

BRIEF REPORT

Are squash players protecting their eyes?

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Objective: To determine factors associated with adult squash players' protective eyewear behaviours. **Methods:** A survey of 303 players (aged ≥ 18 years) was conducted at three squash venues in Melbourne, Australia over a three week period in June 2000 to obtain information about protective eyewear use.

Results: Of 303 participants the response rate was 98.1%; 66.1% were males, with a mean age of 40.5 years. The majority (68.4%) had played squash for 10 years or more. Although 18.8% of players reported using protective eyewear, only 8.9% reported wearing approved eyewear. Both age group ($p < 0.05$) and years of squash experience ($p < 0.01$) were significantly associated with any eyewear use. The two main influences were personal experience of eye injuries (50.0%) and knowledge of eye injury risk (33.9%). A commonly reported barrier was restriction of vision (34.2%).

Conclusion: These findings demonstrate a low prevalence of voluntary use of appropriate protective eyewear. Future prevention strategies incorporating education campaigns should focus on increasing players' knowledge of risks. The barriers to use and misconceptions about which types of eyewear is most protective need to be addressed as a priority.

Squash is a popular sport with many participants in Australia and worldwide. There are approximately 15 million players in 135 nations.^{1,2} The small dimension of the squash court occupied by two people, swinging racquets and a small ball potentially travelling in excess of 200 km/hour, with the ability to penetrate the eye socket, contribute to a high risk of eye injury in this sport.^{3–10} Internationally, squash has been reported as either the first or second highest ranked sport associated with sports related eye injuries.^{6,11–13}

These injuries are almost completely preventable¹⁴ by protective eyewear.¹⁵ Standards approved polycarbonate eyewear is the only appropriate eyewear, protective against squash eye injuries.^{14,16–18} Most prescription lens materials can splinter on impact^{13,19} and other unsuitable types of eyewear, such as open eyeguards, may exacerbate these injuries.^{15,20}

Fewer than 10% of players actually wear suitable eye guards when playing squash.^{6,19,21,22} To foster protection, it is necessary to understand the reasons why so few players wear such protection. The literature suggests that knowledge of injury risk contributes to decisions to adopt safety measures.^{23–25} Surveys have found many players who use inappropriate eyewear believe it to be suitably protective.^{6,19,21,22} Competition players tend to use protection in matches but not during practice.²¹ However, the literature has not addressed influences on use of eyewear or how this might vary according to player characteristics.

The purpose of this study is, therefore, to describe player characteristics associated with knowledge and use of protective eyewear.

METHODS

We administered a questionnaire to competitive and social/recreational adult squash players at three venues during a three week period in June 2000. Every adult player present during these randomly selected data collection sessions was invited to participate. This project was conducted in conjunction with the Victorian Squash Federation (VSF), the major body responsible for squash activities in Victoria, Australia. Deakin University Ethics Sub-Committee approved this study.

The questionnaire consisted of multiple choice questions with set options including an "other" option to allow for

additional responses. For validity and comparison reasons, the content of the questionnaire was largely based on a previous survey in Melbourne.²¹ Once formulated, the questionnaire was piloted with several colleagues, squash players, and with the Executive Director of the VSF.

The questionnaire requested information about:

- Player characteristics—age, gender, hours played per week, total years and level of squash participation, and history of eye injury.
- Protective eyewear behaviours—frequency of such use and type of eyewear used.
- Reasons for use or non-use.

Analyses were performed using SPSS (Statistical Package for the Social Sciences). The response rate was calculated by subtracting the number of returned questionnaires from the total number of players approached. The proportion of players responding to each specified option of the categorical variables was determined and 95% confidence intervals (CI) were calculated. Age was grouped as < 40 years ($n = 146$) and ≥ 40 years ($n = 155$). Experience was categorised as < 20 ($n = 174$) years and ≥ 20 years ($n = 124$). The χ^2 test was used to determine associations between age, gender, experience, injury history, and use of eyewear. We also performed a logistic regression analysis to determine the relationship between these factors and eyewear behaviour.

Eye injury history was obtained from the question "Have you sustained an injury to the eye itself or its surrounding structures, including the eyelids, eyebrows and cheek or socket bones within the past 12 months whilst playing squash?" Use was determined by the question: "Do you wear protective eyewear when playing squash?"

Appropriate eyewear was defined as polycarbonate eyewear meeting the Squash Australia Standards.¹⁸ All other types of eyewear were defined as inappropriate.

Abbreviations: CI, confidence interval; OR, odds ratio; VSF, Victorian Squash Federation

Table 1 Reasons for wearing protective eyewear among players reporting use (n=56)*

Reasons for wearing	No	% Players wearing (95% CI)
I have knowledge of the risks of eye injury	19	33.9 (28.6 to 39.2)
I know someone else who has had an eye injury and I do not want to get one myself	15	26.8 (21.8 to 31.8)
I have had an eye injury before and do not want to get another one	13	23.2 (18.4 to 28.0)
It is compulsory for me to wear protective eyewear	12	21.4 (16.8 to 26.0)
Protective eyewear use has been recommended to me	10	17.9 (13.6 to 22.2)
I need to wear glasses for vision	6	10.7 (7.2 to 14.2)
Other	5	9.0 (5.8 to 12.2)

*n = 1 missing value.

Table 2 Barriers to the use of protective eyewear among players reporting non-use (n=231)*

Reasons for not using protective eyewear	No	% Players wearing protective eyewear (95% CI)
I do not want to	92	39.8 (34.1 to 45.5)
It restricts my vision while playing	79	34.2 (28.7 to 39.7)
It is too uncomfortable to wear	60	26.0 (20.9 to 31.1)
I have never thought about it	31	13.4 (9.5 to 17.3)
It is not necessary, as the risks of eye injury are not that great	27	11.7 (8.0 to 15.4)
I am not at risk of an eye injury because of my playing level	27	11.7 (8.0 to 15.4)
I do not like the look of protective eyewear	13	5.6 (2.9 to 8.3)
I am too lazy	13	5.6 (2.9 to 8.3)
I wear glasses while playing	11	4.8 (2.3 to 7.3)
Other	9	3.9 (0.0 to 6.1)

*n = 15 missing values.

RESULTS

A total of 303 players participated, a response rate of 98.1%. Males comprised 66.1%, which is similar to the gender distribution of squash players in Australia.²⁶ The mean age was 40.5 years, with a range of 18–68 years. Most (86.6%) played an average of <5 hours per week and 68.4% had played for at least 10 years, with 77.7% participating in organised competition. Only nine players (3.0%) reported that they had sustained an injury to the eye or its surrounding structures within the 12 months before the survey.

A total of 246 players (81.2%, 95% CI 76.8 to 85.6) reported that they did not wear protective eyewear. Of the 57 players who did so only 48.2% (or 8.9% of the total sample) wore appropriate eyewear (that is, polycarbonate lens eyewear) and 51.8% (9.9% of the total) reported wearing eyewear that was inappropriate—for example, prescription glasses or open eyeguards. The majority stated that they “always” wore their eyewear (68.5%, 95% CI 63.2 to 73.8) and 20.3% (95% CI 15.7 to 24.9) reported wearing protection “sometimes”.

A significantly higher proportion of players aged ≥ 40 years reported wearing protective eyewear than those <40 years (23.1% v 13.8%, $\chi^2_{(1)} = 4.3$, $p < 0.05$). Those playing for ≥ 20 years were more likely to report wearing protective eyewear than those playing shorter periods of time (25.8% v 14.4%, $\chi^2_{(1)} = 6.1$, $p < 0.01$). There was a non-significant trend towards more females than males reporting protective eyewear use (24.5% v 15.6%, $\chi^2_{(1)} = 3.6$, $p = 0.06$) and no significant relationship between the standard of player and eyewear use (16.0% v 2.7%, $\chi^2_{(1)} = 2.6$, $p = 0.11$).

The logistic regression analysis identified two significant independent factors associated with eye protection—gender and playing experience. Males were less likely to report being protected than females (odds ratio (OR) 0.48, 95% CI 0.26 to 0.88) as were those with less than 20 years’ experience relative to those with longer experience (OR 0.45, 95% CI 0.25 to 0.84)

Table 1 summarizes the reasons given for wearing eyewear. Only those who stated that they used protection (either appropriate or inappropriate) were prompted to answer this

question. Wording of the question options were as specified in table 1, with the exception of “I need to wear glasses for vision” response—a response given by a number of players. Players could give more than one response, or another not listed. The most frequent reason for eyewear was knowledge of the risks of injury. Another common reason was personal experience of a squash eye injury (50.0% of all players who wore eyewear), either through knowing someone who had been injured or having been personally injured in the past.

The reasons given by non-users are shown in table 2. Almost 40% of the non-users stated that they did not do so because they did not want to. One third said that it restricted their vision and 25% said it was too uncomfortable. Other barriers included cost (n=5), not yet been hit (n=2), not knowing where to get it (n=1), and not easy to use with a hearing aid (n=1).

Players who “did not want to” use protective eyewear were more likely to be male (44.1% v 27.0%, $\chi^2_{(1)} = 6.2$, $p < 0.01$). Those ≥ 40 years were more likely than younger players to report that eyewear restricted their vision (40.0% v 25.8%, $\chi^2_{(1)} = 5.5$, $p < 0.05$). Similarly, players with ≥ 20 years experience were more likely to state that it restricted their vision than players with less experience (42.9% v 26.9%, $\chi^2_{(1)} = 6.4$, $p < 0.01$).

Altogether 42.3% of non-users stated that they had tried wearing protective eyewear. Most players (67.0%) who stated “I do not want to wear protective eyewear” had never tried to do so. Among non-users, 22.7% of those who stated that eyewear was too uncomfortable, and 22.8% of those who reported that it restricted their vision, had never tried to use eyewear.

DISCUSSION

Beyond efforts to promote protective eyewear can be effectively developed it is important to determine players’ current behaviours and knowledge of suitable eyewear and injury risk. Use in this study was low, with few players reporting being informed about the risks of eye injury or which type of

Key points

- Few players wear standards approved protective eyewear when playing squash.
- Eye injury experience is a major influence on protective eyewear use.
- Strategies to increase protective eyewear use need to incorporate education of players.
- Education strategies should focus on increasing players' appreciation of injury risk in this sport.
- Players also need to be informed about what is appropriate eyewear.

eyewear is protective. Fewer than half of the reported users of eyewear wore polycarbonate lens/standards approved eyewear, with many players using eyewear that could actually heighten the risk of ocular damage.^{4 6 17} It is essential that players are made aware that only standards approved polycarbonate lens eyewear ensures safety.

A major reason given for protective eyewear use was experience of an injury, a major motivator for adopting any injury prevention measure.²⁴ Most squash players have had no such injury.²⁷ Thus education is needed to inform players of the risks and of the benefits of appropriate eyewear. Such a strategy might help change attitudes. Enforcing compulsory eyewear use for all players without prior education would not necessarily ensure high compliance rates.²⁸

Limitations

One limitation of this study was that it did not include any players who would have been away from squash at the time of survey due to an injury. A second limitation is that the self reported responses were not validated. Future studies incorporating direct observations would be needed to do so.

IMPLICATIONS FOR PREVENTION

Player characteristics associated with knowledge and self reported behaviours associated with the use of protective eyewear are essential for designing prevention strategies. The distinct needs of these groups must be met yet be flexible in their approach. Joint efforts, involving leading squash bodies, squash venue managers, eyewear manufacturers and distributors, and player associations are required. This could include an investigation of making appropriate eyewear available at all venues. Eyewear companies should assist with this goal. In addition to having eyewear available, information needs to be provided to all players about the risk of injury and about appropriate eyewear. Players should also be informed that protective eyewear can be worn with prescription glasses.

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