

Why University Athletes Choose Not to Reveal Their Concussion Symptoms During a Practice or Game

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Objective: To determine why athletes decide not to seek medical attention during a game or practice when they believe they have suffered a concussion.

Design: A retrospective survey.

Setting: University Sport Medicine Clinic.

Participants: A total of 469 male and female university athletes from several varsity team sports were participated in the study.

Main Outcome Measures: Athletes were surveyed about the previous 12 months to identify specific reasons why those athletes who believed they had suffered a concussion during a game or practice decided not to seek attention at that time, how often these reasons occurred, and how important these reasons were in the decision process.

Results: Ninety-two of the 469 athletes (19.6%) believed they had suffered a concussion within the previous 12 months while playing their respective sport, and 72 of these 92 athletes (78.3%) did not seek medical attention during the game or practice at least once during that time. Sports in which athletes were more likely to not reveal their concussion symptoms were football and ice hockey. The reason “Did not feel the concussion was serious/severe and felt you could still continue to play with little danger to yourself,” was listed most commonly (55/92) as a cause for not seeking medical attention for a presumed concussion.

Conclusions: A significant percentage of university athletes who believed they had suffered a concussion chose not to seek medical attention at the time of injury. Improved education of players, parents, and coaches about the dangers of continuing to play with concussion symptoms may help improve reporting.

Clinical Relevance: Medical staff should be aware that university athletes who believe they have suffered a concussion may choose not to volunteer their symptoms during a game or practice for a variety of personal and athletic reasons.

Key Words: concussion, symptoms, team sports, university, reasons
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INTRODUCTION

Concussions are a common occurrence in sport. Some estimates have suggested that almost 3 million sport or recreation-related concussions occur each year in the United States.¹ Not all concussions are recognized, diagnosed, and treated.² It is believed that a significant number of sport concussions go unrecognized or undiagnosed.³ Rapidly identifying, evaluating, and managing athletes who have suffered a concussion or more severe brain injury is vital. Clinicians who identify and treat these athletes must address immediate safety concerns such as ruling out serious intracranial pathology, intermediate concerns such as managing concussion symptoms and neurocognitive impairment, and long-term concerns such as safely managing the return to play process in these athletes.

It is well known that many athletes do not volunteer their symptoms once they have sustained a concussion. Possible reasons for not seeking medical attention range from not understanding they may have suffered a concussion, to deliberately choosing to not reveal their symptoms for fear of being prevented from playing their sport, or not wanting to be ostracized by teammates.^{4–10} Former professional hockey players who retired because of postconcussion symptoms revealed that they routinely hid their symptoms from teammates, coaches, and medical professionals to continue playing.¹¹ Many were only removed from competition by their coaches and medical professionals when they were no longer able to hide their concussion symptoms. The Concussion in Sport Group recommends that all athletes experiencing any signs or symptoms from a concussion be removed from play that day, monitored to ensure symptoms do not worsen, and be medically evaluated and monitored during a stepwise return to play process.^{2,12,13} Athletes who continue to play while symptomatic from a concussion are believed to be at risk for more severe injury, including second-impact syndrome, and repeated concussions may also result in progressive and cumulative neurologic and neuropsychological impairment.^{14–18} Research has also shown that athletes who

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sustain multiple concussions may be more at risk for early cognitive impairment and depression later in life.¹⁹⁻²²

Making an accurate and prompt diagnosis is paramount to managing concussions properly and preventing further injury. There is no loss of consciousness and often no obvious external signs in the majority of sport-related concussions.^{2,23} As such, physicians, therapists, and trainers are usually dependent on athletes coming forward to volunteer their symptoms. This will not occur if an athlete is unaware that their symptoms are those of a possible concussion, or they are aware, but decide not to volunteer their symptoms to their medical staff.

This study was undertaken in an effort to better understand why athletes who believe they have suffered a concussion while playing their sport “hide,” or decide not to volunteer, their symptoms to medical staff. The primary goal of the study was to identify specific reasons why athletes who believed they had suffered a concussion during a game or practice decided not to seek attention from medical staff at that time, how often these reasons occurred, and how important these reasons were in the decision process. The secondary objective was to determine whether there were individual variables that may have made an athlete more likely to not volunteer his or her symptoms to a therapist/trainer or physician during a game or practice.

METHODS

McGill University and Concordia University are both located in Montreal, Quebec, Canada. Both universities field

athletes were asked to complete an anonymous questionnaire. Anonymous questionnaires have been used in past concussion research and have been shown to be more effective than traditional prospective data collection in providing a more accurate assessment of the actual incidence of head injuries and concussions.^{8,9,24,25} Athletes have expressed concerns during past concussion research that identifying themselves on concussion questionnaires may lead to the information somehow being used against them in the future.⁹

The questionnaire (see Appendix A) first inquired about general demographic information, past recognized concussions, and other head injuries using a similar version of an existing questionnaire that has been used in previous studies with athletes.^{7-9,24,26} The questionnaire then inquired specifically about the previous 12 months including different positions and the number of games played during the past varsity season. Athletes were asked how often they believed they suffered a concussion during the previous year during a game or practice in their respective sport. They were asked how often when they believed they had suffered a concussion during a game or practice, that they sought medical attention from a therapist/trainer, physician, or other health care professional and when this occurred. Finally, athletes were asked a series of questions about possible reasons why, during a game or practice in the previous 12 months, they chose not to seek medical attention at the time they believed they had suffered a concussion. They were given a number of possible reasons and for each reason they were asked:

a) Number of times this occurred: _____ times over past 12 months

b) How important was this reason most of the time:

0 1 2 3 4 5 6 7 8 9 10

(0 is not important at all, 5 is moderately important, 10 is very important)

numerous sports teams in Canadian Interuniversity Sport (CIS), which is the Canada wide organization that governs university sport. Medical coverage for varsity teams is provided by physical therapists (PTs), athletic therapists/trainers (ATs), and physicians. The physicians and therapists/trainers follow the specific team for the entire season and are well known to the athletes and coaches. All games and most practices for varsity sports at both universities are covered by certified PTs or ATs. Student PTs or ATs occasionally cover practices with a certified PT or AT on call in the university sport medicine clinic for backup. Physicians are usually present at games, depending on the sport.

Athletes (N = 469) participating in varsity football, soccer, ice hockey, basketball, and rugby at each university were approached in the fall of 2012 to participate in the study. Athletes were given an information and consent form. All athletes approached agreed to participate. Once enrolled,

It should be noted that the questionnaire did not list the signs and symptoms of a concussion. This was performed purposely to include only those episodes where the athlete self-diagnosed their concussion during a game or practice, and avoid biasing an athlete into considering episodes where they did not believe, at the time, that they had suffered a concussion.

For each categorical outcome of interest, we report the proportion of players in each sport within each category of the outcome. For continuous outcomes, we report median and interquartile range because neither of them showed evidence of normality. In the cohort of players who felt they had experienced a concussion while playing their sport during a game or practice within the past 12 months, we compared the proportion of those athletes who did not seek medical attention during the game or practice versus those athletes who sought medical attention during the game or practice.

These hypotheses were tested with χ^2 tests for goodness-of-fit. Associations between these groups and their particular sport, gender, whether the player had past diagnosed concussion, and different positions within the same sport were all investigated with χ^2 tests for independence. When comparing the distribution of values for number of years playing their respective sport, as well as for number of past concussions, between these groups, we used Wilcoxon rank-sum test. All analyses were performed using SAS (version 9.2; SAS Institute Inc, Cary, North Carolina). All statistical hypothesis tests were 2-sided and performed at the 0.05 significance level. The study was approved by the Ethics Review Board of the McGill University School of Medicine.

RESULTS

The demographic information for the athletes answering the questionnaires is listed in Table 1. The numbers of athletes who had experienced a past diagnosed concussion and when these occurred are listed in Table 2.

Ninety-two of the 469 athletes (19.6%) believed they had suffered a concussion within the previous 12 months while playing their respective sport. There were a total of 147 self-diagnosed concussions among these 92 athletes. Although 64 of the 92 athletes felt that they had suffered 1 concussion (71.7%), 15 (17.4%) felt they had suffered 2, 5 (5.4%) felt they had suffered 3, 3 (3.3%) felt they had suffered 4, 4 (4.3%) felt they had suffered 5, and 1 athlete (1.1%) felt he/she had suffered 6 concussions during the past 12 months while playing their respective sport.

Of the 92 athletes who believed they had suffered a concussion within the previous 12 months while playing their respective sport, 46 athletes (50.0%) stated that at some point they did seek medical attention, for a presumed concussion, from a physician or therapist/trainer during a game or practice. Seventy-two of these 92 athletes (78.3%) did not seek medical attention during a game or practice at least once during the previous 12 months for

a presumed concussion. Table 3 lists the reasons those athletes who felt they had suffered a concussion during a game or practice did not seek medical attention or volunteer their symptoms to a physician or therapist/trainer during a game or practice. Table 3 also lists the medians of how important these reasons were. The reason “Did not feel the concussion was serious/severe and felt you could still continue to play with little danger to yourself,” was listed most frequently (55/92) as a cause for not seeking medical attention for a presumed concussion.

Some athletes were consistent in their behavior in response to a presumed concussion during a game or practice. Of the 92 athletes, 44 (47.8%) never sought any medical attention during a game or practice for their self-diagnosed concussions, whereas 18 of the 92 (19.6%) always sought medical attention during a game or practice for their self-diagnosed concussions. Many athletes, however, had different responses to separate episodes within the same 12-month period. Of the 92 athletes, 28 (30.4%) had episodes where they did seek medical attention during a game or practice and other episodes where they did not seek medical attention during a game or practice for a self-diagnosed concussion. Of the 92 athletes, 2 (2.2%) athletes answered they believed they had suffered a concussion during a game or practice but did not answer whether they did or did not seek medical attention during the game or practice.

When examining variables that may have predisposed to not seeking medical attention during a game or practice for a presumed concussion, the 44 of the 92 athletes who never sought any medical attention during a game or practice were compared with the 18 of the 92 athletes who always sought medical attention during a game or practice for their self-diagnosed concussions. Athletes who had both behaviors (28/92) were excluded. Sports in which athletes were more likely to hide their concussion symptoms were football ($\chi^2 = 4.76, P = 0.03$) and ice hockey ($\chi^2 = 5.00, P = 0.02$). There were no statistical differences found between the different sexes, different positions within the same sport, number of years

TABLE 1. Demographics of Athletes Responding to Questionnaire*

	Football	Basketball	Hockey	Rugby	Soccer	All
No. players (N)	146	41	94	90	98	469
Females, n (%)	0	15 (36.6)	40 (42.6)	45 (50.0)	47 (48.0)	147 (31.3)
Males, n (%)	146 (100)	26 (63.4)	54 (57.5)	45 (50.0)	51 (52.0)	322 (68.7)
Age at time of study	21 (20-22)	21 (20-22)	21 (20-22)	20 (19-22)	20 (18-21)	21 (19-22)
Total years played of respective sport†	9 (6-11)	10 (8-12)	15 (13-16)	5 (4-8)	13.5 (12-15)	10 (7-14)
No. games played previous year for respective sport‡	9 (3-10)	30 (20-30)	35 (25-50)	8 (6-11)	18 (10-24)	11 (8-26)
Played in CIS the previous year§, n (%)						
Yes	77 (52.7)	29 (70.7)	63 (67.0)	32 (35.6)	51 (52.0)	252 (53.7)
No	69 (47.3)	12 (29.3)	31 (33.0)	58 (64.4)	47 (48.0)	217 (46.3)

*Data presented as n (%) or median (IQR), where IQR refers to interquartile range from 25% percentile to 75% percentile.

†N = 467 (1 missing in hockey, 1 missing in rugby).

‡N = 465 (2 missing in football, 2 missing in rugby).

§CIS refers to Canadian Interuniversity Sport is the Canada wide organization that governs university sport.

TABLE 2. Past Diagnosed Concussions in Athletes (N = 467)*

Sport	Athletes With No Past Diagnosed Concussions, n (%)	Athletes With Past Diagnosed Concussions, n (%)	No. Concussions Suffered at Each Level of Sport†				
			Pre-High School	High School	Cegep‡	University	Other§
Football							
Female (N = 0)	NA	NA	NA	NA	NA	NA	NA
Male (N = 145)	103 (71.0)	42 (29.0)	6	40	12	13	2
Basketball							
Female (N = 15)	10 (66.7)	5 (33.3)	1	0	4	1	0
Male (N = 26)	22 (84.6)	4 (15.4)	1	1	4	0	0
Hockey							
Female (N = 40)	23 (57.5)	17 (42.5)	4	13	5	7	0
Male (N = 54)	29 (53.7)	25 (46.3)	3	13	7	14	10
Rugby							
Female (N = 45)	28 (62.2)	17 (37.8)	0	15	9	3	2
Male (N = 44)	27 (61.4)	17 (38.6)	1	13	7	13	0
Soccer							
Female (N = 47)	23 (48.9)	24 (51.1)	4	13	5	12	0
Male (N = 51)	37 (72.5)	14 (27.5)	2	7	1	4	0
Totals (N = 467)	302 (64.7)	165 (35.3)	22	115	54	67	14

*Data were missing from 2 subjects: 1 in football and 1 in rugby (male).

†Athletes with a diagnosed past concussion may have had these at more than one level of sport.

‡Cegep is a level of schooling for athletes in some areas of Canada that encompasses grades 12 and 13 but may be completed over a 2- to 3-year period of time.

§“Other” included city leagues or semi-professional level.

playing their respective sport, number of prior concussions, and those athletes with a past diagnosed concussion versus those without a past diagnosed concussion.

DISCUSSION

The study revealed that 92 of the 469 athletes believed they had suffered a concussion within the previous 12 months while playing their respective sport. The majority of these 92 athletes (72/92) believed that they had suffered a concussion but decided not to seek medical attention from a therapist/trainer or physician during the game or practice for at least 1 episode during the previous 12 months. Similar to past research, the reason “Did not feel the concussion was serious/severe and felt you could still continue to play with little danger to yourself,” was listed most commonly (55/92) as a cause for not seeking medical attention for a presumed concussion.⁴ Experts agree that all athletes suffering from a concussion should be removed from play and not return the same day.²⁷⁻³⁴ Alarming, this behavior is something that recurs in concussed athletes as many (35/92) stated they did not volunteer symptoms because they “had similar symptoms of a concussion in the past and felt that there was little or no danger as you had no problems with previous concussions or similar symptoms in the past.” These findings underscore the importance of concussion education for athletes, parents, and coaches. All groups must be made aware of the risks of continuing to play while suffering from a concussion.

Coaches should also be aware that their attitudes and behavior toward concussions and injured athletes may

encourage some athletes not to come forward with their symptoms. This may have been a factor for some athletes who answered they did not reveal their symptoms at the time of injury because of “Fear that being diagnosed with a concussion would affect your standing with the current team or future teams” (30/92) and “Fear that being diagnosed with a concussion would result in negative of repercussions from the coach or coaching staff” (20/92). Past research has revealed that some concussed athletes do not volunteer their concussion symptoms for fear of losing their jobs or roles on the team.¹¹

Athletes are often already aware of the initial and possible subsequent management of a concussion as many answered “You felt that you would be removed from the game by the medical staff and you did not wish this to happen” (44/92) and “Fear that being diagnosed with a concussion would result in your missing future games” (44/92). It is interesting to observe that many athletes seem quite knowledgeable about the potential of being removed from a game or practice if they volunteer having concussion symptoms. However, many also behave as if they are not well educated about the risks of continuing to play with a presumed concussion, or they choose to ignore this knowledge and continue to play regardless. Even when those athletes who answered that they wanted to finish the game or practice before seeking medical attention were asked “how often did you actually seek medical attention after the game or practice?” some athletes (9/42) responded that they did not seek medical attention afterward for at least 1 episode in the previous 12 months. Clinicians and therapists should endeavor to inform athletes that prudent and safe management of an initial concussion may prevent a more serious injury,

TABLE 3. Reasons That Athletes Who Felt They Had Suffered a Concussion During a Game or Practice Did Not Seek Medical Attention or Volunteer Their Symptoms to a Physician or Therapist/Trainer

Q. No.	Reason	No. Athletes	No. Times This Occurred for Each Athlete	Median of How Important (IQR*)
1a	Wanted to finish the game or practice and planned to seek medical attention after the game	44	One = 30 Two = 8 Three = 1 Four = 2 Five = 3	6.5 (4.5-8)
1b	If you wanted to finish the game or practice and planned to seek medical attention after the game, how often did you actually seek medical attention after the game or practice?	42†	Zero = 9 One = 21 Two = 7 Three = 3 Five = 2	NA
2	You felt that you would be removed from the game by the medical staff and you did not wish this to happen	44	One = 30 Two = 11 Three = 2 Four = 1	7 (5-8.5)
3	Fear of letting the team or teammates down by being removed from the game	44	One = 28 Two = 10 Three = 3 Four = 3	8 (5-9)
4	Fear that being diagnosed with a concussion would result in your missing future games	44	One = 27 Two = 12 Three = 3 Four = 2	7 (5-9)
5	Did not feel the concussion was serious/severe and felt you could still continue to play with little danger to yourself	55	One = 41 Two = 11 Three = 2 Four = 1	7 (5-8)
6	You had similar symptoms of a concussion in the past and felt that there was little or no danger as you had no problems with previous concussions or similar symptoms in the past	35	One = 19 Two = 9 Three = 3 Four = 2 Five = 2	7 (4-10)
7	Fear that being diagnosed with a concussion would affect your standing with the current team or future teams	30	One = 17 Two = 8 Three = 4 Four = 1	7.5 (6-9)
8	Fear that being diagnosed with a concussion would result in negative of repercussions from the coach or coaching staff	20	One = 13 Two = 5 Three = 2	5 (4-10)
9	Fear of being isolated from the team or teammates by being removed and having to take time off from the team	22	One = 12 Two = 6 Three = 3 Four = 1	5.5 (4-9)
10	Normally you would have sought medical attention but the concussion occurred during an important game or at an important time of the season	34	One = 29 Two = 2 Three = 3	7.5 (6-9)
11	Fear that being diagnosed with a concussion would cause concern and worry amongst family or friends	20	One = 9 Two = 8 Three = 1 Four = 2	6.5 (3-10)

(continued on next page)

TABLE 3. (Continued) Reasons That Athletes Who Felt They Had Suffered a Concussion During a Game or Practice Did Not Seek Medical Attention or Volunteer Their Symptoms to a Physician or Therapist/Trainer

Q. No.	Reason	No. Athletes	No. Times This Occurred for Each Athlete	Median of How Important (IQR*)
12	Fear that being diagnosed and labeled with a concussion could affect your financial income now or in the future	11	One = 7 Two = 1 Three = 1 Four = 0 Five = 2	7 (1-9)
13	The injury did not occur when any medical personnel were present and you did not have time or desire to go to a medical clinic or hospital to be examined	15	One = 8 Two = 4 Three = 3	6 (4-8)
14	Other reasons for not volunteering symptoms	0	NA	NA

*IQR refers to interquartile range from 25% percentile to 75% percentile.
 †N = 42 athletes (ie, 2 athletes did not answer question 1b after answering affirmative to question 1a).

which may result in even more time lost from athletics, school, or work. If an athlete is aware of this, they may be more forthcoming with an initial concussion injury.^{35,36}

Individual athletes may behave differently during different episodes of a presumed concussion. The same athlete may decide not to volunteer symptoms during 1 episode and volunteer during another. Although this study cannot determine why this occurred in each individual athlete, some athletes did acknowledge that they did not report symptoms because “Normally you would have sought medical attention but the concussion occurred during an important game or at an important time of the season” (34/92). Past research on head injury patients has also speculated that seeking medical attention may sometimes be based more on the severity of the symptom(s), rather than the presence of individual symptom(s).³⁷

Not all teams have the resources to have medical staff present at all games or practices. As is occurring in many recreational leagues in Canada and in the USA, therapists, trainers, or emergency medical technicians (EMTs) are provided by sport facilities to cover sporting events occurring at the facility.³⁸ If medical staff is present, these people should be introduced and known to the athletes, parents, and coaches before play to prevent reasons such as “The injury did not occur when any medical personnel were present and you did not have time or desire to go to a medical clinic or hospital to be examined.” Coaches are also being trained on the basics of diagnosis and management of head injuries during certain certification programs and can be a valuable asset in the safe management of athletic head injuries and suspected concussions.³⁹

LIMITATIONS

There were several limitations in this study. The study size may not have been large enough and contain enough power to answer some of secondary outcome questions

posed. This was especially true in trying to determine which individual variables may have made an athlete more likely to hide or not report their concussion symptoms to medical staff. Although football and ice hockey were found to be the sports in which athletes were more likely to hide their concussion symptoms, these were also the sports with the largest number of self-diagnosed concussions and may have been better able to detect differences. A larger study involving more athletes or following the same athletes over multiple years may be better able to answer some of the secondary outcomes and questions posed in this study.

The study is retrospective in nature and thus not ideal in that respondents can forget symptoms, self-diagnosed concussion episodes, and their decision-making process. It also does not allow for identification of which specific symptoms resulted in an athlete self-determining that they had suffered a concussion, or whether severity of specific symptoms was more important in their decision-making process. The design of the study also makes it impossible to determine what medical personnel were present at all practices and games for each sport. Although unlikely, it is possible that some practices or games did not have medical personnel present, or at least some athletes were unaware of their presence.

The questionnaires were answered anonymously. Although this makes it impossible to confirm or gather further data from respondents, it was decided that they would be less inhibited in answering an anonymous questionnaire. Athletes have expressed concerns during past concussion research that identifying themselves on concussion questionnaires may lead to the information somehow being used against them in the future.⁹ The anonymity allowed respondents to answer truthfully with less fear of negative repercussions and was especially important in this study, where we specifically were addressing episodes where they did not volunteer their self-diagnosed concussion episodes to medical staff. However, it is possible that some athletes were still

fearful of volunteering that they hid concussions in the past, perhaps leading to an underestimation of the problem.

CONCLUSIONS

Based on the findings in this study, a significant percentage of university athletes who believed they have suffered a concussion chose not to disclose this information to medical personnel. A majority did not believe their symptoms were serious and many felt that because they had suffered similar episodes in the past, there was little or no danger to them if they continued playing. Despite the limitations of this study, it highlights the numerous and varied reasons as to why an athlete may not volunteer their concussion symptoms. Better education for players, parents, and coaches, as well as improving medical coverage and identifying the supervising medical staff before a game or practice may help to improve this situation.

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APPENDIX A QUESTIONNAIRE USED FOR UNIVERSITY BASKETBALL ATHLETES

Section 1. Basketball History

If additional space is needed for explanation, please use the reverse side.

1. How old are you now? _____
2. Are you: male _____
 female _____
3. At what age did you start playing organized basketball? _____
4. How many years have you played?
 - a) Pre-high school basketball _____
 - b) High school basketball _____
 - c) Cegep basketball _____
 - d) University basketball _____
 - e) Other (Major Junior, Semi-professional, etc.) _____
 - f) Professional _____
5. How many years TOTAL have you played ALL types of organized basketball? _____
6. Did you play in the CIS last year (ie, 2011 season)?
 YES _____ NO _____
 If YES, with which team did you play your last game? _____
 If NO:
 - a) In which league did you play your last game?
 (eg, CIS/College, CEGEP, High school, etc.) _____
 - b) In what year did you play your last game?
 (eg, 2011, 2010, 2009, etc.) _____
7. Approximately how many games did you play last season?
 (Please also include exhibition, preseason and playoff games) _____
8. Which was your **primary position** (most often played) **last year**?
 (Circle your response—may circle **only one** answer)
 - a) Point Guard
 - b) Shooting Guard
 - c) Forward
 - d) Power Forward
 - e) Center
9. Which **other position(s)** did you play **last year**?

(Circle your response—may circle **more than one** answer)

- a) Point Guard
- b) Shooting Guard
- c) Forward
- d) Power Forward
- e) Center

Questions 10 and 11 apply to all of your PAST CONCUSSIONS and HEAD INJURY EXPERIENCES (not only in basketball but in all aspects of your life)

Note: Duration of symptoms for the following questions can be listed in number of **seconds, minutes, hours, days, weeks**, etc.

10. Prior to 2011 season, have you ever been told that you had a **concussion**?

YES _____ NO _____

If **YES**, how many times did you have a concussion? Please also list the **longest duration** that you had symptoms from the concussion.

- a) Number pre-high school _____ Longest duration _____
- b) Number in high school _____ Longest duration _____
- c) Number in cegep _____ Longest duration _____
- d) Number in university _____ Longest duration _____
- e) Number in professional _____ Longest duration _____

If **YES**, who *usually* told you that you had a concussion? (*Please check one*)

If it was someone *other* than the trainer/team doctor (eg, you decided yourself, nurse, parent), please specify who it was.

- a) Pre-High School: Trainer _____ Team doctor _____ Other (explain) _____
- b) High School: Trainer _____ Team doctor _____ Other (explain) _____
- c) Cegep: Trainer _____ Team doctor _____ Other (explain) _____
- d) University: Trainer _____ Team doctor _____ Other (explain) _____
- e) Professional Trainer _____ Team doctor _____ Other (explain) _____
- f) Other: Trainer _____ Team doctor _____ Other (explain) _____

11. Prior to last year, have you ever been suffered a **serious head injury** that was not a concussion (eg, Skull fracture, brain bleed etc.)?

YES _____ NO _____

If **YES**, please explain what occurred, how old you were, and where you were treated.

Section 2. Concussions in the Past 12 Months

This section deals with concussions that occurred while you were **playing organized basketball** in the **past 12 months**

1. How often do you believe you suffered a concussion while playing basketball in the past 12 months?

_____ times

2. How often did you seek medical attention or volunteer your symptoms to a therapist/trainer, doctor or other medical staff **during** the game or practice when you believed you suffered a concussion playing basketball?

_____ times

3. How often did you seek medical attention or volunteer your symptoms to a therapist/trainer, doctor or other medical staff **after** the game or practice when you believed you suffered a concussion playing basketball?

_____ times

For Questions 4 to 17:

When you believe you likely suffered a concussion but did NOT seek medical attention or volunteer your concussion symptoms to medical staff during the game or practice, how often and important were the following reasons for NOT seeking medical attention.

Note: i) # of times refers to how often this was a reason to NOT volunteer your symptoms to medical staff during the game

ii) How important each reason is scored on a 10 point scale where:

0 is not important at all

5 is moderately important

10 is very important

iii) You can choose more than one answer as several reasons may have been involved in your decision not to seek medical attention during a game or practice.

Reasons for not volunteering symptoms of a concussion to medical staff:

4. Wanted to finish the game or practice and planned to seek medical attention after the game.

a) # of times this occurred: _____ times

b) how important was this reason most of the time:

0 1 2 3 4 5 6 7 8 9 10

(0 is not important at all, 5 is moderately important, 10 is very important)

c) How often did you actually seek medical attention after the game or practice?

_____ times

5. You felt that you would be removed from the game by the medical staff and you did not wish this to happen.

a) # of times this occurred: _____ times

b) how important was this reason most of the time:

(0 is not important at all, 5 is moderately important, 10 is very important)

6. Fear of letting the team or teammates down by being removed from the game.

a) # of times this occurred: _____ times

b) how important was this reason most of the time:

(0 is not important at all, 5 is moderately important, 10 is very important)

7. Fear that being diagnosed with a concussion would result in your missing future games.

a) # of times this occurred: _____ times

b) how important was this reason most of the time:

(0 is not important at all, 5 is moderately important, 10 is very important)

8. Did not feel the concussion was serious/severe and felt you could still continue to play with little danger to yourself.

a) # of times this occurred: _____ times

b) how important was this reason most of the time:

(0 is not important at all, 5 is moderately important, 10 is very important)

9. You had similar symptoms of a concussion in the past and felt that there was little or no danger as you had no problems with previous concussions or similar symptoms in the past.

a) # of times this occurred: _____ times

b) how important was this reason most of the time:

(0 is not important at all, 5 is moderately important, 10 is very important)

10. Fear that being diagnosed with a concussion would affect your standing with the current team or future teams.

a) # of times this occurred: _____ times

b) how important was this reason most of the time:

0 1 2 3 4 5 6 7 8 9 10

(0 is not important at all, 5 is moderately important, 10 is very important)

11. Fear that being diagnosed with a concussion would result in negative of repercussions from the coach or coaching staff.

a) # of times this occurred: _____ times

b) how important was this reason most of the time:

0 1 2 3 4 5 6 7 8 9 10

(0 is not important at all, 5 is moderately important, 10 is very important)

12. Fear of being isolated from the team or teammates by being removed and having to take time off from the team.

a) # of times this occurred: _____ times

b) how important was this reason most of the time:

0 1 2 3 4 5 6 7 8 9 10

(0 is not important at all, 5 is moderately important, 10 is very important)

13. Normally you would have sought medical attention but the concussion occurred during an important game or at an important time of the season.

a) # of times this occurred: _____ times

b) how important was this reason most of the time:

0 1 2 3 4 5 6 7 8 9 10

(0 is not important at all, 5 is moderately important, 10 is very important)

14. Fear that being diagnosed with a concussion would cause concern and worry amongst family or friends.

a) # of times this occurred: _____ times

b) how important was this reason most of the time:

0 1 2 3 4 5 6 7 8 9 10

(0 is not important at all, 5 is moderately important, 10 is very important)

15. Fear that being diagnosed and labeled with a concussion could affect your financial income now or in the future.

a) # of times this occurred: _____ times

b) how important was this reason most of the time:

0 1 2 3 4 5 6 7 8 9 10

(0 is not important at all, 5 is moderately important, 10 is very important)

16. The injury did not occur when any medical personnel were present and you did not have time or desire to go to a medical clinic or hospital to be examined.

a) # of times this occurred: _____ times

b) how important was this reason most of the time:

0 1 2 3 4 5 6 7 8 9 10

(0 is not important at all, 5 is moderately important, 10 is very important)

17. Please list *any other reasons* that affected your decision NOT to volunteer your concussion symptoms to medical staff during a game or practice:

Reason 1: Please explain reason:

a) # of times this occurred: _____ times

b) how important was this reason most of the time:

0 1 2 3 4 5 6 7 8 9 10

(0 is not important at all, 5 is moderately important, 10 is very important)

Reason 2: Please explain reason:

a) # of times this occurred: _____ times

b) how important was this reason most of the time:

0 1 2 3 4 5 6 7 8 9 10

(0 is not important at all, 5 is moderately important, 10 is very important)