Youth field hockey players' perceptions and utilisation of sports recovery strategies

Article · September 2024

CITATIONS
0

READS
51

5 authors, including:

Cameron Collins
University of Auckland
2 PUBLICATIONS **0** CITATIONS
SEE PROFILE

Frans H Van der Merwe
Waikato Institute of Technology
11 PUBLICATIONS **4** CITATIONS
SEE PROFILE

Kesava Kovanur Sampath
Waikato Institute of Technology
76 PUBLICATIONS **409** CITATIONS
SEE PROFILE

Suzanne Belcher
Waikato Institute of Technology
15 PUBLICATIONS **56** CITATIONS
SEE PROFILE

Youth field hockey players' perceptions and utilisation of sports recovery strategies.
Journal of Australian Strength & Conditioning. 32(04):16-24. 2024 © ASCA.

Original Scientific Research Study

YOUTH FIELD HOCKEY PLAYERS' PERCEPTIONS AND UTILISATION OF SPORTS RECOVERY STRATEGIES.

Aleisha J. Rainey[1], Cameron M. Collins[1], Frans H. van der Merwe[2], Kesava Kovanur Sampath[1], Suzie Belcher[1*]

[1]Centre for Health and Social Practice, Waikato Institute of Technology - Te Pūkenga, Hamilton, New Zealand.
[2]Centre for Sport Science and Human Performance, Waikato Institute of Technology – Te Pūkenga, Hamilton, New Zealand.

BLUF

Fifty-two percent of New Zealand youth field hockey players perform sports recovery during the regular season, with knowledge and time being significant barriers to the implementation thereof, suggesting a need for sports recovery education for youth players.

ABSTRACT

Youth field hockey exhibits elevated injury rates, potentially attributed to insufficient training, limited injury prevention awareness, and resource constraints for players and coaches. Furthermore, a connection exists between inadequate sports recovery practices and sports-related injuries. This study represents the inaugural exploration in New Zealand into the utilisation, beliefs, obstacles, and perspectives regarding sports recovery among youth field hockey participants throughout a typical season. A survey was conducted involving 119 participants, comprising 73 females (average age = 17.07 ± 0.98 years; average years of playing = 10 ± 3.06) and 46 males (average age = 17.28 ± 0.97 years; average years of playing = 7.98 ± 3.32). Participants completed a 22-item online questionnaire. Nearly half (47%) played at a representative level, while 52% engaged at a recreational level. The questionnaire encompassed inquiries about their adoption of recovery strategies, perceived hindrances, and comprehension of sports recovery. Data were analysed using Excel and presented as percentages, means ± standard deviation (SD), or median ± interquartile range (IQR). Among the findings, 52% of players incorporated sports recovery practices, with stretching being the most prevalent (93%), regarded as beneficial by 51%. Tissue release techniques and active land-based strategies were utilized by 73% of players, cold water immersion by 41%, and contrast water therapy by 15%. Time constraints and limited knowledge were commonly cited as barriers to recovery practices. Athletes primarily valued physical benefits, such as injury prevention, performance enhancement, and reduced muscle tightness. Given their reported constraints, this study underscores the potential need for targeted education on sports recovery for New Zealand's youth field hockey players. It also sheds light on the prevalence and preferred strategies among these athletes.

Key Words - Field hockey, youth, sports recovery, questionnaire, athlete utilisation.

INTRODUCTION

Sports recovery strategies are utilised worldwide in all sports codes and are essential for players to maximise performance and prevent adverse outcomes, including overtraining syndrome, fatigue, injuries, or illness (14, 20). The concept of recovery is a comprehensive definition encompassing various approaches tailored to the distinct requirements of a particular sport, team, or individual. It is characterized as a multifarious rehabilitative procedure that aids in reinstating physical and psychological equilibrium using different recovery strategies (20, 5). There are many elements to consider with players and how each factor influences the player, their recovery and specific recovery needs. Elements include but are not limited to the level of play, gender, age, fitness and environmental factors (5). Although the components may be similar, the focus of recovery changes between sports levels, sports types and resources available (5).

Many evidence-based recovery strategies exist in sports today (31). Common strategies include stretching, a strategy in which specific muscles and tendons are stretched to improve individuals' feeling of elasticity. Stretching is often prescribed to reduce the delayed onset of muscle soreness and improve recovery of strength and range of motion (2). Active land-based recovery includes walking, running and yoga and the more recently common strategy of tissue release modalities, including massage guns and foam rollers, has been suggested to increase blood flow and range of motion to muscles (9, 15, 20). Water-based recovery strategies include active water-based, contrast water therapy and cold-water immersion recovery strategies prescribed to minimise lactate accumulation, inflammation, pain, muscle stiffness and oedema (8, 9, 17, 33). However, many of these common strategies are prescribed and used without compelling supportive evidence for the strategy's effectiveness in enhancing post-exercise recovery (4, 9, 17). There remains conflicting evidence on the most effective delivery of recovery strategies, with no one generalisable method deemed superior to others (14).

There are an extensive range of recovery strategies utilised by different players depending on knowledge, personal opinion, culture and available resources (11, 26). Strategies are more regularly performed in elite settings due to physical and financial accessibility and the constant supervision of multidisciplinary support team members to improve performance (11). Recovery strategies are also more regularly implemented during tournaments across levels than regular sessions or training (31). Within elite sports environments, the most popular forms of recovery vary, but many studies found cold water immersion and massage to be the most used strategies (10, 11, 32). In sub-elite and recreational player populations, stretching is the most used recovery strategy, followed by active land-based recovery, potentially alluding to resource access (10). Similarly, the most popular form of recovery for youth swimmers was active land-based (31). In Asia and the UK, youth sports players most commonly performed active land-based recovery, sleep and nutrition (26).

Limited resources and the lack of knowledge of youth players around sports recovery could potentially contribute to youth players having the highest prevalence of field hockey injuries in New Zealand (1). Youth hockey involves players between the ages of 12 and 19 (18). Hockey New Zealand considers players up to 19 years old as developing youth players (18). Over the past five years (2017-2021), players aged 15 to 19 have accounted for an average of 25.8% of field hockey injuries annually in New Zealand (1). These concerning injury rates highlight the need for an improved understanding of perceptions, use and trends of sports recovery in sub-elite New Zealand youth field hockey populations to prevent injuries.

The primary aim of this study was to determine what recovery strategies are currently used by youth players during a regular hockey season. The secondary aim was to understand why players are using or not using recovery strategies by examining beliefs, barriers and benefits of sports recovery. This research may improve understanding of common sports recovery trends in youth field hockey players in New Zealand and likewise provide some discussion on the potential implications this may have on the high field hockey injury rates amongst the youth population. This research may also provide the New Zealand youth field hockey community and health professionals with further data on sports recovery education implementation needs and resourcing challenges.

METHODS

Approach to the Problem

An online survey was developed and distributed using the Qualtrics software (Qualtrics 2022, v.05/22, Provo, UT) to measure participants' knowledge and perceptions of sports recovery and barriers to application within New Zealand youth field hockey players. Mixed response types were used throughout the survey, with different question types inclusive of open-ended text boxes, a Likert scale, closed-ended text boxes and tick boxes. The survey design was developed with adapted items from previously published research surveys on sports recovery (10, 26, 31) and youth field hockey (28). The Wintec Human Ethics Committee approved ethics before the survey's release (Wintec ethics approval number WTLR16090522). In addition, participants provided informed consent before starting the survey.

Subjects

Eligible participants were identified through convenience sampling of 25 consenting New Zealand field hockey associations. To be included in the study, participants had to satisfy two key inclusion criteria; Field hockey players aged 16-19 years old and played at least one field hockey season in New Zealand within the last five years. Participants were recruited via individual field hockey associations' social media platforms and email databases using an advertisement poster with an embedded survey link. A total of 119 players consisting of 73 females (age = 17.07 ±0.98 years; years played = 10 ± 3.06) and 46 males (age = 17.28 years ± 0.97 years; years played = 7.98 ± 3.32) consented to participate in the study and met all inclusion criteria. No identifiable information was requested throughout the survey to ensure the anonymity of participants was maintained.

Procedures

To review clarity, comprehension, timing and ease of completion of the survey before publication, three research members and five convenience volunteers known to the researchers completed the survey. Following the review, the survey was deemed appropriate and had face validity for publication. The survey was published through Qualtrics (Qualtrics © 2022, v.05/22, Provo, UT) and distributed to the respective field hockey associations via the associations' chosen method (six via email, 19 via social media platforms). The survey was open for three months.

The study survey comprised three sections, including 22 items. Participants' response to question one was used to screen for participant eligibility, and if eligible, participants were directed to the three sections of the study survey. Section 1 comprised eight items to acquire participants' demographic data. Section 2 consisted of four items exploring whether participants performed sports recovery, what sports recovery strategies participants used from a predetermined list, the most beneficial strategy as perceived by the participant and any barriers to performing sports recovery in a regular field hockey season. The predetermined list of sports recovery strategies included active land-based, stretching, tissue release modalities, cold water immersion, contrast water treatment and active water-based. The survey was terminated in section 2 if participants did not perform sports recovery at any stage throughout the season. Finally, section 3 encompassed nine items investigating the participants' perceptions of why they perform sports recovery. Each response in section 3 was determined using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Statistical Analyses
Responses were screened before analysis and removed if they were not 90% complete. This aligns with previous research, which suggests that missing data of greater than 10% is likely to bias statistical analysis and subsequent discussion (3, 13). In addition, potential misinterpretation of questions where respondents gave multiple or a range of responses were filtered, retaining the first responses only. The recorded first response was analysed as the research team considered this response to likely be the participants' priority response (34). The median value for number ranges was also taken for analysis, and decimal values were rounded up to whole numbers for ease of readability and analysis.

Analysis was conducted using Microsoft Excel (25), and visual exploration of normality given as box plots. The data appeared normally distributed, with no apparent outliers. The small sample size of 119 in Sections one and two and 54 in section 3 resulted in data being presented as proportions (%), means ± standard deviation (SD) or median ± interquartile range (IQR) to compare responses across sections one and two. Participant agreement to statements in the 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) is also presented as means ± standard deviation (SD).

Open-ended responses were analysed using thematic analysis principles (7). Responses were grouped into common themes. Two researchers (AR & CC) independently carried out theme identification and allocation. A comparative consensus meeting of potential themes was held to confirm agreement on the final thematic responses.

RESULTS

Field hockey players' data was collected from 20 associations across New Zealand (11 North Island, 9 South Island), with five associations returning no participant responses. Players participated on average 5 ± 2.29 hours per week and 7 ± 2.29 months per year during a regular field hockey season. The average player attended 2 ± 1.3 tournaments per year, with recreational (school and club) players attending on average 1 ± 1.24 per year and representative (regional and national) players 2 ± 1.11 per year. Forty-seven percent of participants played at a representative level, and 52% at a recreational level.

Implementation of Sports Recovery Modalities
Fifty-two percent of the participants utilised some form of sports recovery modality during the regular season. There was no difference in sports recovery modality implementation between the genders; however, results showed that 40% of recreational compared to 64% of representative players performed sports recovery.

Types of Sports Recovery Modalities Implemented
The most frequently utilised recovery strategy by players was stretching (96% recreational, 91% representative), as seen in Figure 1, followed by tissue release modalities (68% recreational, 78% representative) and active land-based (72% recreational, 75% representative), then cold water immersion (24% recreational, 59% representative). The least frequently used recovery strategies were contrast water treatment (4% recreational, 27% representative) and active water-based (8% recreational, 27% representative). Both recreational and representative level players used a median of 3.0 ± 1.0 (IQR) recovery strategies each during a regular field hockey season.

Stretching (50% recreational, 52% representative) was perceived as the most beneficial strategy, as seen in Figure 1. Recreational players considered active land-based (22%) the next most beneficial strategy, while representative players considered tissue release modalities (20%) the second most beneficial strategy. Recreational players perceived contrast water treatment (0%) as the least beneficial, while representative players perceived both contrast water treatment (2%) and active water-based (2%) equally as the least beneficial strategy.

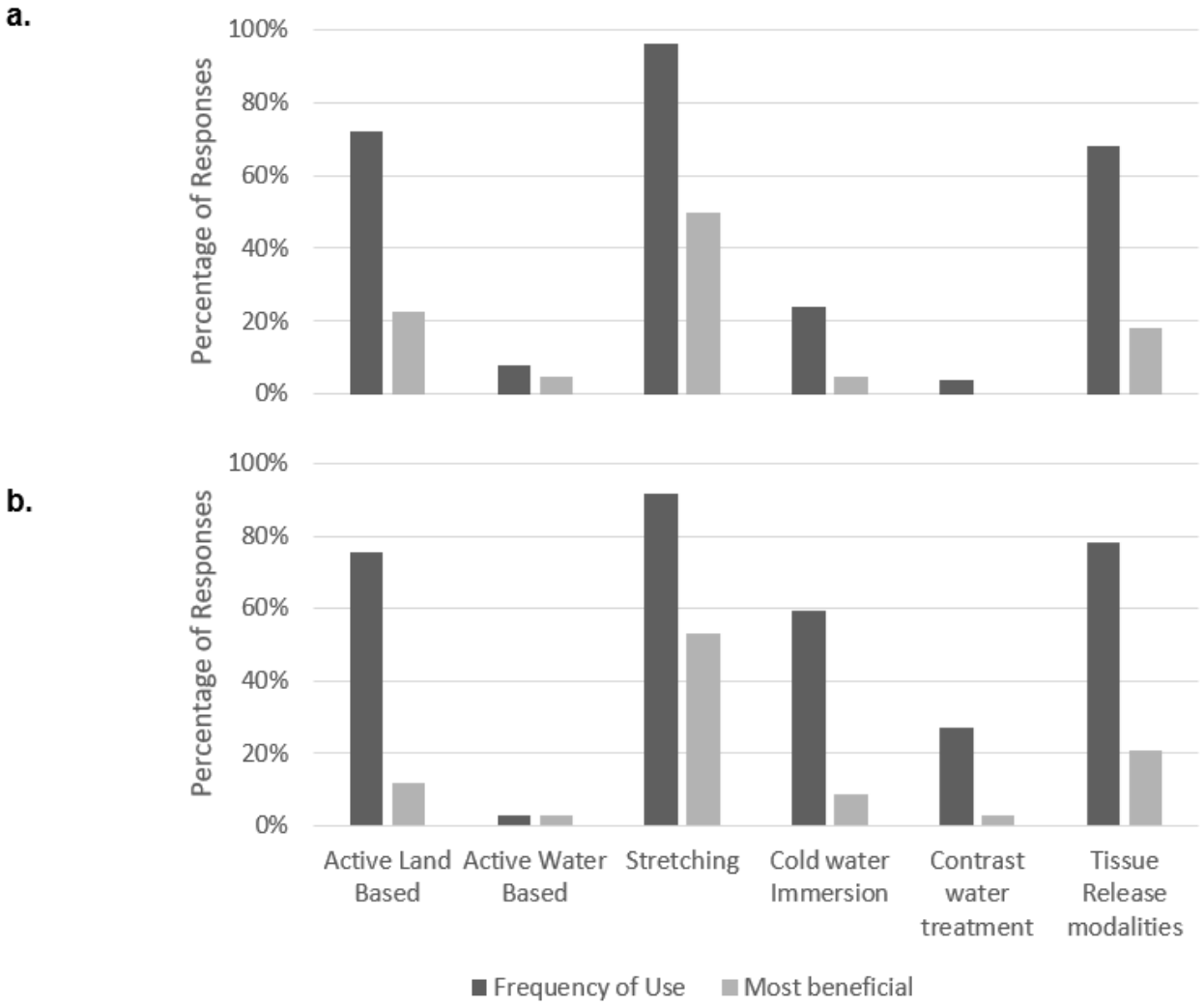

Figure 1 – Players' responses to the usage of recovery strategies and the most beneficial recovery strategies. a) recreational players, b) representative players.

Barriers to Recovery

Seven themes were identified from the participants' responses regarding barriers to performing sports recovery, as seen in Figure 2. Barriers identified included time, resources, lack of knowledge, motivation, fatigue, injuries, and 'don't think they need to'. Time was perceived as the most common barrier by players who performed recovery (46%) and players who did not (32%). Time was also identified as an increasing barrier with the increase in age between 16 and 19 (40%, 44%, 47% and 70%, respectively). Players who performed recovery considered resources (13%) and fatigue (11%) as the next biggest barriers to performing recovery, whereas players who did not perform recovery considered lack of knowledge (18%) and motivation (10%) as the next biggest barriers. Lack of knowledge was identified as a decreasing barrier with age between 16 and 19 (20%, 12%, 5% and 5%, respectively).

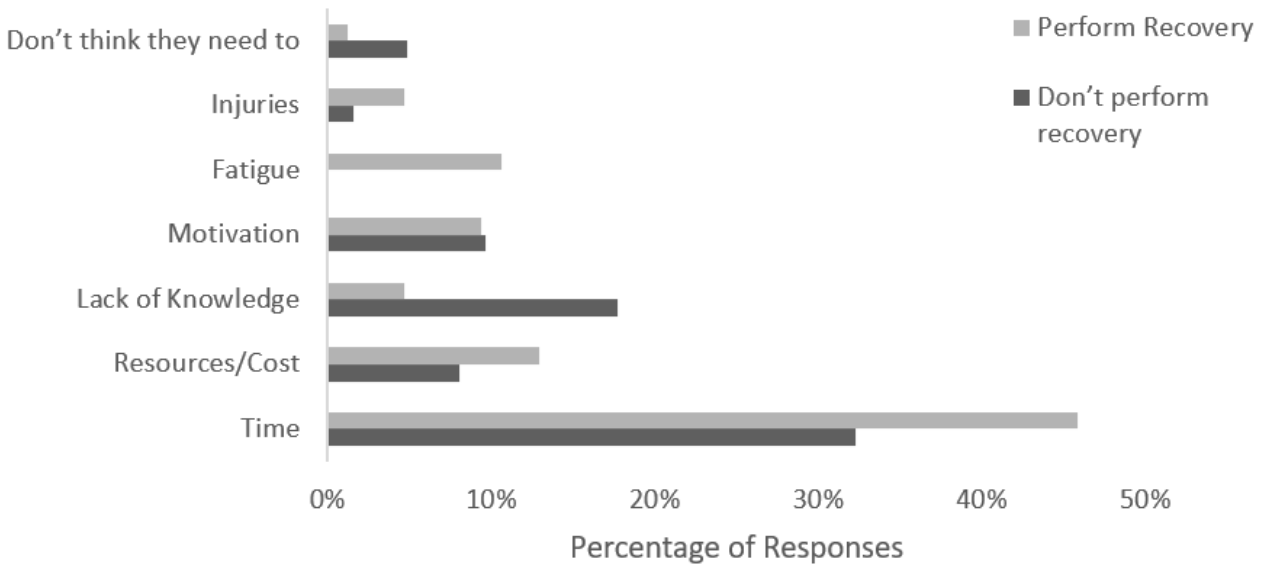

Figure 2 – Percentage of barriers reported by players.

Perceptions of Recovery

Fifty-four participants completed Section 3 of the survey and were included in the results in Figure 3. The most highly rated benefits from the predetermined list were physical (4.37 ± 0.66), followed by physiological (3.92 ± 0.68), with the lowest rated the psychological benefits (3.8 ± 0.9). The highest-rated physical benefit was 'Reduces muscle spasm, tightness and/or soreness' (4.5 ± 0.63), while the lowest was 'Reduces injury rates' (4.3 ± 0.68). The highest-rated physiological benefit was 'Improves muscle healing' (4.06 ± 0.62), while the lowest was 'Reduces swelling or inflammation' (3.76 ± 0.69). The highest rated psychological benefit was 'Have been advised to by coach/mentor or seen another player/coach do it' (4.02 ± 0.92), while the lowest rated benefit was 'Improves mental health or mental clarity' (3.54 ± 0.85).

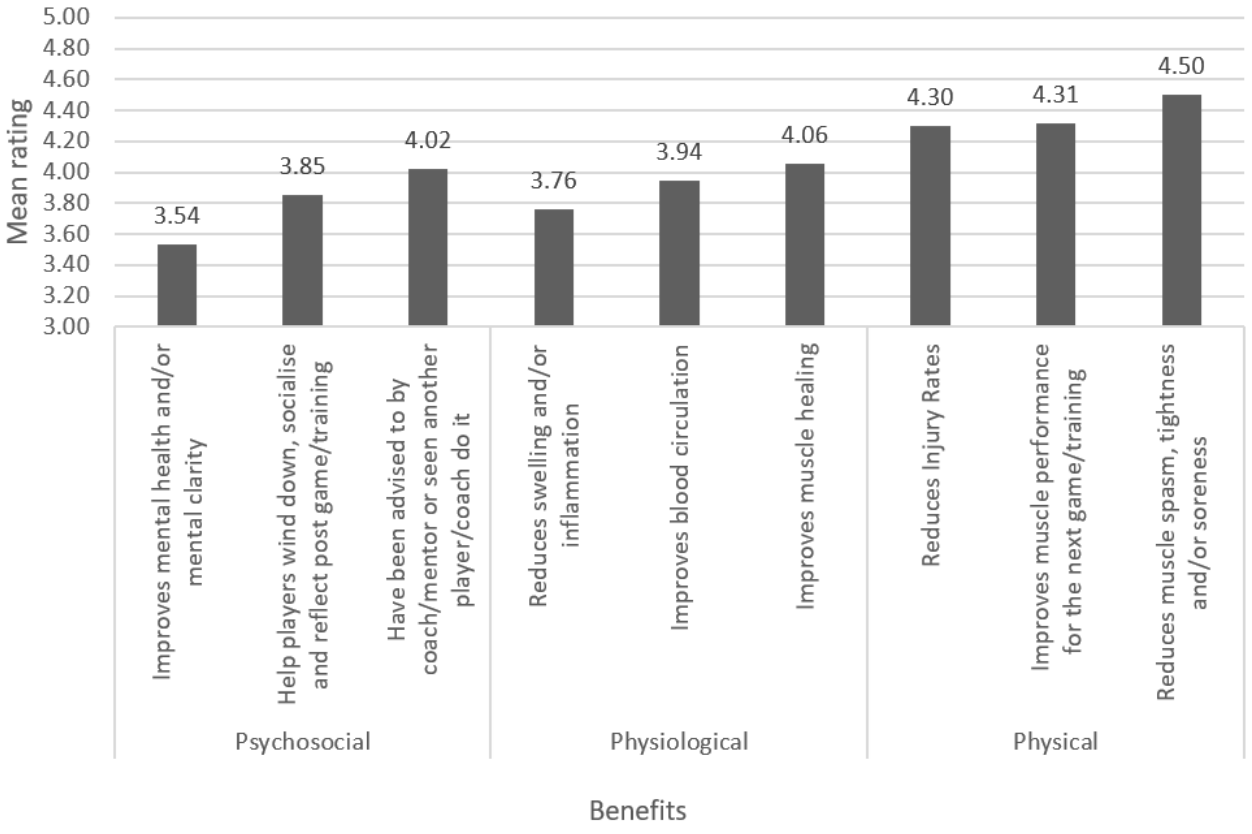

Figure 3 – Players' self-reported ratings of benefits of sports recovery.

DISCUSSION

The main aim of this study was to describe and explore the trends around the usage, beliefs and perceptions of sports recovery among youth field hockey players in New Zealand. Fifty-two percent of all players surveyed performed sports recovery within a regular field hockey season. This indicates that approximately half of youth field hockey players incorporate and use sports recovery strategies during a field hockey season. The percentage of players that perform sports recovery is slightly lower than that of previous research on elite players from multiple sports codes at 57% (10). However, there is a large difference of 24% within this study between the proportion of recreational players that implement recovery strategies compared to representative players. This result may be attributed to representative athletes' increased exposure to recovery knowledge from coaches and other staff members. Players competing in elite representative environments often have access to strength and conditioning coaches and health professionals compared to those at a recreational level (30). This increases the players' exposure to recovery whilst offering greater support and encouragement to perform sports recovery regularly. Further to these findings, representative field hockey players likewise have an increased frequency and weekly training load than recreational players (20). Representative players often have multiple trainings and games at a school, club and national level, increasing the overall load and need for recovery (20). Youth field hockey players run on average between 5-7km per game (35), with most representative players playing two games a week, doubling running loads to 10-12kms a week. Whereas recreational players will often only play one game per week, only reaching between 5-7km running distance (35). Increased loads in representative players may increase the need for recovery and the likelihood of self-discipline to perform sports recovery, thus allowing the player to sustain training loads. This may also suggest a reduced application, knowledge, financial and physical resource accessibility to implement sports recovery at lower levels of youth hockey. This is supported by previous literature findings, which showed that more players implemented sports recovery at a higher performance level (10, 31, 32). These results suggest that New Zealand field hockey organisations should create educational resources detailing the importance of performing effective recovery, particularly targeting school-age player populations and recreational association hockey members. Implementing endorsed educational sports recovery programmes at the national organisational level will likely increase the authenticity, dissemination and exposure across the community, but particularly offer reach to those target populations most lacking education at present (12).

In agreement with previous research, commonly used recovery strategies amongst players included stretching (STR), active land-based (ALB) and tissue release modalities (TRM) (10, 26, 31). The most commonly used strategy among youth field hockey players was STR, which reflects the findings of previous research on team sport players (10). Compared to other adolescent individual sports players, ALB was the most commonly used recovery strategy (26, 31). The frequent use of STR within teams may be due to ease of use, reduced need for individuality, minimal space or equipment required, a common strategy performed in the sports industries and can be performed as a team (10). However, there is conflicting evidence on the effectiveness of stretching. Some literature has determined that stretching prevents muscle soreness and delayed onset of muscle soreness through the rationale of viscoelastic and stress-relaxation behaviours of the muscle (23). In contrast, other literature determines low levels of evidence for the physical or physiological effects of stretching (16). This may suggest that the high frequency of stretching among field hockey players may be ineffective in preventing injuries and improving performance. Further research exploring the effectiveness of recovery strategies such as stretching would benefit those who wish to educate or prescribe methods with more certainty of benefitting injury risk or performance outcomes.

Although STR, ALB and TRM are the most frequently used strategies, the proportion of players that believe the strategies are beneficial decreases largely within this study. Only 21% of youth field hockey players who use ALB as a recovery strategy find the strategy beneficial, while only 23% of players who use TRM reported the strategy to be the most beneficial. Compared with STR, 49% of players who utilise the strategy find it the most beneficial. As so few participants perceived either TRM or ALB recovery as beneficial, comment can be made that perhaps the methods are not being performed effectively or are indeed not effectual. Further research within the field would benefit this discussion. Current literature has shown that self-myofascial release, a TRM strategy, does not significantly improve muscle performance or decrease delayed onset of muscle soreness (DOMS) (6). However, this intervention increased joint range of motion (ROM) and decreased short-term muscle pain (6). The limited evidence for the use of tissue release modalities on muscle recovery or performance, in combination with the low proportions of players that believe it is beneficial, challenges the use of the strategy for effective recovery. However, this remains a relatively under-researched strategy. Research has determined evidence supporting the efficacy of active recovery on a player's performance, demonstrating decreased inflammatory markers and muscle damage in players, subsequently increasing players' performance (14). There are also suggested positive psychological outcomes of active recovery, such as walking, running and cycling (27). These findings suggest that messaging regarding recovery education should initially encourage players to perform active recovery strategies post-game and training as their priority or targeted recovery method.

Cold-water immersion (CWI) and contrast water treatment (CWT) were more frequently used by representative field hockey players than recreational players, with a frequency difference of 35% and 23%, respectively. The increased frequency of CWI and CWT use in representative players may be attributed to a combination of considerations, including increased autonomy to practice recovery amongst higher-level players. Research has determined that players at a higher level of competition occupy a different subordinate position from their coaches and, therefore, have greater

autonomy in decisions around their training and recovery (19). In addition, exposure to more varied recovery strategies amongst higher-level players may also affect these players' choice to prefer CWI and CWT methods. Research has established that players use CWI and CWT more in competitions and tournaments than in training or regular season fixtures (26, 31). As representative players attend, on average, one more tournament a year than recreational level players and at a higher level, there is an increased chance of exposure to CWI and CWT strategies for players to use (10).

Time was considered the primary self-reported barrier to performing sports recovery amongst all players. Similarly, this was recognised within previous research where time was reported as a common barrier to performing sports recovery (31). Commonly reported sub-themes within the “time” barrier included other commitments and insufficient time on the turf post-game or training to recover. Previous research has highlighted the effect of other routine life commitments, including mental, emotional, social, study and work commitments, as stressors that affect a player's ability to perform within the realm of their sport (32). At 19, most players have finished school, so they have increased stresses of work, tertiary study and potentially social stresses, including living independently of guardians. Therefore, at an institutional level, youth hockey associations and clubs should perhaps recognise these " time " barriers and added stressors contributing to poor recovery behaviours. One way to improve these behaviours is for associations and teams to advocate allocated time and space available within training sessions and competition draws to allow the players to perform recovery. These changes, alongside increased dissemination by associations and teams of quality recovery strategy education resources or courses, may improve effective, consistent sports recovery for players. Associations should also consider the psychological challenges for youth in sports and offer support to players and teams alike, which may improve players' performance and overall wellbeing (29). Providing hockey associations with psychological intervention resources and programmes may better support our youth field hockey players and reduce added stressors that might decrease the quality and ability to perform sports recovery.

Lack of knowledge of sports recovery was also perceived as a common barrier, especially among players who do not perform recovery. Lack of knowledge is a major limitation to performing sports recovery effectively or at all (28). Research has shown that performing recovery effectively decreases injury risk among players (14, 20). Research determined a 37% decrease in inflammation and muscle damage in players who performed sports recovery effectively, which significantly lowered players' injury rates (14). Cold water immersion below 15 degrees, active recovery and massage were determined as the most effective strategies to reduce injury risk in players (14, 20). As this age group of field hockey players has such a high rate of injuries (1), it is essential to improve education on the importance of recovery to reduce injury risk. The results of this study indicate a predominance of stretching as a recovery method by players, which has previously shown contradictory or no benefit to players' injury risk compared to more effective strategies. A potential change in recovery strategies toward more active recovery and cold-water immersion, requiring limited resources, may provide a solution to reduce injury rates within the youth population. Targeting education, particularly towards 16- and 17-year-olds, may also be beneficial, as this age group reported the highest number of players who choose “lack of knowledge” as a barrier to performing recovery. Research has determined that recovery is vital for fatigued and injured players to improve flexibility, range of motion, functional strength, pain, neuromuscular control and inflammation (22). This research supports participants' possible lack of knowledge of sports recovery, with 10% of players considering fatigue and injuries a barrier to recovery. These improvements contribute to the restoration of sports performance and sport-specific functional skills (20, 22). This lack of understanding can negatively affect the players' performance and potentially cause high injury rates within youth hockey populations.

The players' perceptions of recovery also showed a lack of knowledge and understanding of sports recovery. The mean response of “physical” benefits of recovery was rated 0.45 higher on a Likert scale than the “physiological” benefits. However, it is known that the physiological performance of recovery directly affect the physical benefits achieved (23). For example, research has determined that the reduction of inflammation and swelling following exercise-induced muscle microtrauma improves muscle soreness and, therefore, increases muscular performance (23). Although players rated 'Reduces muscle spasm, tightness and/or soreness' the highest, 'reduces swelling and/or inflammation’ was rated the lowest physiological benefit. The players' responses suggest little understanding of these physiological cellular mechanisms that affect the physical responses of muscles and the overall body systems. This demonstrates a gap in the knowledge of youth field hockey players and an area where education can be improved around the effect of sports recovery on their body systems.

Youth field hockey players rated physical benefits the highest, followed by physiological and then psychological benefits. Comparatively, to previous research, elite players rated physical benefits the highest, followed by psychological and physiological benefits (10). This may suggest that youth players have reduced beliefs about the psychological benefits of sports recovery. The highest rated psychological benefit of the youth field hockey players is 'Have been advised to by coach/mentor or seen another player/coach do it'. This finding may suggest that perceptions of the input of coaches and high-performance players of youth field hockey players align with previous research (26, 31). Literature has determined that youth players rely on coaches as a primary source of recovery information and play a critical role in dictating recovery behaviours (31). Players have also indicated that confidence in and respect for their coaches' capabilities is high, and subsequently, players believe what the coach says as truth (26). This suggests that youth field hockey players need to improve their education regarding recovery and greater adherence may be driven by similarly educating the coaches to influence players to participate in the recovery practices.

This study is not without limitations. Similar to previous research, this study may have been limited by the influence of social desirability bias (10, 31), where players may answer according to the perceived correct or socially acceptable responses rather than their true beliefs. The study may also be limited by misinterpretation of questions, causing decreased clarity of responses. Multiple answers were given to questions that only required one answer, affecting the interpretation of results. The survey questions discussing the use of recovery strategies lacked specific detail regarding the timing of or what period during participation the sport recovery took place. Participants may have included warm-up, cool-down or next-day recovery activities within the responses. This may have overestimated the results of those who perform stretching in this study, as most players perform a stretching warm-up routine rather than a post-game recovery method. However, it argues whether practitioners should consider the recovery period more extensive than just a post-game episode. These limitations may cause a slight skew of the results and bias the findings. Another limitation of this study was the inability to give a true representation of the entirety of New Zealand's youth field hockey population. Two of the most highly populated associations did not consent to participate in this study, which accounts for 1.65 million people in New Zealand (24), reducing representative generalisability. The inability to obtain information on the number of registered youth field hockey players in New Zealand also limited this study. As the population size could not be obtained, it is difficult to determine if the research's sample size is large enough to accurately represent the entirety of the youth field hockey population in New Zealand.

PRACTICAL APPLICATIONS

This research suggests that further education around the potential benefits and use of sports recovery for youth field hockey players and communities could encourage sports recovery implementation and subsequently improve injury rates within the population. Although it is often not feasible to have health professionals on hand within youth teams to implement recovery strategies, education could be created and distributed at an association and institutional level. Institutional changes within New Zealand youth hockey could better support players in sports recovery, mainly targeting recreational participants. The creation and implementation of educational age and experience-level recovery strategies by New Zealand hockey following health and sports professionals may expose more players and coaches to authenticated and effective prescription of recovery methods. Resources created could also encourage alternative recovery strategies, including active recovery and cold-water immersion compared to standard stretching to align more with current research evidence, with consideration to reducing injury risk in players. These resources should be distributed to hockey associations, club teams, and schools to increase dissemination, reach and uptake. Some discussion within the recovery educational content should be granted to the benefits of recovery on psychological well-being, with a recognition of wellbeing on improving performance outcomes. This will likely improve the uptake of the messaging by some of the population, who look towards performance outcomes as a driver for undertaking activities.

Further research is needed to explore the effects of sports recovery education on implementing recovery methods and the subsequent effect on rates or risk of injury and physiological responses in players within the youth field hockey population. Additionally, research into the effects of different sports recovery strategies currently utilised by youth field hockey players in New Zealand could provide a greater understanding regarding recovery strategies prescription. This research indicated players predominately utilised stretching as a recovery strategy and believed it most beneficial; however, little is known about the effect stretching may have on players' physiological responses and performance. Further research should be carried out in both observational and experimental studies to gain the most robust understanding of the effects and trends of sports recovery and sports recovery education on youth field hockey players in New Zealand. The results of this study suggest a possible correlation between poor usage of sports recovery methods and increased injury rates within the youth field hockey population. This research increases awareness of youth field hockey recovery practices and may be applied to future education and resources delivered to New Zealand youth field hockey players, coaches and parents.

REFERENCES

1. ACC injury hockey data received on 25th February, 2022.
2. Afonso, J., Clemente, F. M., Nakamura, F. Y., Morouço, P., Sarmento, H., Inman, R. A. & Ramirez-Campillo, R. The effectiveness of post-exercise stretching in short-term and delayed recovery of strength, range of motion and delayed onset muscle soreness: A systematic review and meta-analysis of randomized controlled trials. **Frontiers in Physiology**. 12: 677581. 2021.
3. Bennett D. A. (2001). How can I deal with missing data in my study? **Australian and New Zealand Journal of Public Health**. 25(5): 464–469. 2001.
4. Bleakley, C. M. & Davison, G. W. What is the biochemical and physiological rationale for using cold-water immersion in sports recovery? A systematic review. **British Journal of Sports Medicine.** 44(3): 179–187. 2010.
5. Calleja-González, J., Mielgo-Ayuso, J., Sampaio, J., Delextrat, A., Ostojic, S. M., Marques-Jiménez, D., Arratibel, I., Sánchez-Ureña, B., Dupont, G., Schelling, X. & Terrados, N. Brief ideas about evidence-based recovery in team sports. **Journal of Exercise Rehabilitation.** 14(4): 545-550. 2018.
6. Cheatham, S. W., Kolber, M. J., Cain, M. & Lee, M. The effects of self-myofascial release using a foam roll or roller massager on joint range of motion, muscle recovery, and performance: A systematic review. **International Journal of Sports Physical Therapy.** 10(6): 827-838. 2015.
7. Clarke, V., Braun, V., & Hayfield, N. **Thematic analysis, qualitative psychology: A practical guide to research methods**. (3rd ed). Thousand Oaks, CA: Sage Publications. 2015.
8. Coffey, V., Leveritt, M. & Gill, N. Effect of recovery modality on 4-hour repeated treadmill running performance and changes in physiological variables. **Journal of Science and Medicine in Sport**. 7(1): 1–10. 2004.
9. Crowther, F., Sealey, R., Crowe, M., Edwards, A. & Halson, S. Influence of recovery strategies upon performance and perceptions following fatiguing exercise: A randomized controlled trial. **BMC Sports Science, Medicine, and Rehabilitation**. 9: 25. 2017.
10. Crowther, F., Sealey, R., Crowe, M., Edwards, A. & Halson, S. Team sport athletes' perceptions and use of recovery strategies: A mixed-methods survey study. **BMC Sports Science, Medicine and Rehabilitation**. 9: 6. 2017.
11. Doherty, R., Madigan, S. M., Nevill, A., Warrington, G. & Ellis, J. G. The sleep and recovery practices of athletes. **Nutrients**. 13(4), 1330. 2021.
12. Donaldson, A., Lloyd, D. G., Gabbe, B. J., Cook, J., Young, W., White, P. & Finch, C. F. Scientific evidence is just the starting point: A generalizable process for developing sports injury prevention interventions. **Journal of Sport and Health Science**. 5(3): 334–341. 2016.
13. Dong, Y. & Peng, C. Y. Principled missing data methods for researchers. **SpringerPlus**. 2(1): 222. 2013.
14. Dupuy, O., Douzi, W., Theurot, D., Bosquet, L. & Dugué, B. An evidence-based approach for choosing post-exercise recovery techniques to reduce markers of muscle damage, soreness, fatigue, and inflammation: A systematic review with meta-analysis. **Frontiers in Physiology**. 9: 403. 2018.
15. Gill, N. D., Beaven, C. M. & Cook, C. Effectiveness of post-match recovery strategies in rugby players. **British Journal of Sports Medicine**. 40(3): 260–263. 2006.
16. Herbert, R. D., de Noronha, M. & Kamper, S. J. Stretching to prevent or reduce muscle soreness after exercise. **Cochrane Database of Systematic Reviews**. (7): Cd004577. 2011.
17. Hing, W. A., White, S. G., Bouaaphone, A. & Lee, P. Contrast therapy- A systematic review. **Physical Therapy in Sport**. 9(3): 148–161. 2008.
18. Hockey New Zealand (2019). **New Zealand Hockey Federation: The Hockey NZ youth hockey policy (v2).**
19. Jackson, B., Beauchamp, M. R. & Knapp, P. Relational efficacy beliefs in athlete dyads: An investigation using actor-partner interdependence models. **Journal of Sport and Exercise Psychology**. 29(2): 170-189. 2007.
20. Kellmann, M., Bertollo, M., Bosquet, L., Brink, M., Coutts, A. J., Duffield, R., Erlacher, D., Halson, S. L., Hecksteden, A., Heidari, J., Kallus, K. W., Meeusen, R., Mujika, I., Robazza, C., Skorski, S., Venter, R. & Beckmann, J. Recovery and performance in sport: Consensus statement. **International Journal of Sports Physiology and Performance**. 13(2): 240-245. 2018.
21. Kinugasa, T. & Kilding, A. E. A comparison of post-match recovery strategies in youth soccer players. **Journal of Strength and Conditioning Research**. 23(5): 1402–1407. 2009.
22. Kraemer, W., Denegar, C. & Flanagan, S. Recovery from injury in sport: Considerations in the transition from medical care to performance care. **Sports Health: A Multidisciplinary Approach.** 1(5): 392-395. 2009.
23. Lewis, P. B., Ruby, D. & Bush-Joseph, C. A. Muscle soreness and delayed-onset muscle soreness. **Clinics in Sports Medicine**. 31(2): 255-262. 2012.
24. Macrotrends. **Auckland, New Zealand Metro Area Population 1950-2022**. 2022.
25. Microsoft Corporation. **Microsoft Excel.** 2018.
26. Murray, A. M., Turner, A. P., Sproule, J. & Cardinale, M. Practices & attitudes towards recovery in elite Asian & UK adolescent athletes. **Physical Therapy in Sport**. 25: 25-33. 2017.
27. Ortiz, R. O., Jr., Sinclair Elder, A. J., Elder, C. L. & Dawes, J. J. A systematic review on the effectiveness of active recovery interventions on athletic performance of professional-, collegiate-, and competitive-level adult athletes. **Journal of Strength and Conditioning Research.** 33(8): 2275-2287. 2019.
28. Rees, H., Matthews, J., McCarthy Persson, U., Delahunt, E., Boreham, C. & Blake, C. Coaches' attitudes to injury and injury prevention: A qualitative study of Irish field hockey coaches. **BMJ Open Sport & Exercise Medicine**. 7(3): e001074. 2021.
29. Reyes-Bossio, M., Corcuera-Bustamante, S., Veliz-Salinas, G., Villas-Boas, M., Delgado-Campusano, M., Brocca-Alvarado, P., Caycho-Rodríguez, T., Casas-Apayco, L., Tutte-Vallarino, V., Carbajal-León, C. & Brandão, R. Effects of psychological interventions on high sports performance: A systematic review. **Frontiers in Psychology**. 13: 1068376. 2022.
30. Salcinovic, B., Drew, M., Dijkstra, P., Waddington, G. & Serpell, B. G. Factors influencing team performance: What can support teams in high-performance sport learn from other industries? A systematic scoping review. **Sports Medicine - Open**. 8(1): 25. 2022.
31. Shell, S. J., Slattery, K., Clark, B., Broatch, J. R., Halson, S., Kellmann, M., & Coutts, A. J. Perceptions and use of recovery strategies: Do swimmers and coaches believe they are effective? **Journal of Sports Sciences**. 38(18): 2092-2099. 2020.
32. Venter, R. E. Perceptions of team athletes on the importance of recovery modalities. **European Journal of Sport Science**. 14 Suppl 1: S69-76. 2014.
33. Wilcock, I. M., Cronin, J. B. & Hing, W. A. Physiological response to water immersion: A method for sports recovery? **Sports Medicine**. 36(9): 747–765. 2006.
34. Willis, G. B. & Artino, A. R. What do our respondents think we're asking? Using cognitive interviewing to improve medical education surveys. **Journal of Graduate Medical Education**. 5(3): 353–356. 2013.
35. White, A. D. & MacFarlane, N. G. Contextual effects on activity profiles of domestic field hockey during competition and training. **Human Movement Science**. 40: 422-431. 2015.