics among general university students, it would be rather difficult for us to make comparisons of the issue specifically for this population. We therefore used findings from collegiate athletes or reports of sports injury for comparisons. The injury risk of 0.34 injuries/student/year in our general university students was clearly lower than those observed in physical education teacher education (PETE) students or other athletic populations (9, 30). For example, Goossens et al. revealed an injury risk of 0.85 injuries/student/year among 128

Belgian PETE students, which is 2.5 times of that in this study. A similar situation was also found in the IID, where reports from previous studies among collegiate athletes were somewhat higher than this study (9, 22, 31, 32). The lower TOE of 11.52 h/week in our population compared with the athletes (9, 31) probably contributed to the lower injury risk and IID in our study. Also, the divergence of injury definitions might underline this difference (7, 9). In this study, we also take those injuries causing class absence into account, but the injury risk was nonetheless lower than that of the earlier studies (9, 30). Moreover, the different era and populations in which data were collected might contribute partly to this discrepancy (9, 22).

In contemporary China, near half of graduates from secondary schools (48%) can be admitted into different colleges and universities (33), resulting in a huge population size of college students. According to the 2015 one-percent national sample census, the number of current college students aged 18-24 years hit 39.7 million, accounting for 32.6% of the total national population at the same age (33). We therefore estimated that there would be 13.5 million PARIs occurring among all college students in China each year. Thus, though the injury risk in this study was far lower than the above-mentioned studies, the public health impact of PARI is large and should be paid more attention on. We need to attach great importance to this problem particularly underlying the fact that PA promotion is a public health priority.

We found that more injuries happened during extracurricular sports activities. Roller skating (3.31/1000 hours), football (2.72/1000 hours), and basketball (2.28/1000 hours) had higher IIDs though their exposure times were not the highest in

our subjects. This might relate with the greater possibility of physical contact, jumping, sprinting, and/or pivoting among them (34). However, the IIDs of these relatively risky PAs were clearly lower than those in other sports-active populations. For example, the IIDs among National Collegiate Athletic Association (NCAA) women's and men's basketball were 6.54 and 7.97/1000 athlete-exposures (AE), respectively (22), while NCAA football players had higher IIDs of 8.07 and 8.44/1000 AE in women and men, respectively (35). These may indicate that IIDs increase with higher PA levels, and this increase may relate to the higher intensity of gameplay in more elite populations (22). Admittedly, different IIDs may also be the result of various methodologies, more studies are therefore warrant to enable us to more validly compare IIDs across levels and within populations across time (22).

In fact, PARI (the primary contributor of non-fatal injury) is the one health threat to school-aged adolescents and young adults (11, 12). It could cause not only considerable financial costs but other indirect adverse effects such as fear or discontinuity of PA involvement (14, 36). Our study indicated that over half (52.1%) of the injured students sought medical attention, and more than half of which the visit of university infirmary was required. Compared with males who had higher injury risk and IID, a larger proportion of medically attended injuries were observed among female students, with a significant difference (61.9% vs. 37.4%, $P < 0.001$). One possibility is that females may be more careful of their health and therefore seek medical care. In addition, about 64.6% of all injuries resulted in time loss from activity, the majority of which was 1-7 days. This is not in accordance with the

findings reported by Goossens et al. who found that over half of all cases involved the inactivity of at least one week (9). An important distinction to note in our study is that we considered class absence as another consequence of injury definition, aiming to obtain a better understanding of the true epidemiology of PARI. We found that about 15% of the students experienced a class absence due to injuries. These results indicate that PARI does have associated medical costs and there is also a cost to physical inactivity or class absence. Most injuries are preventable, and costs as a result of PARIs can be reduced accordingly (13). It is therefore urgent to develop injury-prevention strategies when we stimulate students to take part in PA to enhance their health.

With respect to injury types, we observed a good portion (66.6%) of sprain and strain. Comparable results in other sports-active populations were also obtained, where sprain and strain comprised the predominant proportion of injuries, irrespectively of sports (22, 23, 35). Furthermore, most injuries for general university students were new, acute, and occurred in non-contact situations, which parallels with the earlier reports (9). IIDs varied by PAs, but students in different PAs sustain the lager part of injuries to a specific extremity (21). Another specific characteristic is the fact that lower extremity injuries accounted for nearly two thirds of all injuries. This finding is in line with previous epidemiological investigations in various NCAA sports. Nearly 70% of all NCAA women’s and men’s basketball injuries are to the lower extremities (22). Reports from other PAs like soccer, volleyball, and tennis also reveal that most injuries locate at the lower extremities (21, 23, 35). These consistent

reports involving various kinds of PAs are important to both sport practitioners and researchers to develop injury intervention programs for university students to reduce injury rates across the whole body. Differences in injury location might be due to anatomical and neuromuscular discrepancies, and/or disparities in activities involvement between males and females (37, 38). Other than the frequent involvement in most sports, there are possibly several contributors to the higher injury rates of lower extremity, including constant deceleration/acceleration, various court surfaces, and latent high-load frontal plane movements (21). We should put enough emphasis on these potential factors to lower extremity injuries, which is the key to implement effective and practical injury prevention and rehabilitation programs.

Some limitations should be concerned when interpreting our findings. Previous study noted that cross-sectional study provides less accurate IID and risk because it depends largely on participants' responses and memories, and on diagnoses that lack verification from a physician (39). This means that the loss of information due to participants' recall of PARI episodes and the tendency to remember later and major injuries clearly but forget earlier and minor events easily may influence the results to some extent. Similar with earlier findings (36), our study revealed that 64.6% of the injured students experienced an inactivity of at least one day; that is to say, PARI—especially the multiple PARI episodes can hinder students from exercising. However, we could not capture its dynamic changes as PA data were measured only once in this study, and therefore might have overestimated the PA exposure hours. Furthermore, PA (as a socially desirable behavior) is likely to be over-reported (40),

which may also have led to overestimation of PA levels. Consequently, the overestimated PA in this study may have biased our results by underestimating the IIDs. Furthermore, there were discrepancies existing in study methods across studies (e.g., different measurements of PA exposure), which might have also partially contributed to the different outcomes (e.g., IIDs) observed between our study and others. Through telephone interviews after their completion of the face-to-face investigations, we obtained reliable results via one-week test-retest. Nevertheless, the nature of cross-sectional study is still the limitation of our study because we cannot fully preclude the possibility of recall and reporting bias. Moreover, chosen from the baseline survey, the subjects who participated in this interview were not a completely random sample though their basic demographics were similar in two stages. This may limit the generalizability of our results. Our group is conducting a prospective cohort study to avoid these limitations and form a good representation to describe PARI in general university students.

Perspectives

With an injury risk of 0.34 injuries/students/year (males: 0.52; females: 0.28) and an IID of 0.57 injuries per 1000 hours of exposure (males: 1.07; females: 0.45), PARI is a public health concern among college students in China, given the huge number of this population. It should not be ignored when promoting a physically active lifestyle. A great portion of these injuries occurred during extracurricular sports activities, and the top three risky PAs were roller skating, football, and basketball, respectively. More injuries occurred outdoors and involved the lower extremities, with sprain and

strain being the main injury types. Additionally, most injuries were newly occurred, acute, and took place in non-contact situations. Over half (52.1%) of the injuries required medical attention and 64.6% led to the inactivity of one or more days. Significant differences were observed between males and females in part of the injury characteristics. Considering that evidence about PARI problem is scarce, more studies should be conducted to form a good view of injuries among general university students, which is valuable to develop effective prophylactic interventions for high-risk populations to reduce PARI.

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Conflict of interest

None declared.

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Tables and figures

Table 1. Baseline characteristics of the Participants

Characteristics	Total population mean (SD)	Males mean (SD)	Females mean (SD)	χ^2/t	*P*
Grade, n (%)				4.524	0.104
Year 1	556 (39.1)	161 (42.7)	395 (37.8)		
Year 2	447 (31.5)	103 (27.3)	344 (33.0)		
Year 3	418 (29.4)	113 (30.0)	305 (29.2)		
Age, years	20.09 (1.15)	20.10 (1.21)	20.08 (1.13)	0.175	0.861
TOE (min/week) [1]	691.21 (632.64)	738.99 (635.24)	673.96 (631.11)	1.712	0.087
PARI episode, n (%)				17.233	<0.001
0	1132 (79.7)	282 (74.8)	850 (81.4)		
1-2	227 (16.0)	65 (17.2)	162 (15.5)		
⩾3	62 (4.4)	30 (8.0)	32 (3.1)		

[1]: TOE, time of exposure to different kinds of physical activities.

Table 2. Incidence densities per 1000 exposure hours and 95% confidence intervals for primary physical activities among university students [1]

Activity items	Exposure time (min/week)	No. of injuries	Incidence density/ 1000 hours	95% Confidence interval
Roller skating	4535	13	3.31	1.92, 5.70
Football	11007	26	2.72	1.85, 3.99
Basketball	59250	117	2.28	1.90, 2.73
Martial arts	11270	17	1.74	1.08, 2.80
Running	61087	87	1.64	1.33, 2.02
Volleyball	23000	27	1.35	0.93, 1.97
Swimming	11895	8	0.78	0.39, 1.56
Bicycling	51751	26	0.58	0.39, 0.85
Tennis	11920	6	0.58	0.26, 1.29
Track and field	28970	13	0.52	0.30, 0.89
Badminton	53926	23	0.49	0.33, 0.74
Fitness	59635	13	0.25	0.15, 0.43
Hiking	38956	7	0.21	0.11, 0.44
Walking	379761	38	0.12	0.09, 0.16

[1]: only listed those physical activities had more than five PARI episodes.

Table 3. Distribution of injured body parts among injured participants

Characteristics	Total, n (%)	Males, n (%)	Females, n (%)
Lower extremities			
Ankle/foot/toe	208 (34.7)	85 (36.3)	123 (33.7)
Knee/shin/calf	117 (19.5)	53 (22.7)	64 (17.5)
Thigh	59 (9.8)	22 (9.4)	37 (10.1)
Hip	14 (2.3)	2 (0.9)	12 (3.3)
Sub-total	398 (66.4)	162 (69.2)	236 (64.7)
Upper extremities			
Wrist/hand/finger	49 (8.2)	24 (10.3)	25 (6.8)
Shoulder/upper arm	19 (3.2)	9 (3.8)	10 (2.7)
Elbow/forearm	29 (4.8)	9 (3.8)	20 (5.5)
Sub-total	97 (16.2)	42 (17.9)	55 (15.1)
Trunk			
Upper/lower back	22 (3.7)	8 (3.4)	14 (3.8)
Chest/abdomen	14 (2.3)	4 (1.7)	10 (2.7)
Sub-total	36 (6.0)	12 (5.1)	24 (6.6)
Head/face/neck/tooth/eye	40 (6.7)	13 (5.5)	27 (7.4)
Heat stroke	28 (4.7)	5 (2.1)	23 (6.3)
Total	599 (100.0)	234 (39.1)	365 (60.9)

Table 4. Type of the injury among injured participants

Characteristics	Total, n (%)	Males, n (%)	Females, n (%)
Sprain	229 (43.0)	102 (47.1)	127 (40.1)
Strain	126 (23.6)	58 (26.9)	68 (21.4)
Contusion	39 (7.3)	17 (7.9)	22 (6.9)
Dislocation/fracture	13 (2.4)	2 (0.9)	11 (3.5)
Tendinitis	9 (1.7)	3 (1.4)	6 (1.9)
Laceration/abrasion	86 (16.1)	30 (13.9)	56 (17.7)
Sunstroke	31 (5.8)	4 (1.9)	27 (8.5)
Sunburn	23 (4.3)	4 (1.9)	19 (6.0)
Others	23 (4.1)	7 (2.8)	16 (5.0)
Total	579 (100.0)	227 (39.2)	352 (60.8)

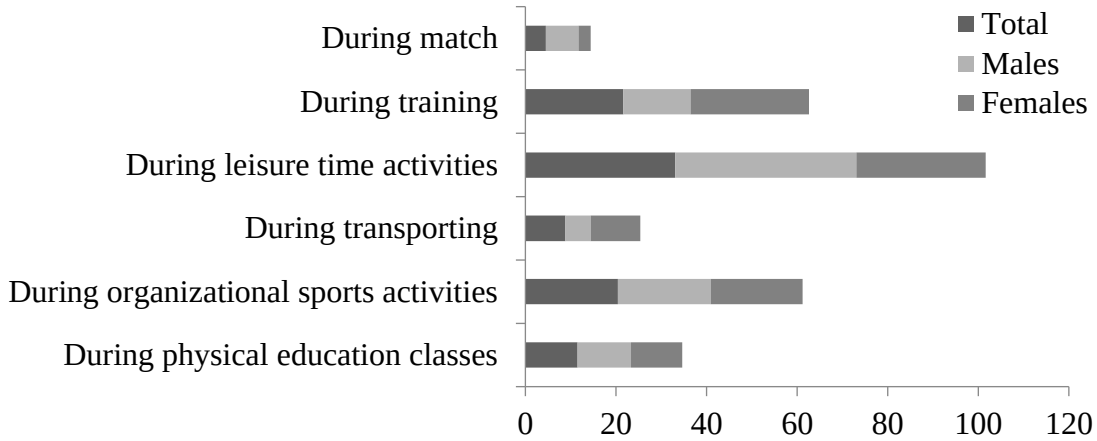

Figure 1. Circumstances of the injury among injured participants

Table 5. Time loss from physical activity among injured participants

Withdrawal time of physical activity	Total n (%)	Males n (%)	Females n (%)

No inactivity	172 (35.4)	69 (35.4)	103 (35.4)
1 day	47 (9.7)	11 (5.6)	36 (12.4)
2 to 4 days	91 (18.7)	44 (22.6)	47 (16.2)
5 days up to 1 week	96 (19.8)	40 (20.5)	56 (19.2)
1 or 2 weeks	25 (5.1)	11 (5.6)	14 (4.8)
3 or 4 weeks	22 (4.5)	7 (3.6)	15 (5.2)
More than 4 weeks	33 (6.8)	13 (6.7)	20 (6.9)

Table 6. Absence from class among injured participants

Withdrawal time of class	Total n (%)	Males n (%)	Females n (%)
No class absence	414 (85.2)	176 (90.3)	238 (81.8)
1 day	16 (3.3)	1 (0.5)	15 (5.2)
2 to 4 days	31 (6.4)	6 (3.1)	25 (8.6)
5 days up to 1 week	17 (3.5)	9 (4.6)	8 (2.7)
8 or more days lost	8 (1.6)	3 (1.5)	5 (1.7)