








User perception and acceptance of softshell headgear amongst youth rugby players

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ABSTRACT

This study investigated the attitudes, preferences, motivations and acceptance of softshell headgear among youth rugby players. Female and male rugby players (ages 13-17) were surveyed regarding headgear use during training and matches, discontinuation reasons, preferred brands, motivations for use, and reasons for non-use. We assessed confidence without headgear, head injuries, familiarity with specifications, and awareness of benefits/risks. Most (86%) didn't wear headgear during training; 74.4% abstained in matches. Reasons for discontinuation included discomfort and perceived ineffectiveness. Parental advice (78%) and injury protection (52%) drove headgear use. Non-use reasons: lack of ventilation (67%), bulkiness (50%), discomfort (44%), non-compulsory use (36%), and lack of consideration (36%). 44.2% believed headgear protects against head injuries; 30.2% were unsure. The results of this study indicate a range of attitudes among youth rugby players towards the use of headgear. Understanding their motivations and concerns is crucial for improving player safety. While some players see headgear as a valuable protective measure, others are deterred by factors such as discomfort and lack of ventilation. There is a need for greater awareness and education about headgear benefits and risks among rugby players, potential modifications to headgear design to enhance comfort and ventilation should be explored and further research conducted to explore the benefits that headgear has for head impact protection.

Keywords: Physical activity psychology, Head injuries, Sports science, Sport and exercise, Protective equipment, Rugby safety, Player attitudes.

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INTRODUCTION

Rugby, a dynamic and widely embraced contact sport, has experienced remarkable global growth, boasting participation from over 7.6 million players in more than 128 countries (World Rugby, 2021). The substantial numbers of registered players, both worldwide and in specific regions like New Zealand, underscore the sport's universal appeal. Studies have identified a positive correlation between rugby's popularity and increased media coverage, strengthened safety regulations, and the establishment of community youth programmes in rugby (King et al., 2009; New Zealand Rugby, 2023; Quarrie et al., 2020; World Rugby, 2021). In nations like New Zealand, where the population is around five million, the robust engagement of over 160,000 players highlights the sport's profound popularity at the grassroots level (New Zealand Rugby, 2023). However, the current body of literature addressing rugby at the youth and community levels is notably limited (Freitag et al., 2016).

In the context of rugby, a sport demanding physical prowess and marked by high competitiveness, the risk of injuries, particularly those affecting the head, has become a focal point. In the pursuit of player safety, the sport has evolved, with protective equipment playing a pivotal role in injury prevention. Softshell headgear, a notable addition to protective gear, has garnered attention in recent years (King et al., 2016).

Within the landscape of youth rugby, understanding the attitudes and acceptance of softshell headgear becomes crucial. The safety of young athletes is paramount, and comprehending their preferences, motivations, and concerns regarding headgear usage is of utmost importance (Freitag et al., 2016).

A systematic review of strategies aimed at preventing concussions determined that while headgear may effectively reduce superficial head injuries, it does not offer protection against concussions (Schneider et al., 2017). However, studies indicate that a noteworthy percentage of players, as high as 60%, maintain the belief that wearing headgear can prevent serious head injuries, including concussions (Finch et al., 2001; Menger et al., 2016; Pettersen, 2002). While strides have been made in improving headgear designs and materials, understanding how youth players perceive and accept this equipment is a critical aspect of rugby safety (King et al., 2016). This study delves into the attitudes and perceptions held by high school-level youth rugby players towards softshell headgear. This study aims to explore the preferences, choices, and beliefs of youth rugby players regarding softshell headgear. It investigates usage patterns during training sessions and matches, reasons for discontinuing headgear use, brand preferences, and motivating factors for both wearing and not wearing headgear (Fuller et al., 2017; Makovec Knight et al., 2021; Pfister et al., 2016).

The novelty of this research lies in its specific focus on high school-level youth rugby players and their perceptions of softshell headgear. The unique characteristics and concerns of younger athletes may significantly differ from those of adults (Freitag et al., 2016). By bridging this knowledge gap, this study seeks to provide insights that can inform decision-makers, coaches, and parents about safety measures deemed effective and acceptable by youth players in rugby (Quarrie et al., 2020; Silver et al., 2018).

As youth rugby continues to gain popularity, striking a balance between player engagement and maintaining a safe playing environment is essential. This research, by delving into the nuanced world of youth rugby players' attitudes towards softshell headgear, aims to contribute to the development of strategies that not only reduce the risk of head injuries but also enhance the overall safety and well-being of these young athletes (Quarrie et al., 2001).

MATERIAL AND METHODS

Ethics approval and informed consent

This research received ethical approval from the University of Canterbury Human Research Ethics Committee (HEC 2021/26) and all procedures were conducted in accordance with relevant ethical standards and regulations. This research adhered to ethical guidelines, with the informed consent of participants and respect for their privacy. The data collected were anonymised to protect the identities of the participants.

Study participants

A total of 43 high school-level rugby players, including both females (aged 13-17 years) and males (aged 14-16 years), participated in this study. The female participants were 1st and 2nd XV rugby players drawn from one high school. The male participants were Under16 club rugby players drawn from three different high schools. The participants reflected a mix of rugby experiences, and backgrounds.

Survey method

To assess the attitudes and acceptance of softshell headgear among the youth rugby players, a structured questionnaire was developed. The questionnaire aimed to capture a comprehensive overview of the participants' perspectives regarding headgear usage. The questions were designed to explore various aspects, including the frequency of headgear use during training sessions and matches, past experiences with headgear, reasons for discontinuing its use, preferred headgear brands, motivating factors for using or not using headgear, belief in the efficacy of headgear, confidence in head protection without headgear, history of head injuries, familiarity with headgear specifications and regulations, and perceptions of the availability of information regarding headgear benefits and risks.

Table 1. Survey questions.

Questions
Do you wear headgear during rugby training sessions?
Do you wear headgear during rugby gameplay (matches)?
If you DO NOT wear headgear have you worn it in the past?
If you answered YES to the above question, why did you stop using headgear?
If you have ever worn headgear, what brand/s of headgear have you worn?
For those who wear headgear: What are the primary reasons for choosing to wear headgear during rugby activities?
Please select your preferred brand/s of headgear to wear:
For those who DO NOT wear headgear: What are the main reasons for choosing not to wear headgear during rugby activities?
Related to the above question, are there other specific concerns or disadvantages you associate with headgear that influence your decision not to wear it?
Do you believe that headgear offers protection against potential head injuries?
Please explain your above answer about whether you believe that headgear offers protection against potential head injuries?
How confident are you in your head protection without wearing headgear?
Have you experienced any head injuries while playing rugby, and if so, how severe were they?
Have you had a concussion while playing rugby this season?
How familiar are you with the specifications and regulations regarding headgear in rugby?
Do you think there is enough information available to players about the benefits of wearing headgear and/or the risks of not wearing headgear?
Is there anything specific that could be done to make headgear more appealing or effective for rugby players?
Please explain your above answer in regards to potential improvements to headgear.
If there is anything else you'd like to share about your decision to wear or not wear headgear in rugby, please do so.

The majority of attitudinal and knowledge data were captured through questions using a five-point Likert scale. Survey questions related to reasons for wearing or not wearing headgear, as well as questions about favourable headgear design and features, presented a set of options for participants to select the most fitting responses. The wording for these attitudinal and opinion-based questions, along with their corresponding options, is outlined in Table 1.

The questionnaire was administered to the participants through majority in-person surveys but due to accessibility issues two participants completed the questionnaire online. Participants were provided with clear instructions on how to complete the questionnaire. Data collection was conducted in an ethical manner, ensuring that all participants provided informed consent before participating in the study. The data collection process aimed to be inclusive and non-intrusive, acknowledging the sensitivity of the topic.

Statistical analyses

The data obtained from the completed questionnaires was analysed using descriptive statistics. The responses were collated and summarised to provide an overall view of the participants' attitudes towards softshell headgear. These statistics included percentages, counts, and proportions that helped identify patterns and trends in the participants' responses.

Limitations

It is essential to acknowledge potential limitations in the methods employed in this study. The sample size of 43 participants, while diverse, may not be fully representative of all youth rugby players, and the findings may not be generalisable to all populations. Additionally, the use of a structured questionnaire, while allowing for quantitative analysis, may not capture the full spectrum of qualitative insights that participants may have regarding headgear usage. It is important to note that the questionnaire did allow for participants to comment and add in other options to the structured list of answers in various question sections.

Overall, the methods used in this study aimed to comprehensively assess the attitudes and acceptance of softshell headgear among high school-level youth rugby players. The structured questionnaire provided a structured approach to gathering information from participants, allowing for the quantitative analysis of their responses. These methods, while not without limitations, were chosen to ensure the ethical conduct of the study and the extraction of valuable insights into this crucial aspect of player safety in youth rugby.

Data availability

Raw data were generated at the Department of Mechanical Engineering at the University of Canterbury. Data generated during this study are available from the corresponding author upon reasonable request. The data are not publicly available to protect the privacy of the players involved.

RESULTS

All 43 study participants completed the survey. 41 participants were taken through the survey in-person with one of the researchers. Two participants completed the survey online, without the supervision of one of the researchers.

Uptake of headgear use

Data from the questionnaire responses were analysed using descriptive statistics, and the results are presented below. Among the participants, 37 (86%) did not wear headgear during training sessions, with 3

(7%) using headgear occasionally and 3 (7%) using headgear consistently. In matches, 32 (74%) did not wear headgear, 3 (7%) used headgear occasionally, and 8 (18.6%) used headgear consistently.

Reasons for wearing headgear

Of those who previously wore headgear but stopped (14 participants), reasons included discomfort, a perception that headgear was not needed, and that headgear was bulky/annoying. Some participants reported that various brands of headgear were used, with CCC (Canterbury of New Zealand) being the most common (12 participants), followed by NPro (Contego Sports Ltd., approved by World Rugby Trial WRX-286-IKY), (9 participants).

For those who have worn headgear at any stage, the primary reasons (chosen from any of ten options) included parental advice (19 respondents), protection from head injuries (12), protection from scratches/cauliflower ear (8), and feeling safer when wearing headgear (7). See Figure 1.

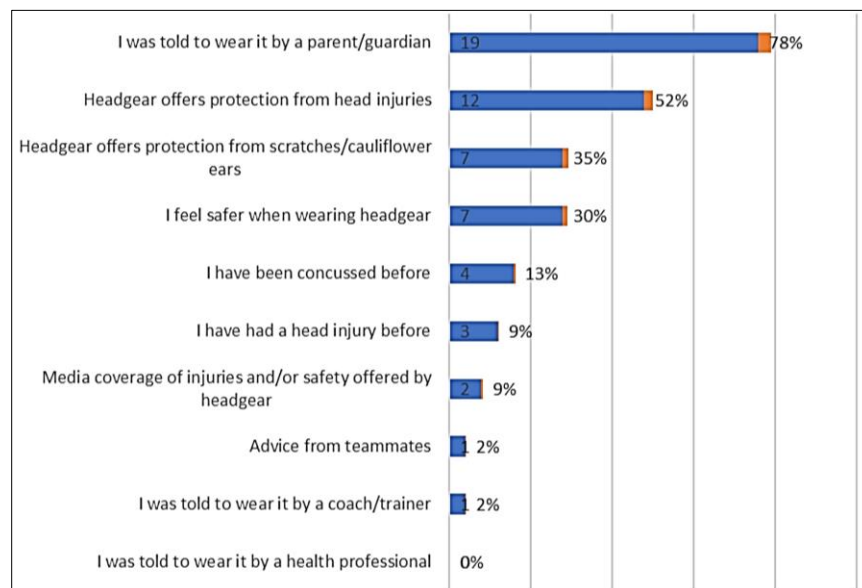


Figure 1. Primary reasons for wearing headgear (23 respondents).

Reasons for not wearing headgear

The primary reasons for not wearing headgear as shown in Figure 2 were lack of ventilation (24 respondents), headgear being bulky and annoying (18), general discomfort (16), headgear not being compulsory (13), not considering wearing headgear (13), headgear appearance was undesirable (12), the perception that headgear was not needed (12). Also cited was headgear being a barrier to hearing (9) and headgear not fitting properly (6) as reasons. Headgear restricting mobility (3) and the cost of headgear (3) were also mentioned.

Efficacy of headgear

In terms of belief in headgear efficacy in head protection, 44% believed that headgear offers protection against potential head injuries, while 26% did not, and 30% were unsure.

In assessing their confidence in head protection without wearing headgear, the majority of participants expressed confidence, 16% were completely confident, 49% were very confident, 5% were somewhat confident, only 2% were not confident at all, and 28% were neutral (see Figure 3).

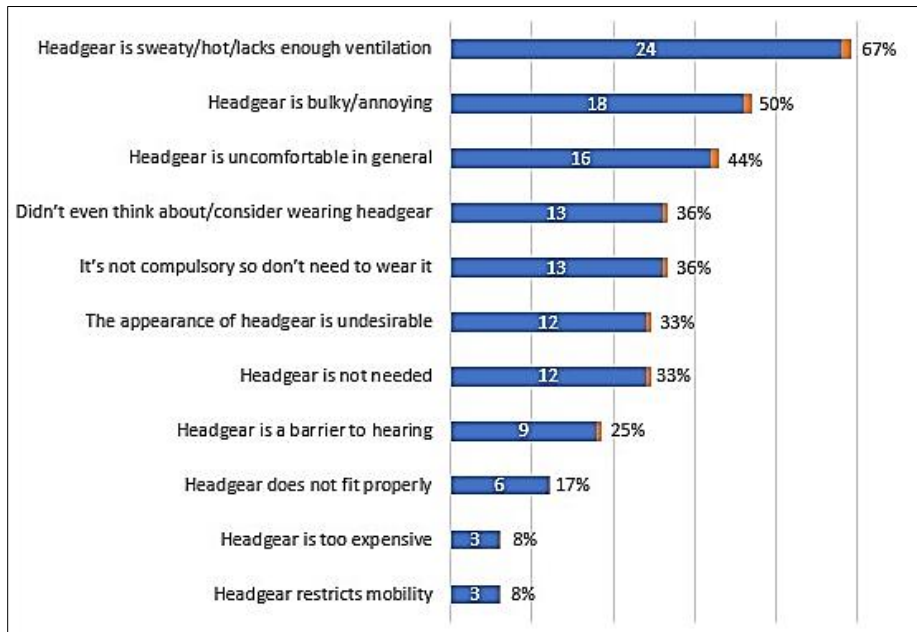


Figure 2. Primary reasons for not wearing headgear (36 respondents).

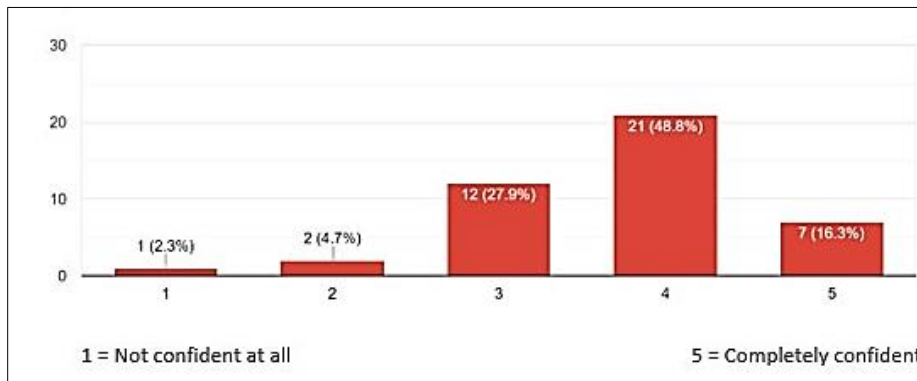


Figure 3. Player level of confidence in head protection without wearing headgear.

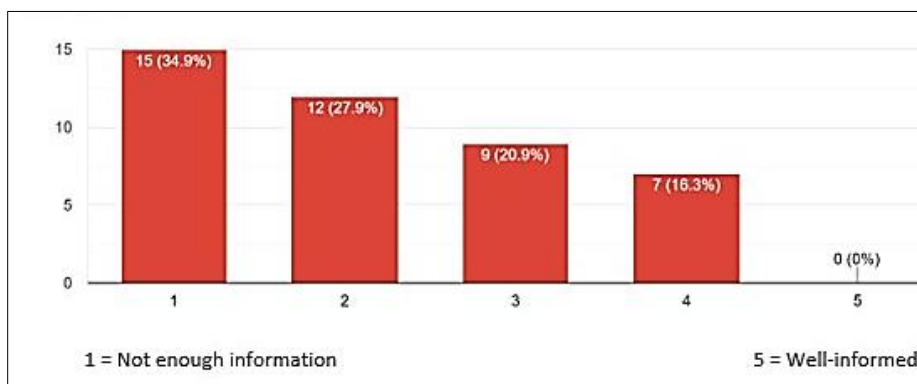


Figure 4. Scale of perceived amount of information available to players, about the benefits of wearing headgear and/or the risks of not wearing headgear.

Head injuries

Regarding whether the players had experienced any head injuries while playing rugby, 25 (58%) participants reported no head injuries, (9) 20% had mild head injuries, 6 (14%) had moderate head injuries, 4 (9%) had significant head injuries, and 1 (2%) had experienced a serious head injury. It should be noted that 2 players each reported on 2 different head injuries (at different severity levels). No players reported having experienced severe head injuries.

Information availability

In terms of familiarity with the specifications and regulations regarding headgear in rugby, 77% (33 out of 43 participants) were not familiar at all, 12% were somewhat familiar, 7% were neutral, 2% were familiar, and 2% felt they were extremely familiar.

Participants' perceptions of information availability about the benefits and risks of headgear varied (see Figure 4): 35% felt there was not enough information available, 28% thought there was somewhat enough information, 21% were neutral, and 16% believed there was information available. None reported having a lot of information.

Making headgear more appealing or effective

Suggestions by participants for making headgear more appealing or effective (Figure 5) included increasing ventilation (79%), better hearing access (42%), improving design for proper fitting (33%), making it more affordable (26%), making headgear less stiff/rigid (26%), using a thicker shell (19%), using a thinner shell (16%), and making headgear compulsory under World Rugby rules (16%). Four participants (9%) indicated that no specific changes were needed.

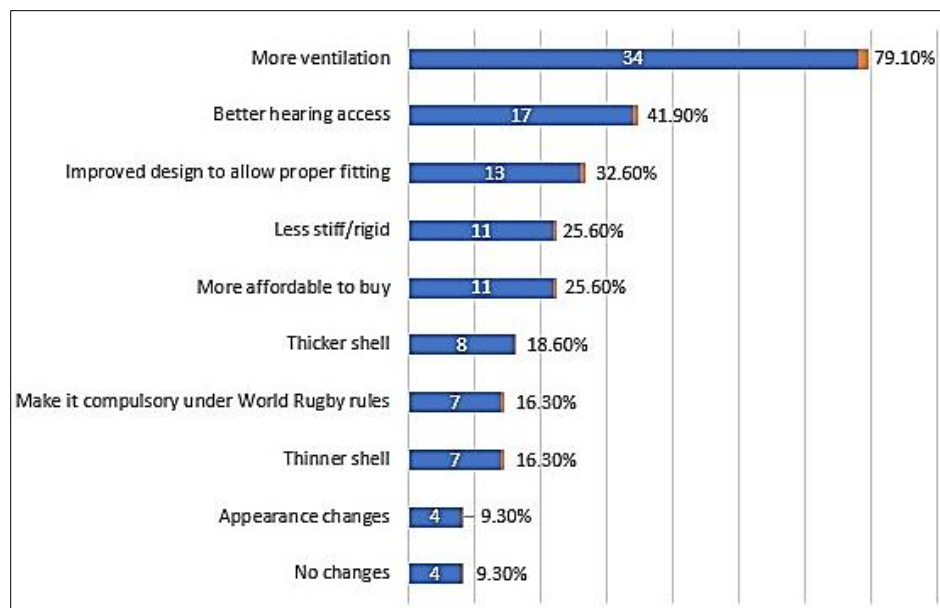


Figure 5. Player suggestions on how headgear could be more appealing or effective (43 respondents).

DISCUSSION

In exploring the growth of rugby at the youth and community levels, our findings present crucial points for discussion, particularly when compared to existing research. Our study also highlights a noticeable gap in

the literature concerning youth and community rugby. While research has addressed safety concerns at the professional level, the dearth of comprehensive studies focused on grassroots rugby is evident (Freitag et al., 2016; Quarrie et al., 2001). This emphasises the urgency for targeted research in these demographics to provide a nuanced understanding of safety dynamics (Freitag et al., 2016).

The lack of information surrounding the benefits to wearing headgear and the risks of not wearing headgear, and the adequacy of safety education, resonate with the broader discourse in rugby safety research. Studies have highlighted similar concerns, indicating a need for standardised safety protocols and comprehensive educational initiatives across all levels of play (Fuller et al., 2017; King et al., 2016).

Furthermore, our study aligns with Quarrie, Gianotti, and Murphy's (2020) investigation into injury risks in New Zealand Rugby Union. Their nationwide study of injury insurance claims from 2005 to 2017 complements our findings, highlighting the need for a comprehensive approach to injury prevention at the grassroots level (Quarrie et al., 2020). Additionally, the prospective cohort study by Quarrie et al. (2001) on risk factors for injury in rugby union football adds depth to our understanding of injury dynamics in community rugby. Their research supports the notion that a holistic approach, considering player-specific factors, is essential for mitigating injury risks (Quarrie et al., 2001).

In summary, our study contributes valuable insights into the safety concerns associated with the growth of rugby at the youth and community levels. While our findings align with broader trends identified in existing research, the specificity of our focus on grassroots rugby illuminates unique challenges that warrant dedicated attention. Future research should build upon these comparative insights to develop targeted interventions and safety strategies that align with the distinct characteristics of youth and community rugby. By doing so, we can collectively work towards ensuring that the burgeoning enthusiasm for the sport of rugby is met with robust safety measures at every level of play.

CONCLUSIONS

This study has shed light on the complex and varied attitudes of youth rugby players towards the use of softshell headgear. It is evident that there is no one-size-fits-all perspective on this protective equipment. While some players view headgear as a valuable safeguard against head injuries, others are deterred by the discomfort and lack of ventilation it may bring. These contrasting opinions highlight the need for a nuanced understanding of the factors that influence players' decisions regarding headgear usage.

The findings underscore the importance of addressing these multifaceted attitudes in the context of youth rugby. Player safety is a paramount concern, and the efficacy of protective equipment is contingent on players' willingness to wear it. A comprehensive understanding of the factors influencing player choices can inform strategies for injury prevention and safety enhancement in the sport.

Increasing awareness and education about the benefits and risks associated with headgear is an imperative step towards mitigating the misconceptions and uncertainties prevalent among young rugby players. Many players are unsure about the protective qualities of headgear, and a significant portion believes that it does not offer the protection it claims to provide. Clarifying these aspects through education and information dissemination can contribute to more informed decision-making by players.

Furthermore, the issue of headgear design warrants special attention. Many players cited discomfort, bulkiness, and lack of ventilation as reasons for not using headgear. Enhancing the design to address these

concerns, such as improving ventilation, achieving better fit, and reducing bulkiness, can make headgear more appealing and comfortable to wear. This can lead to a higher acceptance rate among players.

It is also worth considering whether making headgear compulsory under World Rugby rules could be a viable option. While this may face resistance due to individual preferences and potential challenges with enforcement, it could be explored further in the context of youth rugby, where safety is of utmost concern.

In conclusion, the diverse attitudes towards softshell headgear among youth rugby players highlight the need for a multifaceted approach to player safety. Addressing concerns related to comfort, ventilation, and information gaps, while exploring potential modifications to headgear design, can contribute to a safer playing environment for young athletes. Additional research is necessary to evaluate the actual impact of softshell headgear in reducing head injuries in youth rugby and to further inform policy decisions in the sport. Ultimately, the health and well-being of youth rugby players should remain a top priority, and efforts should be directed towards minimising the risk of head injuries and promoting a culture of safety in the sport.

RECOMMENDATIONS

Considering the findings from this study, several recommendations are proposed to promote player safety and well-being among youth rugby participants.

It is imperative to establish comprehensive education programmes and awareness campaigns, designed to reach youth rugby players, coaches, and parents/guardians, ensuring that all stakeholders are well-informed about the benefits and risks associated with softshell headgear. Educating players is pivotal in dispelling misconceptions and empowering them to make informed choices regarding headgear usage. Collaborative efforts with rugby governing bodies, schools, and youth rugby organisations should continue to emphasise the importance of headgear as a protective tool. Targeting both players and their parents or guardians is essential to ensure that decision-making is guided by accurate information.

Simultaneously, there is a need to explore design modifications that enhance the comfort, fit, and ventilation of softshell headgear. Ongoing research in this area, focused on materials and construction innovations, should aim to reduce bulkiness, improve fit, and prioritise player comfort. A critical aspect of headgear's effectiveness is proper fitting. The development and adoption of standardised fitting protocols should be encouraged. Standardised fitting procedures can enhance comfort and protective capabilities while addressing issues related to poorly fitting headgear.

Furthermore, the issue of affordability should not be overlooked. Initiatives to make headgear more financially accessible to youth players, such as subsidies, discounts, or sponsorships for youth rugby organisations, can help reduce financial barriers and encourage broader adoption of protective headgear.

The question of whether softshell headgear should be made compulsory under rugby regulations is one that deserves thorough exploration. While the idea of mandatory headgear usage may face resistance due to individual preferences and enforcement challenges, it should be considered in the context of youth rugby where safety is paramount. Such regulations would ensure a consistent level of protection for all players, thereby promoting a culture of safety.

In conjunction with these recommendations, longitudinal research is essential to assess the actual effectiveness of softshell headgear in reducing head injuries among youth rugby players. This research

should consider variables such as age, level of play, and the specific types of head injuries encountered in rugby. Long-term studies can provide evidence-based insights for further safety measures.

Regular checks and maintenance of headgear should be promoted to keep equipment in optimal condition. Coaches and parents should be educated on how to assess headgear for wear and tear, highlighting the importance of well-maintained protective equipment.

Furthermore, the establishment of a feedback mechanism between players and manufacturers is necessary. This ongoing dialogue can inform future innovations, ensuring that headgear remains in line with the evolving preferences and needs of young rugby athletes.

Finally, a culture of safety should be promoted within youth rugby, emphasising the importance of prioritising well-being. Coaches, parents, and administrators should lead by example, emphasising the significance of protective equipment and adherence to safety guidelines.

These interconnected recommendations, ranging from education to design modifications, affordability, and cultural shifts, collectively address the multifaceted attitudes of youth rugby players towards softshell headgear. By implementing these measures, stakeholders in youth rugby can collaboratively enhance the safety and well-being of young athletes, creating a safer playing environment while allowing them to enjoy the sport with minimised potential harm.

AUTHOR CONTRIBUTIONS

Survey design was by Heward-Swale. Implementation of the research was by Heward-Swale, Spriggs and Henley. Heward-Swale performed the measurements, processed the experimental data and performed analysis. Kabaliuk conceptualised the study. Kabaliuk and Draper supervised the work. Hamlin supervised Spriggs. Heward-Swale wrote the manuscript. Kabaliuk and Draper reviewed and approved the final version of the manuscript.

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DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

ETHICAL APPROVAL

This research received ethical approval from the University of Canterbury Human Research Ethics Committee (HEC 2021/26) and all procedures were conducted in accordance with relevant ethical standards and regulations.

INFORMED CONSENT

Written informed consent was obtained from all study participants and their parents, prior to the study.

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