International Journal of Sports Science 2016, 6(4): 138-145
DOI: 10.5923/j.sports.20160604.02

The Effect of Prophylactic Ankle Bracing on Physical Performance Measures in Jumping Athletes

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Abstract ***Introduction and Objective:*** Prophylactic bracing of the ankle is commonly used in jumping sports in an effort to reduce the risk of injury; however, the research surrounding the effectiveness of ankle braces at reducing the risk of injury is far from conclusive. While there may be some merit to wearing an ankle brace prophylactically to reduce the risk of injury, the potential impact on game and physical performance, such as vertical jumping and agility has not been well studied. Therefore, the purpose of this study was to examine the effect of two common ankle orthosis (ASO EVO©, Active Ankle T1©) on vertical jump height and agility time in varsity jumping sport athletes. ***Methods:*** Fourteen participants (6 male, 8 female; 6 basketball, 8 volleyball) with a mean age of 20.92+/-1.94 years had their vertical jump height and agility time assessed on three separate days under one of three conditions (no brace, ASO EVO© Brace, or Active Ankle T1© Brace) on both ankles each day. The independent variable in this study was brace type for each condition and the dependent variables were vertical jump height and time to complete agility test. A one-way repeated measures ANOVA was used to examine the effect of brace type on vertical jump height and time to complete agility test with an alpha level set at $p<.05$. ***Results:*** Descriptive statistics showed that vertical jump height was reduced when wearing the ASO EVO© Brace (M=276.66, SD=20.28) and Active Ankle T1© Brace (M=275.79, SD=18.67) when compared to the no brace control condition (M=278.14, SD=18.43). Inferential statistics revealed a significant reduction in jump height when wearing an ankle brace, $F(1.66, 21.63) = 4.175$, $p = 0.035$. Post-hoc analysis revealed that the significant difference was between the mean jump height of the no brace control condition and the Active Ankle T1© Brace ($p=0.01$). No significant difference, however, was found between ankle brace conditions with respect to agility test times. ***Conclusions:*** These findings suggest that ankle bracing may have a negative impact on vertical jump height, regardless of the type of brace worn. A decrease in vertical jump was more evident when wearing the Active Ankle T1© Brace compared to the ASO EVO© Brace. This reduction resulted in a 2.35 cm decrease in vertical jump height on average. With respect to agility, overall agility time was not affected by wearing an ankle brace. However, given the lack of significant evidence to support ankle bracing's ability to reduce the risk of injury, the potential for ankle orthosis to decrease physical performance should be considered by athletes, healthcare providers, coaches, and teams using prophylactic ankle bracing in an effort prevent injury.

Keywords Ankle bracing, Vertical jump height, Agility

1. Introduction

Prophylactic taping of the ankle is a common practice amongst athletes and healthcare providers to protect against potential injury, as well as to treat injuries [18]. However, prophylactic taping is expensive, labour intensive, and has been shown to lose its effectiveness after just 10 minutes [1]. This has led to the popularity and development of several types of prophylactic braces in recent years [21]. While the effect that prophylactic braces have on injury risk has been moderately investigated, the effect of these braces on measures of physical performance, such as vertical jumping and agility is not well represented in the literature [5].

In sports that require jumping, such as volleyball and basketball, teams often have a policy that all players wear prophylactic ankle braces with the hope that there is a reduction in the risk of injury. While injury prevention is no doubt vital to elite athletes, performance is also an important consideration. Fractions of seconds can make the difference between winning and losing, hitting a ball over a block, or being in a proper defensive position to defend a shot or hit. This makes any decrease in performance potentially detrimental to an athlete's success and performance [8]. As such, the effect that prophylactic ankle bracing could have on game and physical performance should be considered when deciding to wear an ankle brace in an effort to prevent injury.

Two styles of ankle braces are the (semi-) rigid or stirrup type brace, and the softshell type brace. The Active Ankle

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Published online at http://journal.sapub.org/sports

T1© Brace is an example of a type of (semi-) rigid stirrup style brace that is often used in the sport of volleyball [26]. This brace is composed of two hard-shell plastic sides with a hinge located underneath the heel to allow for plantarflexion and dorsiflexion [26]. Another commonly used type of brace in various sports is the nylon lace-up softshell brace [28]. An example of this type of brace is the ASO EVO© Brace. Despite the popularity of bracing, there is limited research on the effects of (semi-) rigid braces or on softshell braces on physical performance measures.

Most ankle braces are designed to reduce subtalar motion in the frontal plane; however, sagittal plane motion can also be limited. Therefore, it has been hypothesized that performance measures such as running and jumping may in fact be affected by using an ankle brace [5]. However, the effects of prophylactic ankle bracing on sport performance are unclear. Leonard and Rotay [14] found that there was no decrease in vertical jump and agility performance when wearing a softshell brace. Another study by Macpherson, Sitler, Kimura, and Horodyski [16] examined the effect of softshell and (semi-) rigid braces on vertical jump, agility, and speed via a 40 yard sprint. The authors also concluded that neither the softshell or (semi-) rigid brace affected performance. Furthermore, Pienkowski et al. [21] observed no decrease in performance when wearing an ankle brace for vertical jump, standing long jump, cone running, or shuttle running. While these studies suggest that ankle bracing does not affect measures of physical performance, studies by Burks, Bean, Marcus, and Barker [4], MacKean, Bell, and Burnham [15], and Paris [18] suggest that ankle bracing does have a negative impact on physical performance.

Burks et al. [4] examined the effect of tape, softshell, and (semi-) rigid braces on broad jump, vertical leap, 10 yard shuttle run, and 40 yard dash performance. The authors found a significant decrease in vertical jump, shuttle run, and vertical leap performance when wearing a (semi-) rigid brace. Vertical jump performance was also negatively affected when wearing a softshell brace. These results are similar to the findings of MacKean et al. [15] who examined vertical jump, jump shot, sprint drill, and submaximal treadmill run performance in basketball players when wearing a softshell brace and two different types of (semi-) rigid braces (Aircast Air-Stirrup © and Active Ankle ©). It was found that all types of ankle orthoses decreased overall performance in these measures when compared to wearing no ankle brace. Furthermore, in Paris' study [18] on the effect of ankle bracing versus taping on speed, balance, and agility, a decrease in vertical jump performance was reported when wearing an ankle brace. Conversely, when Verbrugge [25] examined the effect of a (semi-) rigid brace and ankle taping on agility, sprint run, and vertical jump, a trend towards an improvement in agility time and vertical jump height was noted when wearing a (semi-) rigid brace. The conflicting results of these studies further highlight the need for research in the area of prophylactic ankle bracing and physical performance measures.

Studies that have examined physical performance measures when wearing an ankle brace have utilized vertical jumping, as well as agility, to assess the effect of ankle bracing on participants. However, there are significant differences in methodology from study to study. Some studies have used the Sargent Jump Test [18]; whereas other studies did not use scientifically standardized protocols or the movements and tests used did not replicate the type of movements used for that specific sport [15, 16, 21, 27]. Furthermore, the methodology of the vertical jumping task was not described at all, in some cases. This creates a problem when interpreting and comparing the results, as it is not known if the jump was completed from a half squat, quarter squat, timed, or any combination of factors thereof; all of which could affect the comparison of results between tests and studies. Hypothetically, if a participant completing a vertical jump test only used a quarter squat, the ankle may not reach a degree of dorsiflexion where a limitation in ankle range of motion is seen and a possible negative effect on jump performance as a result of wearing the brace. As such, uncontrolled jumping techniques may hinder the ability to accurately evaluate the effects of ankle bracing as reported by Wiley and Nigg [27]. Here an unregulated running start was used as part of the vertical jump testing, which may have impacted on the results between subjects in that each subject may have taken a different number of steps before take-off.

In studies that have examined physical measures of performance when using an ankle brace, the choice of dependant variables must also be considered. Some studies have utilized the subject's best jump height to calculate vertical jump [14, 16, 21], whereas others have utilized the mean vertical jump height of multiple trials [4, 15]. When using multiple trials and averaging the results, it creates the question as to what degree fatigue may have affected performance and test scores. However, using the participant's best trial, or only using a single trial may not be an accurate representation of the participant's performance during a game or match. This is due to the fact that if the participant makes an error or uses poor form during testing, the results may not be representative of the individual's capabilities.

Agility is another common measure used to evaluate measures of physical performance when using an ankle brace. However, like vertical jumping, there are methodological differences between studies in that almost all studies use a different agility test or measure. In a comprehensive literature review on ankle bracing by Cordova et al. [5], 11 studies involving ankle braces and agility were examined, of which only three had similar tools for measuring agility. Another consideration is the fact that some tools used to measure agility had no direct mediolateral movement in the frontal plane [14, 16, 21, 25].

This makes it difficult to apply the results to basketball and volleyball, for example, two sports that rely heavily on the ability to generate mediolateral movement and movements in multiple planes of motion, depending on the sport specific situation or tactic [3].

Due to the number of different braces available, studies examining physical performance measures are rarely duplicated with the exact same braces and methodological designs. However, the Aircast Air Stirrup© and Swede-O-Universal© Brace are models that do appear across multiple studies, making it possible to assess their effects on physical performance. The Aircast Air Stirrup© Brace is a (semi-) rigid stirrup brace similar in design to the Active Ankle T1© Brace. Studies by Greene and Wight [10], MacKean et al. [15], Macpherson et al. [16], Pienkowski et al. [21], and Verbrugge [25] examined the Aircast Air Stirrup© Brace. While Macpherson et al. [16], Pienkowski et al. [21], and Verbrugge [25] found no decrease in vertical jump and agility when using the Aircast Air Stirrup© Brace, or any other ankle brace, MacKean et al. [15] found that vertical jump height, number of jump shots made, sprint drill (time), and submaximal run performance (15 minute steady state treadmill run) were all negatively affected in female basketball players wearing an ankle brace. Greene and Wight [10] also found that the Aircast Air Stirrup© Brace significantly affected base running performance in softball players. Verbrugge et al. [25] reported a slight increase in agility speed when wearing an Aircast Air Stirrup© Brace. As such, it appears that the impact of the Aircast Air Stirrup© Brace on performance may be dependent on the skill being executed.

A similar brace to the ASO EVO© Brace is the Swedo-O-Universal© Ankle Brace, which has been investigated in a few studies examining physical performance [4, 15, 18, 21]. No significant effect on speed, agility, or balance when wearing the Swedo-O- Universal Ankle Brace was found by Paris et al. [18] and Pienkowski et al. [21]; however, Burks et al. [4], MacKean et al. [15], and Paris [18] found a significant decrease in vertical jump height when participants wore the Swede-O-Universal© Brace.

While there is literature examining the effect of prophylactic ankle bracing on physical measures such as vertical jump height and agility, research that has been completed has reported mixed results and used various study designs and methodologies. Furthermore, due to the many different models and types of braces available, previous literature has quickly become outdated as new brace models are developed and put on the market. As a result, there are few studies examining the same model of brace. Therefore, the purpose of this study was to examine the effect of the Active Ankle T1© (semi-) rigid brace and the ASO EVO© softshell brace on vertical jump height (centimetres) and agility performance (time in seconds) in jumping athletes.

2. Methods

2.1. Subjects and Inclusion/Exclusion Criteria

Fourteen participants were recruited for the study. See Table 1 for characteristics, demographic, and anthropometric information of participants.

Table 1. Participant characteristics, demographic, and anthropometric information

Gender	6 male, 8 female
Age (years)	M=20.83; SD=1.80
Height (cm)	M=177.42; SD=7.48
Body Mass (kg)	M=79.13; SD=12.54
Jumping Sport	6 basketball, 8 volleyball

After obtaining ethical approval from the academic institution prospective participants were recruited and potential participants were included into this study if they: 1) were male or female, varsity or club student athletes at the academic institution; 2) took part in jumping sports (volleyball and basketball) and; 3) were between the ages of 18-24 years. This age range and these specific sports were selected in order to represent the athletic jumping population, as well as the sports where prophylactic ankle bracing is commonly used [22]. Participants were excluded from this study if they: 1) were suffering from a diagnosed lower extremity or foot injury (e.g., fracture, sprain, tendonitis) currently or in the past six months; 2) had undergone any ankle surgical procedure in the last six months; 3) were allergic to any of the material used in the ASO EVO© and the Active Ankle T1© braces (i.e., Velcro, plastic); and 4) were pregnant. Pregnant females were excluded from participating in this study, as engaging in strenuous physical activity could put both the mother and fetus at risk of injury and complications, due to increased joint laxity, change in the mother's centre of mass, and the increased risk of pre-term labour as a result of maximal effort exercise [24].

Purposive sampling was used to recruit participants. Purposive sampling was used as the targeted population was competitive athletes who competed in jumping sports. When a potential participant expressed interest to partake in the study, he/she was presented with an individual copy of the information letter detailing the specific requirements of the study. When the participant was deemed eligible to partake in the study, he/she voluntarily signed up for pre-scheduled testing sessions.

2.2. Procedure

Three testing sessions, lasting approximately 20 minutes each were used to collect data. After obtaining consent from the participant, a Physical Activity Readiness Questionnaire (PAR-Q) was completed and the age (years), height (centimetres), weight (kilograms), and standing reach (centimetres) of each participant was measured and recorded.

Participants completed the physical component of the testing session three times on three separate days, spread over a maximum of 10 days, performing the tests under a different condition each day. On day one, participants wore no ankle brace; on day two, participants wore the ASO EVO© Brace (softshell brace) on both ankles; and on day three, participants wore the Active Ankle T1© Brace (semi-rigid brace) on both ankles. Participants wore his/her normal training shoes for all sessions. All testing procedures were performed on a rubberized track surface. On the first testing day, the participant began the physical component of the testing session by warming up for five minutes on a spin bike at an intensity of 10-12 on the Borg Scale of Perceived Exertion [6]. To help participants determine intensity, a visual representation of the Borg Scale was shown to them in the first minute of the warm-up.

Following the warm-up, a brief three minute rest period followed. During this time, the Vertical Jump Test was explained, and the participant was allowed two submaximal practice attempts. During these submaximal attempts, the researcher provided feedback on the participant's form, in an effort to standardize form across participants. The Vertical Jump Test was performed, but using a Vertec device (see Figure 1). For the Vertical Jump Test, the participant stood with his/her feet flat on the floor, parallel to the Vertec device. The participant then got in position to perform his/her jump; he/she initiated the jump by bending at the knees and lowering into a 45 degree semi-squatted position, while simultaneously moving the arms down and back. In this position, the researcher visually evaluated the participants form to ensure consistency between participants and stopped the test if the participant was not in an acceptable position. The participant paused for two seconds in this semi-squat position before jumping as high as possible, touching the Vertec device at the highest level he/she could reach. The mean jump height (centimetres) of three trials, spaced approximately 15 seconds apart was recorded [6]. The vertical jump height was calculated by measuring the distance from the ground to the highest point reached during the jump.

Following the completion of the Vertical Jump Test, participants were given a three minute rest period. After the rest period, the T-Test agility protocol was completed, which has been shown to be a reliable measure of agility [19]. During this time, the participant was allowed two submaximal attempts to become familiar with the test. The T-Test is an agility course in the shape of a "T." The top of the "T" was composed of a straight line of three cones, each spaced five metres apart. The base of the "T" was made by placing a tape line 10 metres from the middle cone (see Figure 2). The participant began the test at the bottom of the "T." The researcher blew a whistle, signalling the start of the test, and began the timer. The participant ran to and touched the middle cone. He/she then side stepped to the cone on his/her right and touched it before side stepping to the furthest cone on his/her left. After touching the left hand cone, the participant side stepped to the middle cone and touched it, before backpedalling back to the starting cone, where the timer was stopped [17].

Figure 1. Vertec device. This figure displays the Vertec device on the rubberized track surface

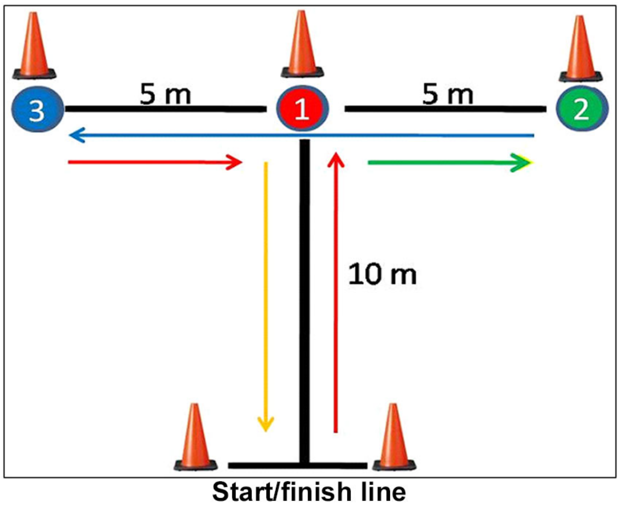

Figure 2. T-Test agility test. This figure displays the timed path that participants attempt to complete as quickly as possible for testing

The participant was then given approximately a one minute rest period before performing the test two more times. Once the Vertical Jump Test and T-Test agility test were completed, the participant cooled down for five minutes on a spin bike at an intensity of 10-12 on the Borg Scale of Perceived Exertion. As previously described, a visual representation of the Borg Scale was shown to the participant to help he/she attain the desired intensity. Once the participant finished the five-minute cool-down the testing session was completed.

On the second testing day, participants performed the same testing procedures wearing the ASO EVO© Brace on both ankles. Application of the ankle orthosis was done prior to the warm-up by the participant. The participant applied the braces following the manufacturer's directions, which were conveyed verbally by the researcher. Various sized braces were available and supplied by the researcher to participants. Adjustment of the brace was allowed during the testing session, if deemed necessary, to attain the correct fit as described by the manufacturer.

For the last testing session, participants performed the tests wearing the Active Ankle T1© Brace on both ankles, following the same procedure for application of the braces. A one-way repeated-measures ANOVA ($p < .05$) was used to compare the means of the no brace control condition, ASO EVO© Brace, and Active Ankle T1© Brace on each dependant variable (vertical jump height and agility test time).

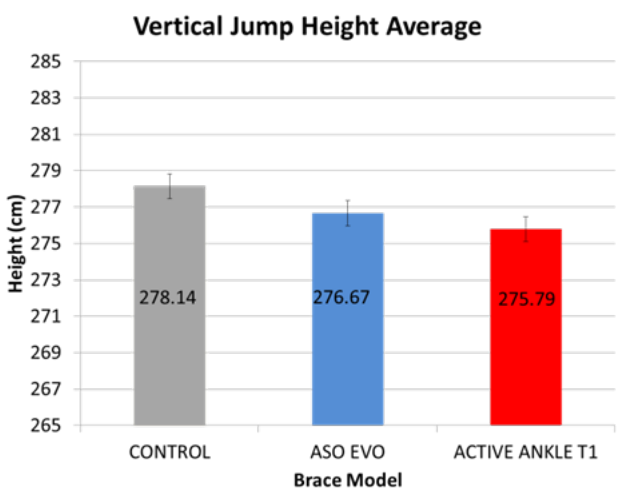

Figure 3. Mean vertical jump height (centimeters) across different brace models

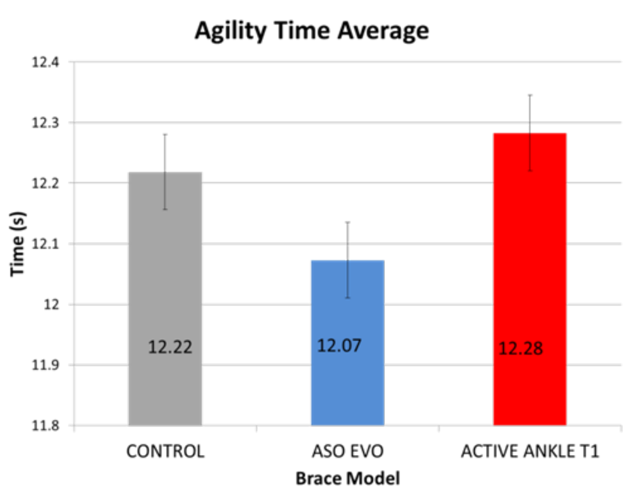

Figure 4. Mean agility time (seconds) for the T-Test agility test across different brace models

3. Results

Mean values for vertical jump height and agility test time are illustrated in Figures 3 and 4. Vertical jump height was reduced when wearing the ASO EVO© Brace (M=276.66, SD=20.28) and Active Ankle T1© Brace (M=275.79, SD=18.67) when compared to jumping without a brace (M=278.14, SD=18.43). After conducting the inferential statistical analysis, the results indicated a significant difference in vertical jump height between the control condition and both braces, $F(1.66, 21.63) = 4.18$, $p = 0.04$. Bonferroni pairwise comparisons analysis revealed that the significant difference was between the mean jump height with no brace and the Active Ankle T1© Brace ($p = 0.01$). Descriptive statistics also revealed a small difference in agility test times between the no brace control condition (M=12.22, SD= 1.14) and when wearing the ASO EVO© Brace (M=12.07, SD=1.1) and Active Ankle T1© Brace (M=12.28, SD= 1.3). Inferential statistics, however, revealed no significant difference between agility test times with no brace and with the application of both braces, $F(1.54, 19.98) = 1.42$, $p = 0.26$.

4. Discussion

The purpose of this study was to examine the effect of two braces, the ASO EVO© Brace (softshell brace) and the Active Ankle T1© Brace (semi-rigid brace) on vertical jump height and agility performance in jumping athletes. No significant effect on agility test time was seen between conditions. However, the results of this study revealed a statistically significant mean decrease of 2.35 cm in vertical jump height when wearing the Active Ankle T1© Brace compared to no brace. Additionally, an overall decrease in vertical jump height was evident when participants wore a brace compared to the no brace condition. The implications of this study are two-fold; in a sport such as volleyball, a reduction in vertical jump height of this magnitude may be the difference between contacting a ball on a block and missing it entirely. In basketball, this reduction may mean the difference between getting a shot over a block or not, or defensively making the block. Secondly, a reduction in vertical jump height may impact on an athlete's biomechanics, timing, and point of contact when hitting a volleyball, receiving a pass, or making a shot at the basket in basketball. Thus, ankle bracing could have an impact on physical performance and the outcome of a game or the results.

The ASO EVO© Brace and Active Ankle T1© Brace are often used in place of taping to reduce the risk and severity of injury in the ankle joint and cost as they can be reused by the individual independently. However, both the ASO EVO© Brace and Active Ankle T1© Brace have limited research to support their ability to reduce injury severity and risk [20, 28]. Rather, the majority of injury prevention research focuses on the ability of prophylactic braces to restrict range of motion at the ankle joint, and not on injury prevention. It is interesting to note that given the wide spread use of these braces in sports such as volleyball and basketball, the performance implications of wearing these braces has not been further investigated, considering that the goal of prophylactic ankle bracing is to restrict range of motion [7].

The reduction in vertical jump height when wearing a brace may be explained by the reduction in range of motion. By restricting the range of motion available at the ankle joint, the amount of total force that muscles can generate may be reduced [12]. According to Gudibanda and Wang [11], the ASO EVO© Brace restricts plantarflexion and dorsiflexion, as well as inversion and eversion. Similarly, the Active Ankle T1© Brace has been reported by Siegler et al. [23] to restrict eversion and inversion but not plantarflexion and dorsiflexion [9]. Therefore, it has been hypothesized that the design of the Active Ankle T1 may be less restrictive when performing jumping tasks [1]. However, based on the results of the current study, the Active Ankle T1© Brace reduces vertical jump height more than the ASO EVO© Brace.

An alternative hypothesis as to why the Active Ankle T1© reduced vertical jump height more than the ASO EVO© is that it does not provide ankle support in all planes of motion. The ASO EVO© provides an all-around compressive support via restriction of sagittal and frontal plane motion, in combination with its heel-lock design [11]. According to Kraemer et al. [13], the application of compression garments has also been shown to improve vertical jump height. If we were to apply similar clinical reasoning of these findings to the ASO EVO© Brace and the resultant compression from its heel-lock design, it is logical to suggest that the added compression may mitigate any potential decrease in vertical jump height, which may explain why the decrease in vertical jump height when wearing the ASO EVO © brace was not as pronounced as the decrease in vertical jump height when wearing the Active Ankle T1© Brace.

The findings from this study contradict that of Leonard and Rotay [14] who investigated the effect of ankle bracing and taping on vertical power, vertical jump height, and agility in athletic and non-athletic populations. The authors found no difference between the no brace and brace conditions with respect to agility, average power generation, or vertical jump height. The methodology used by Leonard and Rotay was similar in design to this current study in that it is a Vertec Vertical Jump Test and an agility test to measure performance was used. Despite the fact that both studies had similar procedures for measuring vertical jumping, the current study found a statistically significant reduction in vertical jump height when wearing a (semi-) rigid brace, and an overall reduction in vertical jump height when wearing a softshell brace, contrary to Leonard and Rotay's findings. While Leonard and Rotay only used a softshell brace and not a rigid brace, it is important to note that similarities between their study and the current study were reported with no significant effects on agility test time or vertical jump height when wearing a softshell style brace. Furthermore, the Illinois Agility Test was used by Leonard and Rotay, whereas the T-Test agility test was used in the present study. However, because both studies found that a brace had no effect on agility time, this difference is likely irrelevant.

The T-Test agility test was selected as a measure of agility due to its inclusion of medial, lateral, forward, and backward movement. Because this study included only basketball and volleyball players, a test with direct medial and lateral movements was selected to mimic the sport specific requirements of a volleyball player positioned in the front row, or an athlete playing defense in basketball. Other agility tests, such as the Illinois Agility Test, incorporate more diagonal and figure-8 type movements and may be more appropriate for other sports and have broader applications to other populations [14].

The findings from this study also contrast those of MacKean et al. [15] who compared the effect of softshell ankle braces, and multiple (semi-) rigid ankle braces on vertical jump height, jump shot, and sprinting speed. MacKean et al. found that the Active Ankle T1©, as well as other ankle orthoses had a limited effect on vertical jump or sprint speed. However; the softshell lace-up brace produced the greatest negative impact on vertical jump and speed. Like this study, MacKean et al. also compared both (semi-) rigid and softshell braces to wearing no brace on vertical jump height. While a slight decrease in mean vertical jump height was observed by MacKean et al. when wearing all braces, it was not statistically significant; in comparison to this study, where a statistically significant decrease in mean vertical jump height was found when wearing an Active Ankle T1© Brace. This could be due to the fact that the current study did not randomize the order in which the ankle orthoses were tested, whereas MacKean et al. did, potentially removing any learning effect bias from the results that may be present in this study.

Each participant in this study completed the three sessions in the same order, starting with the no brace condition and ending with the semi rigid brace. As this study was not counterbalanced, if there was a linear improvement in vertical jump height and T-Test agility test time, it is plausible that this would have been the result of a learning effect. However, with respect to vertical jump height, performance actually decreased between the first and last testing sessions. As such, it is difficult to attribute the results to a learning effect of the tests. Rather, we may be able to attribute the decrease in performance to each individual participant's familiarity with each brace. This study did not control for experienced brace users and inexperienced brace users; hence, some participants had previously worn an ASO EVO© Brace or Active Ankle T1© Brace in practice and game situations, whereas others had not. Therefore, participants who had experience wearing these braces may have been used to any affect that these braces had on their movement, performance, and comfort, thus they were able to adjust their performance accordingly. Those who had not previously worn an ASO EVO© or Active Ankle T1© may have had their performance inhibited simply by the fact that they were not used to wearing a brace.

Another limitation of this study included the small sample size and the fact that the time between sessions was not standardized for all participants. Future studies that include a larger sample size that examine the effects of bracing on force production, range of motion, electromyographic muscle activity, and possibly changes in the biomechanics of the sport specific or functional task may produce further information to determine the utility of bracing. Also, designing a study that includes a comparison between the effects of therapeutic taping compared to different types of bracing on performance measures may further provide information to coaches, athletes, and clinicians to determine which intervention may produce the desired effects but at the same time not impact on performance.

5. Conclusions

Ankle orthoses are often prescribed by healthcare providers and practiced by coaches and athletes to potentially reduce the risk of injury. While the results of the current study revealed no significant difference on agility time between each condition, a significant decrease in vertical jump height was evident when wearing the semi-rigid brace Active Ankle T1© Brace. As such, it appears that ankle bracing may affect sport performance by reducing vertical jump and should be considered in the decision to use as this may impact on sport performance. Further research is required to examine the clinical utility of bracing and their possible effect on sport specific and functional tasks.

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