

# Inadequate pre-season preparation of schoolboy rugby players — a survey of players at 25 Cape Province high schools

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**Objective.** To establish the previous rugby experience, the knowledge and the use of injury prevention techniques by South African schoolboy rugby players.

**Design.** Before the first full-contact match of the 1991 rugby season, 2 330 players completed a detailed questionnaire.

**Setting.** High schools in the Cape Province. Three thousand three hundred and thirty players from 25 schools selected because of a record of excellence in and commitment to schoolboy rugby.

**Main outcome measures.** Personal data including age, height, mass and rugby experience; history and nature of previous rugby injuries; knowledge of techniques known to prevent rugby injuries; parental and personal reasons for playing rugby.

**Results.** The incidence and distribution of the different types of injuries previously sustained by the players were the same as those identified prospectively in the same population. A-team players were significantly heavier and taller than players in lower teams in most playing positions in most age groups. Although A-team players were more likely to participate in pre-season endurance or strength training, fewer than 40% of players overall trained adequately in the pre-season. Less than 30 minutes was allocated to the practice of tackling and falling techniques prior to the first full-contact match. Knowledge of different high-risk situations during play was generally sketchy, and only 24% of players wore gumguards all the time. More fathers (84%) than mothers (63%) encouraged their sons to play rugby.

**Conclusions.** The results indicate that the incidence and nature of the injuries reported retrospectively were similar to those reported in prospective studies at the same schools. The players' knowledge of techniques known to

prevent rugby injuries was inadequate and too little attention was paid at the start of the rugby season to training and coaching techniques to reduce injury risk. Coaching errors may therefore have predisposed players to injury.

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Previous studies from this unit<sup>1-3</sup> have determined the incidence and aetiology of schoolboy rugby injuries. As a result of concerns that the incidence, especially of cervical spinal injuries,<sup>4,5</sup> was unacceptably high, a series of specific rule changes was introduced to South African schoolboy rugby in 1990. The effects of these rule changes on the incidence and nature of schoolboy rugby injuries are currently being evaluated in 25 of the 26 schools surveyed in the original study.<sup>3</sup>

An issue that has yet to be addressed is the attitude of schoolboy rugby players and their coaches to rugby injuries, in particular their knowledge of factors that might either predispose to or reduce their injury risk.

Accordingly, a questionnaire was sent to all rugby players at the 25 high schools involved in the larger study. The questionnaire was designed to evaluate the pre-season training of these players as well as their knowledge of training and other techniques known to reduce the risk of rugby injury.

## Subjects and methods

In the week before the first full-contact match of the season, all schoolboys in 25 high schools in the Cape Province who intended playing rugby during the 1991 season were required to complete a pre-season questionnaire. As was the case in previous studies<sup>2,3</sup> the project was sanctioned by the Cape Education Department and participation was compulsory.

The questionnaire sought answers to the following questions: (i) personal data — age, height, mass, position, number of years playing rugby, average level (e.g. A-team) played during career; (ii) previous injuries; and (iii) general questions relating to techniques known to prevent injury. The latter included gumguard possession and use, front-row substitution by non-specialist players, the amount of pre-season strength and endurance training, knowledge of and participation in neck-strengthening exercises, the amount of pre-season tackling practice, parental attitudes to schoolboy rugby, the two most important reasons for playing rugby, and attitudes to two specific playing situations — falling on an outstretched arm when tackled and falling on the point of the shoulder when tackled — both of which may be associated with injury risk.

Of the approximately 4 100 players scheduled to play during the season, 3 330 (81%) returned questionnaires and all were used. All data from the questionnaire were entered into a DBase III System (Ashton-Tate product by Borland International, Inc. Berkshire, England). Totals and averages for relevant data were acquired using the adding and averaging features of the DBase III package.

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## Results

### Previous injuries

Fig. 1 compares the incidence of the different types of injuries reported retrospectively in this study with those reported in the prospective study undertaken at the same schools.<sup>3</sup> With the exception of ligament injuries, which were reported less frequently in this study, the incidence of the different injuries in the two studies was very similar. Fractures were the most common injuries (27%), followed by ligament injuries (22%), muscle injuries (20%), concussions (15%), lacerations (4%) and dislocations (3%). Eight hundred and eighty-eight concussion injuries were reported by 471 players, an average of 1.9 concussion injuries per concussed player during their playing careers. Thirty-six per cent of injuries were to the lower limbs, 28% to the head and neck, 26% to the upper limbs and 10% to the trunk and abdomen.

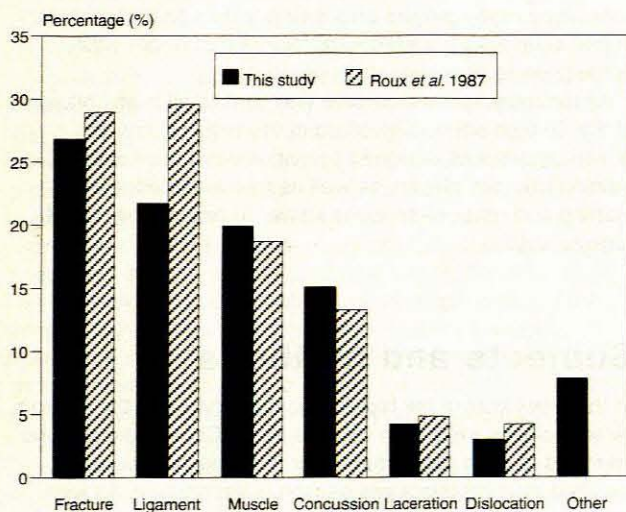


Fig. 1. The incidence of different types of injuries reported retrospectively in this study, compared with those reported in a prospective study<sup>3</sup> at the same schools.

### Pre-season training

Fig. 2 shows the percentage of players classified as A-team players or lower-team players in each age group who completed pre-season training programmes for endurance and general strengthening.

A greater percentage of A-team players of all ages undertook pre-season endurance or strength training. At all ages and at all levels of play, more players reported that they participated in endurance than strength training. Similarly, a greater percentage of players in older age groups reported that they had completed such programmes.

### Gumguards

Forty-six per cent (1 543) of the 3 330 players possessed gumguards. Of these 24% wore them all the time, 18% wore them some of the time and 58% never used them.

Of the 1 781 players who did not possess gumguards, 48% thought they were unnecessary and 35% said that they did not know enough to warrant their use. The remaining

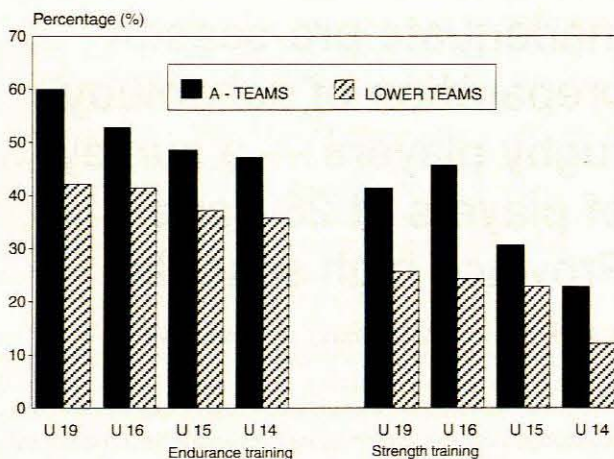


Fig. 2. Percentage of players in the A and lower teams in each age group who completed pre-season training for endurance and general strength.

17% provided other reasons for not possessing gumguards. These included: expense (11%); will be obtaining one soon (2%); have no reason for wearing one (2%); and could not be bothered, they are a nuisance, wear braces, or they make one feel sick (each 0.5%).

### Front-row substitutions

Of a total of 2 646 non-specialist front-row forwards in the study, 973 (37%) had previously substituted in this position at some stage of their career; 160 (16%) indicated that they were injured while doing so.

### Reasons for playing rugby

Sixty-nine per cent of players gave leisure as one of the reasons for playing rugby, 48% gave health and fitness, 20% played for social reasons, 16% as a result of external pressure, 15% for the image of masculinity, 11% for psychological reasons (religion, glory, sportsmanship) and 11% for mastery of the game. Ten per cent of players gave only one reason for playing rugby.

Far fewer players reported that they undertook specific strength training, especially neck-strengthening programmes. Of the 684 specialist front-row forwards in the study, only 6 (0.9%) had followed an appropriate neck-strengthening programme and a further 6 had undertaken isometric strengthening using their hands. Eighteen per cent of players had a knowledge of the correct methods for neck strengthening (bridging exercises, resistance exercises using a partner and/or weights attached to a head piece): 16% believed that resistance training using their own hands was adequate for isometric strengthening.

### Tackling practice

The average ( $\pm$ SD) time spent in practising falling techniques prior to the first full-contact match of the season was  $16 \pm 22$  minutes. The average time spent on tackling practice was  $15 \pm 24$  minutes; the average time spent listening to verbal coaching or lecturing on tackling techniques was  $11 \pm 21$  minutes. These averages did not differ at the different ages.

### Knowledge of risk factors

Forty-four per cent of the players felt that falling on an outstretched arm when tackled was an injury risk, and 72% felt that falling on the point of the shoulder when tackled was an injury risk.

### Parental attitudes

Eighty-four per cent of fathers and 63% of mothers encouraged their sons to play rugby, while 10% of fathers and 31% of mothers actively discouraged their sons from playing; the remainder were indifferent. Sixty-four per cent of the 305 fathers who discouraged their sons from playing rugby had played rugby while at school.

## Discussion

The impression gained from this study is that the schoolboy rugby players who were surveyed had insufficient knowledge of techniques known to prevent rugby injuries. They were inadequately prepared at the start of the rugby season and coaching errors may have predisposed some of these players to injury. These findings may be even more pronounced among players in other schools in which rugby is a less important activity.

That the players were ignorant of even the most basic techniques known to prevent rugby injuries is shown by the finding that the majority of players did not possess, let alone wear, gumguards despite conclusive evidence that gumguards not only prevent injuries to the orofacial region almost completely, but also reduce the probability of concussion and even neck injury.<sup>6-9</sup> Wearing of a gumguard should be made compulsory at all levels of play and parents should be advised accordingly.

Furthermore, the majority of players in this study did not know of one correct method for strengthening their neck muscles, and they were not aware of the risk of injury to the wrist, elbow, shoulder and clavicle when falling, or of how to prevent these injuries.

Evidence that the players in this study were inadequately prepared at the start of the rugby season is shown by the small percentage who reported that they had undergone pre-season endurance and strength training programmes. Disturbingly few players, and in particular specialist front-row forwards (< 1%), had followed a pre-season neck-strengthening programme.

We recommend that all players be strongly encouraged to follow comprehensive and position-specific pre-season training programmes.<sup>10,11</sup> These should be closely monitored and revised during the season. Coaches need to ensure in particular that their forwards participate in a supervised programme of neck strengthening;<sup>11</sup> front-row forwards should not be allowed to scrum in that position unless the programme has been completed.

While the large standard deviations in the time allocated to pre-season tackling practice indicates that some coaches might spend a large amount of time on this and others not, the overall impression is that insufficient time for and emphasis on tackling practice may have predisposed some of the players to injury. This is particularly important, as more than 50% of schoolboy rugby injuries occur during the tackling phase of the game.<sup>3,8</sup> Little emphasis was also placed

on the practice of falling techniques. Williams<sup>12</sup> reported that 93% of all acromioclavicular injuries resulted from falling.

As a result of the high injury risk during the tackling phase of the game, players should be taught relentlessly how to tackle correctly and how to 'ride' a tackle. Emphasis should be placed on the technique of tackling and falling, rather than on the speed and impact of the collision.

Even more serious was the high incidence of injury to non-specialist front-row forwards substituting in that position. Such players are a danger not only to themselves but also to competent players scrumming against them.<sup>13</sup>

Finally we found that not all parents, and particularly not all mothers, supported their sons' playing rugby.

An area that we did not investigate was pre-exercise warm-up and stretching procedures. The benefits and necessity of correct warm-up and stretching procedures are well documented.<sup>9-12,14,15</sup> Coaches should ensure that all players follow correct procedures before all matches and practices. This is essential for preventing injuries, while incomplete or incorrect warm-up and stretching procedures may predispose to injury.

In summary, the principal findings of this study suggest that prevention of injury is not a high priority among players and rugby coaches at high school. Findings that indicate this include a lack of pre-season physical training, lack of time spent on learning tackling and falling skills, and an inadequate knowledge and use of techniques known to prevent injuries.

We recommend that more attention be paid to pre-season physical and skill training and to injury prevention among schoolboys. Perhaps the desire to win rugby matches has become so pervasive that other considerations are neglected.

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