



Evidence Summary: Squash

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Evidence synthesis tool

SPORT:	Squash		Target Group:	adults, elite athletes, recreational players	
Injury Mechanisms:		Mechanisms of injury in squash include non-specific mechanisms during play, trauma from contact with racquet, ball, or other players, overuse injuries. Injuries to the lower extremities are most common.			
Incidence/Prevalence	Risk/Protective Factors	Interventions	Implementation/Evaluation	Resources	
<p>Finch et al. (2001) conducted a systematic review of the epidemiology of squash injuries that included studies published between 1980 and 2000. Their review identified five studies reporting the incidence and prevalence of squash injuries.¹</p> <p>Finch et al.'s (2001) review demonstrated that squash injuries most commonly occur to the lower limb (32-58% of all squash injuries), and that among lower limb injuries, the most frequently injured body part is the ankle (13% to 16%), followed by the knee (7% to 9%). The review demonstrated that upper-limb injuries make up 17% to 35% of all squash injuries and that among these, the elbow is the most frequently injured body part (7%). Lumbar-back injuries from overuse were reported to account for 10-16% of squash injuries. Eye</p>	<p>There are few studies that examine risk factors for injury in squash. One study, Finch et al.'s (2001) systematic review identifies skill level and sex as risk factors for squash injuries. The studies included in their review indicated that novice players sustain 2 to 4 times more injuries than advanced players. Further, men are reportedly experienced 2.5 times more injuries than women did.¹</p>	<p>Only a few intervention studies related to squash injuries have been conducted. High-quality studies on effective interventions for the prevention of squash injuries as the cost-effectiveness of those interventions are needed.</p> <p>The existing studies have focused on interventions related to eye injuries or lower extremity injuries.</p> <p>Eyewear Promotion</p> <p>Eime et al. (2005) conducted an ecological study to assess the effectiveness of an eye protection promotion program. Players in the facilities that were given the eyewear promotion program had 2.4 times the odds (95% CI: 1.3-4.2) of wearing appropriate eyewear compared with control group players post-intervention.¹</p> <p>Ankle Bracing</p> <p>Myburgh et al. (1984) tested ankle stability using an ankle</p>	<p>Studies on implementation/evaluation of injury prevention interventions for squash are needed.</p> <p>One study, examined predictors of eye protection use. Eime et al. (2002) identified two independent predictors of eye protection use: sex and number of years playing squash. Males were less likely to report wearing eye protection than females (OR=0.48, 95% CI: 0.26-0.88) as were those with less than 20 years' experience compared to those with longer experience (OR=0.45, 95% CI: 0.25-0.84).¹ In a larger study, Eime et al. (2005) surveyed 1163 adult squash players and found that the vast majority of them (92.2%) did not wear appropriate protective eyewear. The authors identified the following significant predictors of protective eyewear use: female gender (OR=2.80, 95%CI: 1.7-4.59), previous eye injury (OR=4.2, 95%CI: 1.76 - 10.03), more favourable attitudes</p>	<p>Websites</p> <p>Better Health Victoria https://www.betterhealth.vic.gov.au/health/healthyliving/squash-preventing-injury</p> <p>OPHEA, The Ontario Physical Education Safety Guidelines http://safety.ophea.net/safety-plan/165/2023</p> <p>Sports Medicine Australia http://sma.org.au/resources-advice/sports-fact-sheets/squash/</p> <p>ViaSport British Columbia http://www.viasport.ca/sport/squash</p>	

<p>injuries, although not the most frequent squash injury, were found to have the most literature dedicated to them due to the severity of such injuries. There was no consensus in the literature as to whether contact with the squash ball or the racquet was a more frequent mechanism of eye injury in squash.¹</p> <p>To report on existing incidence and prevalence data, the authors grouped squash injuries into three main categories: musculoskeletal and non-orthopedic injuries, eye and head injuries, and cardiac injury, death and heart illness.¹</p> <p>Musculoskeletal and non-orthopedic injuries accounted for 64-91% of all squash injuries. Incidence rates for eye and head injuries ranged from 5.2 to 33.3 injuries per 100,000 playing sessions. Mortality rates from cardiac injury, death, and heat illness were reported as about 5 deaths per year in some countries.¹</p> <p>Since the review, few high-quality incidence and prevalence studies related to squash injuries have been</p>		<p>brace and taping and determined that the ankle guards provided no significant support, but taping provided support before exercise and up to ten minutes afterwards (but not an hour afterwards).²</p> <p>Footwear</p> <p>Sinclair et al. (2016) studied the effect of minimalist footwear on the loads experienced by the ankle and knee during the squash lunge and found that running shoes contributed to significantly more force on the ankle and knee compared to minimalist footwear.³</p>	<p>towards eye protection (OR=11.15, 95%CI: 5.25-23.67), and playing squash 2 or more times per week (OR=2.26, 95%CI: 1.33-3.83).² In another study, Eime et al. (2002) found that reported use of protective eyewear had increased significantly over a ten-year period (10.0% in 1989 to 18.8% in 2000).³</p>	
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<p>conducted. Eime et al. (2003) conducted a retrospective review of hospital admissions and emergency department visits attributed to squash injury in Australia and reported an overall hospital-treated injury rate of 80.9 injured players per 100,000 squash players. Consistent with Finch et al.'s (2001) systematic review, Eime et al. (2003) found lower extremities to be the most frequently injured region of the body (34.7 lower limb injuries per 100,000 squash players). The overall injury rate for eye injuries in their study was 19.0 per 100,000 squash players.²</p> <p>Persic et al. (2006) conducted a cross-sectional survey to identify the prevalence of dental injuries among squash players in Switzerland, Germany, and reported that of the 600 squash players in their study, 37.7% of all players had sustained an orofacial injury, the most common of which were lacerations (n=139), followed by eye injuries (n=60).³</p>				
<p>Works Cited: 1. Finch, C. F., & Eime, R. M. (2001). The epidemiology of</p>	<p>Works Cited: 1. Finch, C. F., & Eime, R. M. (2001). The epidemiology of</p>	<p>Works Cited: 1. Eime, R., Finch, C., Wolfe, R., Owen, N., & McCarty, C. (2005).</p>	<p>Works Cited: 1. Eime, R. M., Finch, C. F., Sherman, C. A., & Garnham, A. P.</p>	

<p>squash injuries. <i>International SportMed Journal</i>, 2(2), 1-11.</p> <p>2. Eime, R., Zazryn, T., & Finch, C. (2003). Epidemiology of squash injuries requiring hospital treatment. <i>Injury Control and Safety Promotion</i>, 10(4), 243-244.</p> <p>3. Persic, R., Pohl, Y., & Filippi, A. (2006). Dental squash injuries—a survey among players and coaches in Switzerland, Germany and France. <i>Dental Traumatology</i>, 22(5), 231-236.</p>	<p>squash injuries. <i>International Sport Medicine Journal</i>, 2(2), 1-11.</p>	<p>The effectiveness of a squash eyewear promotion strategy. <i>British Journal of Sports Medicine</i>, 39(9), 681-685.</p> <p>2. Myburgh, K. H., Vaughan, C. L., & Isaacs, S. K. (1984). The effects of ankle guards and taping on joint motion before, during, and after a squash match. <i>American Journal of Sports Medicine</i>, 12(6), 441-446.</p> <p>3. Sinclair, J., Bottoms, L., Taylor, P. J., & Mahmood, K. (2016). Influence of minimalist footwear on knee and ankle loads during the squash lunge. <i>Movement & Sport Sciences</i>, (1), 77-84.</p>	<p>(2002). Are squash players protecting their eyes?. <i>Injury Prevention</i>, 8(3), 239-241.</p> <p>2. Eime, R., McCarty, C., Finch, C. F., & Owen, N. (2005). Unprotected eyes in squash: not seeing the risk of injury. <i>Journal of science and medicine in sport</i>, 8(1), 92-100.</p> <p>3. Eime, R. M., & Finch, C. F. (2002). Have the attitudes of Australian squash players towards protective eyewear changed over the past decade?. <i>British journal of Sports Medicine</i>, 36(6), 442-445.</p>	
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Review of Sport Injury Burden, Risk Factors and Prevention

Squash

Incidence and Prevalence

Finch and Eime (2001) conducted a systematic review of the epidemiology of squash injuries, including studies published between 1980 and 2000. Their review identified five studies that reported the incidence and/or prevalence of squash injuries.

Finch and Eime's (2001) review demonstrated that squash injuries most commonly occur to the lower-limbs (32-58% of all squash injuries), and that among lower-limb injuries, the most frequently injured body part is the ankle (13% to 16%), followed by the knee (7% to 9%). The review demonstrated that upper-limb injuries make up 17% to 35% of all squash injuries and that among these, the elbow is the most frequently injured body part (7%). Lumbar-back injuries from overuse were reported to account for 10-16% of squash injuries. Eye injuries, although not the most frequent squash injury, were found to have the most literature dedicated to them, likely as a result of the severity of such injuries. There was no consensus in the literature as to whether contact with the squash ball or the racquet was a more frequent mechanism of eye injury in squash.

For incidence and prevalence, the authors grouped squash injuries into three main categories: musculoskeletal and non-orthopedic injuries, eye and head injuries, and cardiac injury, death and heart illness. Musculoskeletal and non-orthopedic injuries accounted for 64-91% of all squash injuries. Incidence rates for eye and head injuries ranged from 5.2 to 33.3 injuries per 100 000 playing sessions. Mortality rates from cardiac injury, death, and heart illness were reported as about 5 deaths per year in some countries.

Since the review, few high-quality incidence and prevalence studies related to squash injuries have been conducted. Eime, Zazryn, and Finch (2003) conducted a retrospective review of hospital admissions and emergency department visits attributed to squash injury in Australia and reported an overall hospital-treated injury rate of 80.9 injured players per 100,000 squash players. Consistent with Finch and Eime's (2001) review, Eime et al. (2003) found lower extremities to be the most frequently injured region of the body (34.7 lower limb injuries per 100,000 squash players). The overall injury rate for eye injuries in their study was 19.0 per 100,000 squash players.

Persic, Pohl, and Filippi (2006) conducted a cross-sectional survey to identify the prevalence of dental injuries among squash players in Switzerland, Germany, and France, and reported that of the 600 squash players in their study, 37.7% had sustained an orofacial injury, the most common of which were lacerations (n=139), followed by eye injuries (n=60).

Limitations

As a result of the varying and sometimes unclear definitions of injury and classifications

of exposure, it is difficult to compare injury rates across studies. Further, the majority of incidence and prevalence studies related to squash injuries have been conducted in Australia. Studies from other countries are needed to confirm the results of the Australian studies, and provide a more comprehensive picture of the burden of squash-related injuries.

Risk and Protective Factors

Finch and Eime's (2001) review identified skill level and sex as risk factors for squash injuries. The studies included in their review indicated that novice players sustain 2 to 4 times more injuries than advanced players, and men reportedly experienced 2.5 times more injuries compared to women.

Limitations

The majority of the risk-factor studies related to squash injuries have been conducted in Australia. Studies from other countries are needed to confirm the results of the Australian studies. Several of the studies included in this review utilize a cross-sectional design and self-reported surveys. This may introduce recall bias.

Opportunities for Prevention: Effective Interventions, Cost-Effectiveness, Implementation and Evaluation

Only a few intervention studies related to squash injuries have been conducted. High-quality studies on effective interventions for the prevention of squash injuries as well as the cost-effectiveness of those interventions are needed.

The existing studies have focused on interventions related to eye injuries or lower extremity injuries. Eime, Finch, Wolfe, Owen and McCarty (2005) conducted an ecological study to assess the effectiveness of an eye protection promotion program. Four squash facilities were given the program and four acted as controls. Players in the facilities that were given the eyewear promotion program had 2.4 times the odds (95% confidence interval, 1.3 to 4.2) of wearing appropriate eyewear compared with control group players after the intervention.

In a small experimental study (n=12), Myburgh, Vaughan, and Isaacs (1984) tested ankle stability using two different types of ankle guards and taping and determined that the ankle guards provided no significant support but taping provided support before exercise and up to ten minutes afterwards.

In another small experimental study (n = 12), Sinclair, Bottoms, Taylor, and Mahmood (2016) studied the effect of minimalist footwear on the loads experienced by the ankle and knee during the squash lunge and found that running shoes contributed to significantly more force on the ankle and knee compared to minimalist footwear.

Overall, studies on implementation/evaluation of injury prevention interventions for squash are needed.

There are some studies on predictors of wearing eye protection for squash players. In a cross-sectional survey of 303 adult squash players, Eime, Finch, Sherman, and Garnham (2002) identified two independent predictors of eye protection use: sex and number of years playing squash. Males were less likely to report wearing eye protection than females (OR=0.48, 95% CI: 0.26-0.88) as were those with less than 20 years' experience playing squash compared to those with longer experience (OR=0.45, 95% CI: 0.25-0.84). In a larger study, Eime, McCarty, Finch, and Owen (2005) surveyed 1163 adult squash players and found that the vast majority (92.2%) did not wear appropriate protective eyewear. The authors identified the following significant predictors of protective eyewear use: female gender (OR=2.80, 95%CI: 1.7-4.59), previous eye injury (OR=4.2, 95%CI: 1.76 - 10.03), more favorable attitudes towards eye protection (OR=11.15, 95%CI: 5.25-23.67), and playing squash two or more times per week (OR=2.26, 95%CI: 1.33-3.83).

Eime and Finch (2002) found that self-reported use of protective eyewear had increased significantly over an eleven-year period (from 10.0% in 1989 to 18.8% in 2000). However, player attitudes toward the risk of eye injury and the importance of wearing appropriate eyewear had not significantly changed. The authors concluded that a shift to appropriate eyewear behaviors is required before mandatory use regulations could be effectively implemented.

References

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