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Physical activity and injuries during pregnancy

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Abstract

Background—Although physical activity can provide health benefits to pregnant women, population-based research on the circumstances surrounding injuries from physical activity during pregnancy is lacking.

Methods—Physical activity and subsequent injuries among a cohort of 1,469 pregnant women in North Carolina were examined prospectively from the third phase of the Pregnancy, Infection, and Nutrition Study between 2001 and 2005. Chi-square analyses were used to compare distributions of maternal characteristics among women who sustained injuries from physical activity and women who reported no injuries during pregnancy. Injury incidence rates were calculated.

Results—Few pregnant women (N=34) reported a physical activity-related injury during pregnancy. The rates of physical activity-related and exercise-related injuries during pregnancy were 3.2 per 1,000 physical activity hours and 4.1 per 1,000 exercise hours, respectively. The most common types of injuries were bruises or scrapes (55%). Among all injuries, 33% resulted from exercise and 67% resulted from non-exercise physical activities. Sixty-four percent of all injuries were due to falls.

Conclusions—The incidence of injury from physical activity was low during pregnancy. Women should continue to be encouraged to maintain involvement in physical activity during pregnancy, while being aware of the potential for injury, particularly falls, from these activities.

Keywords

exercise; leisure activities; women; cohort

INTRODUCTION

Physical activity is beneficial for women's health as it is associated with a decreased risk of coronary heart disease, stroke, diabetes, colorectal and breast cancer, osteoporosis and improved mood and feelings of well-being. [1–3] In particular, regular exercise is important for most women during pregnancy as it helps increase energy, improve mood, promote strength and endurance, control excess weight gain, and reduce the risk of gestational diabetes. [4–11] In 2004, approximately 65.6% of pregnant U.S. women reported that they engaged in at least some leisure-time physical activity in the month before the interview. [5]

Despite an increased awareness of the importance of physical activity for health and well-being during pregnancy, women often reduce their activity during pregnancy because of concerns about the potential adverse effects on themselves and the outcome of their pregnancy. [6,12,13] Specifically, some women have reported fear of injury as a barrier to physical activity during pregnancy. [12,13] In the 1980s, the American College of Obstetrics and Gynecology (ACOG) recommended against vigorous exercise during pregnancy for previously inactive women. [14] For women who were active before pregnancy, ACOG recommended that they reduce exercise intensity in order to prevent harm to their fetus. [14] However, more recent studies have investigated the effects of exercise on pregnancy and have concluded that participation in moderate exercise and recreational activities may have favorable effects on maternal and fetal health. [15–17] Current research suggests that healthy pregnant women can maintain a physically active lifestyle and should not fear injuries to themselves or their fetus [9]. As a result, ACOG updated the guidelines in 2002 and recommended that in the absence of medical or obstetric complications, pregnant women should engage in moderate-intensity exercise for 30 minutes each day. [4] The U.S. physical activity guidelines for Americans concurred with these pregnancy-related recommendations in 2008. [18]

Although there is increasing evidence that physical activity can provide significant health benefits to pregnant women, there is a lack of population-based research on the circumstances surrounding maternal injuries resulting from these activities. Most studies pertaining to injury during pregnancy have focused on pregnancy outcomes following motor vehicle crashes [19–22] and musculoskeletal disorders and pain during pregnancy. [23–26] In addition, previous maternal injury research has focused exclusively on hospitalized or Emergency Department -attended injuries, despite the fact that these injuries are a small minority of all injuries. [20–22, 27–31] No studies to date have examined non-hospitalized physical activity-related injuries during pregnancy. Since there are many changes in a pregnant woman's body that may affect the ability to exercise, including increased joint and ligament laxity, shifts in the body's center of gravity, and increased heart rate, there may be increased injury risks during physical activities. [9]

The purpose of this study was to conduct a descriptive analysis to examine the incidence and type of injuries occurring as a result of physical activity during pregnancy among a cohort of pregnant women enrolled during pregnancy and followed to gestation. As a secondary aim, we examined fear of injury as a barrier to involvement in physical activity to explore any differences in responses between injured and non-injured women. We distinguished physical activity from exercise and physical activity from non-exercise activities (such as housework, occupational, or non-exercise walking) in order to understand the relationship between each type of activity and injury incidence.

METHODS

Data Source and Participants

This study used data from the third phase of the Pregnancy, Infection, and Nutrition (PIN3) Study. PIN3 recruited pregnant women less than 20 weeks' gestation seeking prenatal care at clinics associated with the University of North Carolina Hospitals. Trained staff identified women through review of all medical charts of new prenatal patients. Women were not enrolled if they were non-English speaking, under the age of 16 years, carrying multiple gestations, not planning to continue care or deliver at the study hospital, or did not have a telephone from which they could complete the phone interviews. Recruitment began in January 2001 and continued through July 2005, with the last birth occurring in December 2005. During this time, 3,203 women were eligible for the study, 2,006 were successfully recruited and provided informed consent, and 1,868 delivered at the University of North Carolina Hospitals. Enrolled women were asked during pregnancy to complete two telephone interviews, two clinic visits, two self-administered questionnaires distributed at the clinic visits, and an in-hospital interview. Medical records for all births were abstracted after delivery. The study was approved by the Institutional Review Board of the University of North Carolina and informed consent was obtained for all participants.

Measures

Physical Activity—A questionnaire on physical activity was administered during two telephone interviews at 17–22 and 27–30 weeks' gestation. The questionnaire assessed frequency and duration of all physical activities during the week prior to interview separately for occupational, recreational, transportation, child and adult care, and indoor and outdoor household activity. Using recreational activity as an example, the question asking about participation in particular modes of physical activity was: "In the past week, did you participate in any non-work, recreational activity or exercise, such as walking for exercise, swimming, or dancing, that caused at least some increase in breathing and heart rate?" If the participant responded 'yes', then the participant was asked to list all types of activities, one by one, with the following question: "What type of recreational activities did you do during the past week?" For each activity, the participant reported the number of sessions per week, duration of each session, and perceived intensity level using the following options: 'fairly light', 'somewhat hard', and 'hard or very hard'. The perceived intensity categories were modified from the Borg scale and corresponded to light, moderate, and vigorous intensity, respectively. [32] In addition, the activities were later assigned an absolute intensity level using published metabolic (MET) tables. [33–35] These questions were repeated for occupational, transportation, child and adult care, and indoor and outdoor household activity and coding occurred for all activities, with a detailed description available elsewhere. [12,36].

Total number of hours in the past week (h/wk) and total number of MET hours per week (MET h/wk) were computed. Activities were assigned to be exercise if they were "exercise in nature" and included "planned, structured, and repetitive bodily movement done to improve or maintain one or more components of physical fitness." [35]

The physical activity questionnaire (the structured one-week recall) took approximately 10 to 20 minutes to complete. Intra- and inter-interviewer quality control measures, such as expert review of taped interviews, were established to ensure that interviewers were asking questions reliably and systematically. The test-retest reliability of this questionnaire was measured among 109 women within 48 hours of interview completion at 17–22 or 27–30 weeks' gestation. [37] The measures used for this study generally displayed substantial agreement using Landis and Koch's classification. [36] For example, the intraclass correlation coefficient was 0.84 (95% confidence intervals, CI, 0.77–0.89) for total activity in MET h/wk. The criterion validity of this questionnaire was examined in 177 pregnant women who wore an accelerometer for one week, kept a daily structured diary, and following these two measures, completed a one-week recall of the PIN3 physical activity questionnaire. The diary generally displayed moderate to substantial agreement with the questionnaire; the Spearman correlation coefficient was 0.67 (95% CI 0.55–0.78) for total activity in MET h/wk. The agreement between the questionnaire and accelerometer was lower, with the Spearman correlation coefficient of 0.29 (95% CI 0.10–0.47) for total activity in MET h/wk comparing total counts.

Injuries Associated with Physical Activity—Injuries were ascertained at an in-hospital interview conducted shortly after the delivery of the baby. Respondents were asked, "Have you been injured as a result of your physical activity or exercise during this pregnancy?" Respondents could report any number of incidents that occurred and those who reported experiencing an injury during pregnancy were then asked: 1) date of injury occurrence; 2) type of injury; 3) part of the body that was injured; 4) physical activity at time of injury; 5) description of how the injury occurred; 6) highest level of medical treatment received; and 7) the number of additional times injury occurred as a result of physical activity. If multiple body parts were injured during a reported incident, then the number of injuries was enumerated as the number of body parts injured. Therefore, a woman may have experienced multiple injuries during one event.

In order to quantify the intensity of physical activity at the time of injury, we assigned an absolute intensity level using published metabolic (MET) tables [33–35] to each reported physical activity. The absolute intensities of physical activity at the time of each injury were categorized as “light” (<3 METS), “moderate” (3–6 METS), and “vigorous” (>6 METS).

Barriers to Physical Activity—At the second telephone interview, conducted at 27 to 30 weeks' gestation, women were asked, "What is the one main reason that keeps you from being more active while you are pregnant, either during work or nonworking time?" The interviewer recorded the open-ended response verbatim if the answer was not one of the response options in the database. These participant responses were analyzed using content analysis, a method for the objective and systematic description of qualitative data. [38,39] Categories of responses were created by one reviewer, with a second reviewer checking each decision, with disagreements resolved together. This helped ensure accuracy and reliability of decision rules, as well as consistent categorization and coding of the data. From this we ascertained a subset of women who reported "fear of injury" as their main barrier to physical activity.

Other measures—The mother’s age at time of conception was determined from the medical record and telephone interview. Women were asked during the first telephone interview at 17–22 weeks’ gestation about their race/ethnicity, marital status, education, employment, and general health. Information obtained from the medical record included self-reported weight and measured height for the determination of pre-pregnancy body mass index (BMI). BMI values were grouped using the Institute of Medicine recommendations for pregnant women into low (<19.8 kg/m^2), normal weight (19.8-<26.0 kg/m^2), overweight (26.0-<30.0 kg/m^2), and obese (>=30.0 kg/m^2). [39] Gestational age at delivery was calculated based on an algorithm that combined last menstrual period with ultrasound occurring prior to 22 weeks' gestation. [41] If an ultrasound was not recorded prior to 22 weeks' gestation, then the last menstrual period was used for calculations (n=76).

Statistical Analysis

Chi-square analyses were used to examine whether distributions of several covariates varied among women who sustained physical activity-related injuries and women who reported no injuries during pregnancy. At two time periods during pregnancy, corresponding to the two telephone interviews, we compared the percentages of injured and non-injured women who reported involvement in any physical activity and exercise during pregnancy. Exact p-values were used to account for the small sample sizes in each cell.

Physical activity-related injury incidence rates were estimated as the number of injuries divided by the total number of hours women engaged in physical activity during their entire pregnancy. We calculated the number of hours by multiplying the gestational age in weeks by the reported number of hours per week women engaged in physical activity. Exercise-related injury incidence rates were calculated similarly. Specifically, from conception to the first telephone interview, the hours per week of physical activity recorded at the first telephone interview were multiplied by the completed weeks of gestation at that time. Between the first and second telephone interviews, the number of weekly physical activity hours recorded at the first and second interviews were averaged and multiplied by the weeks

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of gestation completed between the two interviews. From the second telephone interview to delivery, the hours per week of physical activity recorded at the second interview were multiplied by the weeks of gestation completed between the second interview and delivery. In total, the number of hours used in the denominator of the incidence rates represented activity during all weeks of gestation. For the four women who did not complete a second telephone interview and were missing data regarding their participation in physical activity, we assumed that women maintained the same level of involvement in physical activity and exercise reported at the first interview and through the duration of their pregnancy.

RESULTS

Descriptive Information on the Study Population

A total of 1,469 pregnant women were included in the study population after excluding 446 women who did not complete an in-hospital interview and 91 women who had successive pregnancies (only their first pregnancy was counted). A high proportion of all pregnant women in the study population were 30–35 years old, Non-Hispanic White, married, college graduates, employed, in very good health, and/or reported normal pre-pregnancy BMI (Table 1).

Ninety-four percent of women reported at 17–22 weeks' gestation that they engaged in physical activity during pregnancy in the past week. Among these women, 84% reported fairly light activity, 63% reported somewhat hard activity, and 16% reported hard or very hard activity (categories not mutually exclusive). In regard to exercise, almost seventy percent of women reported that they engaged in exercise during their pregnancy that was at least fairly light activity. Among these women, 39% reported fairly light exercise, 37% reported somewhat hard exercise, and 8% reported hard or very hard exercise (categories not mutually exclusive). Overall, 3.3% of the women in the study population reported that fear of injury was a barrier to their involvement in physical activity when asked at 27–30 weeks' gestation.

Predictors of Injury

We examined associations between the socio-demographic/physical activity data and injury status. There were no differences in the distributions of maternal age, race/ethnicity, marital status, education, employment, general health, and pre-pregnancy BMI between women who sustained physical activity-related injuries and women who reported no injuries during pregnancy (Table 1). The proportion of women who reported that fear of injury was their main barrier to physical activity during pregnancy was also the same between injured and non-injured women (3%). However, when comparing injured and non-injured women by physical activity and exercise, we found that the percent of women who reported hard or very hard (vigorous intensity) physical activity or exercise at the first interview was significantly higher among those who were injured compared to those who were not injured (Table 2). There were no significant differences between injured and non-injured women who reported hard or very hard activity at the second interview and there were also no differences at either time period when comparing total activity or activities women reported as fairly light (light intensity) or somewhat hard (moderate intensity).

Injury Incidence

In this population of pregnant women, 34 experienced at least one physical activity-related injury (2%) and 1,435 experienced no injury (98%) during their pregnancy (Table 1). The overall rate of physical activity-related injury during pregnancy was 3.2 per 1,000 physical activity hours. The rate of exercise-related injury during pregnancy was higher, an estimated 4.1 injuries per 1,000 exercise hours.

There were a total of 44 injuries reported from the 34 injured pregnant women. Three women experienced 2 injury events during pregnancy and no one reported more than two events. Among all reported injuries, the most common type of injury was a bruise or scrape, followed by strains and sprains (Table 3). Twenty-one percent of injuries occurred to the ankle, while 16% occurred to the knee, 14% to the back, 9% to the abdomen, and 9% to the tailbone. A high proportion of all injuries occurred while the women were engaging in non-exercise activities; more than half occurred while walking (e.g., with luggage at the airport, down stairs, etc.), followed by home activities and working. The remaining one-third of all injuries occurred while pregnant women were exercising. In addition, the majority of injuries occurred as a result of moderate intensity activities, while very few occurred as a result of light or vigorous activities using absolute intensity measures.

Falls were the leading cause of all physical activity-related injuries. More than one-third of the injuries were self-treated, while a slightly lower proportion of injuries were treated in the emergency room or the doctor's office. Fourteen percent of injuries resulted in hospital admission. Among the six injuries that resulted in hospitalization, all were caused by falls, four of which occurred while the pregnant woman was walking (not for exercise). Two of the six injuries requiring hospitalization were bruises or scrapes to the back, one was a bruise or scrape to the abdomen, one was a bruise or scrape to the arm, one was a bruise or scrape to the leg and one resulted in a concussion.

DISCUSSION

The incidence of injury from physical activity and exercise in this pregnancy cohort was low. Previous studies have only reported rates for injuries resulting in hospitalization. [22, 27–31] However, we were able to include data on non-hospitalized injuries. Thus, our injury rate of 2% in this cohort (which equals 20 per 1,000 deliveries) is low when compared to those previously reported for all hospitalized injuries (i.e., from motor vehicle crashes, falls, assaults, etc.) which range from 1.6 per 1,000 deliveries during the prenatal period in California [27] to 8.7 per 1,000 person-years in Pennsylvania [31] and most recently to 3.9% (or 39 per 1,000 deliveries) in Utah. [22]

Among the 44 injuries sustained by pregnant women in our study, two-thirds occurred from non-exercise physical activities and two-thirds of all injuries resulted from falls. The majority of injured women in this pregnancy cohort sustained relatively minor injuries, including bruises, scrapes, strains, and sprains. Although there were few injuries that resulted in hospitalization, all of the hospital visits for maternal injuries were due to falls. Specifically, there were six women who sustained injuries from falls that were severe enough to result in hospitalization. These falls generally occurred during non-exercise walking. These findings support previous research indicating that falls were a leading cause of maternal injury among pregnant women. [22, 27–31] This is likely due to the musculoskeletal changes in a woman's body during pregnancy (such as increased joint and ligament laxity from hormonal changes) and shifts in the body's locus of balance from increasing body weight and changing center of gravity. [11,12,25,42,43]

The ACOG guidelines for exercise during pregnancy indicate that, in the absence of contraindications, moderate intensity non-contact activities are safe for women who engaged in these activities before pregnancy. [4] However, ACOG recommends that women avoid contact sports or activities with a higher risk for falling, due to the potential for collision, losing balance, and risk of falling. [11] In this cohort, there were no women who reported involvement in contact sports at the time of injury during their pregnancy. The majority of pregnant women were engaged in non-exercise activities at the time of injury, particularly non-exercise walking and home activities.

A higher proportion of women who were injured reported involvement in at least some vigorous activity (reported as hard or very hard) during 17 to 22 weeks' gestation than non-injured women. It is possible that vigorous activity was related to their injuries. However, only a small percentage of injuries occurred as a result of vigorous activities while the majority of injuries occurred as a result of moderately intense activities. Also, since this study is a descriptive analysis, we cannot conclude that the intensity of the physical activity at the time of injury determines the likelihood of injury.

Strengths and Limitations

This population-based study has numerous strengths, including the prospective design and the ability to ascertain all physical activity-related injuries, not just those resulting in hospitalization, in a large cohort of pregnant women. In addition, this is the first population-based study to examine the circumstances surrounding injuries resulting from physical activity and used a detailed physical activity questionnaire. However, this study is subject to several limitations.

First, the findings from this study are not generalizable to all pregnant women since the study population was selected from central North Carolina. Second, during the hospital interview, respondents reported injuries that occurred during their pregnancy. The perceived intensity of physical activity at the time of the injury was not ascertained. However, the absolute intensities of physical activity at the time of injury were quantified by assigning MET values for each activity resulting in injury. Also, physical activity was estimated from two 1-week recalls and was not collected each week. Therefore, although we assumed in our incidence rate calculations that the reported level of physical activity was consistent across the weeks, we have no way to verify this assumption. Third, since measures were self-reported, there may be the potential for over- or under-reporting of physical activity or injury and we cannot rule out the potential for recall bias. However, previous studies not specific to pregnant women found that injury status is accurately recalled for periods of up to 12 months, particularly for minor injuries such as those reported in this study. [44,45] Therefore, we do not expect there to be a significant amount of recall bias for self-reported injury in this study. Fourth, missing information regarding the exact date of injury occurrence for half of the injuries prevented the exploration of differences between injury severity or medical treatment received and the gestational age at time of injury. Finally, although reliability and validity were assessed for our physical activity questionnaires, our measures pertaining to barriers to physical activity and physical activity at the time of injury lack assessments of reliability or validity.

CONCLUSIONS

This study addresses the potential for injury from physical activity among pregnant women. Most women should continue to be encouraged to maintain involvement in physical activity and exercise during pregnancy, while being aware of the potential for injury, particularly falls, from these activities. In addition, other population-based studies are needed to extend our understanding of physical activity-related injuries during pregnancy and to confirm and extend these findings.

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TABLE 1

Socio-demographic and health characteristics of pregnant women in the third phase of the Pregnancy, Infection, and Nutrition Study (N=1,469), 2001–2005, by injury status.

	Total (N=1,469)		Injury (N=34)		No Injury (N=1,435)		
	N	**%**	**N**	**%**	**N**	**%**	**p-value***
Maternal age							
16–17	25	1.7	0	0.0	25	1.7	0.79
18–24	292	19.9	6	17.7	286	19.9	
25–29	423	28.8	11	32.4	412	28.7	
30–35	546	37.2	13	38.2	533	37.1	
36+	183	12.5	4	11.8	179	12.5	
Missing	0		0		0		
Race/ethnicity							
Non-Hispanic White	1,026	71.6	25	73.5	1001	71.5	0.49
Non-Hispanic Black	283	19.7	3	8.8	280	20.0	
Hispanic	70	4.9	4	11.8	66	4.7	
Non-Hispanic Other	55	3.8	2	5.9	53	3.8	
Missing	35		0		35		
Marital status							
Single	315	21.4	7	20.6	308	21.5	0.46
Married	1,102	75.0	24	70.6	1078	75.1	
Other	52	3.5	3	8.8	49	3.4	
Missing	0		0		0		
Education							
Less than high school	103	7.0	3	8.8	100	7.0	0.72
High school graduate	200	13.6	6	17.7	194	13.5	
Some college	284	19.3	4	11.8	280	19.5	
College graduate	882	60.0	21	61.8	861	60.0	
Missing	0		0		0		
Current employment							
Yes	637	43.4	18	52.9	619	43.1	0.29

	Total (N=1,469)		Injury (N=34)		No Injury (N=1,435)		
	N	%	N	%	N	%	p-value*
No	832	56.6	16	47.1	816	56.9	
Missing	0		0		0		
General health							
Excellent	449	30.6	12	35.3	437	30.5	0.69
Very Good	640	43.7	14	41.2	626	43.7	
Good	294	20.1	6	17.7	288	20.1	
Fair/Poor	83	5.7	2	5.9	81	5.7	
Missing	3		0		3		
Pre-pregnancy BMI							
Underweight	203	14.0	3	8.8	200	14.1	0.61
Normal	733	50.6	19	55.9	714	50.5	
Overweight	158	10.9	2	5.9	156	11.0	
Obese	355	24.5	10	29.4	345	24.4	
Missing	20		0		20		
Barriers to physical activity							
Afraid of injury	45	3.3	1	3.3	44	3.3	0.96

*P-value for the exact chi-square statistics testing the association between injured and non-injured women for each covariate.

TABLE 2

Physical activity and exercise characteristics of pregnant women in the third phase of the Pregnancy, Infection, and Nutrition Study (N=1,469), 2001–2005, by injury status.

	Injury				No Injury			
	First interview* (N=34)		Second interview† (N=30)		First interview* (N=1,432)		Second interview† (N=1,323)	
	Any Activity (%)‡	Median (IQR)§	Any Activity (%)‡	Median (IQR)§	Any Activity (%)‡	Median (IQR)§	Any Activity (%)‡	Median (IQR)§
All physical activity**								
Fairly light (h/wk)	82.4	2.0 (0.8–6.9)	80.0	2.0 (0.4–7.0)	84.2	2.1 (0.6–5.2)	80.7	1.8 (0.3–4.3)
Somewhat hard (h/wk)	73.5	2.9 (0.0–6.5)	53.3	0.5 (0.0–7.2)	62.3	1.0 (0.0–3.0)	61.2	0.8 (0.0–2.8)
Hard or very hard (h/wk)	35.3††	0.0 (0.0–0.7)	23.3	0.0 (0.0–0.0)	15.3	0.0 (0.0–0.0)	15.3	0.0 (0.0–0.0)
Total (h/wk)	94.1	6.8 (3.8–13.9)	96.7	9.5 (2.4–16.2)	94.3	4.5 (2.0–8.9)	93.2	4.0 (1.8–7.9)
Total (MET h/wk)	94.1	26.6 (14.2–53.7)	96.7	31.8 (7.1–59.9)	94.3	16.5 (7.5–33.1)	93.2	14.5 (6.0–29.0)
Exercise**								
Fairly light (h/wk)	32.4	0.0 (0.0–1.0)	36.7	0.0 (0.0–1.0)	39.3	0.0 (0.0–1.0)	34.5	0.0 (0.0–1.0)
Somewhat hard (h/wk)	47.1	0.0 (0.0–2.3)	36.7	0.0 (0.0–2.0)	36.7	0.0 (0.0–1.0)	32.8	0.0 (0.0–1.0)
Hard or very hard (h/wk)	20.6††	0.0 (0.0–0.0)	6.7	0.0 (0.0–0.0)	7.8	0.0 (0.0–0.0)	7.0	0.0 (0.0–0.0)
Total (h/wk)	70.6	2.0 (0.0–3.0)	66.7	1.2 (0.0–4.0)	66.6	1.0 (0.0–2.7)	61.0	1.0 (0.0–2.3)
Total (MET h/wk)	70.6	7.7 (0.0–17.4)	66.7	5.0 (0.0–14.4)	66.6	4.0 (0.0–11.1)	61.0	3.7 (0.0–9.3)

* The first interview was conducted during 17–22 weeks of gestation

† The second interview was conducted during 27–30 weeks of gestation

‡ Percentage of women who reported any physical activity

§ IQR=interquartile range

** Intensity categories are not mutually exclusive

†† The exact chi-square statistics testing the association between injured and non-injured women at the first interview was statistically significant at α=0.05; no other significant differences between percentages were found.

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TABLE 3

Injury characteristics among pregnant women who reported a physical activity-related injury in the third phase of the Pregnancy, Infection, and Nutrition Study (N=44), 2001–2005.

	Injuries (N=44)	
	N	**%**
Type of injury		
bruise/scrape	24	54.6
concussion	1	2.3
fracture	2	4.6
sprain	7	15.9
strain	10	22.7
Body part injured		
abdomen	4	9.1
ankle	9	20.5
arm	1	2.3
back	6	13.6
coccyx	4	9.1
elbow	1	2.3
finger	2	4.6
head	2	4.6
hips	1	2.3
knee	7	15.9
leg	3	6.8
pelvis	2	4.6
ribs	1	2.3
wrist	1	2.3
Physical activity at time of injury		
Exercise	14	32.6
Walking for exercise	8	57.1
Other exercise	6	42.9
Non-Exercise Physical Activities	29	67.4
Home activities	7	24.1
Lawn/garden	2	6.9
Occupational	3	10.3
Walking, not for exercise	16	51.7
Other, tripped over toy	1	3.5
Missing	1	
Absolute intensity of physical activity at time of injury		

	Injuries (N=44)	
	N	**%**
Light (<3 METS)	1	2.4
Moderate (3–6 METS)	35	85.4
Vigorous (>6 METS)	5	12.2
Missing	3	
Injuries from falls		
Yes	28	63.6
No	16	36.4
Type of medical treatment received		
Emergency room	12	28.6
Doctor's Office	9	21.4
Hospital Admission	6	14.3
No Treatment	1	2.4
Self-treated	14	33.3
Missing	2	