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Sun protection behaviour of junior cricketers and their coaches: an observational study

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ABSTRACT

The questions addressed by this study were:

1. What is the overall status of sun protection behaviour among junior cricket players (under 14 years of age, male) and their coaches?
2. Do teams with sun protection policies have better sun protection behaviour than teams without sun protection policies?

Observations of cricket players' and their coaches' sun protection behaviour were made during two consecutive weeks of cricket matches in mid-February 2000, during the peak of the Australian summer. In addition, coaches were interviewed about the provision for sun protection and policies at their cricket clubs.

Cricket matches were randomly selected from 116 scheduled 2 day matches: in total, 27 matches or 54 cricket teams were observed when sitting on the sidelines waiting to bat, and fielding, over two consecutive Saturday mornings of play. In the first week of observation a total of 280 players were observed while fielding and 288 players observed whilst batting or sitting on the sidelines waiting to bat. In the second week of play, 310 players were observed whilst fielding and 302 while batting or sitting on the sidelines waiting to bat. The sun protection behaviour of 108 coaches was also observed during the cricket matches. In addition, 32 coaches and 16 managers were interviewed about sun protection practices of the club.

Results indicated that there was limited use of shade by players and coaches. Fifty six percent of players did not have any shade available to them, and 80 percent of coaches did not have shade available. However, average total body cover was high, around 90% for players and 80% for coaches. Approximately two-thirds of players wore a peaked cap like a baseball or cricket helmet, leaving ears or neck exposed. Some players wore no hat at all (26% on sidelines, 17% fielding), while use of a broad-brimmed or legionnaire hat was relatively uncommon (7% on sidelines; 23% fielding). The most common leg covering worn by the players was full-length pants. The majority of players wore elbow length shirts. 97% of players did not wear sunglasses.

On average, coaches wore less clothing cover than players, but more coaches wore sunglasses. Of the coaches, 45% wore elbow length shirts. In contrast to junior cricket players, less protective styles of leg cover were commonly worn by the coaches.

Overall, approximately 50 percent or more of the clubs consistently endorsed the use of protective clothing. The exceptions were that the majority of clubs sold or provided baseball caps, whereas a very small proportion of clubs sold or provided legionnaire hats. Just under half of the clubs had hat-wearing regulations, and endorsed the hat-wearing regulations most of the time.

An overall score for SunSmart behaviour of clubs was composed by adding 'yes' responses to questions which reflected good sun protection practices. However, there was no correlation between total score on SunSmart questions and total body cover protection, partly due to the lack of variation in body cover by the players. There was a trend towards more players not wearing a hat in teams where there was no sun policy or no hat regulations. There was also a non-significant trend toward teams with higher percentages of the team wearing peaked caps among clubs that sold or provided baseball caps.

The following recommendations were made for cricket clubs as a result of this study:

- encourage coaches to provide sun protective role models for junior players;
- clubs should be encouraged to develop written sun protection policies with a view to improving standards for encouraging sun protection of members;
- review of hat regulations, to include different types of hats;
- provision or availability of broad brimmed or legionnaire style hats rather than peak caps, for both coaches and players;
- promotion of the use of sunglasses by players as well as coaches.

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INTRODUCTION

While sun protection programs targeted at younger children have been demonstrated to be highly effective, adolescents and older teenagers are more resistant to health promotion messages in general and in particular to sun protection messages. Studying early adolescents may lead to insights into how to improve sun protection messages appropriate for this group.

One channel for improving sun protection messages may be through modelling the behaviour of sports team coaches. Team coaches have been underestimated in their potential influence on health behaviour of children.¹ There have been few published studies of the sun protection behaviour of children during sporting activities.

In 2002 SunSmart had a sponsorship relationship with the Victorian Cricket Association. During the period of sponsorship, a study was undertaken of sun protection behaviour and policies among cricketing associations. This study aimed to investigate the sun protection behaviour of junior cricket players (under 14 males) and their team coaches, and club policies on sun protection.

Most previous studies of the sun protection behaviour of children have used self-report or questionnaire methods, but in this study observational techniques were used to measure sun protection behaviour. There is no gold standard for measuring sun protection behaviour, and all measures have some limitations.² The methodological advantages of observation and direct measurement over self report have been noted in other studies.^{3,4,5} Self-report measures of sun protection may overestimate sun protection behaviour.⁶ Direct measurement avoids issues of selective memory, response bias (social desirability) and educational limitations of child respondents. On the other hand, direct observation may be subject to Hawthorne effects,⁷ especially if participants have advance warning that they are going to be observed; and the generalisability of direct observations to usual behaviour requires further study.

Questions to be explored in this study were as follows:

1. What is the overall status of sun protection behaviour among junior cricket players and their coaches?
2. Do teams with sun protection policies have better sun protection behaviour than teams without sun protection policies?

METHOD

Observations of cricket players' and their coaches' sun protection behaviour were made during two consecutive weeks of cricket matches in mid-February 2000, during the peak of the Australian summer. In addition, coaches were interviewed about the provision for sun protection and policies at their cricket clubs.

Sample

Through random sampling, 39 junior cricket matches (78 teams playing) were selected from 116 scheduled two-day matches. In order to be selected, the match had to be the first innings of a two-week match taking place on Saturday morning in the Melbourne metropolitan region. Twelve matches that were observed were excluded from the study due to irregular scheduling of innings: such as only one team batting on both observation days, or the match being held on only one of the observation days. Therefore of the matches randomly selected for observation, 27 matches resulted in observations of the sun protection behaviour of 54 teams, when sitting on the sidelines waiting to bat, and fielding, over two consecutive Saturday mornings of play. Appendix 1 shows the regions and cricket associations which participated in the study.

In each team there were up to 14 players. In the first week of observation a total of 280 players were observed while fielding and 288 players observed whilst batting or sitting on the sidelines waiting to bat. In the second week of play, 310 players were observed whilst fielding and 302 while batting or sitting on the sidelines waiting to bat (there were more players observed in the second week because one match was postponed and played in one day on the last Saturday).

The sun protection behaviour of 108 coaches was also observed during the cricket matches. In addition, forty-eight coaches or managers were interviewed about club policies.

Because of inconsistencies in the data collection, it was not possible to match coach observations with team observations. Therefore the resulting data sets did not address the influence or relationship between coach behaviour and player sun protection behaviour.

Procedure

The fieldworkers observed the sun protection behavior of the cricket players and coaches, and recorded responses based on the type of headgear worn, whether sunglasses were worn, the shirt cover worn (if sleeves were rolled up), and the type of leg cover worn. Observations were taken while players were fielding (fielding team) and again while players were waiting to bat on the sidelines (batting team). Availability of shade and use of shade was observed for the batsmen's team players and coaches while they sat on the sidelines.

Coaches were approached and asked to fill in a questionnaire. The survey included questions about the players' sun protection behaviour and items about the club's encouragement of SunSmart behaviour, such as the endorsement of the players wearing protective clothing, whether the club has regulations on hat wearing, the provision of shade and sunscreen. Finally, the coaches were questioned about whether the club has a sun protection policy, and if so, whether it was a written policy.

Weather conditions during the matches were recorded as UV level, cloud cover and wind level. Fieldworkers were provided with polysulphone dosimetric sun cards to measure the UV level. Cloud and wind level measurements at each ground consisted of fieldworkers' subjective observational reports. The temperature at the different matches was determined by establishing temperature patterns across the city from available temperature readings. Hourly readings at four Bureau of Meteorology' weather stations across the city (City, Laverton, Moorabbin and Frankston) and midday temperature readings taken at Ringwood for a separate research study were used.

Statistical analysis

An index indicating the proportion of total body surface area covered by clothing was calculated based on the rule of nines used by the St John Ambulance and a male body.⁸ Using this index the head was assumed to comprise 9% of the body, each arm 9%, each leg 18% and the torso 37%. Higher scores reflected more clothing coverage of a body region. Simple descriptive (percentages and means) statistics were used to describe junior cricketers' sun protection behaviour.

RESULTS

Setting

Although the study was conducted in the summer over two consecutive Saturdays, the weather conditions were markedly different on the two days. Overall, temperatures were hotter and winds stronger in the second week of play. Cloud cover and UV, on the other hand, tended to vary by region rather than week of survey. Details of the weather conditions by region are available in Appendix 2.

The mean temperature during observations in the first week of play was 17°C (sd = 1.2; range 17-20°C). In the second week of play the mean temperature was 30°C (sd = 2.3; range 27-35°C). The wind was not particularly strong being on average “slight” to “moderate” on both days. The skies were relatively clear. Average cloud cover fell between “clear” and “thin” cloud cover on both days. Average UV levels were “moderate” to “high”, but ranged from “mild” to “extreme” depending on the region.

Overall status of junior cricket players’ and coaches sun protection behaviour

When players were off the pitch waiting to bat it is reasonable to expect they would use available shade. A total of 553 players’ shade use was observed whilst they were sitting on the sidelines waiting to bat. Shade was assessed as being ‘available’ to the player observed, where shade from natural trees or portable shade was in close proximity to the activity area being used while sitting on the sidelines watching the match. Tables 1 and 2 show limited use of shade by players and coaches; few teams supplied their own portable shade. Thirty-one percent of players were using some shade on the sidelines. Fifty-six percent of players did not have any shade available to them, and 13% did not use shade that was available (see Table 1).

A total of 108 coaches were observed for their use of shade. The amount of shade used by the coaches is presented in Table 2. Eighty per cent of coaches did not have shade available. Ten percent of the coaches utilised the shade available to them; 7% were not using the shade available to them.

Table 1:
Availability of shade and use of shade by players on the sidelines

Amount of shade available	% (n=553)
Fully in shade	22%
Partially in shade	9%
In full sun; shade not available	56%
Shade available; not used	13%
Uncertain of availability of shade	1%

Note: Percentages do not total 100% due to rounding

Table 2:
Availability of shade and use of shade by coaches

Amount of shade available	% (n=108)
Fully in shade	5%
Partially in shade	5%
In full sun; shade not available	80%
Shade available; not used	7%
Uncertain of availability of shade	4%

Note: Percentages do not total 100%, due to rounding

Table 3 shows that use of hats was not ideal for sun protection as most of the cricketers wore a peaked cap like a baseball or cricket hat, or cricket helmet (64% on sidelines; 60% fielding) leaving ears or neck exposed. Some of the players wore no hat at all (26% on sidelines; 17% fielding), while use of a broad-brimmed or legionnaire hat (7% on sidelines; 23% fielding) was relatively uncommon. We would expect that broad brimmed hats might impair vision during fielding, however it appeared that hat use was slightly more common during fielding than on sidelines. By far the most common leg covering worn by the players was full-length pants, with a very small proportion of players

preferring mid-thigh and knee length shorts when waiting on sidelines and fielding. In relation to type of shirt worn, the majority of players were wearing elbow length shirts. Short-sleeved shirts was the next most common type of shirt worn by the players when batting and fielding. Long-sleeved shirts were worn by 17% of players waiting on the sidelines and 15% of fielders. Sunglasses were not commonly used when waiting on the sidelines or fielding, with 97% of players not wearing sunglasses.

Table 3:
Cricket players' sun protection when batting and fielding

Sun protection	Waiting to bat/batting	Fielding
	% (n=553)	% (n=564)
No hat	26%	17%
Narrow hat	4%	2%
Peaked cap	64%	60%
Broad-brimmed hat	7%	23%
Full-length leg cover	98%	99%
Sleeveless shirt	0.4%	0
Short-sleeved shirt	34%	33%
Elbow length shirt	48%	51%
Long-sleeved shirt	17%	15%
Mid-thigh leg cover	0.4%	0
Knee-length leg cover	2%	0.4%

Note: Percentages do not add total 100% due to rounding

On average, coaches wore less clothing cover than players, but more coaches wore sunglasses. The types of clothing worn by the coaches are presented in Table 4. Like the players, the majority of the coaches wore peaked caps (65%), 19% of the coaches wore broad-brimmed hats and 16% wore no hats. In terms of type of shirt worn, 45% of the coaches wore elbow length shirts, 31% wore short-sleeved shirts, 19% wore long-sleeved shirts and $\frac{3}{4}$ length shirts (1%). A few coaches were observed wearing less protective styles such as singlets (3%) or sleeveless shirts (1%). In contrast to the junior cricket players, less protective styles of leg cover were commonly worn by the coaches. Full-length pants were observed to be worn by 47% of the coaches, 34% of the coaches wore knee-length shorts and 18% wore mid-thigh length shorts. Thirty-nine percent of the coaches were wearing sunglasses.

Table 4:
Coaches' sun protection due to clothing

Sun protection	% (n=108)
No hat	16%
Peaked cap	65%
Broad-brimmed hat	19%
Singlet	3%
Sleeveless shirt	1%
Short-sleeved shirt	31%
Elbow length shirt	45%
$\frac{3}{4}$ length sleeves shirt	1%
Long-sleeved shirt	19%
Mid-thigh leg cover	18%
Knee length leg cover	34%
Ankle length leg cover	47%
Sunglasses worn	39%

Clothing cover

Separate clothing cover indices were calculated for the cricket players when waiting to bat and when fielding. As would be expected for cricketers, most of whom wore long trousers on the days of observation, the total body coverage was quite high. The total body coverage when batting was 89% (sd=2.2) and 90% (sd=2.0) when fielding. Coaches wore less clothing, with average total body coverage 80% (sd=12.2).

Relationship between sun protection policies and players' behaviour

The sun protection behaviours endorsed by the clubs (n=48) and reported by coaches and managers are presented in Table 5. Forty percent of the coaches reported that SunSmart posters were displayed in clubrooms, 44% stated that SunSmart posters were not displayed, 13% didn't know and 4% stated that this was not applicable because the club did not have a clubroom.

Overall, approximately fifty percent or more of the clubs consistently endorsed the use of protective clothing. The exceptions were that the majority of clubs sold or provided baseball caps, whereas a very small proportion of clubs sold or provided legionnaire hats. Fifty-eight percent of the clubs encouraged the use of broad-brimmed hats. Fifty-four percent of the clubs encouraged the use of broad-brimmed hats with logos. Eighty-five percent of the clubs either sold or provided baseball caps, whereas 15% did not. Only 4% of clubs either sold or provided legionnaire caps, whilst 96% did not. Fifty percent of the clubs either sold or provided broad-brimmed hats.

Table 5:

Sun protection behaviours encouraged by the clubs

Sun protection behaviour	Yes (% n=48)
SunSmart posters displayed	40%
Broad-brimmed hats encouraged	58%
Broad-brimmed hats with logos encouraged	54%
Baseball caps sold/ provided	85%
Legionnaire caps sold/provided	4%
Broad-brimmed hats sold/provided	50%
Shirts with long sleeves sold/provided	54%
Shirts with collars sold/provided	50%

Fifty-four percent of the clubs either provided or sold shirts with long sleeves, whereas 46% did not. At 50% of the clubs shirts with collars were either sold or provided, a further 48% of the clubs did not sell or provide shirts with collars, and 2% of the coaches reported that they did not know whether shirts with collars were sold or provided.

Overall, just under half of the clubs (46%) had hat-wearing regulations, and endorsed the hat-wearing regulations most of the time (95%) (see Table 6). Thirty-seven percent of the clubs applied their hat-wearing regulations between 11am and 3 pm whereas 100% of the coaches stated that hat-wearing regulations were dependent on the weather conditions. These regulations were often not exclusive to a specific style of hat. For 65% of the clubs, the hat regulations applied to baseball caps, for 14% of the clubs it applied to legionnaire caps, and for 52% of the clubs it applied to broad-brimmed hats.

Table 6:
Percentage of clubs (maximum n=48) with hat wearing regulations

Hat regulation	Yes (% n=48)
Club has hat regulation	46%
Hat regulations apply all the time*	95%
Hat regulations apply between 11 am and 3 pm*	37%
Hat regulations dependent on weather conditions*	100%
Hat regulations apply to baseball caps*	65%
Hat regulations apply to legionnaire caps*	14%
Hat regulations apply to broad-brimmed hats*	52%

*Managers could respond to more than one choice

The proportion of clubs providing sun protection products and which have sun protection policies are presented in Table 7. Overall, more clubs provided sunscreen (46%) than portable shade (19%) and just under one third of the clubs had a sun protection policy. Thirty-one percent of the clubs had a sun protection policy, and 26% of the clubs had written sun protection policies.

Table 7:
Percentage of clubs providing sun protection products and with sun protection policies

Provisions made	Yes (% n=48)
Portable shade provided	19%
Sun-screen provided	46%
Policies	
Club has sun protection policy	31%
Sun protection policy written	26%

Attempting to match coach interviews with cricket player behaviour, there were 48 coach interviews available, and 54 teams of players in the data set. In matching these two sets, there were 14 teams of players that did not have a coach interview available, and 8 coaches whose teams had been excluded from the main data set, leaving 40 sets of coach/manager and team that could be examined to analyse the question, 'do teams with sun protection policies have better sun protection behaviour than teams without sun protection policies?'

As written sun protection policies were uncommon, an overall score for SunSmart behaviour of clubs was composed by adding 'yes' responses to the following questions which reflect practices we would expect from clubs with good sun protection policies:

1. Does your club display SunSmart posters?
2. Are junior members at your club encouraged to wear broad brimmed hats?
3. Are broad brimmed hats with the club logo available for purchase by junior members?
4. Does your club provide members with ...uniforms that include shirts with long sleeves?
5. Does your club provide members with ...uniforms that include Legionnaires caps?
6. Does your club provide members with ...uniforms that include broad brimmed hats?
7. Does your club have any regulations on players wearing hats?
8. Do these rules apply all the time?
9. Do these rules apply between 11 am and 3 pm?

10. Are players required to wear legionnaires caps?
11. Are players required to wear broad brimmed hats?
12. Does your club provide any portable shade for junior teams to use?
13. Does your club provide junior teams with SPF 15 or SPF 30+ sunscreen?
14. Does your club have a policy or set of procedures that specifically deals with sun protection?
15. Does your club have a written sun protection policy?

Clubs were given a score for these sets of questions, with a maximum score of 15. A higher score indicates stronger sun protection behaviour endorsed by the club. The average score was 6 (range 1 to 13).

It was found that there was no correlation between SunSmart score and total body cover protection used by players. This lack of correlation was partly due to the lack of variation in body cover by the players.

Looking at the relationship between specific policies and player behaviour, there was no statistically significant difference between teams with hat wearing regulations (question 7 above; fielding $t=1.211$, $df=38$, $sig=.225$; batting $t=-.552$, $df=38$, $sig=.585$) or sun protection policies (question 14 above; batting $t=0.058$, $df=36$, $sig=.954$; fielding $t=-1.5$, $df=36$, $sig=.142$) in terms of the percentage of the team not wearing any kind of hat, although there was a trend towards more players not wearing a hat in teams where there was no sun policy or no hat regulations.

Table 8:

Aggregate data showing average percent of each team not wearing a hat while batting or fielding for clubs with and without sun protection policies

Club policies		Average percent of team <i>not</i> wearing a hat while batting	Average percent of team <i>not</i> wearing a hat while fielding
No sun policy	(n=23)	22.5%	18.1%
Sun policy	(n=15)	22.8%	12.5%
No hat regulations	(n=22)	22.9%	18.3%
Hat regulations	(n=18)	20.3%	13.3%

The majority of clubs (85%) sold or provided baseball caps, and overall peaked hats (baseball hats or cricket helmets) were observed to be the most common hats worn by the players, so there was some correlation between policy and behaviour (without showing a causal effect). In aggregate data, there were only five clubs which did not provide or sell baseball caps, but the overall result was shown in a non-significant trend with higher percentages of the team wearing peaked caps among clubs that sold or provided baseball caps.

Table 9:

Aggregate data showing average percent of each team not wearing a hat while batting or fielding for clubs which did or did not provide baseball caps

Club policy		Average percent of team wearing peaked caps while batting	Average percent of team wearing peaked caps while fielding
No baseball caps sold/provided	(n=5)	57.3%	46.0%
Baseball caps sold/provided	(n=35)	68.7%	64.5%

DISCUSSION AND CONCLUSIONS

Most players in this sample emulated the traditional cricket uniforms of long trousers, short or long sleeved shirts with collars and cricket caps or baseball style caps. In general body coverage was quite high among these samples due to most players wearing long trousers. However, most players preferred peaked caps, either baseball caps or cricket helmets which do not provide ideal head coverage. Use of sunglasses among players was low. These findings could be due to safety issues in needing full vision to see cricket balls approaching, however players' behaviour was no different while sitting on the sidelines. Use of shade when not playing was also less than ideal and few players had shade available to them. Most coaches also wore peak caps, and use of sunglasses, while higher than players was still relatively low (39%).

This study provided some correlational evidence that club practices are related to observed sun protection behaviour of members. It appears that a number of sun protective practices are encouraged at these clubs despite only 26% clubs having written policies. The overall score for good sun protection policies among these clubs was quite good, but the endorsement of baseball caps instead of broad brimmed or legionnaire style hats could be reviewed. Most clubs endorsed baseball caps and the use of peak caps among players was quite high. It was disappointing to see, however, that many coaches wore shorts rather than longer trousers.

The following recommendations can be made for cricket clubs as a result of this study:

- encourage coaches to provide sun protective role models for junior players;
- clubs should be encouraged to develop written sun protection policies with a view to improving standards for encouraging sun protection of members;
- review of hat regulations, to include different types of hats;
- provision or availability of broad brimmed or legionnaire style hats rather than peak caps, for both coaches and players;
- promotion of the use of sunglasses by players and coaches.

Further research in this area could include exploration of the relationship between coaches' sun protection behaviour and their teams' sun protection behaviour. Qualitative research could also explore the suitability of more protective styles of hats for playing cricket, perhaps in liaison with sports clothing manufacturers.

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Appendix 1:
**Regions and cricket associations which were observed
 at cricket matches in this study**

Region	Cricket Club/association
Central	Melton Junior Cricket Academy
Lower South Eastern	City of Moorabbin Cricket Association
Upper South Eastern	Box Hill Reporter Cricket Association
North Western	North West Cricket Association
North Eastern	Diamond Valley Cricket Association
Eastern	Eastern Cricket Association
East Central	Heidelberg Cricket Association
Lower North Eastern	Ringwood and District Cricket Association
South Western	Williamstown and District Cricket Association

Appendix 2:
**Range of match observations for temperature, wind level,
 cloud cover and UV levels by region in Weeks 1 and 2**

Region/Week	No. matches observed	Observation time (Sat am)	Temp. /°C	Wind	Cloud	UV
Central	2					
Week 1		9.00–10.45	17.1 ^a	1 ^a	0–3	1–3
Week 2		9.20–10.30	29.2–31.7	3–2	0 ^a	2–3
Lower South Eastern	6					
Week 1		8.30–11.25	16.5–18.1	0–2	0–1	1–2
Week 2		8.30–11.40	28.5–33.8	1–3	0–1	1–2
Upper South Eastern	4					
Week 1		8.45–11.30	16.9–19.0	0–2	0–1	0–3
Week 2		8.30–11.30	28.5–33.0	0–2	0–1	0–3
North Western	7					
Week 1		8.30–10.25	16.6–19.2	1–2	0–1	1–2
Week 2		8.25–10.40	27.2–31.1	2–3	1–2	1 ^a
North Eastern	3					
Week 1		8.30–11.00	16.6–20.0	1 ^a	0–2	1–3
Week 2		8.30–11.30	27.2–32.9	1–3	2 ^a	0–2
Eastern	2					
Week 1		9.15–10.10	16.5–19.0	1–2	1–2	1 ^a
Week 2		9.15–10.10	28.5–33.0	1 ^a	1–2	1 ^a
Lower North Eastern	3					
Week 1		10.10–11.25	19.0–20.0	0–2	0–2	1–2.5
Week 2		10.00–11.30	33.0–35.0	1–2	0–1	2–3
South Western	1					
Week 1		10.00	17.1	2	0	2
Week 2		10.00	31.7	2	0	2
Average match conditions						
Week 1		8.30–11.30	17.1 (1.24)	1.2 (.69)	0.7 (.91)	1.8 (.74)
Week 2		8.30–11.30	30.3 (2.34)	1.8 (.84)	0.9 (.66)	1.5 (.84)

^a These readings were identical for each match in the region.

Wind: 0 = none; 1 = slight; 2 = moderate; 3 = strong; 4 = very strong.

Cloud: 0 = sunshine; 1 = mixed thin; 2 = mixed thick; 3 = overcast thin; 4 = overcast thick.

UV: 0 = mild; 1 = moderate; 2 = high; 3 = extreme.