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## Youth field hockey coaches' perspectives and use of sports recovery strategies

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### ABSTRACT

Field hockey, a physically demanding sport gaining popularity among New Zealand's youth, necessitates a balanced approach to training load and recovery to minimise injury risk and performance decline. Youth sports coaches are vital in implementing injury prevention programs prioritising sports recovery and the health and wellbeing of young field hockey players. This study aimed to investigate New Zealand field hockey coaches' practices, beliefs and perceived barriers, and benefits of sports recovery protocol implementation. Twenty-three New Zealand youth field hockey coaches (female  $n = 15$ , male  $n = 7$ , non-binary  $n = 1$ ) completed the 21-question Qualtrics questionnaire distributed via 25 New Zealand field hockey associations. Data were analysed using Microsoft Excel and presented as proportions (%) and means  $\pm$  standard deviation. Coaches illustrate a positive view towards sports recovery and appear to understand why sports recovery is performed in youth field hockey. Stretching was the most frequently used (100%) and perceived to be the most beneficial (61.5%) form of sports recovery; however, the prescription of sports recovery amongst participants was low (57%). Limited knowledge, time, and resources have been highlighted as critical barriers to implementing sports recovery. Therefore, providing more coach education and resources may be beneficial, allowing youth field hockey coaches to manage time and space to prescribe sports recovery post-games and training more effectively.

## 1. Introduction

In the contemporary landscape of youth sports in New Zealand, field hockey, an internationally and Olympic-recognised sport, plays a pivotal role for many youths. However, sport in New Zealand, in common with the global context, has witnessed a noticeable surge in competitive play and training demands imposed upon young players, propelled by their personal aspirations and expectations of their support systems to achieve sporting success (Gould et al., 2012; Walters et al., 2022). This engagement reflects a broader societal shift toward structured and highly competitive sporting experiences for young players

(Brenner et al., 2016). Notably, this transformation of the sport has led to a significant amplification in the demands associated with weekly training, playing, and tournament commitments, creating a dynamic and demanding environment known as 'organised chaos' (Phibbs et al., 2018; Van der Merwe et al., 2019). This evolved landscape presents a multifaceted challenge for youth coaches responsible for guiding young players through the paths of skill development, performance optimisation, and injury prevention.

One of the central challenges faced by youth field hockey coaches within this 'organised chaos' is striking the delicate balance between optimising player performance and preventing

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overexertion (Phibbs et al., 2018). This challenge encompasses both the physical and mental demands placed on young players as they strive to meet the ever-increasing expectations of a highly competitive environment (Brenner et al., 2019; Phibbs et al., 2018). Coaches grapple with the fine line between functional over-reaching, characterised by controlled training stress that leads to performance improvement, and non-functional overreaching, which increases the risk of injury and burnout (Clive et al., 2018). Recognising when and how to push players to their limits while safeguarding their well-being is paramount. It is within this intricate framework that the importance of sports recovery strategies becomes evident (Ihsan et al., 2016). Effective integration of recovery techniques has been found to enhance players resilience which in turn prevented injury risk as well as optimising some performance outcomes, enabling them to thrive in the youth field hockey environment (Kellmann et al., 2018; Van der Does et al., 2017).

Globally, coaches and athletes routinely implement a wide range of sports recovery methods. Active-land-based (e.g. walking, jogging, low-intensity cycling), active-water-based (e.g. swimming, pool walking), stretching (e.g. static, dynamic, yoga), cold water immersion, contrast water immersion (alternating hot and cold water), and tissue release modalities (e.g. foam rolling, massage, and massage guns) have commonly been reported within research as those strategies frequently used by coaches and players (Crowther et al., 2017; Murray et al., 2017; Shell et al., 2020). In a study by Shell and colleagues (2020), common reasons for coaches ( $n = 10$ ) prescribing active-land-based, active-water based, stretching and massage were to 'decrease muscle soreness', 'increase blood flow', 'reduce muscle soreness', and 'increase subsequent performance'. Common reasons for prescribing cold water immersion and contrast water therapy were to 'reduce muscle soreness' and 'enhance blood flow and circulation (Shell et al., 2020). However, conflicting evidence exists regarding which strategy is most effective and how to prescribe recovery.

Despite limited research outlining the trends and perceptions of sports recovery strategies used by youth coaches in New Zealand, youth sports coaches are known to play a vital role in facilitating recovery (Rees et al., 2021). However, appropriate coach education is key to successfully delivering appropriate sports recovery strategies (Gianotti et al., 2010). The impact youth coaches have on player adherence to sports recovery remains unclear (McKay et al., 2014); however, it is thought adherence to sports recovery and injury prevention programmes is greater if coaches are actively implementing them into their training, games, and tournaments (Lindblom et al., 2014). In addition, it has been reported that younger players who are often inexperienced or knowledgeable regarding effective post-game recovery strategies look to coaches to guide them (Rees et al., 2021; Shell et al., 2020). Coaches' priorities and behaviours could be seen as paramount in creating safe sporting environments for youth players; however, the level of injury prevention knowledge in youth coaches appears limited as youth coaches are often volunteers and cannot be expected to be experts in sports recovery (Rees et al., 2021). Therefore, youth coaches must be educated accordingly to provide safe and effective strategies to help improve recovery (McKay et al., 2014).

Many sports recovery strategies exist in a broader attempt to optimise player performance, reduce player fatigue, aid in injury prevention, and assist in overall player well-being. A key JSES | <https://doi.org/10.36905/jses.2023.03.05>

influence on youth players' uptake of sports recovery is the self-efficacy, knowledge, attitudes, and behaviours of youth coaches implementing the strategies. Therefore, the primary aim of this study was to determine what recovery strategies are currently being used by New Zealand youth field hockey coaches during a regular field hockey season. The secondary aim was to gain insight into why participants are using or not using recovery strategies by examining beliefs, barriers, and benefits of sports recovery. This research will provide valuable insight into the perspectives and practices of recovery strategies and may be used to inform educational strategy in the future.

## 2. Methods

### 2.1. Design

An online questionnaire was developed and distributed using Qualtrics software (Qualtrics<sup>®</sup> 2022, v.05/22, Provo, UT) to measure participants' usage, knowledge, perceptions, and barriers of sports recovery of New Zealand youth field hockey coaches. The questionnaire incorporated mixed response types, including open and closed-ended questions, tick boxes, and a Likert scale. The questionnaire was developed by adapting questions from previously published research questionnaires relating to sports recovery (Crowther et al., 2017; Murray et al., 2017; Shell et al., 2020), and youth field hockey (Rees et al., 2021). The Wintec Human Ethics Committee granted ethics approval before the survey's release (Approval reference: WTLR16090522), and participants provided informed consent before commencing the questionnaire.

### 2.2. Participant recruitment

Eligible participants were invited to participate in the study via an invitation sent by 25 New Zealand field hockey associations. To be included in the study, participants had to satisfy two critical inclusion criteria: a field hockey coach, coaching an under-20 school, club, representative, or national team inclusive of players 16 – 19 years of age, and experience coaching over at least one season of field hockey in New Zealand within the last five years. Participants were recruited via the New Zealand Field Hockey Association's social media platforms and email databases using the researcher's advertising poster, where participants could directly access the questionnaire.

### 2.3. Procedure

The questionnaire contained 21 items. The questionnaire comprised three sections: section one encompassed eight questions for collecting demographic data. Section two included four questions investigating whether participants promote sports recovery, what sports recovery strategies were used, the perceived benefit of the strategy, and any barriers to facilitating sports recovery. Responses to the first three questions were collected using tick boxes with selection options; participants were encouraged to provide open-ended responses when describing any barriers, they encountered in facilitating sports recovery. Section three constituted nine questions exploring the participant's perceptions of why they facilitate sports recovery. Section three

utilised a 5-point Likert scale to determine responses (where 1 = strongly disagree, 5 = strongly agree). The participant's survey was terminated in section three if they did not facilitate sports recovery. Three members of the research team and five volunteers known to the researchers completed the survey before publication to check the survey's clarity, comprehension, timing, and ease of access. The survey was then published through Qualtrics (Qualtrics® 2022, v.05/22, Provo, UT) and distributed via New Zealand Field Hockey Associations between June and September 2022. No identifiable participant information was collected within the survey questions to maintain the anonymity of the participants.

#### 2.4. Statistical approach

Raw data were screened and withdrawn if the data set was less than 90% complete. In accordance with previous research, including missing data sets of greater than 10% is likely to result in statistical analysis bias and is considered substantial in subsequent discussions (Bennett, 2001; Dong et al., 2013). Additionally, data sets were screened for incomplete responses. Demographic responses in section one that did not use whole numbers were rounded up or down to the nearest whole number. Section two, question three, resulted in some respondents giving multiple responses when only one response was required. Only the first response was analysed, as the research team considered the first response to be the participants' priority response.

Analysis was conducted using Microsoft® Excel® 2016 MSO (Version 2210, WA), and box plots were used to analyse normality visually; if the sample size were small, the data would be primarily represented as a proportion (%). Participants' agreement to the 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) statements were presented as mean ± standard deviation (SD).

### 3. Results

Twenty-three New Zealand field hockey coaches (female  $n = 15$ , male  $n = 7$ , non-binary  $n = 1$ ) met the inclusion criteria and provided consent to participate in the online questionnaire; no participants were excluded from this study due to an incomplete questionnaire. A relatively even spread of representation was achieved including coaches from 14 New Zealand field hockey associations nationwide, ensuring a diverse and balanced perspective on sports recovery strategies. The distribution of participants age was 19 – 24 years ( $n = 6$ ), 25 – 34 years ( $n = 7$ ), 35 – 44 years ( $n = 3$ ), 45 – 54 years ( $n = 4$ ), and 55 – 64 years ( $n = 3$ ). The average coaching experience was 9.3 years ± 10.3 years, with 8.7% of coaches coaching at the national level, 56.5% at a regional level, 34.8% at a club level, and 91.3% at a school level. The range of hours coached over a week was 3 to 13 hours for 3 to 10 months, and coaches attended up to five tournaments within a year. Coaching six hours a week for six months and attending two tournaments a year were the most common coaching training and competition demographics. Though the data approximated normal distribution, the sample size remained small ( $n = 23$  in sections one and two;  $n = 11$  in section three), and therefore the data was primarily presented as proportions (%).

Fifty-seven percent of the participants self-reported prescribing sports recovery strategies during the field hockey

season. Coaches commonly prescribed  $3.6 \pm 1.0$  forms of sports recovery, and the most prescribed sports recovery strategy amongst all levels of coaches was stretching (100%). Active land-based (92.3%) and tissue release modalities (69.2%) were the following most prescribed recovery strategies among coaches (Figure 1).

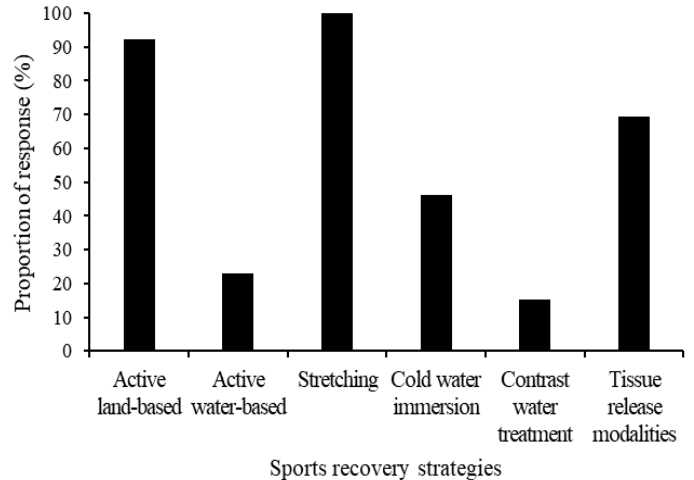


Figure 1: Proportion of self-reported use of different sports recovery strategies of coaches.

All coaches (100%) with more than six years of coaching experience prescribed stretching (static/dynamic stretching or activities such as yoga) and active land-based recovery throughout a field hockey season (Figure 2). Interestingly, of the 43% of coaches who did not prescribe sports recovery, 70% of these coaches had somewhere between one and five years of experience (Figure 2).

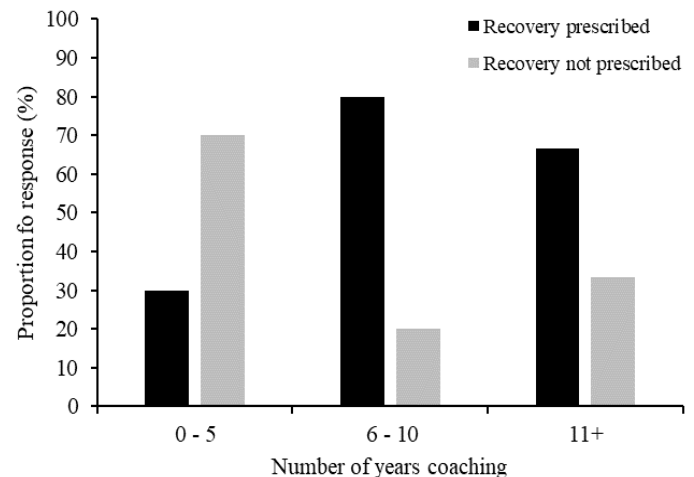


Figure 2: Proportion of self-reported prescription of sports recovery based upon years' experience.

Stretching, followed by active land-based recovery, was perceived as the most beneficial form of sports recovery. Across all levels of coaching, of the coaches that prescribed stretching ( $n$

= 13), 61.5% of coaches perceived this to be the most beneficial form of recovery strategy. Contrary to this, for coaches who prescribed active-land-based interventions ( $n = 12$ ), only 25% of coaches perceived this to be the most beneficial. None of the coaches perceived active water-based, contrast water therapy or tissue release modalities as the most beneficial form of sports recovery (Figure 3).

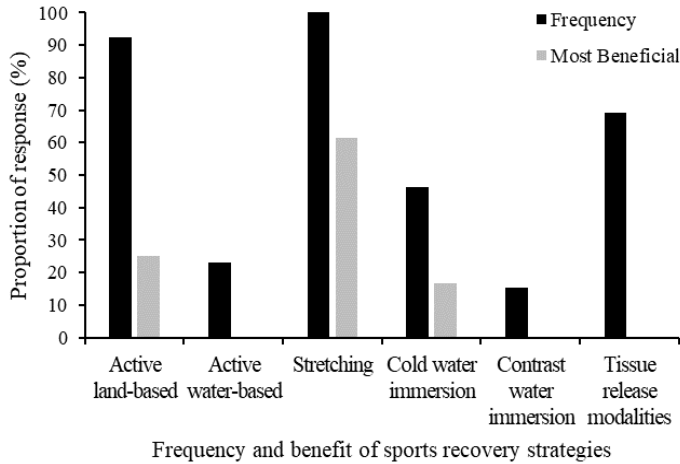


Figure 3: The proportion of self-reported use and most beneficial sports recovery strategies of coaches.

Numerous barriers to sports recovery were highlighted in the study. Of the coaches that prescribed sports recovery ( $n = 13$ ) during the field hockey season, time (44%), player motivation and mindset (17%), and resources (17%) were the most common barriers to sports recovery prescription. Conversely, of the coaches who did not prescribe sports recovery ( $n = 10$ ) during the field hockey season, lack of knowledge (40%) and time (33%) were commonly reported as barriers to sports recovery prescription (Figure 4).

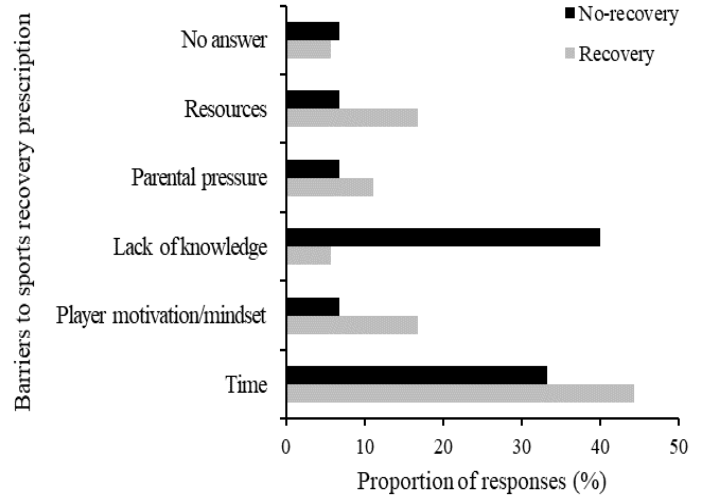


Figure 4: The proportion of self-reported barriers to sports recovery of coaches who carry out sports recovery and participants who do not carry out sports recovery.

Eleven coaches completed section three of the survey. Perceptions of why coaches prescribe sports recovery can be seen in Figure 5. Overall, coaches appeared to have some understanding as to why sports recovery is performed. The most highly rated reason for coaches prescribing sports recovery was ‘reduces injury rates.’ The statement ‘Have been advised to by coach/mentor or seen another player/coach do it’ was the lowest ranked reason for coaches’ prescribing sports recovery. Physical benefits (mean  $\pm$  SD =  $4.3 \pm 0.2$ ) were the most common reason why coaches prescribed sports recovery, followed by physiological benefits (mean  $\pm$  SD =  $4.0 \pm 0.1$ ) and psychological benefits (mean  $\pm$  SD =  $3.9 \pm 0.6$ ) (Figure 5).

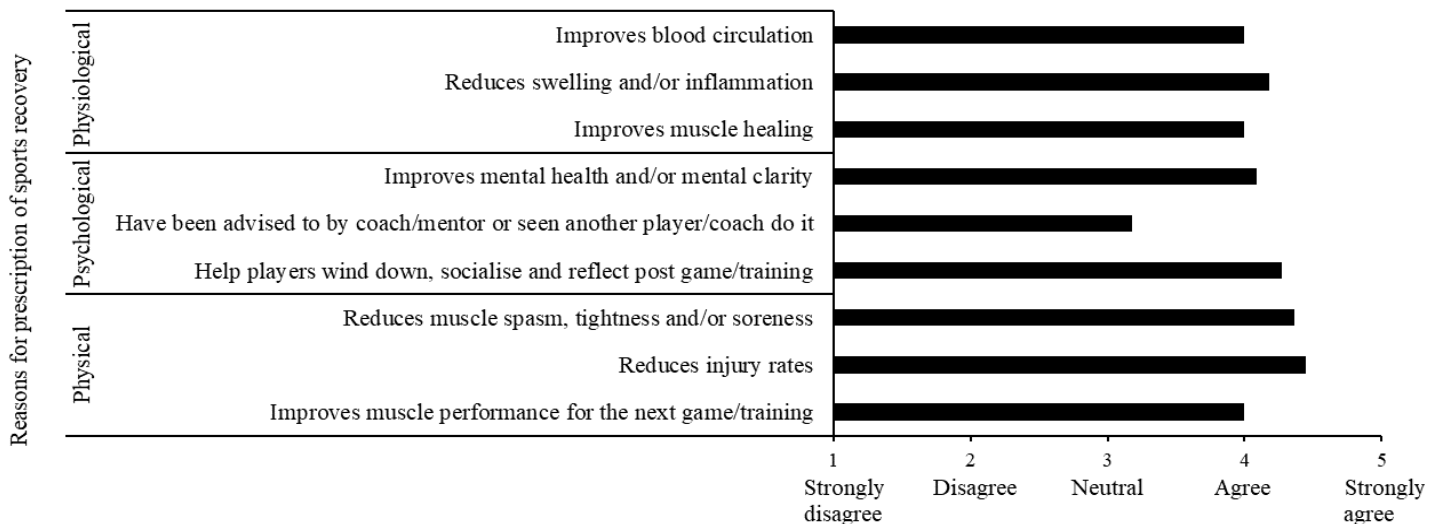


Figure 5: Coaches' ratings of perceived reasons for prescribing sports recovery.

#### 4. Discussion

This study aimed to better understand coaches' current practices of sports recovery in youth field hockey and examine coaches' beliefs, barriers, and perceived benefits of sports recovery. We found that coaches across a range of coaching experiences prescribe numerous sports recovery strategies. In addition, varying opinions exist on the perceived benefit of sports recovery as well as the reasons why sports recovery is prescribed. Fifty-seven percent of youth field hockey coaches surveyed prescribed sports recovery throughout the season, indicating that many coaches do not deem sports recovery integral to sports performance (McAtte et al., 2014). In alignment with previous research, several commonly prescribed techniques included stretching, active-land-based activities, and tissue release modalities (Crowther et al., 2017; Murray et al., 2017; Shell et al., 2020). However, it is important to note that participants' interpretation of stretching both in our study as well as previous research was largely open to interpretation. Conversely, previous studies more commonly used hydrotherapy strategies compared to this research (Murray et al., 2018). This difference could be due to coaches in this study highlighting access to resources, time, and knowledge as significant barriers to prescribing sports recovery.

Stretching was the most common sports recovery strategy used across all coaching levels, keeping with previous literature suggesting that stretching is the most common form of sports recovery. Stretching was also perceived to be the most beneficial form of sports recovery across coaches, rating it significantly more beneficial than active-land-based recovery, which was perceived to be the second most beneficial form of sports recovery. Typically, coaches get limited contact time with players throughout the week, requiring players to recover quickly post-training or games to maintain peak performance, and stretching may be considered an easily accessible, quick recovery strategy (Rees et al., 2021). In addition, the popularity of stretching across coaches could be due to several factors, including but not limited to the ability to perform stretching as a team, self-administered, mainstream popularity amongst other teams, accessibility, no equipment, and space required, and ease of use (Crowther et al., 2017; Rees et al., 2021). Likewise, decades of research throughout mainstream literature have recommended stretching in post-sport recovery (Afonso et al., 2021; Apostolopoulos et al., 2018; McAtte et al., 2014; Sands et al., 2013). Although stretching was found to be the most frequent and perceived beneficial form of sports recovery, further research is now required to understand how coaches prescribe stretching and whether stretching prescriptions are appropriate.

Active land-based recovery was also primarily used among coaches, with 100% of coaches with more than five years of experience prescribing forms of active land-based recovery. However, many coaches did not perceive it as the most beneficial form of sports recovery. Performance-based research by Rasooli and colleagues (2012) found that active land-based recovery between intermittent performance resulted in worse performance than passive or combined recovery. Furthermore, Van Hooren and colleagues (2018) suggested that active land-based recovery does not improve next-day performance or sports performance on the same day if subsequent performances are greater than four hours apart. This aligns with multiple papers that suggest active sports

recovery benefits successive sports performance; however, this was only when the time between sports performance was short (10 – 20 minutes; Franchini et al., 2009; Heyman et al., 2009). Based on New Zealand field hockey tournament scheduling at secondary school's tournament week and U18 national tournament week, players are highly unlikely to play two games within four hours (Hockey New Zealand, 2022a; Hockey New Zealand, 2022b). Therefore, coaches' possible lack of perceived benefit of active land-based recovery aligns with current research suggesting that active land-based recovery does not improve player performance over other sports recovery strategies if the time between sports performance is greater than four hours (Van Hooren et al., 2018). However, given its prescription popularity amongst coaches, subsequent investigations must be completed on field hockey players to determine the influence active land-based recovery has on youth field hockey players. This will ensure that coaches receive appropriate education to prescribe active land-based recovery correctly.

Coaches are likely to encounter barriers when prescribing sports recovery, with many obstacles often out of the coach's control (Rees et al., 2021). New Zealand field hockey coaches are generally community-based, limiting coaches' time with players (Hockey New Zealand, 2021). It can be suggested that youth players' schoolwork, employment commitments, and social life may play a part in why coaches struggle to prescribe sports recovery (Venter, 2014). Because many teams train for 1.5 – 2 hours twice a week, coaches may be reluctant to allocate training time to sports recovery, instead relying on players to complete this in their own time (Rees et al., 2021). However, research has suggested that coaches should incorporate recovery into training and tournament planning, which has been shown to improve adherence and subsequent recovery between sports sessions (Kellmann, 2010; Venter, 2014). Therefore, sports recovery programmes would benefit from being short yet ensuring the programmes are beneficial for players to account for the limited time coaches have with their players.

Coaches who completed this survey generally illustrated a positive attitude towards sports recovery with a good understanding of the physical, psychological, and physiological effects sports recovery has on players. However, despite the average participant having 9.3 years of coaching experience, a lack of practical knowledge and skills inhibited many coaches' ability to implement sports recovery. Furthermore, survey participants with one to five years of experience were less likely to implement sports recovery, which could be attributed to a lack of knowledge (Norcross et al., 2016; Rees et al., 2021). Many youth field hockey coaches in New Zealand are amateurs predominantly hired on a volunteer basis (Hockey New Zealand, 2021). Sports recovery has been suggested to increase undue pressure on coaches who cannot be expected to be knowledgeable in sports recovery (Rees et al., 2021). Amateur coaches are likely to have vocations outside of coaching field hockey, and therefore, it would appear excessive and unfair to make our youth coaches carry the burden of sports recovery without appropriate knowledge (Rees et al., 2021).

Despite a perceived lack of knowledge inhibiting many coaches' ability to implement sports recovery, coaches who completed the survey preferred to obtain their own knowledge on sports recovery rather than base their practices on other coaches' recovery practices. The varying responses to the implementation

of sports recovery have highlighted the need for theoretical education on sports recovery and its practical application within the field hockey environment (Murray et al., 2017). Therefore, workshops providing evidence-based educational programmes to coaches could help improve sports recovery prescription and use (Fullagar et al., 2019). This has been proven successful for New Zealand rugby, which implemented a compulsory coaching workshop called 'RugbySmart', which focuses on primary and secondary injury prevention, including aspects relating to sports recovery (Quarrie et al., 2020). In a survey by New Zealand Rugby in 2017, 84% of respondents either agreed or somewhat agreed with the appropriate and relevant content (New Zealand Rugby, 2017).

The research has some limitations. One limitation of this study pertains to the method of data collection for sports recovery strategies, specifically related to stretching. Participants were asked to tick a box that mentioned "stretching (static/dynamic or activities such as yoga)." This approach could potentially lead to over-reporting or under-reporting of responses, as the generic nature of the options may not capture the full range and nuances of stretching practices utilised by participants. Additionally, multiple questions were misinterpreted, which decreased the clarity of responses. Multiple responses were provided when only one answer was required. In these cases, researchers only accepted the first result, which may have biased the results. Social desirability bias may have influenced the participant's responses. In alignment with research by Perinelli and colleagues (2016), coaches may have answered questions about what they perceived as correct or socially acceptable. Future research studies using observation methodologies could help minimise social desirability bias. Despite participants from 14 New Zealand field hockey associations being represented within the data, many regions were not, and therefore, generalising the findings to the wider population of New Zealand youth field hockey coaches is difficult. Finally, this study used a small sample size; therefore, future research would benefit from a larger sample of youth field hockey coach responses.

## Conclusion

This research consisted of an original study investigating coaches' current practices of sports recovery in youth field hockey in New Zealand and examining coaches' beliefs, barriers, and perceived benefits of sports recovery. Generally, coaches illustrate a positive view towards sports recovery and show some understanding of the benefits of why sports recovery is performed in youth field hockey. Like past research, stretching was the most common sports recovery strategy prescribed and perceived as the most beneficial form of sports recovery across all coaching levels. However, youth coaches with greater coaching experience were more likely to prescribe sports recovery. Finally, knowledge and time constraints are key barriers to implementing sports recovery in youth field hockey. Future research focussing on the key findings and limitations addressed in this study must further understand the landscape of youth coaches' practices, attitudes, and knowledge towards sports recovery in youth field hockey. This may help guide the development of suitable sports recovery educational programmes and resources for youth field hockey coaches in New Zealand.

## Practical Implications

Based on the key findings of this study, the following recommendations should be considered by key stakeholders involved in New Zealand field hockey regarding youth coaches and sports recovery:

- Increase youth coaches' knowledge of sports recovery through resources and online/face-to-face workshops, emphasising delivering to less experienced coaches.
- Develop a hockey-specific post-training and game recovery routine/strategy for regional associations to deliver to youth coaches.
- Adapt turf booking schedules for training, games, and tournaments to allocate time for coaches to implement effective sports recovery programmes.
- Allocate designated space at turf locations with appropriate resources (if available) to ensure youth coaches can implement sports recovery programmes successfully.
- Educate players and parents on the importance of sports recovery and the possible implications of not performing sports recovery.

## Conflict of Interest

The authors declare no conflict of interests.

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