

ORIGINAL RESEARCH

Utilization of Chiropractic Care at The World Games 2017: A Retrospective Descriptive Study

Debra D. Nook, MBA,^a Erik C. Nook, PhD,^b and Brian C. Nook, DC^c

ABSTRACT

Objective: The purpose of this study was to report utilization of chiropractic care during The World Games 2017 in Wroclaw, Poland.

Methods: A retrospective analysis was performed on treatment records. Thirty-five chiropractors trained in sports injuries provided care for athletes and non-athletes (support personnel) who voluntarily sought chiropractic care. Data included demographics (age, sex, role, country, and sport), category of anatomical regions treated, treatment modality (manipulation, myotherapy, mobilization, taping, and other), and participants' self-reported pain ratings.

Results: A total of 1902 completed treatment forms representing 1902 encounters were included for athletes (n = 1238, 65%) and non-athletes (n = 664, 35%). There were 9385 individuals (athlete or non-athlete). Five hundred ninety of 3666 (16%) athletes and 422 of 5719 (7%) non-athletes received chiropractic treatment. Athletes represented 28 of 31 (90%) sports and 79 of 108 (73%) countries present. The thoracic spine was the most frequently treated spinal region (n = 846, 44%), followed by lumbar spine (n = 831, 44%) and cervical spine (n = 725, 38%). Frequency of treatment modalities was manipulation (n = 1610, 82%), myotherapy (n = 1522, 80%), mobilization (n = 607, 32%), and taping (n = 380, 20%). Acute injuries were more prevalent for athletes (61%) than non-athletes (35%), and athletes sought follow-up care (54%) more than non-athletes (36%). Overall, 89% of participants reported pain reduction immediately after treatment.

Conclusion: This article describes chiropractic care utilization at a multisport event as part of a health care team. The range of treatments included manipulation myotherapy, mobilization, and taping. Although a minority of athletes and non-athletes received chiropractic treatment, many participants reported pain reduction immediately after treatment. (*J Manipulative Physiol Ther* 2024;00:1-9)

Key Indexing Terms: *Chiropractic; Utilization Review; Sports*

INTRODUCTION

Researchers regularly contribute to the literature by publishing statistics regarding utilization of medical and physiotherapy at the Olympics and Paralympics.¹⁻⁸

However, the utilization of sports chiropractic care by athletes at multisport, international events is less regularly reported.⁹⁻¹³ Nonetheless, publications reporting utilization surveillance statistics at previous international, multisport games such as The World Games (an international athletic competition similar in format and scope to the Olympics) provide emerging evidence that chiropractic care is sought for both athletic and non-athletic injuries.⁹⁻¹³

Utilization surveillance (ie, describing the rates and anatomical areas of treatments)¹⁴ at sporting events provides important information that can guide clinical decision-making and sporting policies. Analysis of acute or chronic presentations and returning for care (follow-up treatments) was conducted to understand prevalence and differentiation between athletes and non-athletes. Documenting utilization statistics and common treatment responses can further develop sports policies and treatment plans that assist with injury prevention, athlete performance, and recovery.

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Preliminary research suggests that chiropractic care can reduce self-reported pain and affect function.^{9-11,15-17} Prior research on The World Games 2009 and 2013 revealed that chiropractic treatments reduced participants' self-reported pain with an effect size—94% and 87% of patients reported an immediate reduction of self-reported pain following chiropractic treatment, respectively.^{10,11} The minimally clinically important difference (MCID) was 2.76 or 39.74% at The World Games 2009 and 2.8 or 38.64% at The World Games 2013.

Existing research shows that injuries and illnesses are the most common conditions requiring medical care at multisport events.^{1-8,18} Outside of the academic context, research suggests that people tend to seek chiropractic care for sprains, muscle strains, and low back pain.¹⁹⁻²² A review shows that low back pain was the most common reason for seeking chiropractic care (49.7%) followed by neck pain (22.5%),²⁰ with similar statistics emerging across specific studies.²³ However, clear insight into specific patterns of injuries and reasons for seeking care in athletic contexts requires large-scale data collection. Although such data for chiropractic care are gradually accumulating,⁹⁻¹³ additional utilization surveillance at large multisport competitions is needed.

Events like the Olympics, Paralympics, and World Games provide an opportunity for documenting athletic injury and treatment statistics.^{1-5,7-11} At these games, local organizing committees often organize medical teams to care for athletes and non-athletic personnel who support the games (eg, coaches, sporting officials, other medical personnel, and volunteers). The purpose of this study was to analyze the utilization of chiropractic services during The World Games 2017 (TWG2017) in Wrocław, Poland.

METHODS

This is a retrospective chart review that analyzed data from treatment forms ([Supplementary Data](#)) from treatments provided during TWG2017. The Palmer College of Chiropractic, Davenport campus, Research Ethics Committee approved all methods used in the study (ethics number X2017-4-12-N).

Participants

The individuals who received care were “accredited” (ie, accreditation is the process by which someone's identity is validated and recognized as having a particular status at an event) at TWG2017. Swiss Timing (the software, time-keeping, and data handling partner) recorded all individuals (both athletes and non-athletes) who participated in the games as part of their services to the International World Games Association (IWGA). All individuals either competing, supporting the athletes, or involved in the organizing

and implementation of the games were accredited by the IWGA. The accreditation process collected demographic information on the individual, sports-specific, or individual's role in the games and is their passport for the games. Swiss Timing provided the demographics of 9385 accredited individuals for TWG2017. The charts reviewed were from those who volunteered and consented to treatment by the sports chiropractors during TWG2017. Treatment forms for individuals under the age of 18 were not included.

Procedure

The Federation Internationale de Chiropratique du Sports (FICS) sent 35 sports chiropractors and 5 research assistants to TWG2017. To participate, sports chiropractors were required to have completed the postgraduate qualification of the International Chiropractic Sports Certificate. Each of the selected sports chiropractors provided treatments to participants and completed treatment forms during the event.

The IWGA provided a handbook for all accredited individuals prior to the games. This publication disseminates information concerning the presence and location of sports chiropractors during TWG2017. Individuals seeking care approached the treatment areas voluntarily. Sports chiropractors were located at warm-up areas at the venues to provide care for preparation for and recovery after competition. The local organizing committee medical services provided all care on the field of play. As such, the study data only reflects treatments in warm-up areas and does not include any injury that was addressed by medical staff on the field of play. Sports chiropractors were available at 28 of the 31 competition venues, accepting accredited individuals who voluntarily sought treatment over the 10-day event. Chiropractors were not present at venues for 3 sports (Boules, Air Sport, and Orienteering) due to their venue locations being distant from other venues or limited staffing, which will impact the results for these sports.

After voluntarily requesting chiropractic care, the participant was provided a research information letter regarding consent, after which the form was signed by the participant. Each treatment was recorded on a paper treatment form (see [Appendix A](#) in the [Supplementary Data](#)) that had an identification number (ID) to protect their identity. Their name and ID number were entered onto a separate log sheet, which was kept isolated from treatment forms. Each treatment then began with the sports chiropractor entering the participant demographics onto the treatment form. The chiropractor recorded the participant's age, sex, country represented, their sport or non-athlete status, first or follow-up visit, and whether the complaint was acute or chronic. An acute condition was defined as symptoms within the

past 3 months, and a chronic condition as symptoms lasting more than 3 months. The participant then completed a pretreatment numerical pain rating scale (NPRS) by indicating their current level of pain on an 11-point scale (0 = no pain, 10 = severe pain).²⁴

The participants provided a history of their complaint and received a focused physical examination. The anatomical area(s) that were treated were recorded, as well as the type of treatment provided. Sports chiropractors could select from 17 anatomical areas listed on the treatment form. Treatments were categorized as at least one of the following methods: mobilization, manipulation, tape, myotherapy, and other (ie, ice or referral to a medical professional). The form allowed for written notes for added clinical information. The sports chiropractor explained the findings to the participant, the treatment plan, and obtained the participants' consent to treatment. Following the treatment, the participant completed the posttreatment NPRS privately. The research assistant then entered the information on the form into the password-protected Microsoft Excel spreadsheet. This process was consistent for every encounter, whether this was their first encounter or subsequent encounter. As such, treatment forms each represented a unique encounter. However, when participants returned for additional treatments, their forms were marked as follow-up encounter, allowing us to track the unique number of participants. De-identified data was entered into a separate password-protected Microsoft Excel spreadsheet for subsequent analyses.

Analyses

We examined (1) the utilization of chiropractic care and demographics of individuals using care, (2) statistics regarding injuries, including which sports sought treatment for which anatomical regions, and (3) immediate changes in self-reported pain following chiropractic treatment, just as we have done in prior World Games.⁹⁻¹¹

We analyzed the change in self-reported pain as an outcome measure to further understand the impact of treatment during an event on a participant's self-reported prepain and postpain perception. We compared the 11-point NPRS before and after each treatment. The NPRS test-retest has moderate reliability rating (intraclass correlation coefficient = 0.76; CI, 0.51-0.87).²⁵ Self-reported pain and subsequent change in NPRS are commonly used outcomes studies utilized in clinical trials.²⁶ Farrar et al proposed that pain is subjective, the numerical value by patients varies widely, and data-driven cut-off points are necessary to measure the MCID for reported acute or chronic pain.²⁷ The change in self-reported pain has been compared to a validated measurement tool of the Patient's Global Impression of Change (PGIC) for both acute and chronic pain.²⁷ Several studies, including large patient sets of both acute and chronic pain, have proposed the best cut-off points for

change in NPRS of a minimum of 2 points reduction in NPRS or a reduction of 30%, which correlated with "much improved" or very much improved" on the PGIC.^{26,28-31} Self-reported pain through the NPRS results has been supported for acute and chronic pain studies.^{26,28-31} They have determined an MCID and established thresholds for the difference in magnitude of the response.^{26,29,31} Applying the reduction of at least 2 points or a 30% change in NPRS scores will provide support for the determination of MCID in studies.²⁷ Since pain cannot be objectively measured, utilizing this research and analysis strategy will be helpful in further understanding the change in self-reported acute and chronic pain and was used by McGregor et al as a measurement of immediate effects of thoracic mobilization on patients with mechanical neck pain.³² Data were analyzed using R.³³ Two χ^2 tests were conducted to test whether the prevalence of acute vs chronic injury differed between athletes and non-athletes and whether the tendency to seek follow-up care differed between athletes and non-athletes.

RESULTS

Chiropractic Treatments

During the 10-day event, 1956 total treatments were collected with 1902 (97%) forms with complete data. Forty-nine forms were excluded for treatments to minors (under the age of 18), and 5 were missing critical information (eg, participant demographics). All participants read and signed the consent form.

Most treatments were for athletes (n = 1238, 65%) and the remainder for non-athletes (n = 664, 35%) (Fig 1). These treatments were administered to 1012 unique individuals, representing 590 of 3666 (16%) accredited athletes and 422 of 5719 (7%) non-athletes at the games. Six hundred forty-eight athletes returned for at least 1 follow-up treatment. A total of 664 follow-up treatments were provided to the non-athlete group, with medical personnel showing the highest utilization (24%), followed by officials (10%), coaches (9%), and volunteers (4%). A minority of treatment forms contained missing values for the following 2 questions: chronic vs acute injury (n = 3, 0.17%) and the NPRS (n = 102, 5.79%). These treatment forms were not included in analyses of these specific questions. Demographics of participants are reported in Table 1.

Treatments by Sport and Country

In 28 competition venues, athletes sought and received care (Fig 2). Athletes from 79 of 109 (72%) countries sought treatments from sports chiropractors. The athletes receiving the largest number of treatments were from the following countries: United States (n = 191, 29%), Poland (n = 116, 17%), Australia (n = 80, 12%), Great Britain

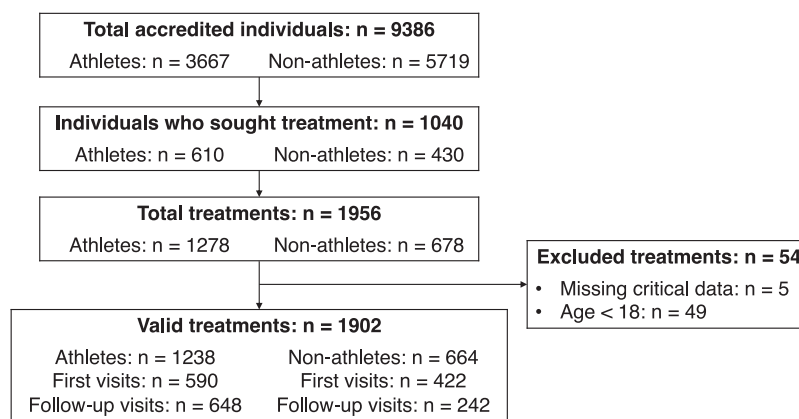


Fig 1. Flowchart illustrating the flow of data through the study for charts included in analyses. A minority of treatment forms contained missing values for the following 2 questions: chronic vs acute injury ($n = 3$, 0.17%) and the NPRS ($n = 102$, 5.79%). These treatment forms were not included in analyses of those specific questions. NPRS, Numeric Pain Rating Scale.

($n = 57$, 9%), and Italy ($n = 53$, 8%). Athletes from 6 countries represented 100% utilization of the FICS delegation—Fiji (1/1), Guatemala (1/1), Macau (1/1), Mauritius (3/3), Serbia (8/8), and British Virgin Islands (1/1)—but this is understandable due to the countries' small delegations. There were 30 countries for which no athletes sought treatment from the FICS delegation (Supplementary Data). There were 422 of 5719 (7%) accredited non-athletes who sought treatment. This group consisted of volunteers, officials, coaches, and medical personnel. Officials had the highest number of treatments with 231 (35%), followed by volunteers ($n = 179$, 27%), coaches ($n = 159$, 24%), and medical personnel ($n = 95$, 14%) (Table 2).

Acute vs Chronic Conditions

Of treatments provided to athletes, 722 (58%) were for acute conditions. By contrast, only 245 (37%) of treatments for non-athletes were categorized as being for acute conditions. A χ^2 test revealed that acute injuries were a more prevalent cause for seeking chiropractic care in

athletes than non-athletes (χ^2 [df = 1, N = 1012] = 46.13, $P < .001$).

Treatments by Anatomical Region

A total of 2953 anatomical regions were listed as receiving treatment. The most frequent area for athletes was the lumbar spine ($n = 527$), thoracic spine ($n = 487$), and cervical spine ($n = 393$). The total treatments for the axial skeleton were 1675 (57%). The total number of treatments provided to the upper limb was 371, and 907 treatments were applied to the lower limb (see the Supplementary Data for a breakdown of injury locations for each sport). Anatomical region treatments varied across sports. Waterski/wakeboard has the highest number and percentage of treatments for lumbar, thoracic, and cervical spine, with 68 (13%), 73 (15%), and 54 (14%), respectively. Korfball athletes received the highest lower limb treatments of the ankle, foot, and calf, with 65 (33%), 37 (34%), and 23 (31%), respectively.

Treatment Methods

Treatment methods across athletes and non-athletes were, in decreasing order, manipulation ($n = 1610$, 82%), followed by muscle work ($n = 1522$, 80%), mobilization ($n = 607$, 32%), and taping ($n = 380$, 20%) (Fig 2). "Other therapy" were interventions using ice ($n = 137$) or referral to an ancillary medical professional ($n = 9$). Several participants received at least 1 of the therapy methods per treatment. There were no reported or recorded adverse effects of the treatments provided by the sports chiropractors during the event.

When examining the proportion of athletes and non-athletes who sought a single chiropractic treatment vs those who returned for follow-up treatments, we observed that 54% of athletes sought repeated treatments, but only 36% of non-athletes did so.

Table 1. Participant Demographics

Role	Age—Mean (SD)	Sex (men/women)
Athletes	28.18 (6.65)	370/220
Non-athletes	38.6 (12.74)	288/134
Coach	44.1 (9.93)	101/6
Medical	38.17 (10.27)	36/18
Official	43.53 (12.66)	89/45
Volunteer	28.94 (10.03)	62/65

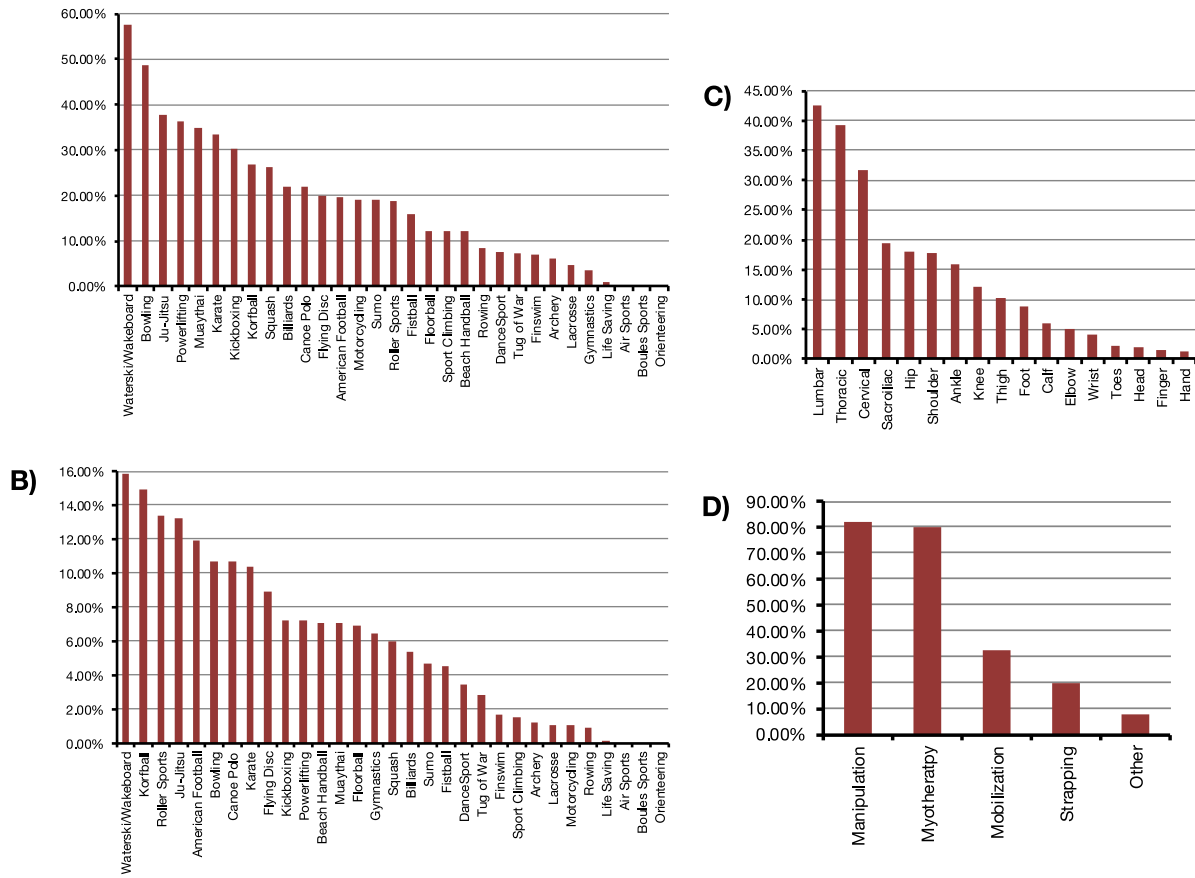


Fig 2. Visual illustration of athlete-only treatment details. Utilization of chiropractic care by athletes from each sport (A). Percentage of total athlete treatments provided for each sport (B). Percentage of athlete treatments that involved each anatomical region (percentages sum to more than 100% because treatments often involved multiple anatomical regions) (C). Percentage of athlete treatments that involved each treatment method (percentages sum to more than 100% because treatments involved multiple methods) (D).

Pretreatment and Posttreatment Self-Reported Pain

Self-reported pain levels on an 11-point NPRS scale were reduced by an average of 2.68 or 38% for all

treatments. A paired samples *t* test revealed that this was a statistically significant reduction with a large effect size ($t[1901] = 64.04, P < .001, \text{Cohen's } d = 1.33$). NPRS mean

Table 2. Athlete and Non-athlete Utilization of Chiropractic Care

Role	Accredited Athletes	First-Visit Treatments	Follow-up Treatments	Total Treatments	Utilization, First Visits/Accredited (%)	Total Treatments (%)
Athlete utilization of chiropractic care						
Athlete	3666	590	648	1238	2172	100
Non-athlete utilization of chiropractic care by role						
Coach	1173	107	52	159	9	24
Medical	223	54	41	95	24	14
Official	1302	134	97	231	10	35
Volunteer	3021	127	52	179	4	27
Total	5719	422	424	664	12	25

pretreatment score for all athletes and non-athletes was 4.35, with a posttreatment score of 1.67. Athletes' mean NPRS pretreatment score was 4.37, with a posttreatment score of 1.85. There was a reduction of 2.53 or 42% in NPRS scores. Non-athletes' mean NPRS pretreatment score was 4.31, with a posttreatment score of 1.34. There was a reduction of 2.97 or 31% in NPRS scores. Most participants self-reported posttreatment pain ratings were numerically lower than pretreatment pain ratings for 88% of athlete visits and 89% of non-athlete visits.

DISCUSSION

Sports chiropractors focus on restoration, maintenance, optimal movement, and muscular control of athletes.¹³ According to the Australian Institute of Chiropractic Education, "Sports and Exercise Chiropractic is a recognized special interest subset of chiropractic that focuses on the comprehensive and holistic health care of the physically active individual or athletes to prevent injury, restore optimal function and contribute to the enhancement of sports performance. They achieve this using sports-specific knowledge, skills and attitudes to achieve best clinical practice."³⁴ Sports chiropractic is an emerging subset of chiropractic practice,³⁵ with nearly 50% of Australian chiropractors stating that they treat athletes.¹⁹ This interest in sports chiropractic supports the need for an understanding of the utilization of sports chiropractic, the specific anatomical areas sports chiropractors treat, and the impact of sports chiropractic on participants.

In this study, we found that chiropractors provided 1902 treatments over 10 days at TWG2017. In fact, this is higher than both that observed for TWG2013 (with 1463 total treatments)¹¹ and TWG2009 (with 1514 total treatments).¹⁰ The FICS delegations included 35 sports chiropractors at 3 World Games, suggesting that treatment utilization has increased even when the supply of chiropractors has remained constant and not a factor of accessibility to services. Of the 1902 treatments at TWG2017, 590 (16%) of accredited athletes and 422 (7%) of accredited non-athletes utilized chiropractic care. These values are similar to previous findings at TWG2009 (where 15% of accredited athletes and 16% of accredited non-athletes sought care)¹⁰ and TWG2013 (where 18% of accredited athletes and 10% of accredited non-athletes sought care)¹¹ (12% for athletes and 4% for non-athletes). These results provide consistent evidence that sports chiropractic services are sought out by athletes and non-athletes during TWG.

Physiotherapy utilization during the London 2012 Olympic Games showed similar utilization to our findings for both athletes and non-athletes (12% for athletes and 4% for non-athletes).⁷ Physiotherapy at these Olympic Games included sports physiotherapists, sports massage practitioners, osteopaths, and chiropractors. Similar results were

also reported from the 2004 Olympic Games on utilization of physiotherapy services by Athanasopoulos.¹⁸ As such, these results demonstrate that when sports chiropractic is available at large multi-sports events, it is utilized at rates similar to other health professions.

Utilization rates varied among countries and sports. There are several reasons why countries and sports may have had higher or lower utilization rates, including (1) varying levels of familiarity with or prior use of chiropractic care, (2) varying levels of recognition of the FICS delegation from previous World Games or other international events,⁹⁻¹¹ (3) differences in proximity to sports chiropractors (eg, Boules, Air Sport, and Orienteering did not have a FICS delegation at their venue), (4) differences in the extent to which sports require chiropractic care and preparation (eg, contact/collision sports vs non-contact/collision sports), and (5) differences in openness to complementary therapies across sport and country subcultures. These are all important contextual factors that should be studied in future research to explain the differences we observed here. However, baseline differences in the number of attendees across countries should also be considered when interpreting statistics regarding utilization across countries.

Analysis of the treatment of anatomical regions across sports revealed several interesting patterns. First, extremity treatments varied dramatically across sports. Some sports regularly required treatments to the lower limb (eg, American Football, Floorball, Flying Disc, Kickboxing), whereas others did not (eg, Lifesaving, Motorcycling, Rowing). Upper limb was also regularly treated in some sports (eg, Ju-Jitsu, Inline Hockey, Canoe Polo) but not at all in others (eg, Floorball, Lifesaving, Motorcycling). Second, sports also varied in their treatments to the spine and sacroiliac joint, with some interesting areas not receiving treatment at all for certain sports. This could either reflect that these areas are less prone to injury in these sports or that health care teams are less likely to consider these areas as needing treatment in these sports.

We found that acute injuries were more likely in athletes than non-athletes, and athletes were more likely to return for follow-up care than non-athletes. Our findings are similar to those reported for physiotherapy encounters at the London Olympics (physiotherapy encounters with athletes included 501 [41%] first visits and 717 [59%] follow-up visits, but encounters with non-athletes included 316 [57%] first visits and 243 [43%] follow-up visits).⁷ The higher percentage of athletes with acute injuries likely reflects the fact that athletes are training and competing (leading to injuries that drive them to seek care), whereas most non-athletes were support personnel in roles that are unlikely to induce injury. Similarly, non-athletes may not have used our services as often as athletes due to their time restraints and other volunteer responsibilities. Consequently, information gathered from this research is shared with the National Governing Bodies of Sport, International

Federations of Sport, athletes, coaches, and trainers attending TWG2017 to provide improved recognition of treatments specific to each sport, which can guide tailored training strategies.

Finally, we observed a difference in pretreatment and posttreatment self-reported pain. Additionally, we analyzed the change in self-reported pain as an outcome measure to further understand the impact of treatment during an event on a participant's self-reported prepain and postpain perception. An 11-point NPRS was utilized before and after each treatment. The NPRS test-retest has moderate reliability rating (intraclass correlation coefficient = 0.76; CI, 0.51-0.87).²⁵ Self-reported pain and subsequent change in NPRS are commonly used outcomes studies utilized in clinical trials.²⁶ Farrar et al proposed that pain is subjective, the numerical value by patients varies widely, and data-driven cut-off points are necessary to measure the MCID for reported acute or chronic pain.²⁷ The change in self-reported pain has been compared to a validated measurement tool of the PGIC for both acute and chronic pain.²⁷ Several studies, including large patient sets of both acute and chronic pain, have proposed the best cut-off points for change in NPRS of a minimum of 2 points reduction in NPRS or a reduction of 30%, which correlated with "much improved" or very much improved" on PGIC.^{26,28-31} Self-reported pain through the NPRS results has been supported for acute and chronic pain studies.^{26,28-31} They have determined an MCID and established thresholds for the difference in magnitude of the response.^{26,29,31} Applying the reduction of at least 2 points or 30% change in NPRS scores will provide support for determination of MCID in studies.²⁷ Since pain cannot be objectively measured, utilizing this research and analysis strategy will be helpful in further understanding the change in self-reported acute and chronic pain and was used by McGregor et al as a measurement of immediate effects of thoracic mobilization on patients with mechanical neck pain.³²

This adds to the growing literature showing that chiropractic treatment may be associated with reduced pain immediately following treatment.^{13,17,19,25,35-38} Additionally, the NPRS has been used as a measurement of self-reported pain in research when longer-term assessments are not possible.²⁴ In fact, there is increased emphasis on "participant-reported outcomes" (which focus on self-reported perceptions of change) in clinical research, including use of the NPRS to document immediate changes in perceived pain.^{28-30,39}

Furthermore, scholars have computed a value for the MCID in NPRS measures by comparing NPRS scores and PGIC scores.^{26,31} The resulting MCID of pretreatment and posttreatment NPRS has been defined as a reduction of 2 points or 30%.^{26,31} In the current study, we observed an average NPRS reduction of 2.68 or 38% (n = 1685) for all individuals, 2.53 or 42% (n = 1095) for athletes, and 2.97 or 31% (n = 590) for

non-athletes. These values exceed the MCID value established by prior work. These statistics are also very similar to our study at The World Games 2013, in which we observed an average decrease of 2.8 or 39% (n = 1271) for all individuals, 2.5 or 40% (n = 758) for athletes, and 3.1 or 34% (n = 513) for non-athletes.¹¹ Again, in The World Games 2009, we observed a change of 2.36 or 40% (n = 1366) for all individuals, 2.6 or 42% (n = 816) for athletes, and 2.96 or 37% (n = 635) for non-athletes.¹⁰

Future Research

Given that athletes at TWG2017 are held to a standard set by the World Anti-Doping Agency, sports chiropractic may provide a drug-free approach to experiences of pain that aligns with these standards.⁴⁰ Future studies that include (1) objective measures of pain and functioning over longer periods of time and (2) random assignment to a control condition are sorely needed. Future research should continue to collate utilization of various health care providers at sporting events. Understanding the utilization of various health providers, anatomical areas, types of treatment provided, and response to treatment will benefit athletes at events. Further research is needed at other sporting events to advance our understanding of the utilization of chiropractic care, demographics, anatomical areas, types of treatment, and response to treatment, as well as its impact on PGIC and objective performance measures at international sporting events. The addition of PGIC and comparison of NPRS changes in future studies will provide evidence for MCID and is suggested.

Limitations

The dependent measure was immediate changes in self-reported pain. However, an immediate reduction in self-reported pain is only a single dependent variable, and it is subject to self-report bias as well as other limitations. This carries several limitations, as it is vulnerable to misperceptions, demands characteristics (eg, giving responses that the participants think researchers desire), and does not necessarily indicate long-term recovery. Additionally, this was a naturalistic descriptive study without a control condition, so strong interpretations regarding causal impact or overall efficacy of chiropractic care cannot be made. Unfortunately, objective measures for treatment outcomes can be difficult in international multisport events. Accredited individuals at TWG2017 are often present only for 1 day, during which they train and compete. This limited availability restricts acquiring long-term outcome measures. Unfortunately, we were not able to conduct follow-up NPRS at longer intervals posttreatment or include additional

functional tests. Nonetheless, the reduction in self-reported pain in our study was considerable and consistent with other studies we have conducted. Even though multisport events introduce difficult time restrictions, limited ability to follow up with participants, and challenges to confidentiality, additional outcome measures that can be adapted to a multisport event should be strongly considered to further extend these initial findings. Observational studies like these cannot fully document injury statistics outside of those seeking treatment, nor can they claim causal effects of chiropractic care without a randomized controlled trial.

CONCLUSION

This article describes chiropractic care utilization at a multisport event as part of a health care team. The range of treatments included manipulation, myotherapy, mobilization, and taping. Although a minority of athletes and non-athletes received chiropractic treatment, many participants reported pain reduction immediately after treatment.

SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found in the online version at [doi:10.1016/j.jmpt.2024.03.001](https://doi.org/10.1016/j.jmpt.2024.03.001).

FUNDING SOURCES AND CONFLICTS OF INTEREST

No funding sources or conflicts of interest were reported for this study.

CONTRIBUTORSHIP INFORMATION

Concept development (provided idea for the research): B.C.N.

Design (planned the methods to generate the results): B.C.N.

Supervision (provided oversight, responsible for organization and implementation, writing of the manuscript): D.D.N.

Data collection/processing (responsible for experiments, patient management, organization, or reporting data): D.D.N.

Analysis/interpretation (responsible for statistical analysis, evaluation, and presentation of the results): E.C.N.

Literature search (performed the literature search): D.D.N.

Writing (responsible for writing a substantive part of the manuscript): D.D.N., B.C.N., E.C.N.

Critical review (revised manuscript for intellectual content, this does not relate to spelling and grammar checking): E.C.N., B.C.N.

Practical Applications

- A total of 1902 treatments were recorded at The World Games 2017 held in Wroclaw, Poland.
- Athletes from 28 of the 31 different sports received treatment and represented 79 of the 108 countries that attended the event.
- Pre- and posttreatment data revealed that 89% reported a reduction in pain.

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