

**Sport and Military to Civilian Transition (MCT):
Understanding the impacts and power of sport in supporting the
wellbeing of veterans and their families**

Prepared by: Associate Professor Miranda Van Hooff

1 Executive Summary

This report was commissioned by Invictus Australia to enable a deeper understanding of how sport can support the mental, physical and social health and wellbeing of veterans and their family members who are transitioning out of the military and into the civilian community.

Each year, in Australia approximately 5,500 veterans transition out of the Australian Defence Force into the Australian community. This means 5,500 family units are in the process of navigating the complexities of reintegration into civilian life. It is understood that military to civilian transition can be a difficult period for some veterans and their families due to challenges across multiple domains of wellbeing. These challenges might include changes to housing, finances, employment, education opportunities, and social networks all of which can impact the mental health and wellbeing of all members of the veteran family unit. In addition to these life adjustments, leaving one culture (the military) to enter another (the civilian world) may require veterans and their families to redefine themselves according to a new set of social expectations and norms. This may lead to a diminished sense of control, meaning and self-esteem as well as profound sense of identity loss as both the veterans and their family members strive to redefine their purpose in life and establish social connections beyond the hierarchical military structures, they are familiar with.

Current research indicates rates of mental disorder and health risk behaviours such as smoking and substance use are significantly greater in veterans who have transitioned out of the military versus those who are current serving. Devastatingly, the number of suicide deaths in veterans who have left the military also largely out-number the rates in the general community. Further, current first line treatments for veterans with mental disorders such as PTSD are not effective, due to high drop-out rates, low adherence among veterans to standard treatment protocols, a low number of veterans who receive appropriate evidence-based care and complex co-morbid case presentations. As such there is a need to consider the role and effectiveness of complementary or adjunctive interventions to enhance the efficacy of current mainstream mental health treatments, particularly for veterans.

There is a longstanding, historical relationship between sport and the military with both domains mutually influencing each other over time. From ancient civilisations such as the ancient Romans and Greeks, where athletic activities were closely linked to military training and the ideals of martial valour to modern military organisations that actively incorporate sports as part of their training regimen, the connection is evident. Sports have been used not only to build physical fitness among troops but also to foster camaraderie, discipline, and leadership skills essential for military success.

The positive impacts of regular exercise and sport on the health and wellbeing of adults in the community (including veterans) are well known and include reduced symptoms of mental ill health, reduced risk of chronic disease and healthy growth and development.

What has not been clearly articulated in the literature to date, is how exercise, in particular sport, can be used to positively impact and support the mental, physical and social wellbeing of veterans as they undergo the potentially challenging process of transition from military to civilian life.

This report seeks to fill this gap by providing a detailed summary of the available literature to answer three distinct but interrelated research questions.

- (1) What are the key challenges/issues facing veterans and their families who are transitioning to civilian life?
- (2) What current research promotes the value of sport and sport-based rehabilitation in addressing these challenges?
- (3) What are the factors that support/hinder the successful engagement of transitioned veterans and their families into community sport?

For ease of comprehension, this review is structured into eleven sections, each examining a specific way in which sport influences the mental, physical, and social health and wellbeing of transitioning veterans and their families.

- Impacts on mental health
- Impacts on physical health
- Social support and connection
- Increased self-efficacy and self-agency
- Increased positive affect
- Release of aggression
- Supporting the development of a new identity and purpose
- Providing an environment to establish structure and routine
- Opportunities for employment
- Opportunities to support, maintain and strengthen family relationships
- Opportunities to promote help-seeking, provide psychoeducation and reduced stigma.

The report ends with a list of key research gaps and recommendations for future research.

Report Definitions:

The definition of the term 'sport' and sport in this paper were taken from The Clearinghouse for Sport (Clearinghouse) which is Australia's largest online platform for sharing information and knowledge in relation to Australian Sport.

https://www.clearinghouseforsport.gov.au/kb/what-is-sport#further_definitions (accessed 6th, December 2024).

Sport

"A human activity involving physical exertion and skill as the primary focus of the activity, with elements of competition or social participation where rules and patterns of behaviour governing the activity exist formally through organisations and is generally recognised as a sport".

Sport participation

"A 'sport participant' is a person who engages in some way in a sporting activity or event, including playing/competing; coaching, officiating, administrating, or other enabling roles (paid or volunteer); and/or supporting (e.g., cheering, being a fan, etc.)"

Veteran

Anyone who has served or is currently serving in the Defence Force (including Reservists).

Veteran Community

Veterans and members of the community that support them (family members, carers, friends, ex-service and veteran support organisations).

Transition

The journey of a veteran and their family from a military service-centred life to a predominantly civilian life.

2 Acknowledgements

About the author:

Associate Professor Van Hooff is a dynamic and values-driven research and evaluation expert, passionately committed to enhancing the mental health and wellbeing of veterans, emergency service personnel and their families. She has over 25 years of research experience in trauma and mental health; 15 years specifically focused on the mental health and wellbeing of current and transitioned ADF members and their families.

Contract Management and Support: Invictus Australia: Michael Hartung, Neil Burgin

Development of Chapter 3 and Chapter 4: Accenture: Joanne Ng, Carmen Lau, Ketan Sharma

Bibliometric Network Analysis: Dr Camila Guindalini

Consultation and Review of Report: University New South Wales: Kate Muir; IPAR: Peta Siggers

Date of release: 04 September 2025

Table of Contents

1	<i>Executive Summary</i>	2
2	<i>Acknowledgements</i>	4
3	<i>Overview of Sport in Australia</i>	7
4	<i>The Changing Sporting Landscape in Australia</i>	7
5	<i>Sport in the Military</i>	8
5.1	History of military sport	8
5.2	Sports in the Five-Eyes Nations militaries	9
5.3	Sports in the Australian military and veteran community	16
5.3.1	The current Australian landscape	16
5.3.2	The Royal Commission into Defence and Veteran Suicide.....	16
5.3.3	The 2023 Senate Inquiry into Adaptive Sport Programs for ADF veterans ..	17
5.3.4	The Australian Defence Force (ADF) sports program	17
5.3.5	The Australian Department of Veterans’ Affairs and sport	19
6	<i>The Value of Sport and Sport-Based Rehabilitation in Addressing the Key Challenges Facing Transitioning Veterans and their Families</i>	22
6.1	Mental health	23
6.2	Physical health	26
6.3	Social support and connection	28
6.4	Self-efficacy and self-agency	29
6.5	Positive affect	31
6.6	Release of aggression	32
6.7	Identity and purpose	33
6.8	Structure and routine	35
6.9	Employment	36
6.10	Maintaining and strengthening family relationships	37
6.11	Help seeking support, psychoeducation and stigma	41
7	<i>Barriers and Facilitators to Engagement and Participation in Sport</i>	43
7.1	Barriers to engagement and participation in sport	43
7.2	Facilitators of engagement and participation in sport	44

8	<i>The Role of Sporting Type</i>	48
8.1	Team sport.....	48
8.2	Gaming, esports and virtual worlds.....	48
8.3	Competitive sport.....	49
8.4	Outdoor and adventure sport (OAS).....	50
8.5	Other exercise and recreation activities.....	51
9	<i>Network Map of Veteran Sport Research</i>	52
10	<i>Research Gaps and Opportunities</i>	54
10.1	Research methodology.....	54
10.2	Standardised terminology, frameworks and definitions	55
10.3	Program enablers and barriers.....	55
10.4	Secondary impacts on families	56
10.5	Promotion and advocacy	56
10.6	Evaluation and outcome measurement	57
10.7	Sample diversification.....	57
11	<i>Conclusion</i>	58
12	<i>References</i>	60

3 Overview of Sport in Australia

In Australia, the perception of what constitutes "sport" is heavily influenced by traditional sports, professional competitions, and major events like the Olympics and Paralympics, particularly among those who are less engaged in sporting activities themselves.

The Australian Sports Commission (ASC) defines sport as a physical activity that involves effort and skills, often featuring elements of competition and social engagement. This definition underscores the organised nature of sports, which distinguishes them from other forms of physical activities such as exercise or recreational activities.

Organised sport, or "structured" sport, typically involves a certain degree of institutional framework linked to National Sporting Organisations (NSOs), encompassing popular team sports like rugby and football, as well as athletics and swimming. In contrast, social sport refers to more informal, less structured activities that allow for friendly competition, such as park football games or casual matches among friends.

There are currently various forms of new sport both nationally and internationally, that are emerging to enhance inclusivity and cater to a diverse range of abilities. For instance, modified sports provide accessible versions of traditional sports to accommodate different needs. E-sports, which encompass organised and competitive video gaming, alongside simulated sports and fitness gaming, are gaining traction. Additionally, adventure, urban, and extreme sports incorporate elements of traditional sports in outdoor settings, often involving significant physical challenges and risks. Collectively, these variations reflect the dynamic nature of sport, highlighting its capacity to adapt and grow, thereby engaging broader participation and enhancing overall wellbeing within the community. (Source:

<https://www.clearinghouseforsport.gov.au/participation-in-sport>, accessed 13th December 2024).

4 The Changing Sporting Landscape in Australia

The sporting landscape in Australia is currently undergoing significant transformation, influenced by various factors such as new technologies, changing environmental conditions, evolving value systems, and increasing diversity within the population. Six key megatrends have been identified that will shape the Australian sport sector leading up to the 2032 Brisbane Olympic and Paralympic Games and beyond. These trends include: the escalation of exercise motivated by health benefits and convenience, the potential for innovation through advancements in technology and sports science, the growing popularity of entertainment sports and digital engagement, the recognition of Australia's aging and diverse population fostering social connectivity, the expectation for sports to lead positive community impacts, and the necessity to navigate an unpredictable future marked by geopolitical tensions and climate change [1].

To address these trends and drive sporting success, the Commonwealth of Australia has developed "Sport Horizon" the 2024-2034 National Sport Strategy with the vision of "building healthy, active, connected communities and a thriving sport system" in order to "create positive, meaningful change" [2]. The plan outlines the following six key priority areas: (1) Inclusion: which involves promoting safe and welcoming sports environments for a diverse range of populations; (2) Participation: maximising participation in sport through an optimised experience for people of all ages; (3) High Performance: promoting and supporting athlete development pathways from start of their career to transition and beyond; (4) Safety: prioritising safety through ethical conduct; (5) International Engagement: for the purposes of fostering business, economic and investment opportunities, and (6) Economy and Environment: to coordinate and maximise trade, investment and employment opportunities in order to support the ongoing viability of the sector [2]. Through these priorities the government aims to enhance the overall wellbeing of Australians while promoting accessible, inclusive, and prosperous sporting opportunities for all.

5 Sport in the Military

5.1 History of military sport

The historical relationship between sport and the military is deeply intertwined, with both domains mutually influencing each other over time. From ancient civilisations such as the ancient Romans and Greeks, where athletic activities were closely linked to military training and the ideals of martial valour [3], to modern military organisations that actively incorporate sports as part of their training regimen, the connection is evident. Sports have been used not only to build physical fitness among troops but also to foster camaraderie, discipline, and leadership skills essential for military success. During significant conflicts, from World Wars I and II to current conflicts, sport has served as a morale-boosting tool, helping soldiers cope with the psychological challenges of warfare (Source: <https://cove.army.gov.au/article/sitting-bench-reserves-army-sport>, accessed 12 December 2024). Additionally, organised sports, have played a crucial role in the rehabilitation of veterans, promoting social interaction and physical activity as fundamental components of recovery and wellbeing. This historical background underscores the importance of sport in enhancing the mental health and overall wellbeing of military personnel, both during and after their service.

More recently, there have been parallels drawn between return to sporting competitions following injury and the resilience that is trained into military personnel to help them bounce back from the setbacks experienced during military service and deployment [4].

5.2 Sports in the Five-Eyes Nations militaries

Sport within the militaries of the Five Eyes alliance — comprising the U.S., U.K., Canadian, New Zealand, and Australian armed forces — share common goals but also highlight unique focuses specific to each country's priorities and cultural values.

Across all five nations, a central objective is to promote physical fitness and good health, underscoring the importance of physical readiness for operational tasks. For instance, the U.S. Department of Defense emphasises physical fitness as an incentive through competitive sports, while the U.K. prioritises improved physical fitness to perform tasks under stress. Similarly, the Canadian Armed Forces (CAF) and the New Zealand Defence Force (NZDF) stress the promotion of physical fitness as crucial, reflecting an overarching theme of maintaining health and readiness across their forces. The Australian Defence Force (ADF) extends this notion by linking sport to member wellbeing and overall sustainability of capability.

A key similarity is the emphasis on enhancing morale and building esprit de corps (a feeling of pride and mutual loyalty shared by the members of a group). The U.K., Canada, and New Zealand particularly focus on using sport to foster high morale and esprit de corps, which are crucial for unit cohesion and effectiveness. The CAF, in particular, highlights unit cohesion, teamwork, and pride as primary objectives, indicative of fostering strong bonds within the military community. The ADF's emphasis on enhancing member connection across ranks also ties into this objective.

Sport is also recognised for its role in personal development and character building. The U.K. Armed Forces highlight the development of self-discipline, leadership, and courage, and similar sentiments are echoed by the CAF, which values leadership and the warrior spirit as key outcomes of engaging in sports. NZDF's objectives explicitly mention fostering personal qualities and comradeship, emphasising character development.

Another important objective is the use of sports as a tool for international engagement and diplomacy. This is particularly highlighted in the U.S., where military-to-military opportunities through sport with CISM International Military Sports Council member nations are seen as valuable, and in the ADF's aim to support international engagement, underscoring sport's role in fostering international military relations and goodwill.

In June 2024, the Australian Federal Government invited several national sporting organisations and peak bodies to join the Sports Diplomacy Consultative Group, led by the Department of Foreign Affairs and Trade. This newly formed group will explore strategic and economic opportunities and risks for international sport and identify areas collaboration for government and sport. The role of sport in enhancing the public image and recruitment capabilities of the military is also a common theme. The U.S. aims to promote a positive image of the Armed Services through sport, while the NZDF specifically mentions promoting its public image. Recruitment and retention are direct objectives for both the U.S. and the U.K., with the latter viewing sports as supportive of recruitment efforts.

Where differences emerge, they are often in emphasis rather than divergence of goals. The U.K. notably prioritises operational readiness directly through sports-related improvements in stress management and coordination, while the Canadian approach distinctly separates primary and secondary objectives, highlighting personal development and competitive opportunity. The Australian focus on connection within the Services is unique, reflecting perhaps a more holistic view of wellbeing across its defence community.

In conclusion, while each Five Eyes nation tailors its objectives for sports based on distinct national priorities and cultural influences, there is a shared recognition of the multifaceted benefits sports provide to military personnel. This includes enhancing physical fitness and operational readiness, building morale and cohesion, developing personal qualities, supporting international relations, and contributing to recruitment efforts — crucial factors that together support an effective and resilient military force.

Table 1: Overview structure and objectives of sports in the Five-Eyes Nations militaries

US DoD US DoD Armed Forces Sports (AFS) (Website: https://armedforcessports.defense.gov/About/)			
<p>Overview:</p> <p>The AFS program comprises each branch's sports and fitness initiatives. Service members start by competing in unit-level intramurals and can progress to the All-Service level. The AFS also offers military service members opportunities to compete in national and international events. (https://armedforcessports.defense.gov/About/) (accessed 7/10/2024).</p>	<p>Organisational Structure:</p> <p>The AFS program operates under the purview of the Principal Deputy, under Secretary of Defense for Personnel and Readiness (PDUSD (P&R)). PDUSD (P&R) delegates responsibilities to the Principal Director for Military Community and Family Policy (PDMC&FP) to provide guidance and oversight of members participating in national and international amateur sports competitions.</p> <p>The Armed Forces Sports Council (AFSC) is the governing body of the AFS Program and is comprised of the MWR Directors of each of the Services.</p>	<p>Objectives:</p> <ol style="list-style-type: none"> 1. To promote goodwill and a positive image of the Armed Service 2. To provide incentive and encouragement of physical fitness through competitive sports 3. To provide a venue for military athletes to participate in national and international competitions 4. To engage in valuable military-to-military opportunities with CISM member nations through sport 5. To directly contributes to the recruitment, retention, and readiness of Service members 	<p>Sports Strategy:</p> <p>No</p>
UK Armed Forces (UKAF) Sport (Websites Navy: https://www.royalnavy.mod.uk/NAVYfit; Army: https://britisharmysport.com; Airforce: only available via SharePoint login).			
<p>Overview:</p> <p>Sport is one of the three pillars of physical development, along with PT and Adventurous Training. Authorised Sport is a Condition of Service, holding a non-discretionary duty status as a core activity. Joint Service Publication (JSP) 660 – Sport in the UK Armed Forces [UKAF] is the primary reference of relevance for UK Armed Forces sport. It states that "Sport makes a significant contribution to the delivery of operational capability; indeed, it is a core activity in the UK Armed Forces." JSP660 combines policy and guidance for conducting sporting activities as part of UK Armed Forces business^{1,2}.</p>	<p>Organisational Structure:</p> <p>The head of UKAF Sport is the Chief of Defence People (CDP). CDP is accountable to the Defence Board, through the Vice Chief of Defence Staff (VCDS). Defence sporting policy is the responsibility of Assistant Chief of Defence Staff (Personnel Capability), who heads the UKAF Sports Board; the authority governing all UKAF associations.</p>	<p>Objectives:</p> <ol style="list-style-type: none"> 1. Good health, personal fitness and physical development 2. Physical benefit, especially for personnel in sedentary occupations 3. Improved physical fitness for performing operational tasks under stress 4. Promote self-discipline 5. Promote high morale and esprit de corps 6. Improve coordination, determination, confidence and motivation 7. Promote courage and building of character 8. Hone leadership qualities 9. Increase individual competitiveness; and 10. Support recruiting and retention 	<p>Sports Strategy:</p> <p>No</p>

Canadian Armed Forces (CAF): Personnel Support Programs (Website: https://cfmws.ca/sport-fitness-rec/sports)			
<p>Overview:</p> <p>CAF Sports Program are designed to provide a demanding training program as a contribution to the overall effectiveness of the Canadian Forces. The sports program is part of Personnel Support Programs, also using fitness and recreation for health promotion.</p> <p>Tagline from Website: "CAF Sports is more than just a way to stay fit. It develops core military attributes such as teamwork, self-discipline, leadership, esprit de corps, perseverance and resilience. It helps CAF members stay operationally ready".</p>	<p>Organisational Structure:</p> <p>The CAF Sports Program is divided into two general sections: Intramural (Unit sports) and Extramural (regional, national and international level). The program operates under the Canadian Forces Morale and Welfare Services Policy Manual for Personnel Support Programs, governed by the Director Deployment Support, Recreation, and Messes (DDSRM) ^{3,4}. That position oversees 5 Regional Sports Directors, with described boundaries in the reference encompassing:</p> <ul style="list-style-type: none"> • Pacific • Prairies • Ontario • Quebec • Atlantic 	<p>Objectives:</p> <p>Primary:</p> <ol style="list-style-type: none"> 1. To develop unit cohesion, teamwork, morale, pride and identity 2. To instil a high degree of esprit de corps 3. To develop individual attributes such as leadership, self-discipline, self-sacrifice, self-esteem and warrior spirit; and 4. To promote physical fitness. <p>Secondary:</p> <ol style="list-style-type: none"> 1. To provide the opportunity for all members to develop their physical potential 2. To provide the opportunity for members to participate in highly skilled, competitive and organised athletics; and 3. To encourage military athletes and teams to achieve higher standards of proficiency. 	<p>Sports Strategy:</p> <p>Yes ⁵</p>
New Zealand Defence Force (NZDF) Sport (Website: Defence Health Hub: https://health.nzdf.mil.nz/your-health/body/nzdf-testing-and-sports/nzdf-sports ; NZDF Sport Facebook page: https://www.facebook.com/NZDFSport)			
<p>Overview</p> <p>NZDF describes sport as a perennially integral part of military life, due to the premium placed on physical fitness, teamwork and camaraderie.</p> <p>Tagline from website: "The purpose of sport in the NZDF is to contribute to CDF's determination that it is essential for our military people to be fit for operations and our civilian workforce to be fit to do their job". "The primary role of sport in the services is to help all NZDF personnel achieve and maintain a high standard of physical fitness, while also promoting personal qualities and group cohesion"</p>	<p>Organisational Structure:</p> <p>NZDF Sports falls under the People Capability Portfolio, as responsibility of the Chief People Officer. There are three levels of NZDF Sport; Unit (ship or formation), single-Service, and Defence. National and international sporting activities are authorised by the Chief of the Defence Force, with the NZDF Sports Committee (NZDF SC) providing oversight.</p>	<p>Objectives:</p> <ol style="list-style-type: none"> 1. To encourage physical fitness 2. To promote unit morale, esprit de corps and teamwork 3. To develop personal qualities and character 4. To foster comradeship 5. To promote NZDF public image 	<p>Sports Strategy:</p> <p>Yes ⁶</p> <p>NZDF Sport 25. With the vision that "Participation in all sports is maximised across the NZDF and values as developing people who are resilient, have stamina, demonstrate flexibility and have the winning edge."</p>

Australian Defence Force (ADF) Sport			
<p>Overview</p> <p>Sport in the Australian Defence Force is seen as a crucial component for maintaining physical fitness, team building, and morale among service members. Participating in sports helps enhance operational effectiveness and overall wellbeing, as well as international engagement opportunities.</p> <p>Acknowledges the benefit of different sporting roles: competitor, coach or administrator, and recognises the inherent connections between sport, exercise, health and the overall wellbeing of ADF personnel.</p>	<p>Organisational Structure:</p> <p>ADF Sport is governed and funded by the Joint Capabilities Group, and part of the Joint Support Services Division. The ADF Sports Cell promotes and coordinates Joint sporting effort, via the ADF Sports Advisory Council, chaired by the Director General ADF Sports.</p> <p>The ADF defined 3 levels of sport:</p> <ol style="list-style-type: none"> 1. Civilian sport 2. Local (unit) sport 3. Service (representing the single-Services) ADF (including conventional and adaptive sports, along with Pacific). <p>ADF Sport has three councils: Conventional, Adaptive and Pacific (which supports the whole of Government Pacific Step-up initiative).</p> <p>The ADF sports policy⁷ applies to all Defence members, full and part-time, who participate in sport - and those who manage them. This reference lays down policy for organising, funding, and participation in sports at participation and representation levels.</p>	<p>Objectives:</p> <p>These can be gleaned from the mission statement:</p> <ol style="list-style-type: none"> 1. To enhance member wellbeing and connection between all ranks and Services 2. To assist sustainment of Defence's capability requirements 3. To support Defence international engagement 	<p>Sports Strategy:</p> <p>No</p>

¹JSP 660 Part 1 – Directive. https://www.armysportlottery.com/wp-content/uploads/2021/03/20210204-JSP660_Part1-V2.3.pdf

²JSP 660 Part 1 – Guidance. https://www.awsa.org.uk/wp-content/uploads/2018/10/20180309-JSP660_Part2_v2.1.pdf

³Personnel Support Programs Policy Manual , Part 5, Chapter 5-1 – Sport <https://cfmws.ca/CFMWS/media/images/documents/8.0%20About%20Us/Resources%20for%20Messes/English/PSP-Policy-Manual-EN-7-Nov-2022.pdf>

⁴CAF Sports Championships Operations Manual [https://cfmws.ca/getattachment/c1def5cc-94e9-4c47-b85a-5d4dc06214ef/CHAPTER-1-EN-2023-INTRODUCTION-\(09-Feb-23\).pdf](https://cfmws.ca/getattachment/c1def5cc-94e9-4c47-b85a-5d4dc06214ef/CHAPTER-1-EN-2023-INTRODUCTION-(09-Feb-23).pdf) –

⁵Canadian Armed Forces Sports Strategy: <https://cfmws.ca/CFMWS/media/images/documents/8.0%20About%20Us/Strategies/CAF-Sports-Strategy-English-221004-web.pdf>

⁶NZDF Sports Strategy25: <https://health.nzdf.mil.nz/assets/Documents/NZDF-Sports-Strategy25.pdf>

⁷The Military Personnel Manual (MILPERSMAN) Pt 3 Ch 3 - *Sport In Defence*.

Table 2: Authorised sports in the Five-Eyes Nations militaries

Authorised Sports	US Armed Forces Sport	UK Armed Forces Sport	Canadian Armed Forces Sport	Australian Defence Forces Sport	
Alpine Snowsports		✓		✓	
Skiing/Snowboarding					
Angling/Fishing		✓			
Archery	✓				
Aussie Rules Football				✓	
Badminton		✓	✓		
Basketball	✓	✓	✓	✓	✓
Biathlon				✓	
Boxing		✓			
Bowling	✓				
Cricket		✓		✓	✓
Cross-country	✓				
CrossFit				✓	
Curling			✓		
Cycling	✓	✓		✓	✓
Drone Racing				✓	
Equestrian	✓*	✓*			
Esports	✓				
Fencing	✓*	✓*	✓		
Gliding		✓			
Golf	✓	✓	✓	✓	✓
Hang/paragliding & Microlight		✓			
Hockey		✓	✓	✓	✓
Ice Hockey		✓	✓	✓	
Judo	✓	✓			
Kayaking		✓			✓

Lacrosse		✓			
Lawn Bowls				✓	
Martial Arts/Combat Sports	✓		✓	✓	✓
Netball		✓		✓	✓
Orienteering	✓	✓			
Parachuting	✓	✓		✓	
Polo		✓			
Rackets		✓			
Rowing		✓		✓	
Rugby Union	✓	✓	✓	✓	✓
Rugby League		✓		✓	✓
Sailing	✓	✓	✓	✓	
Shooting/Clay shooting	✓		✓	✓	
Skiing and Water Sports	✓				
Soccer	✓	✓	✓	✓	✓
Softball/Slo-pitch	✓		✓	✓	✓
Sport climbing		✓			
Squash		✓	✓	✓	
Surfing & Kitesurfing		✓		✓	
Swimming	✓		✓		
Tennis					
Tenpin Bowling					
Touch Football				✓	✓
Track and Field/Running	✓		✓	✓	✓
Triathlon	✓		✓	✓	
Volleyball	✓		✓	✓	✓
Water Polo				✓	
Weightlifting/Bodybuilding		✓			✓
Wrestling	✓				

*Available but either as a grouped sport or is defined as Recreation

5.3 Sports in the Australian military and veteran community

5.3.1 *The current Australian landscape*

In recent years, the value of sport to the health and wellbeing of the Australian veteran community has garnered increasing attention, including investigations such as the 2023 Senate Inquiry into Adaptive Sports Programs for Australian Defence Force (ADF) Veterans [6] and the Royal Commission into Defence and Veteran Suicide. These initiatives underscore the critical role that involvement in sports can play in promoting both physical fitness and mental resilience among veterans, highlighting how adaptive sports programs may serve as vital interventions to support their reintegration into civilian life. As findings from these inquiries emerge, there is a growing acknowledgment of the need to leverage sporting activities, not only as a pathway to improved health outcomes, but also as a means of fostering social connectivity and community engagement among veterans and their families, ultimately contributing to a more supportive environment for those who have served and continue to serve our nation.

5.3.2 *The Royal Commission into Defence and Veteran Suicide*

The Royal Commission into Defence and Veteran Suicide acknowledged a relationship between sport and mental health in veterans emphasising how the loss of interest in sporting activities can contribute to a degraded self-view, akin to the impact of job loss and disconnection from friendships. As one veteran poignantly expressed:

"I have lost jobs, have been unable to work for long periods of time, have disconnected from friends, have lost interest in social and sporting activities. I am no longer the person I once was. I still do not know how to get myself back." (Vol 1 RCDVS, Executive summary, para 282, page 57).

Additionally, evidence provided by a former ADF senior medical officer noted how Defence is already leveraging a sports science approach to physical training in order to prevent injuries in current serving veterans stating that:

"the sporting model is a proven one and it's highly successful... Contextualising it and perhaps adapting it to the specifics of military is the way to go ... exposing our physical training instructors to the way professional sports teams strengthen and condition their athletes gives them a benchmark." (Vol 4, RCDVS, *Healthcare for serving and ex-serving members* para 167, page 73).

Furthermore, maintaining civilian connections through community sports teams during service is recommended to alleviate transition difficulties for service-leavers, as these connections lower cultural barriers and facilitate reintegration into society. Engaging in community sports allows veterans to contribute to their local environments, with the Commission noting that veterans often excel in roles such as umpires due to their familiarity with rules and regulations, thereby enhancing their integration into the community. (Vol 5, RCDVS, paras 604, 625).

"Members should be encouraged to maintain civilian connections during service – for example, by participating in community sporting teams or other groups – to reduce cultural barriers and facilitate integration after service" (Vol 5, RCDVS, paras 604, page 99).

"the crucial thing is ... the community ownership... veterans make very good umpires because they like following rules, regulations and doing that... if you are in a country town and you are umpiring or playing sport, you are getting reintegrated into the community." (Vol 5, RCDVS, paras 625, page 103).

These key points underscore the potential of sport as a vital component of veterans' mental health strategies and can support the transition to civilian life.

5.3.3 The 2023 Senate Inquiry into Adaptive Sport Programs for ADF veterans

The report into Adaptive sport programs for Australian Defence Force Veterans by The Senate Foreign Affairs, Defence and Trade References Committee in May 2023 [6] examined the role of adaptive sport programs in supporting the wellbeing needs of Australian Defence Force veterans. This report details the benefits of adaptive sport in supporting current and former serving veterans, highlighting its positive impact on mental and physical health, rehabilitation, and social integration.

In addition to summarising the limited research available on the utility of sport for veterans' mental health and wellbeing at the time, this report summarised the outcomes of several public hearings with veterans and others who have been involved in adaptive sports.

The report acknowledged:

- There remains "little peer-reviewed research about the long-term benefits of high-profile competitive adaptive sport" (Dr Jon Lane, psychiatrist page 15)
- "Studies to date are limited, do not involve randomised control trials and rely heavily on qualitative research" (Department of Defence, page 17)
- The need for more research on the "use of sport and exercise to promote mental health in the veteran cohort (Department of Defence, page 17)

In summary, the report underscores the positive impacts of adaptive sports on mental and physical health, rehabilitation, and social reintegration for both current and ex-serving veterans. While highlighting the benefits, such as improved socialisation, family bonding, creation of positive memories (and less focus on the negative experiences of their past), as well as reaffirmation of strengths, the report also acknowledges significant gaps in research and challenges in program delivery.

5.3.4 The Australian Defence Force (ADF) sports program

Sport is considered a capability enabler for the ADF, also playing a critical part in individual wellbeing, while providing strategic international and domestic engagement opportunities for Defence; which also supports Whole of Government regional policy.

Recent policy changes have focussed this strategic effort toward inclusive and culturally diverse communities, from nations around the Pacific rim.

In addition to promoting physical fitness as a key component of team building, wellbeing and operational readiness, the ADF has three primary sports programs designed to encourage ADF personnel to participate and engage in sport:

- The Conventional Sports Program;
- The Adaptive Sports Program (which includes the Warrior Games and Invictus Games); and
- The Pacific Sports Program.

The Pacific program is a relatively new strategic engagement program, set-up in response to the Whole of Australian Government Pacific Step-Up initiative and supported by the conventional programs' associations.

These are facilitated by the ADF sports cell (<https://www.defence.gov.au/adf-members-families/wellbeing/programs/adf-sport>) and are coordinated through the ADF Sports council (<https://clik.dva.gov.au/military-compensation-srca-manuals-and-resources-library/liability-handbook/ch-18-sport-and-fitness-activities/181-adf-and-civilian-sport/1812-australian-defence-force-sports-council>).

The ADF Sports cell aims to improve capability through:

- **Enhancing** the wellbeing of veterans, through sports participation, coaching and sports administration
- Providing opportunities for **connection** which surpasses ranks, ages, gender and Service
- **Sustaining** operational readiness by providing opportunities to enhance morale, regroup, refresh and remain challenged.

The **Conventional Sports Program** includes 30 different ADF Sports Associations, with an estimated membership of 5000 personnel:

Table 3: ADF sport associations

Alpine Snowsports	CrossFit	Parachuting	Soccer
Basketball	Drone Racing	Rugby Union	Surf Riders
Clay-target Shooting	Golf	Rowing	Touch Football
Cricket	Hockey	Rugby League	Triathlon
Cycling	Ice Hockey	Running & Athletics	Volleyball
Creative	Lawn Bowls	Sailing	Water Polo
Combat Sports	Netball	Squash	
Australian Rules Football	Nordic Biathlon	Softball	

The **Adaptive Sports Program** is for current and former serving ADF members who became wounded, injured or ill during service and is designed to support recovery, social re-integration and rehabilitation through facilitation of engagement in local sporting activities as well as selection, training and funding of current serving personnel to compete in international sporting events such as the Invictus Games and Warrior Games. The Adaptive Sports program is delivered in partnership with Invictus Australia and exists to both encourage participation and raise awareness of both issues faced by veterans and their families, and the strength of character in our veteran community. Participation can be through specific adaptive camps and events or within those associations with the necessary skill sets to accommodate the needs of the adaptive participant.

The **Pacific Sports Program**, which is coordinated through the Department of Foreign Affairs and Trade, facilitates opportunities for ADF members and members of the Australian community to engage with veterans and the Pacific Island community (primarily Tonga, Solomon Islands, Vanuatu, PNG, Fiji and Samoa) to train and compete in sports diplomacy matches, events and training camps (<https://www.dfat.gov.au/publications/trade-investment/business-envoy/november-2021/pacificaus-sports>).

Note: Early indications since this program began appears to signal a move away from international sports engagement of countries outside of the Pacific Rim [e.g. at least one event, the second part of a reciprocal visit by the British Biathlon Union to Australia, has been cancelled for this reason].

5.3.5 The Australian Department of Veterans' Affairs and sport

Although the Department of Veterans Affairs (DVA) does not have a specific policy for sports, it continues to invest in research projects aimed at enhancing the evidence base regarding the benefits of sports and physical exercise in supporting the wellbeing of the veteran community. These research initiatives seek to identify effective ways that DVA can assist veterans in their transition to civilian life and promote their overall wellbeing through physical activity, while also fostering social connections within their local communities [6].

Moreover, the DVA's factors of wellbeing encompass several recognised universal benefits of sport, such as health and social support and connection. The Defence and Veteran Family Wellbeing Strategy includes nine factors of wellbeing (see Figure 1 below), defining good wellbeing among Australian veterans and their families as effective functioning across several key factors: health, education and skills, housing, social support and connection, employment, income, and recognition and respect.



Figure 1: Defence and veteran families wellbeing factors

Table 4: Veteran domains of wellbeing from the Five-Eyes Nations

Domains of Wellbeing	Dept. Veteran Affairs Australia	UK Office of Veteran Welfare	Veteran Affairs Canada	Veterans Affairs US	Veteran Affairs New Zealand
<i>Health/provider awareness & education</i>	✓	✓	✓		✓
<i>Education & skills/Personal development</i>	✓	✓	✓	✓	
<i>Housing</i>	✓		✓		
<i>Social support & connection/Family & friends/Community & relationships</i>	✓	✓	✓	✓	
<i>Employment/Meaningful activity</i>	✓		✓		
<i>Income & finance</i>	✓	✓	✓		
<i>Recognition & respect</i>	✓				
<i>Moving the body</i>				✓	
<i>Food & drink</i>				✓	
<i>Focus on prevention & wellbeing promotion</i>					✓
<i>Surroundings/Cultural, diversity & social environment/needs</i>			✓	✓	✓
<i>Recharge, Spirit & soul, and Power of the mind</i>				✓	
<i>Maintain military connectedness</i>					✓
<i>Meet whole family needs</i>					✓
<i>Streamline cross-agency response</i>					✓
<i>Making a home in civil society</i>		✓			
<i>Veterans & the law</i>		✓			

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/755915/Strategy_for_our_Veterans_FINAL_08.11.18_WEB.pdf

<https://www.veterans.gc.ca/en/about-vac/research/info-briefs/veteran-wellbeing>

https://www.va.gov/WHOLEHEALTH/docs/LWH-Introduction_508.pdf

<https://www.veteransaffairs.mil.nz/assets/Work-Programmes/The-Veteran-Family-and-Whanau-Mental-Health-and-Wellbeing-Policy-Framework.PDF>

6 The Value of Sport and Sport-Based Rehabilitation in Addressing the Key Challenges Facing Transitioning Veterans and their Families

Military service both in Australia and overseas is held in high esteem. For most personnel, serving in the military is a positive experience providing opportunities to develop valuable life skills, such as leadership, teamwork, discipline, and resilience, which are highly transferable to civilian life. It fosters a strong sense of camaraderie and community, as service members work together towards common goals, creating lifelong bonds and networks. Additionally, serving in the military offers comprehensive training and professional development opportunities, allowing individuals to gain expertise in various fields and enhance their career prospects.

Military service also provides a sense of purpose and fulfillment, as individuals contribute to national security and humanitarian efforts, ensuring the safety and wellbeing of their country and its citizens. Furthermore, those who serve often experience a deep sense of pride and satisfaction in representing their country and upholding its values, which can enrich their personal and professional lives.

For some, however, military service can significantly impact mental health, affecting individuals both during their service and through the transition to civilian life. This can be due to factors such as cumulative exposure to traumatic events and injuries during deployments and training exercises, prolonged separations from family and familiar surroundings, and health risks like viruses [9-11].

Furthermore, the transition from military to civilian life (MCT) can be fraught with additional challenges across various wellbeing domains, including mental and physical health, social adjustment, employment, education, financial stability, and legal matters. This transition is a continuous process that unfolds over a lifetime rather than a singular event [12, 13]. While MCT frameworks highlight that each veteran's transition journey is unique, influenced by personal experiences, circumstances, and available support systems [12], there are common challenges. These challenges include identity shifts and loss of military identity requiring the formation of new purposes and meanings, alterations in social groups and support networks, difficulties in maintaining physical fitness without structured military PT programs, changes in status due to limited recognition of military rank in the civilian sphere, loss of military comradeship and financial pressures due to lack of financial preparedness [14, 15]. Addressing these challenges is crucial to fostering recovery and resilience, as failing to do so can hinder successful reintegration into civilian life.

Each year, approximately 5,500 veterans transition out of the Australian Defence Force into the community. This means 5,500 family units are in the process of navigating the complexities of reintegration into civilian life, often grappling with identity shifts, social isolation, and mental health concerns exacerbated by their military experiences.

Effective support during this transition is critical as these veterans bring valuable skills, leadership qualities, and life experiences that can greatly benefit the workforce and society at large. However, without targeted resources and programs tailored to their needs, many may struggle to adapt, leading to adverse outcomes such as unemployment, mental health issues, and diminished quality of life. This report provides strong evidence for the utility of Sport and exercise in enhancing veterans' wellbeing in three distinct ways – mentally, physically and socially.

Mentally, exercise promotes the release of endorphins and other neurotransmitters that elevate mood and reduce symptoms of anxiety and depression [16]. This is important due to the high prevalence of Anxiety, Affective and Alcohol Disorders in the Veteran population compared to current serving military members and the civilian community [17].

Physically, engaging in regular exercise and/or sporting activities improves cardiovascular health, sleep, increases muscle strength, and enhances flexibility and endurance, helping veterans maintain physical fitness, manage conditions like obesity or joint pain and assist in the recovery from service-related physical injury such as musculoskeletal conditions [18].

Socially, sports offer opportunities for social interaction, camaraderie and the construction of new positive identities which foster a sense of belonging and community cohesion by building supportive networks that combat loneliness [16]

Additionally, participating in sports provides veterans with a structured routine and a sense of purpose, which can aid in mitigating feelings of isolation and aimlessness often experienced during the transition to civilian life. These activities also empower veterans by allowing them to set and achieve goals, boosting self-efficacy and confidence [19].

Together, these physical, mental and social benefits suggest sport and exercise are a powerful tool in supporting the overall wellbeing of veterans. These specific challenges and the role of sport in mitigating their negative impacts are discussed in detail in the following section.

6.1 Mental health

Military Service is associated with a range of mental health challenges, particularly among those who have left full-time service. These include post-traumatic stress disorder (PTSD) depressive disorders, anxiety, psychological distress, substance use disorders, anger/aggression and suicidal ideation and behaviour [9, 20, 21].

In the Australian Defence Force, mental disorders are more common among those who have left fulltime ADF service than those who are currently serving (Table 5). This highlights the importance of easily accessible and effective resources and support during military to civilian transition.

Table 5: 12-month prevalence of mental disorder in current serving regular ADF members and recently transitioned ADF members

12-month ICD-10 Disorder	2010 Regular ADF (N=50,049)			2015 Transitioned ADF (N=24,932)		
	N	%	95% CI	N	%	95% CI
Panic Attack	3537	7.1	5.6-8.6	4244	17	13.8, 20.8
Panic Disorder	709	1.4	1.0-1.9	1344	5.4	3.6, 8.0
Agoraphobia	1261	2.5	1.8-3.2	2975	11.9	9.1, 15.5
Social Phobia	1919	3.8	3.0-4.7	2738	11	8.4, 14.3
General Anxiety Disorder	533	1.1	0.7-1.5	917	3.7	2.2, 6.0
Obsessive Compulsive Disorder	1581	3.2	1.1-5.2	1029	4.1	2.6, 6.6
PTSD	4169	8.3	6.1-10.6	4408	17.7	14.5, 21.3
Depressive episodes	3182	6.4	5.1-7.7	2783	11.2	8.6, 14.3
Dysthymia	526	1.1	0.6-1.5	1140	4.6	3.1, 6.7
Bipolar Affective Disorder	1401	2.8	0.9-4.7	2443	9.8	7.0, 13.5
Alcohol Harmful Use	1420	2.8	1.6-4.1	948	3.8	2.3, 6.3
Alcohol Dependence	1171	2.3	1.7-3.0	2271	9.1	6.4, 12.8

Data Drawn directly from the 2010 Mental health Prevalence and Wellbeing Study [10] and the 2015 Transition and Wellbeing Research Program [17].

There are a range of factors, both service-related and non-service-related, that increase the risk of mental health symptoms and disorders such as PTSD, depression, anxiety, and alcohol use among individuals transitioning from full-time military service [9].

Among the service-related factors, combat exposure, particularly the nature and frequency of such experiences, and military sexual trauma are the strongest predictors of PTSD. Length of time, since transition is an important predictor of mental disorder (1 year and 4 years post discharge being period of risk) as is discharge type, with medical and administrative discharges posing higher risks [9, 20]. Lower rank, service in the Army, poor unit cohesion, and a lack of post-deployment support further exacerbate these challenges [9, 20]. Finally, early service leavers, individuals who exit before completing their minimum service period, face heightened risks for affective, anxiety, and alcohol disorders [20, 22].

In relation to non-service-related factors, gender plays a role, with female ADF members more likely to meet criteria for an anxiety disorder than their male counterparts [10]. Other pre-service risk factors include childhood trauma and disorder, number of other lifetime events, trauma, unemployment or low income, educational background, and ethnicity [9, 23]. There is abundant evidence for the dosage effect between trauma exposure and likelihood of developing PTSD [24].

First-line treatments for PTSD in veterans, the most prevalence disorder type in this population, are trauma focused cognitive therapies such as Cognitive Processing Therapy (CPT), Prolonged Exposure (PE), and Eye-Movement Desensitisation and Reprocessing which assist veterans process traumatic memories and reduce avoidance behaviours [25]. These therapies, however have been reported to be less effective in veterans compared to civilian populations due to high drop outs rates, low adherence to recommended number of treatment sessions (due to the lengthy time commitments required and the temporary distress caused by the exposure elements of the therapy) as well as the high levels of comorbidity between PTSD, substance use and other mental health disorder and symptoms in veteran populations [25, 26]. While selective serotonin reuptake Inhibitors (SSRIs) such as sertraline, fluoxetine and paroxetine and serotonin-norepinephrine reuptake inhibitors (SNRI) such as venlafaxine may be additionally helpful in managing co-morbid symptoms such as depression, dissociation and anxiety [27], discontinuation of pharmacological interventions among veterans is also high [28]. These factors, combined with the stigma and barriers surrounding mental health treatment, such as a preference for self-reliance, concerns of being perceived as weak or concerns that help-seeking impacting negatively on their careers/deployability, as well as the lack of military aware and culturally competent clinicians contribute to the difficulties many veterans face in accessing, fully adhering to, and benefiting fully from these recommended treatment approaches [10, 29, 30]. As such there is a need to consider the role and effectiveness of complementary or adjunctive interventions (such as mindfulness-based therapies, exercise and sports programs, art therapy and assistance animals) to enhance the efficacy of current mainstream PTSD treatments [31].

A rapid review of the literature published up to and including 2017 by Milanese et al (2018), for example suggested "promising" support for sport as an enabler to improve the mental wellbeing of veterans. They concluded that while several different sporting activities met the ranking of "promising" - structured competitive sport, supervised aerobic exercise, supervised mind body exercise, unmonitored unsupervised physical activity and structured recreational physical activity, results should be interpreted with caution due to only a small number of randomised control studies [32].

Of the studies that have examined veterans, impacts on mental wellbeing have been noted to be widespread. Burling et al. (1992), for example, reported that participation in a community-based softball team significantly improved rehabilitation outcomes for a cohort of 34 male veterans in a residential program for alcohol or drug dependence [33]. In this study those who engaged in softball were more likely to complete the substance abuse program, find secure housing and employment, and maintain abstinence from substance abuse three months post-intervention, indicating that the sport provided valuable opportunities for practicing coping skills and fostering supportive relationships [33].

Laferrier and colleagues reported that participation in structured competitive sports significantly improved self-esteem, post traumatic growth, quality of life and depression scores for veterans with disabilities, with higher self-esteem scores associated with more

years of sports involvement and participation in team events, highlighting the positive impact of peer support within a team environment [34, 35].

Morgan et al (2019) also reported a reduction in symptoms of anxiety, depression and insomnia among 15 UK veterans participating in a 5-week scuba diving program combined with peer support [36]. Positive impacts on the management of anxiety and depression have also been observed in veterans engaged in surfing [37] [38].

Finally, veterans engaged in a week-long adaptive summer sports clinic have also reported a reduction in PTSD, depression, generalised anxiety, and insomnia immediately following program completion. These reduction in symptoms however were not maintained at the 3-month follow-up, with symptom levels across all probable disorder types rebounding back to pre-intervention levels and not meeting criteria for clinically significant reductions [39].

In specific relation to PTSD, Belrose et al. (2021) demonstrated that structured sports programs effectively improve self-representation among veterans with chronic PTSD. By actively participating in sports, these veterans experienced a positive shift in self-image and a notable reduction in their PTSD symptoms. Nature based sports activities such as river kayaking, fly-fishing, ski/snowboarding and surfing [40] have also been shown to reduce symptoms of hyperarousal, re-experiencing, and numbing symptoms of PTSD [41] as well as an overall reduction in PTSD scores [42-44]. When examined as an adjunct to standard medical treatment in a veteran inpatient population however, PTSD symptom reduction was no greater among those engaging in rock-climbing, hiking and white water than those receiving standard clinical PTSD treatments only [45].

6.2 Physical health

While military personnel who deploy to overseas operations are generally seen as healthier than the general population due to a healthy soldier effect, the risk of physical illness and injury (i.e. Traumatic Brain Injury (TBI), hearing impairments/tinnitus, Hepatitis C, and musculoskeletal conditions (including chronic back pain) remains high in this population [9]. Furthermore, transitioning from Military to Civilian life has been reported to be associated with an increase in health risk behaviours including increased alcohol and substance use, decrease in physical activity and rapid weight gain [46].

In the Australian Defence Force, for example, the Transition and Wellbeing Research Programme reported significantly more physical health issues among transitioned ADF members compared to those in service [47]. The most common diagnosed physical health conditions among current and transitioned ADF members in this study were chronic low back pain (11.7% current ADF vs 18.5% transitioned ADF) hearing loss (9.1% vs 15.7%), high cholesterol (11.0% vs 12.8%) other musculoskeletal condition (11.1% vs 12.2%) high blood pressure (7.9% vs 12.0%) and sinus problems (8.2% vs 7.5%) [47]. Additionally, approximately half of Regular (49.1%) and Transitioned (45.5%) ADF members, reported a body mass index (BMI) in the pre-obese range, and around one

quarter reported a BMI in the obese range (Regular ADF: 27.5%; Transitioned ADF: 26.8%) [47].

Physical Disabilities such as visual impairments and amputations are also reported to be high among contemporary deployed military populations [48] due to the increased exposure to blast injury and Intermittent Explosive Devices (IEDs).

While the evidence surrounding the physical health impact of sport/and physical exercise on veterans is notably lacking [32] there is a substantial evidence base around the impacts of physical exercise on the health, morbidity and the mortality of the population more broadly which can inform this discussion.

Regular physical activity, and by definition sport, has been shown repeatedly in the literature to prevent and manage multiple chronic diseases including cardio vascular disease (i.e. 30-40% decrease risk of CVD in women who regularly exercise), Type 2 diabetes, obesity, and cancer (i.e. 20-50% reduction in colon, breast, endometrial and oesophageal cancer) [18]. Furthermore, regular physical activity supports the healthy growth and development of the entire musculoskeletal system including bone density, joints, muscles, tendons and ligaments [18], all of which are essential to maintain the military's physically fit and healthy workforce.

A small number of studies on the physical health impacts of sport in veteran populations also show promising results. Sporer et al (2009), for example, found that participation in the National Veterans Wheelchair games (NVWG) and Winter Sports clinic reported improved mobility in 84% of veterans with a disability, with over 60% of athletes reporting improvements in physical endurance. Eighty-four % of veterans participating in these games also reported improved acceptance of their disability [49].

Veterans competing in the 2016 Invictus Games in Orlando, reported increased weight loss as an outcome of participating in the games resulting in increased confidence and pride. [50]. For a number of participants, getting back to a healthy weight for the first time since their injury had positive impacts on their self-identity by enabling them to move away from some of the negative self-views associated with having a disability and giving them a positive body image.

Exercise and sports-based programs have also been shown to enhance physical health across several domains including cardiorespiratory fitness, strength, function, balance and physical ability [42, 50-52]. Regular participation in exercise classes has also been linked to increased energy levels and greater mental alertness [53]. Combining sport with conventional military training has been shown to result in better physical testing scores in male army cadets compared to those who completed conventional military training only [54]. Additionally, physical exercise has been shown to reduce annual medical expenditures among US civilians with a disability with inactive individuals with a disability saving a minimum of \$2150.06 by simply increasing their activity levels to a low level of activity [55]. Finally, while some studies have reported an association between sport and pain reductions [52, 56], a recent systematic review of surfing programs for military

personnel and veterans reported no positive impacts on pain relief [38]. Collectively, these findings underscore the multifaceted health benefits of engaging in sports and exercise for both veterans and military personnel.

6.3 Social support and connection

Social Health and the social networks we are a part of are crucial determinants of our wellbeing [57, 58]. For veterans, implicit in most of their social networks is a sense of camaraderie, a key element of military social culture rooted in trust and respect [59]. In the military setting, camaraderie is crucial for maintaining morale, unit cohesion, and mental wellbeing within units. It allows deep bonds to form among service members through shared experiences and working closely together in challenging or intense environments. For veterans who have transitioned into the civilian world, the absence of camaraderie can present significant challenges resulting in difficulties in establishing new interpersonal relationships leading to loneliness, social isolation and withdrawal [59]. Transition and reintegration into civilian life is further complicated by veterans' perceptions that civilians inherently differ from military personnel, making it hard for them to understand and relate to veterans' experiences, humour (typically dark humour), and communication styles [59, 60]. As a result, veterans often struggle to build fulfilling interpersonal relationships with civilians, finding these connections less satisfying than those formed during military service [60].

Like the military, sporting clubs provide opportunities for groups of people with similar interests and experiences to work closely together to achieve a common goal creating mutual trust and solidarity. This can help recreate the camaraderie and sense of belonging that veterans are accustomed to in military settings. Research underscores the significant role of sports in aiding veterans' transition by promoting social engagement and a sense of community [52]. Participants of the University of South Australia's Invictus Pathways Program, for example, a student led program utilising sport and exercise to promote health and wellbeing of veteran and first responders, reported enhanced wellbeing and community ties as a consequence of their involvement in the program, similar to military camaraderie which supported their reintegration [52]. Older veterans participating in a supervised clinical exercise program, reported that the camaraderie they felt with the veteran facilitators of the program increased the likelihood of them meeting their personal health goals [61]. Canadian Armed forces veterans engaging in Soldier On sporting events reported a strong sense of camaraderie and connection as a result of engaging in the program with other injured/ill military personnel and veterans [62]. Finally, UK veterans describe how the shared experience of the extremely challenging 23-day hike resulted in the developing a sense of camaraderie and strong relationships with other participants which lasted well beyond the completion of the event [63]

Waldhauser et al. (2021) examined the Purpose After Service through Sport (PASS) program, where 12 Canadian veterans engaged in sports activities designed around shared military identity. The program's structure featuring military team members, a familiar host

environment (a military armoury), a military-associated sport - "ball hockey," and opportunities for social interaction after each game—significantly improved mental health and wellbeing, enhanced social connectivity, and created a new social identity for participants [64]. These factors helped mitigate isolation, bolstered resilience, and addressed the existential challenges veterans face due to the loss of military camaraderie, while simultaneously fostering new friendships and facilitating social engagement beyond the program [64]. This aspect of engaging in sports with other veterans allows them to reconnect with their military identity in an environment and with people they feel safe, comfortable and supported, reducing the feeling of being alone [50].

Duvall and Kaplan (2014) examined 98 veterans engaging in a variety of nature-based recreation/sporting activities such as backpacking, canoeing, white-water rafting, and fly-fishing, 1 week and 1 month post program and reported enhanced social connectivity and a reduction in isolation and loneliness [65].

Spornier et al, (2019) examined 132 veterans in the National Veterans Wheelchair games (NVWG) and Winter Sports clinic who ranked 'increased friends' as one of the aspects of their life most affected by the NVWG. Over 70% also reported that the games impacted their personal relationships, their participation in society and communication skills with friends and family [49].

Furthermore, engaging in sports equips veterans with opportunities to build new friendships and expand their social networks [66], offering increased opportunities for social support in the form of emotional support, encouragement, practical assistance and guidance [62]. Research shows that greater social support and social connectedness in veterans is associated with lower PTSD symptoms and greater self-efficacy [67], better overall mental health [68], lower PTSD severity, lower suicidality, a higher quality of life and lower psychological distress [58]. Additionally, veterans involved in multiple supportive social groups, are also more likely to successfully transition and reintegrate into civilian life [14], particularly if they have been able to maintain civilian ties throughout their military service [14].

This is all dependent of course on the life-stage and perceived relevance of remaining actively socially engaged. Barnett et al (2022) for example, suggests that not all veterans will benefit from joining a new social group. For a veteran transitioning to retirement for example, developing a new civilian identity might not be deemed important nor necessary in order to have a fulfilled life [14].

6.4 Self-efficacy and self-agency

Self-efficacy refers to an individual's belief in their ability to succeed in specific situations or perform accomplish tasks, impacting how they think, behave, and feel about their own capabilities. It influences how goals are set, the effort put forth, resilience to setbacks, and the likelihood of achieving personal goals. Among veterans, self-efficacy has been shown to be one of the strongest predictors of successful MTC transition [69].

Furthermore, for veterans who are injured or ill, enhancing self-efficacy enables veterans to reconnect and accept their broken bodies and minds [57]. Finally, self-efficacy has been shown to mediate the link between post-traumatic stress symptoms and post-traumatic growth among female combat veterans [70], to be inversely related to the severity of PTSD in Biafran war veterans [67], to be inversely related to some depressive symptoms [71]. For veterans who are transitioning from military to civilian life, sport provides a familiar framework to enable veterans to feel a sense of competency again. This is due to a large number of similarities between the military and sport including the requirement to perform in complex and changing environments, the need to use a mix of perception, thinking, and physical skills, in order to gain a tactical edge over opponents, the need to act on incomplete and evolving information and function under stress and the need to work effectively both alone and in teams in order to achieve a desired goal [19].

Brittain et al (2024) found that competing and training for the Invictus Games resulted in veterans gaining a new level of physical competence, by improving their physical ability post injury. This empowered veterans to have the confidence to listen to their bodies and accept their strengths and weaknesses, taking a greater sense of ownership over their own training regimes resulting in a form of post-traumatic growth. [50]

Theal et al, (2020) examine the two-month longitudinal psychosocial outcomes of a 6-day live in Australian adventure-based therapy program, combined with peer led - group CBT-based sessions and reported significant improvements in self-efficacy, and life satisfaction [72].

Finally, Kay et al, (2022) interviewed 10 UK military veterans following a 23 day high altitude trekking expedition combined with health coaching and reported that the extremely challenging nature and ability to share their experience and journeys with other participants of the trek gave them a newfound perspective and sense of competence about what they were capable of achieving both physically and mentally [63].

A related concept to self-efficacy is self-agency which is much more broadly defined. Self-agency refers to the capacity of individuals to act independently to make choices and exert control over their own lives, to act freely to influence their behaviour and the environment around them. While self-agency is not something that is necessarily fostered during military service due to the need for military personnel to follow strict orders, for veterans (particularly those who are injured or ill), self-agency is crucial to the process of recovery, rehabilitation, transition and re-integration [57]. It enables veterans to take ownership of their personal and professional development, allowing them to navigate identity shifts and redefine their purpose outside the structured framework of military service. By fostering self-agency, veterans can set personal goals, make informed decisions about their health and wellbeing, and actively engage in creating a fulfilling post-service life. This sense of control and autonomy is particularly important for mental health, as it helps to counter feelings of helplessness and dependence, thereby building resilience and enhancing overall wellbeing. Couthard et al (2022), describes the benefits of including both injured military personnel undergoing transition with those who have already left and living life in the

civilian world. In this study, service members who were awaiting medical discharge felt hopeful and encouraged by spending time with those who had already transitioned and felt hopeful that there was life after military service [62].

Several studies have reported improved self-agency among veterans through engagement in sport. Burke and Utley (2013) for example, found that seriously injured combat veterans participating in a nine-day climbing challenge, reported that this experience encouraged them to take ownership and responsibility over their own wellbeing and physical recovery. Post et al, 2023 reported similar outcomes among veterans and first responders engaging in a sports/exercise-based rehabilitation program [52, 73]. Finally, Roberts et al (2021) reported an increased feeling of autonomy and competence in UK veterans participating in the 2016 Invictus games [66].

Veterans participating in a sports program informed by social identity theory indicated that the program was a “catalyst for change” for them, motivating them to engage in more health promotion activities such as physical exercise rather than health risk behaviors such as smoking [51, 53, 64]. Veterans engaged in the Invictus Pathways Program for example, described how the program had ignited their interest in engaging with other physical activity opportunities beyond the program such as cycling, wheelchair sports and athletics and rowing [52]. Veterans participating in competitive motor sports, describe how racing resulting in them wanting to change unhealthy eating behaviors and exercise more to become healthy again stating that the sport “opened a door” to a better transition experience for them. [56]. Participants in the 2016 Invictus Games reported decreased alcohol consumption turning to training for the games and sport as their new form of self-medication [50]. Veterans participating in esports report using gaming as a replacement for risky behaviours such as substance abuse and criminal acts [74]. Seventy-eight percent of Australian Defence Force members participating in a study of the impacts of engaging with ADF Adaptive Sports Program reported that that they engaged much more in physical training/activity following the program, and almost half reported that they exercised daily [75].

Other outcomes related to self-efficacy and self-agency include: increased confidence and motivation [52, 76], enhanced feelings of competence to build new skills [51], improved self-esteem due to task mastery and success in achieving goals or winning [49, 56, 74].

6.5 Positive affect

A growing body of literature underscores the positive relationship between physical exercise and mental wellbeing, highlighting sport’s significant role in enhancing positive affect. The World Health Organisation recommends that adults engage in at least 150 to 300 minutes of moderate-intensity or 75 to 150 minutes of vigorous-intensity physical activity per week, while children and adolescents should aim for around 60 minutes of moderate to vigorous activity daily to support both their physical and mental health wellbeing [77]. Participation in sports has been linked to increased feelings of positivity, joy, and happiness [56] as well as an improved mindset and outlook on the future,

including effective goal setting among veterans[7]. For instance, a systematic review revealed enhanced positive affects among military personnel and veterans involved in surfing programs [38]. Additionally, engaging in competitive motor sports allowed veterans to experience a profound sense of embodiment, which helped distract them from negative thoughts and foster joy [56].

This theme of distraction, whereby sports provide a respite from everyday symptoms of mental ill health has been reported by veterans participating in a number of different sporting activities including esports [74] as well as competitive sports events such as the Invictus games, where both families and friends reported that veterans were able to take their mind off their pain and suffering [50]. A systematic review by Caddick and Smith (2014) noted that participation in nature-based sports activities where the veteran was able to “immerse themselves in the environment around them” were particularly beneficial in this sense [78]. Labelled as “eco-therapeutic” they describe how events of this type enable veterans to experience a sense of normalcy, by enabling them to enjoy the beauty of nature around them [78]. These positive impacts of nature-based have been observed in relation to a number of different sports including scuba diving (a number of veterans reporting increased contentment and wellbeing) [36, 79] river kayaking [80], fly fishing (peace and relaxation) [81], a group based outdoor recreation program which included backpacking, canoeing, white-water rafting and flyfishing [65]. Such positive impacts have been reported in one study to be greatest among those veterans who are more psychologically unwell at the start of the program [65]. Collectively, these findings reinforce the idea that sports and physical activities are vital avenues for promoting mental health and enhancing overall emotional resilience.

6.6 Release of aggression

Anger and aggression are prevalent issues among current serving military personnel and veterans, particularly among those returning from deployment with significant implications for both individual wellbeing and unit cohesion [82, 83] Several factors have been identified as contributing to the heightened risk of anger and aggression in adult populations, including gender differences [84], PTSD and combat exposure [82, 85]. Many veterans who have suffered a physical or mental injury as a consequence of service and who are not able to function independently without considerable support can feel frustrated and irritable about the necessity to rely on others resulting in frequent angry outbursts. This can have negative impacts on relationships with friends and family, especially children who can become fearful and anxious due to the volatility of their parent’s emotional states. [86].

There is a well-established link between reductions in anger and sport in general community samples such as adolescents and elite athletes, with similar results observed in veteran studies [50, 87]. Both adaptive sports and recreational sport has been shown to provide veterans with a safe, positive and managed way to release their anger and aggression both on the pitch and off with family members reporting sustained effects of

sport on veteran anger that lasts well beyond the completion of the event/game [50]. This opportunity to safely release their anger and aggression can result in the veteran feeling calmer and more inclined to accept support, conflict and strain within the family [50].

6.7 Identity and purpose

Military culture is hierarchical, highly structured and highly organised with its own entrenched traditions, language, and ways of doing things [59]. People who have served in the military are patriotic, disciplined and hard workers who prioritise the mission over self, even if this requires them to face life-threatening or exceptionally difficult circumstances [59]. As such, the purpose of life in the military is clear: be a good citizen by working hard to serve your country and support your team in order to complete the mission you have been assigned [59]. They are the protectors of our community, and their purpose is to fight to keep our country safe [57]. Without this sense of purpose veterans can feel like they are “drifting” for many years [60].

For most defence force personnel (excluding those from military families who may have been partially inducted into military culture from a very young age in childhood), military identity and the associated feelings of belonging and purpose begin to form upon induction into the military [14]. It is during this training period that members first begin to adopt a new collective identity defined by the values, norms and goals of the military [88]. This can be explained by Social Identity Theory [89, 90] which suggests that individuals derive a significant part of their identity and self-concept from the groups they belong to. These group values, norms and goals which include, integrity, selflessness, sacrifice, discipline, and a strong sense of duty are critical to prepare and enable military personnel to work cohesively and effectively in high-stakes situations [64]. The fact that this new military identity is shared by most military personnel fosters a sense of camaraderie, trust, shared understanding, and unity within the ranks, which is essential for successful teamwork and mission accomplishment. The outcome of this process, however, can be a loss of individuality and a disconnection from their civilian identity [88] creating an ingroup-outgroup and “us” and “them” mentality, through a process known as “social comparison and categorisation” [90] [14].

As a consequence, transitioning from military to civilian life presents significant challenges for veterans, particularly as they grapple with a profound sense of identity loss and strive to redefine their purpose and establish social connections beyond the hierarchical military structures they are familiar with [59]. When transitioning back to civilian life, veterans are often required to completely reshape their lifestyles, including their employment, their finances, their housing and their community [91]. In addition, they are required to redefine themselves according to a new set of social expectations and norms which can result in a diminished sense of control, meaning and self-esteem [52, 60]. This can be particularly challenging for veterans with a salient military identity (defined as an identity that affects thoughts and actions in multiple situations [92], who have consequently developed a discriminatory attitude towards civilians [22]. Such veterans may feel that the civilian

world does not fully understand or recognise their military experiences and values, leading to feelings of isolation, lack of belonging, and difficulty integrating which can go on for years. This connection between military identity, social connectedness and wellbeing has been reported in a recent study of 358 Australian Defence Force Veterans which showed that military identity can both promote or hinder social connectedness which in turn impacts overall wellbeing [58]. For transitioning veterans, these issues can be further compounded by the loss of the structured environment, camaraderie, and sense of purpose that were central to their military identity. For veterans who are required to leave the military abruptly due to service-related physical or mental health condition/injury, adjustment difficulties are amplified by a loss of physical identity and sense of self brought about by the loss of former physical prowess and capability. This can lead to feelings of inadequacy, vulnerability, and social isolation due to physical limitations imposed by the injury as well as an inability to recreate a positive sense of self and a reconstructed identity due to new physical limitations. [88, 93, 94] [14]. Having their career prematurely “cut short” like this and results in a deterioration of their health and wellbeing following transition [20, 52].

Being a part of a civilian sports team can help veterans reclaim their identities in a number of ways. Firstly, it allows the veteran to integrate into a new collective group. The inherent structure and teamwork in sports recreate an environment similar to a military unit, which many veterans find comforting and familiar. This shared focus on team goals and collective effort fosters strong bonds among teammates, mirroring the camaraderie of military service. Being part of such a group therefore allows veterans to develop a civilian identity alongside their military one. It provides a chance to explore new roles and skills and develop new competencies, facilitating personal growth and adaptation to civilian life [95].

Secondly, sport also enables veterans to reconnect with the performance based/goal orientated aspects of their military identity giving them new purpose and meaning (i.e. the competitiveness among sports teams reminiscent of service competitiveness). This allows veterans to rebuild self-confidence and self-esteem through the process of overcoming new challenges and goal setting and for those with service induced injuries - working towards personally meaningful recovery goals [57, 78, 96]. Serfioti and Hunt, for example, highlighted the renewed sense of purpose experienced by veterans participating in competitive motor sports. This was brought about by the military-like nature of the program and the requirement to use the teamwork, leadership, and problem-solving skills to help their team succeed [56]. This renewed sense of purpose has also been reported in veteran participants in the 2016 Invictus Games obtained through enhanced self-management of the injuries, as well as increased drive and motivation [50].

For veterans who have been physically or mentally injured because of service, sport encourages them to live in the present and expand their self-concept by focusing on abilities rather than disabilities through setting and achieving new goals in the civilian realm [7, 50, 97]. This can further assist with the loss of physical identity that can occur in veterans who are may not able to perform with the same level of physical prowess that

they could prior to the onset of their physical and/mental health challenges, improving their self-acceptance [51].

Furthermore, sport can provide an avenue for veterans to continue to 'give back' to the community through volunteer opportunities such as mentoring and coaching. This has been shown to provide veterans with a renewed sense of self-worth, self-agency and purpose [14, 60] by enabling them to utilise the skills and experiences they have gained from military service, providing veterans with an opportunity to continue to serve as they did while they were in the military [52]. Veterans who were a part of the Invictus Pathways program, for example, reported being appreciative of the opportunity to give back to students who had supported them in the program by educating them on military culture and military life, with one participant stating "it is our duty to give back to those who have given to us" (page 13,[52]). Others reported benefits of volunteering including reductions in depression and PTSD severity (feelings of numbness and detachment), increased self-efficacy, perceived increases in social support, and increased help-seeking behaviour [98, 99].

Finally, through participation in sport, injured soldiers have the opportunity to restore and reconstruct a version of their former military self by replacing war for sport and using the power they derive from their sporting triumphs to ignite similar feelings of heroism and compensate psychologically for their failing bodies and minds [3]. This has been observed in veterans engaging in regular sport as well as e-sports [74].

6.8 Structure and routine

Loss of structure when moving from military to civilian life is reported by veterans to be a significant barrier to integrating into the community following transition [52, 100, 101]. Engaging in sport can significantly support veterans during their transition from military to civilian life by providing a structured environment that parallels the regimentation and routines they experienced in the military.

Sports participation introduces a level of organisation and discipline, allowing veterans to maintain regular schedules akin to their military training where routine is essential. This structure helps ease the transition into civilian life, as it fosters a sense of stability amidst the changes they may face. A study by Kay et al (2023), for example, reported how participating in structured training sessions over a period of 12 months prior to a hiking expedition to the Himalayas helped UK veterans to regain a sense of order and purpose in their lives which they hoped would translate to improved routines and increased autonomy upon returning to their lives back home. The discipline and structure required to train and complete this expedition also fostered self-efficacy and resilience, which led them to feel better equipped to handle challenges in their daily lives [102].

6.9 Employment

Transitioning from military service to civilian employment can pose several challenges for veterans, including discrepancies between military qualifications and civilian job requirements, difficulties in articulating military skills and experiences in terms understandable to civilian employers, and a lack of familiarity with civilian workplace practices and culture. As a result, many veterans struggle to secure and maintain meaningful employment after leaving the military, which can result in financial difficulties, diminished self-esteem, poorer mental and physical health including suicidality, and poorer adjustment to civilian life [103, 104].

Sport offers several avenues for promoting employment opportunities for veterans. Beyond potential career paths as professional athletes, coaches, administrators, officials, and sports journalists, involvement in sports helps veterans develop transferable skills, including leadership and teamwork and strategic planning (tactical skills), which are essential to the civilian workforce [56]. The dynamic of working towards common goals in sports settings directly mirrors experiences in the military environment and can also assist in providing veterans with a renewed sense of purpose.

Additionally, it provides valuable networking opportunities and fosters discipline and resilience, all of which can enhance their employability in the civilian workforce. This can lead to job placements and career advancement, with interactions with other veterans and civilians in sports settings opening opportunities for employment, education and professional development [64]. These have been reported to emerge organically through general conversations between players [64].

A study by Galily (2012), highlights a natural fit for transitioning military personnel into the field of sport management. They interviewed 8 high ranking male officers in the Israeli defence force who had transitioned into a second career into sports Management. Results of this study showed a strong link between success in the military and success in sport management due to a number of factors including: the veterans' skills and experience in managing or organising large projects, government oversight of both careers and the requirement for veterans in both roles to engaging in activities that are in the public best interests [105].

Kay et al (2022) reported several positive impacts on employment among 10 UK veterans who had engaged in a 23-day Himalayan trekking expedition 6 -18 months previously. Over half of the participants reported improved employment and decision-making skills which were now implemented in their daily lives, as well as a changed perspective in relation to their preferred ways of working and financial and employment goals [63].

Kim et al (2018) examined employment outcomes in veterans participating in the 2015 National Veterans Wheelchair Games in 2015 in the US and reported a number of positive outcomes. Of the 302 veterans who completed the survey, almost 50% claimed that participation in the games helped them attain employment. This was perceived to be related to positive changes to their personal character such as increased confidence,

motivation and sense of accomplishment [106]. In this study, veterans who engaged with sport and exercise programs for a longer duration (had participated in 3-4 more National Veterans Wheelchair Games events) were more likely to perceive a positive impact of the games on their ability to attain employment [106]. Among community samples with a disability, the effects of adaptive sport on employment seem to hit a ceiling, with increased employment rates for the first 10 years, becoming less pronounced after 15 years and dissipating after 20 years, suggesting early full realisation of employment benefits and potential counteraction by advancing age [107].

Together these studies make a compelling case for allocating more resources to support and promote sports for veterans to support the successful transition from military life to civilian employment.

6.10 Maintaining and strengthening family relationships

While most veteran families do not show signs of poor mental and physical health, research indicates that military service and deployment experiences can extend beyond individual service members, to significantly impacting the mental health and wellbeing of family members in some instances. Spouses and partners of military personnel, for example, have been reported to experience increased psychological distress, parenting stress, and trauma symptoms as well as other ongoing challenges related to the veteran's mental health symptoms and substance use which are heightened during and after deployments and transition when families are required to adjust to new roles and adapt to a "new normal" [108-110].

Military lifestyles factors, such a mobility, parental absence and the risk of parental injury have been linked to depression, anxiety, stress, fear, sadness and worry in children due to lack of continuity in health care, social connections, and schooling, regular changes in family dynamics brought about the veterans' constant cycle of absence and fears and worries of parental harm [111]. Young children aged 0-5, are at a particularly heightened risk during this critical developmental period with deployment related parental absences impacting their ability to form secure attachments with their veteran parent as well as delaying or causing regression in developmental milestones. Older children, in contrast, report increased feelings of anger and more verbal aggression which is often manifested as resentment towards their veteran parent's job [111]. Children from Military families with a parent who has deployed appear to be at particular risk, with these children reporting more mental health problems than civilian children and greater mental health service use [112]. Both studies referenced in this section however also suggest the possibility that the military lifestyle may also promote resilience and growth in military children, depending on the way in which the family responds and deals with the stressors of military life.

Parental PTSD is another significant concern, as it can lead to volatile and distressing family environments due to parental stress, and disrupted communication and alliance between parents, resulting in lasting social and emotional issues and behaviour problems

for children into adulthood [113]. A recent systematic review, by Cramm et al (2022), for example highlighted a number of specific impacts on children brought about by the reactivity, anger and negative parenting practices associated with the PTSD including, anxiety and fear, emotional and physical abuse, parentification -where the child takes on caregiving roles in the family, disrupted parent-child attachment relationships, impaired sibling relationships, and feelings of worthlessness or guilt due to internalised responsibility for the parent's volatile behaviour [114].

Related to this, the family unit itself can suffer from strained parenting processes and spousal relationships, due to changes in communication, emotional connection and affective functioning which serve to undermine overall family cohesion [108]. While most military families manage these stressors effectively, others experience negative outcomes due to the unique demands of military life. These challenges highlight the critical need for comprehensive support systems to address the multifaceted impacts of military service on family members.

Military to civilian re-integration is likewise identified as a difficult period of service life by military families. The UK Veterans Family study for example, reported increased rates of depression and anxiety in transitioned military family members, compared to the civilian community, increased loneliness and financial issues (in those with low financial literacy, or who were involuntarily discharged). In contrast, subjective wellbeing, perceived social support and satisfaction was reported to be high among transitioned UK families [115]. Skomorovsky et al (2020) surveyed 595 spouses of Canadian Armed Forces Personnel who transitioned in 2016, who reported a number of challenges during this time including financial, employment and educational issues, employment and educational challenges for the veteran, challenges accessing health care, challenges navigating Veterans Affairs services and benefits and challenges associate with relocating, losing one's military identity and losing contact with friends [110].

In Australia, recent research emphasises the crucial role families play in supporting help-seeking behaviour among veterans, while simultaneously highlighting significant gaps in services for veteran families. Waddell et al. (2023) found that two-thirds of family members suspected undiagnosed mental health conditions in their veteran relatives, underlining the need for better family support to encourage help-seeking and early intervention. This is especially important given that veterans' reluctance to seek help, combined with Defence's lack of acknowledgment of the crucial role veteran families play in encouraging veterans to seek help has been shown to strain family dynamics. Such factors, have been shown to lead to considerable delays in veterans receiving treatment, negatively affecting the mental health and wellbeing of family members who often assume caregiving responsibilities during this time [116, 117]. Additionally, traumatic experiences, workplace bullying, and insufficient organisational support faced by veterans exacerbate familial stress, as family members frequently endure a "transferred moral injury" by absorbing the psychological burdens of their veteran relatives [117].

Gaps in service provision for veteran families in Australia also remain evident. McMahon et al. (2024) identified a lack of veteran-centric online interventions tailored for veterans' families, while Rogers et al. (2024) noted the absence of age-appropriate resources for young veteran children (ages 2-8) and their parents. Maguire et al. (2022) found that, despite the availability of numerous services, veteran families with complex needs struggle with low health literacy and difficulties in navigating supports, hindering effective access. On a positive note, Evans et al. (2021) demonstrated that mental health first aid training enhances families' knowledge and confidence, reducing personal stigma around mental health issues, though it does not change perceptions of stigma from others. Finally, LaMonica et al. (2019) highlighted efforts to develop a web-based platform for Open Arms through a participatory design process, showcasing initiatives to address these complex challenges. Collectively, these studies underscore the need to enhance resources and support tailored for veteran families, ensuring they are equipped to aid veterans in their mental health journeys.

Families of veterans who have been medically discharged or who have mental or physical conditions report a more challenging transition process due to having to navigate these challenges in addition to the typical stressors associated with reintegration [118]. This can result in the veteran having difficulty finding civilian employment which results in additional strain and distress for the families [119]. Additionally, feelings of disconnection from the military community and the stress of navigating complex compensation and rehabilitation processes during and following transition can increase caregiver burden, ultimately affecting the quality of life for the entire family [119]. Finally, the quality of family functioning for veterans also plays a critical role in recovery and military to civilian transition, as poor family dynamics can exacerbate symptoms such as avoidance, intrusion, and hyperarousal in veterans and their partners [120]. These interconnected factors necessitate a comprehensive approach to support military and veteran families effectively.

Probably most importantly, reintegration of military families following deployment and from military into civilian life poses numerous challenges for Australian veteran families with children, as evidenced by recent studies. This highlights the intergenerational impacts and the long tail of effect that military service can have on some families. Risi et al (2024) reported that ADF families with young children face significant emotional, behavioural, and attachment-related difficulties during reintegration, due to the requirement for children to frequently adapt to changed routines and family dynamics [121]. Rogers et al. (2023) reported that while most defence parents perceive their young children's social and emotional wellbeing as positive, many parents feel ill-equipped to help their children cope with stressors [122]. O'Toole (2017) highlighted the intergenerational transmission of PTSD within families of Australian Vietnam veterans, showing that both sons and daughters face increased PTSD risks [123]. This risk is moderated by a positive family emotional climate, identified as a protective factor, particularly for daughters [123]. Gunter et al. (2020) further reported that positive maternal attachment reduces PTSD and depression risks, while a negative family environment increases these risks for daughters

[124]. Finally, several studies have highlighted the long-term psychological impacts of deployment among children. Forrest et al. (2018), for example, noted heightened anxiety, depression, and suicidality in adult children of Vietnam veterans [125]. McGuire et al. (2016) linked greater behavioural problems and mental health issues in children to the number of times their military parents had been deployed to Timor-Leste, Iraq and Afghanistan [126]. Berle and Steel (2015) emphasise the complex dynamics families face post-deployment, including role renegotiation and increased stressors like relocation and changes in social networks, which can exacerbate family distress [127]. Collectively, these findings illustrate how military deployments profoundly affect family dynamics, mental health, and overall wellbeing, highlighting the need for comprehensive support systems to assist families during the reintegration process.

Engaging in sport/exercise programs has been reported to be a catalyst for veterans to engage more with their family members resulting in improved relationships with their family (specifically spouses), friends and other civilians [36, 51, 52, 63, 72]. Serfioti and Hunt (2022) suggests that this is related to a renewed sense of confidence in the veterans resulting in enhanced communication skills and honest conversations as well more engagement with their family and their social network rebuilding trusted relationships [56]. Morgan et al (2019) describes how the camaraderie and brotherhood gained through participating in a scuba diving program with other likeminded veterans "transferred through to their personal relationships with relatives and friends [36].

For the family members themselves, active participation in sporting events alongside the veteran has been shown to enhance social and interpersonal relationships as well as the family member's own health and wellbeing [76, 128]. Duong et al. (2023), for example, reported improved family and social connectivity and belonging among 21 family members of veterans who attended the 2017 Invictus Games in Toronto. This sense of belonging was attributed to the specific programming for the family and friends at the Games, which actively recognised and acknowledged the role and importance of families both during military service and in the recovery process. Family members also reported enjoying the reprieve from their daily caregiving responsibilities and the opportunity to reconnect with their family unit. Witnessing the veterans' perseverance and determination instilled a renewed sense of pride and hope for the future [76] and helped them to see the veterans in a positive light which fostered connection with their own family, other veteran families and the broader Invictus Games community. Furthermore, attending the event and participating in activities with their veteran family member provided a newfound sense of inclusion and belonging and a deeper understanding of veterans' experiences with disability [76]. A more recent study by Shiazopour et al.

Another study by Reynolds (2020) conducted a 3-month longitudinal follow-up of 315 'armed forces community' children between the ages of 7 and 17 who participated in an 8-week 'Surf Action and Resilient Children and Families Programme together with their parents. Results of this study showed a statistically significant increase in self-reported

wellbeing from baseline to 3-month follow-up, with impacts on wellbeing greatest in the children with the lowest scores prior to the program [128].

Bradshaw et al (2010), describes how engaging in extracurricular activities such as sport in the school environment can enhance the assimilation and re-integration of highly mobile military children into the civilian community. This however is not always a straightforward process, with some schools being reluctant to allow military children to join teams in case they need to leave to post with their families [129].

Finally, research by Bennett (2010) identified that one of the ways that couple leisure/sports interventions improve family and relationship functioning is by distracting the couple from the negative emotions around PTSD (evidence by reduced hyperarousal and avoidance symptoms) and optimistically refocusing their attention on the positive aspects of life and their relationship [130].

In summary, the quality of family relationships plays a crucial role in the mental health of veterans transitioning to civilian life, with supportive family dynamics acting as a protective buffer against stress and negative mental health outcomes (Bowles et al., 2015). Participation in sports offers veterans and their family's opportunities for shared leisure activities, which is consistently reported in the literature to result in greater marital satisfaction, enhanced family adaptability, cohesion, and improved family functioning [91, 130, 131]. This supports the growing body of research in community samples which has shown that family participation in adaptive sports enhances family unity, bonds, and resilience, through improved communication and a heightened sense of pride and resilience [132, 133]. Collectively, these findings highlight that sports provide a vital avenue for enhancing family connectedness and cohesion among veterans, emphasising the need for comprehensive support services that incorporate these activities to address the unique social and psychological needs of military families.

6.11 Help seeking support, psychoeducation and stigma

Accessing healthcare in the civilian community can pose a significant challenge for transitioned veterans, largely due to the limited availability of healthcare providers who have a detailed understanding of military culture and can, therefore, deliver culturally informed care. Although efforts have been made—both in Australia and internationally—to enhance cultural competence among healthcare and mental health professionals, there remains a shortage of culturally competent practitioners in Australia [29].

In addition to these barriers, various forms of stigma can inhibit veterans from seeking or accessing care. Self-stigma involves feelings of shame over mental health challenges and undervaluing one's experiences. Perceived stigma includes fears of judgment, concerns about confidentiality, and potential negative career impacts. Public stigma is characterised by negative societal stereotypes and media representations that reinforce misconceptions about veterans. Furthermore, logistical barriers such as long wait times, geographical constraints, and bureaucratic obstacles further limit access to necessary care.

Nonetheless, large-scale competitive sporting events like the Invictus Games and the US Warrior Games, which are highly televised and portray veterans positively, have been reported to reduce stigma. Through media narratives, these events can serve to normalise mental and physical health difficulties, foster open dialogue about mental health, provide opportunities for peer support, challenge existing stereotypes and provide optimism and hope to veterans and their families around the possibility of overcoming adversity [76, 134].

Improved psychoeducation about available resources and health services for veterans has been reported to be facilitated through conversations and knowledge-sharing with sports team members, family, and volunteers [62]. This approach has proven particularly beneficial for veterans who have been discharged for some time, as they can learn about new programs, services, and supports from contemporary veterans [64]

Family members attending the Invictus Games have reported gaining a better understanding of different rehabilitation journeys and ways to support their injured or ill family members by conversing with other military families. This exchange provided access to new resources, support from lived experiences, and advice that were previously unavailable to them [76].

Serifioti et al. (2022) reported a reduction in self-stigma among veterans with severe physical injuries and disabilities who participate in competitive motor sports. This reduction is achieved by enabling both able-bodied and physically disabled veterans to compete equally and inclusively using adapted equipment, enhancing self-confidence and self-esteem, and "normalising" their disabilities. This reduction in self-stigma is also observed in Invictus Games competitors who reported a greater acceptance of their disability once they began to train and compete against other competitors with more severe and debilitating injuries than themselves [50]. Civilian research further supports these findings with community-based adaptive sports and recreational activities reported to assist individuals with disabilities to "build social networks, experience freedom and success, positively compare themselves with others without disabilities, and feel a sense of normalcy" [94], page 222.

Finally, esports/digital games have been identified in the literature as a way for veterans to engage in self-directed coping for military related stress [135] with gaming distracting them from their daily negative ruminations and providing them with an avenue for managing moods and relieving stress and tension [74].

7 Barriers and Facilitators to Engagement and Participation in Sport

7.1 Barriers to engagement and participation in sport

- Confusion or misconceptions or lack of information around what the program is about [42]. It is essential that the purpose and expectations of the program are clear to the veteran. For some veterans, engagement in sport is not about the competition, therefore veterans need to be able to align the sport with their own individual motivations to engage – i.e. fun, social engagement, and developing a new skill, physical exercise, to improve mental health and wellbeing and personal expectations of the program such as recovery, improving fitness, losing weight. [52, 64].
- If the program is time-limited (i.e. has an expected end date after a period of regular and ongoing activities) – this needs to be communicated upfront with a clear strategy for transitioning the veteran into other community programs [52].
- Failure of program organisers to align the sporting program with the veteran's current level of competency and abilities. Higher levels of frustration and doubts about their own abilities will result in feelings of failure in the veteran resulting in disengagement [136].
- Clinical settings which pathologise the veteran and promote the messaging that veterans are unwell and need to be helped are a barrier to engagement [56].
- Cost can be a barrier for many veterans due to the experience of sport being free previously while in the military [42, 60, 64].
- The period between onset of injury and official discharge orders are not considered to be optimal time for engagement in Sports programs due to the heightened stress and uncertainty of this period as well as the logistical requirements involved in discharge[62].
- Having complex disabilities and high support needs which requires use of a power wheelchair is a barrier for veterans and civilians alike due to the limited number of sports available that can incorporate power wheelchairs and the lack of technology to create the powered sports equipment required [137].
- Other self-reported personal barriers to participation in adaptive sport among veterans include fear of injury or pain, lack of time and low self-esteem [42].
- Transportation has been identified as a top barrier for veterans with a disability. This is related to the limited number of accessible rooms, facilities and transport options particularly for veterans in a wheelchair [138].
- A survey of 37 Australian physiotherapists and 27 exercise physiologists, reported that having a chronic health condition, and lack of interest in managing their own physical activity were the two most important barriers preventing veterans from engaging in physical activity [139].

- Practitioners encouraging veterans to engage in sporting competitions as a form of recovery should assist the veteran to develop and use problems focussed coping strategies to help support them with the stressors of competition as this has been linked to better mental health and wellbeing [140].

7.2 Facilitators of engagement and participation in sport

- Sports recovery programs which include a key quorum of veterans have been shown to be a strong facilitator of engagement due to shared military identity among group members supporting and fostering increased social connectivity, camaraderie and belonging [59, 64, 72]. There are several reasons for this including (1) a sense of shared morals, ethics, and values (2) a sense of shared personal characteristics (such as sense of humor, communication style, language used) (3) shared past experiences of military service including adversity (this allowed things to be said without fear of judgment or not said at all – all within an environment of mutual understanding and acceptance). This contributes strongly to an overall sense of belonging and camaraderie [62, 64].
- Programs which are facilitated/led by lived experience peers with knowledge and experience of both mental health challenges and military service life are showing great promise in terms of promoting trust, open communication and enabling veterans to learn new skills in a relatable manner. This has been shown to be particularly effective when peer led programs are run in a group format, due to the opportunities to build social support and social recognition [72], with peer led sports programs resulting in greater adherence, increased social and emotional support and stigma reduction [59]. Lived experience peers have the cultural expertise and the credibility to normalise thoughts, behaviours, and experiences, easily and effectively to build rapport and break down barriers and stigma that commonly exist in therapeutic and training environments and role model functional recovery, thus improving content and skills uptake [29, 141].
- Alignment of training and program facilities with what is perceived by the veteran to be a “safe environment.” This is particularly important for veterans with PTSD symptoms due to their sensitivity to noise, crowds etc. [52] and for female veterans who may want to disclose sensitive information in a confidential environment where they are not judged [142]. Environments that are welcoming, friendly and inclusive are favoured [64, 76].
- Environments and organisations that promote a strength-based approach to supporting the health and wellbeing of veterans by focusing on personal growth and development are preferred [46]. Team Red, White and Blue, a US non-profit organisation utilising physical and social activity to connect veterans to their community take this one step further highlighting the importance of health, people and purpose as the key core elements involved in enriching veterans' lives [46].
- Having facilitators and trainers to have awareness and knowledge of mental health and to adopt a trauma informed approach to service delivery [52]. This however

must be balanced by ensuring that there is not an explicit/overt focus on improving mental health outcomes as part of the program objectives as this can be stigmatizing for some veterans [64].

- Including mentors/facilitators and trainers who demonstrate that they are available, communicative, caring, non-judgemental, yet firm [61, 143].
- Sports programs, facilities and aspects of delivery that include components that are reminiscent of military life (i.e. regular sport, on base, followed by a beer at the mess; an activity such as competitive motorsport which requires briefings, tactical discussions, preparation and planning) has been shown to enhance initial and sustained engagement and result in increased health and wellbeing due to a sense of familiarity ([56, 60, 64]. Integrating these military aspects and values into the provision of sports recovery programs could lead to improved outcomes [59].
- Incorporating aspects into the sports program which allow the veterans to apply their previous experience, knowledge and skills, this enhances self-esteem and self-efficacy which promotes wellbeing [56].
- Sports programs that are considered high risk, or adrenaline provoking allowing the veteran to experience the same sensations/emotions they experienced previously in training or in combat situations [56].
- Consistency in aspects and timing of program delivery (to facilitate some degree of structure and routine) [52]. However, too much structure can be viewed as too restrictive impeding organic social connections, with a well organised program considered to be the most important factor [64].
- Built in social events to enhance engagement [52, 64]. These are most effective if the social events are conducted after the sporting event in the same location to avoid losing people in transit from one location to another– this has been likened to decompression following deployment. [64].
- Gaining an understanding of motivations for attending is important in the early stages of engagements. Focusing on the health benefits of a sports program will appeal to veterans who are motivated to exercise due to the known connection between physical and mental health and wellbeing [64]. Similarly, considering the timing of participation in relation to transition and mental and physical health recovery is also important. If someone is too unwell or is not motivated to attend, then this has the potential to impede both engagement and recovery.
- Sporting activities that offer the prospect of meeting new people and include opportunities for peer mentorship [64] [52].
- Ensure that the sporting activity is matched to the veteran’s current abilities and competencies to avoid stress and “competence frustration”[136]. Competence frustration is defined as the frustration that occurs where a person feels that the activity/sport is either beyond their capability or does not allow them to demonstrate their true abilities or competence [136]. This is particularly relevant to veterans who have transitioned from the military, due to a mental or physical health problem and therefore do not feel they are able to performing at their pre-

morbid levels. High levels of competence frustration can result in the veteran feeling like there are not progressing and may result in them withdrawing or failing to engage in the activity. Similarly, a lack of confidence and a fear of failure has been identified in a recent study of veterans engaged in a sports and exercise recovery program in Adelaide, South Australia (IPP) as a factor hindering initial engagement with the program [52].

- Drawing from a social relational model of disability there is an increasing body of literature promoting the critical role of family and social support in promoting and supporting veteran engagement in sports [52, 76]. This includes both tangible support like providing transportation to and from events, as well as intangible support such as emotional support and encouragement through participating in sports activities alongside the veteran (Duong et al., 2023). Engagement of the family members in the sport has also been shown to increase the family members sense of belonging within that sporting community, inspiring them to volunteer to support others (Duong et al., 2023). In a study of 514 veterans in a sports recovery program for 3 months to 10 -years, long-term engagement in a sports recovery program was predicted by their perceived level of social support. The authors stated however that they were unsure if it was due to long term engagement that veterans felt socially supported and connected or whether it was the social connection that kept them in the program. The importance of family engagement is supported by research on elite community athletes which has highlighted the importance of open and frank conversations around the type and nature of support that will be required from families, connecting the family with local resources, making the family feel valued by providing them with tailored resources, and by facilitating social connections between new and incoming families and athletes into the team [144].
- Time since onset of injury/illness is an important factor that influences both initial and ongoing engagement with sports programs. For current serving military personnel, the optimal time for engagement is the period between being notified of a medical discharge and the day they transition out of uniform. For those who have already transitioned, significant time should be allowed to pass following discharge in order to allow the veterans to adjust to their new civilian identity and to enable them to deal with the administrative requirements of setting up their new life [62].
- Australian Defence Force veterans participating in the ADF Adaptive Sports program suggest several ways of enhancing the rehabilitation of veterans enrolled in the program. These suggestions included: improving access to sports activities and training equipment through financial subsidies and grants, incorporating a mentor program, including access to allied health practitioners such as nutritionists, and more focus on individual rehabilitation and recovery goals rather than competition [75].

- A survey of 37 Australian physiotherapists and 27 exercise physiologists, reported that the veteran's confidence to manage their own physical activity and social support were the two most important facilitators of self-managed engagement in physical activity [139].
- Veterans who engage with sport and exercise programs for a longer duration are likely to show greater improvements to mental health and wellbeing, self-esteem, quality of life and employment status [32, 34, 106].
- Veterans' level of commitment to and readiness for change are a key predictor of post expedition growth [63].
- In specific relationship to veterans with a physical disability, the Quality Parasport Participation framework highlights how their sporting or exercise experience is improved by feelings of confidence (mastery), the sport's ability to challenge them, their sense of connection to the team and community (belongingness), the personal and social significance of the activity (meaning), and the degree of choice or control they have (autonomy). Long-term engagement is supported by mastery, challenge, belongingness, and meaning [145, 146].
- Additionally, a coach's interpersonal skills, such as understanding participants, listening, and being approachable and trustworthy, enhance the quality of physically disabled veterans' experiences in physical activity. These skills positively affect planning, intentions, and family integration, with the relationship mediated by the veteran's sense of belonging to the community, as supported by the Quality Parasport Participation Framework [145].
- Shirazipour et al (2024) identified three important factors to consider in the programming of military competitive sport in order to support long-term physical, psychological and social health of veterans. These include the importance of broadening sport programming to include those who show interest in being a competitor but do not get selected for competition to facilitate a sense of community and support the wellbeing of these individuals; the benefits of including resilience training alongside sport programming both pre and post competition to reinforce social connection and improve health and wellbeing; and tailoring sport training programs to the type and severity of injury and illness, with those with comorbid physical and mental conditions potentially requiring additional support [147].
- Finally, where physical health is the motive for veterans in a sports recovery program the impacts on physical health and functioning is more pronounced [136]. In contrast, where the program was perceived to cause stress, mental health symptoms were higher. One suggestion therefore is to include stress management techniques in veterans sport programs to lessen the negative impacts of mental health symptoms and to promote ongoing engagement in the program.

8 The Role of Sporting Type

The impact of various sporting types on the mental health and wellbeing of veterans is complex and multifaceted, due to the different aspects of each sporting type catering to unique psychological and social needs. As such, each sporting type can offer unique benefits and challenges that can influence veterans' psychological resilience and emotional stability in distinct ways.

Team sport

Team sports, for example, foster camaraderie, social interaction, and a sense of belonging, by providing a mechanism to bond with others through teamwork. This has been shown to be particularly effective if the sport is challenging as it provides opportunities for shared experience (collective suffering to achieve team goals) which has been shown to forge bonds among military personnel and veterans alike [64] [56].

Gaming, esports and virtual worlds

Esports or electronic sports, defined as “organised, competitive videogaming”, is fast becoming one of Australia’s most utilised recreational activities almost doubling the number of Australians aged 15 or greater who are currently engaging in cycling or swimming <https://www.clearinghouseforsport.gov.au/kb/esports-in-australia> accessed 12.28pm, 7/11/2024). Although considerable international debate still exists as to whether, esports should become a recognised sport [148], there is a growing body of research that supports the utility of esports in supporting health and wellbeing of both the civilian and veteran community.

Systematic reviews have reported a number of benefits of sedentary esports, virtual games and video games including improved social connectivity; reduced loneliness, and enhanced stress management and positive affect, brought about through distracting players from the ongoing stressors of their life and giving them a sense of belonging in the virtual community [149-153]. Other positive outcomes include improved mental health and wellbeing; improved cognitive functioning such as attention, problem solving, spatial recognition, reaction times and working memory; improved motor skills such as hand-eye co-ordination and agility particularly in elite esports athletes, improved self-efficacy, and improvements in ADHD symptoms [149-152].

A small number of studies of veterans participating in sedentary esports and gaming have also shown promising results including – feelings of re-connection with their military identity upon transition through combat themed gaming, improved self-control over PTSD related physical symptoms, improved social connectivity by playing with other veterans and improved mood though distraction from symptoms [74, 154]. Other studies have shown how, esports has been used to recruit tech savvy civilians into the military, with

military command viewing videogames as an innovative way of training teamwork and combat tactics [155].

Evidence about the positive impacts of esports however should be tempered by the emerging literature around some of the negative impacts of esports and gaming. This includes the negative outcomes of using escapism as a motivator to engage in gaming such as negative mental and social health outcomes, distorted perceptions of real life and unhealthy gaming behaviours such as excessive gaming times and gaming addictions [153]. Furthermore, while esports may provide a platform for engagement and competition that resonates with veterans, they can also trigger PTSD symptoms due to their realistic portrayals of combat.

In contrast to sedentary e-sports, non-sedentary e-sports, often referred to as "active e-sports" or "exergaming," integrate physical activity into the gaming experience, distinguishing them from traditional sedentary video games. These games require players to move their bodies and engage in physical exertion to interact with the game, using technologies such as motion sensors, cameras, or wearable devices to track their movements. Examples of non-sedentary e-sports include virtual reality sports simulations, dance rhythm games, and fitness-focused video games, where players must actively participate to succeed. By combining the competitive and interactive elements of e-sports with physical exercise, non-sedentary e-sports offer an innovative way to promote physical health while delivering the entertainment value and social engagement typical of traditional e-sports. This emerging category addresses concerns about inactivity associated with gaming and provides opportunities for individuals to improve their fitness in an engaging and immersive manner, however research in this area remains somewhat limited and largely targeted towards older adults and adults with mobility deficits such as stroke and multiple sclerosis [156-158].

Competitive sport

Competitive sporting events such as the Invictus Games or the US Warrior Games offer structured environments that promote goal-setting and personal achievement, which can enhance wellbeing both in the lead up to and during the event yet may also lead to heightened stress and pressure to perform. Studies by Richardson et al. (2021) and Baker et al. (2022), for example, highlighted the way in which these competitive sports events provided an opportunity for veterans to showcase their skills while cultivating a sense of camaraderie and purpose. The resulting bonds formed during these experiences further assisted veterans to reintegrate into their communities. Shirazipour et al (2024) in the first international longitudinal investigation of the outcomes of two Invictus Games in the context of the COVID 19 -outbreak (Sydney 2018 and The Hague 2022) showed significantly greater improvements in wellbeing in competitors compared to non-competitors. This difference however became less pronounced over time relative to level of increased engagement of the non-competitors in the Invictus community, training activities and programming [147].

Having a goal to compete in a competitive event like the Invictus or Warrior Games can also be a motivation for engagement in a regular physical activity giving participants something to subscribe to and work towards [52]. Furthermore, engaging in competitive sport has also been shown to enhance self-respect and feelings of accomplishment due to the requirement to overcome the hurdles associated with completing each event.

Studies have shown however, a need to manage the stressors associated with competitive sporting events in order to ensure that the competitor's health and wellbeing is not adversely impacted. Robert et al (2019), for example, examined a group UK veterans selected for the 2016 Invictus Games and compared their stress responses to a group of veterans who weren't selected at seven time points beginning at post selection, continuing through training, the games and the post event. In this study, Invictus Games participants exhibited a complex and fluctuating relationship between competition related stressors (including appraisal and coping), behavioural, immunological, endocrinological and psychological outcomes which the authors suggest should be best managed through the incorporation of stress management training and interventions focussed on reducing competition related demands and supporting the veterans to better deal with the stressors imposed on them [140]. Findings from these two studies support Lazarus and Folkman's transactional theory of stress, which suggests that stress arises from the interaction between an individual and their environment, emphasising how people appraise and cope with perceived threats or challenges [159]. This theory highlights that stress is a dynamic process, and is not solely a response to external events, but also involves the individual's perception and interpretation of the situation, which determines their reaction and coping strategies.

Outdoor and adventure sport (OAS)

Outdoor and Adventure Sports are physical activities that are conducted in nature, with a growing body of research highlighting a number of health and wellbeing benefits including increased motivation, self-awareness emotional regulation, stress reduction and relaxation. These outcomes are largely attributed to aspects unique to the natural environment including immersion in nature, feelings of discomfort associated with undertaking physical activity in a natural environment, the progressive adaptability that ensues as a consequence of this discomfort and the physical challenges which are inherent in OAS [160].

Studies by Kaiseler et al. (2019) and Peacock et al. (2019) reported an association between OAS and renewed purpose, personal growth and self-acceptance among rehabilitating UK military personnel. This included an 11% increase in perceived competence, a 6% increase in autonomy and a 5% increase in relatedness in 978 wounded, injured or sick UK military personnel [161]. These positive impacts of OAS were maintained over the short-term, with veterans reporting being more active on a daily basis and continuing to make more healthy lifestyle choices around diet, exercise and hydration 6 months post program [162]. A more recent study by Sidiropoulos et al (2022) surveyed

58 veterans with a disability before and after a one day adaptive sailing and kayaking event and reported acute increases to quality of life [163].

The long-term benefits of engaging in sports are not well addressed in the literature, however a few recent studies on the health and wellbeing impacts of Outdoor Adventure Sports/expeditions show promising results. Kay and McKenna (2022) highlight that veterans who participated in a 5-day multi-activity adventure course reported lasting improvements in their mental wellbeing and quality of life over a period of 6-12 months, suggesting that these activities can be instrumental in ongoing recovery efforts [164]. The same research group interviewed 10 UK military veterans following a 23-day high altitude trekking expedition combined with health coaching and reported improved autonomy (characterised by improved life perspective, life balance, self-confidence and decision-making ability), improved competence (related to employment, health and physical activity, and own perceptions of self) and improved relatedness (including better relationships and perspective of the world and others. These positive impacts were maintained for up to 18 months post program [63].

Peer-led and adventure-based therapies, such as those outlined by Theal et al. (2020) in the Trojan's Trek program demonstrate significant and maintained reductions in depression, anxiety (male veterans only), stress and post-traumatic stress among 51 participating veterans [72].

Other exercise and recreation activities

While this current report focusses primarily on sport that involves physical exertion and skill, competition and/or social participation and formal rules (that exist though a governing organisation) the mental, physical and social benefits of other types of physical activity and physical recreation activities requires a mention.

A 2018 systematic review conducted by Milanese et al. 2018, examined the role of different types of sport and physical activities in improving the mental and physical wellbeing benefits of veterans and categorised the evidence as 'promising' for mental wellbeing and 'unknown' for physical wellbeing [32].

According to Milanese (2018), various types of sporting activities offer differing levels of evidence for mental and physical health benefits in veterans. Supervised aerobic exercise emerges as particularly strong, deemed "promising" for both mental and physical health improvements. Unmonitored and unsupervised physical activities also show "promising" results for enhancing both aspects of health. In terms of mental health specifically, structured competitive sports, supervised mind-body activities, and structured recreational physical activities are all considered "promising," though their physical health impacts remain "unknown." Meanwhile, supervised combined aerobic and anaerobic exercises lack substantial evidence for benefits in both mental and physical domains. While some activities demonstrate strong potential, significant gaps in evidence still exist, especially regarding their physical health benefits [32].

9 Network Map of Veteran Sport Research

In addition to reviewing specific literature on the mental, physical, and social health impacts of sport on transitioning veterans and their families, a broad, high-level network analysis was conducted to identify the key research topics and themes prevailing in the field of veteran sport. Utilising the Web of Science database, a comprehensive query resulted in 508 relevant articles employing search terms such as "veteran AND sport," "ex-military AND sport," and "United States Department of Veterans Affairs AND sport." These results were subsequently imported into bibliometric network analysis software for mapping and cluster analysis, producing the two-dimensional map presented in Figure 2. In this visualisation, each term represents a designated keyword from the pertinent journal articles, with closer proximity indicating a higher likelihood of co-occurrence within an article. Colour coding highlights clusters of closely related terms, with each cluster representing a key research theme. The number of connecting lines signifies the frequency of keyword co-occurrence, while larger circles denote research constructs that have been extensively explored in the literature. From this preliminary analysis, four primary research clusters emerged: Cluster 1 (Red) focuses on the physical health impacts of exercise, Cluster 2 (Blue) addresses sport and traumatic brain injuries, Cluster 3 (Yellow) explores sport and deployment/combat-related mental health, and Cluster 4 (Green) examines sport for rehabilitation in veterans. It is crucial to note that these articles have not been further screened, and therefore, this report represents an initial overview.

10 Research Gaps and Opportunities

While the evidence around the mental, physical health and social health impacts of sport on veterans and their families is continuing to grow, there are a number of research gaps and opportunities that remain to be addressed.

Research methodology

Firstly, from a methodological perspective, many studies conducted in this field to date are observational in nature or employ a qualitative research methodology comprising data collected through observations and interviews with veterans and their family members which can result in unchecked assumptions about their benefits. This is largely due to the bespoke nature of the programs being evaluated and the relatively small number of participants engaging in each program. While a qualitative research approach is completely appropriate for this type of evaluation and provides a deep understanding of human behaviour, attitudes, and experiences, as well as the setting, context and factors that influence behaviour, the ability of qualitative data to make generalisations to larger populations is limited. Furthermore, purely qualitative studies due to the nature of their design typically lack experimental controls and tend to focus on a narrow range of sports and populations. This lack of experimental controls (i.e. participants who have not participated in the sporting activity) makes it difficult to establish an overall causal relationship between sports and reported improvements in mental, physical and social health. To support the strong qualitative evidence base, outlined in this report, therefore more large-scale quantitative or mixed-methods studies are needed to identify patterns and correlations that are representative of the wider veteran community.

Several studies highlight the critical need for more longitudinal research to assess whether the observed improvements in wellbeing as a result of sport are sustained over time [32, 147]. Currently, the limited longitudinal studies available predominantly focus on short follow-up periods of 3 to 6 months and are specifically focussed on discrete single occurrence sports camps, competitions, or expeditions, rather than long-term ongoing engagement in sports [147, 167]. Considering that tangible improvements in wellbeing may take time to manifest [94], this narrow approach can limit the ability to determine whether the positive impacts of sport are actually present and if so, if the benefits are enduring or simply temporary and whether longer-term engagement in sport has any further benefits. Additionally, it does not consider the influence of external factors, such as significant life events, which can greatly affect responses and behaviours over time. Future research should aim to extend follow-up periods to gain a more comprehensive understanding of the long-term effects of sport on the mental health and wellbeing of veterans and their families as well as the factors that maintain or ameliorate any positive impacts of engaging in sport over time.

Standardised terminology, frameworks and definitions

There is a pressing need to clarify the definition of the term "sport" and to standardise the research methodologies and measures of mental health and social wellbeing that researchers use to evaluate the effectiveness of sports programs. This is essential for several reasons. Well-defined concepts and standardised outcome measures provide a consistent framework for assessing wellbeing across various studies and populations. This consistency is especially important in naturalistic settings where incorporating control groups may be challenging, as it allows for easier comparison of results across different studies. Moreover, standardised measures are often aligned with clinical practice, particularly those administered by trained clinicians or researchers rather than relying solely on self-reports. By utilising these measures, researchers effectively communicate in a language familiar to practitioners, thereby enhancing the robustness and credibility of their findings within the scientific and clinical community. Incorporating well defined and validated frameworks like the Quality Parasport Participation [168] could enhance study designs, ensuring sports programs are optimally structured to foster meaningful health advancements across various domains. There is also a need to incorporate assessments of clinically meaningful improvements in health in evaluations (defined as a noticeable, appreciable difference that is of value to the client), rather than just a focus on a statistically significant reduction in symptoms [169].

Program enablers and barriers

Greater attention is required to differentiate which components of sports programs lead to the most significant positive changes for veterans. In relation to adaptive sports, this means investigating which aspects of sports—such as participation frequency and duration, sport type and location (i.e. formal (organised or competitive) sport versus informal (casual) sport), leadership approach to training (i.e. transformational leadership in military sport recovery programming [147]) and demographic variables—are most beneficial. A number of sports programs for example, are facilitated by individuals with mental health experience and therefore include an aspect of health coaching/CBT based activities in the program schedule [72] making it difficult to differentiate the most beneficial aspects of the program. At the broadest level, this involves comparing the health impacts of different types of activities, from high-intensity endeavours like mountaineering to less demanding sports, to identify optimal strategies for various veteran groups. Additionally, investigating how mental health-informed sporting events/activities, team-based models, and sports programs that incorporate components that are reminiscent of military life, uniquely foster social cohesion, camaraderie, and mental fortitude, will provide invaluable insights to enhance the wellbeing of veterans through sport. Another promising area of research involves how activities like "esports" both (sedentary and active forms) might be used therapeutically to address specific symptoms of PTSD such as re-experiencing and avoidance symptoms through a process akin to desensitisation as well as promote rehabilitation and support wellbeing [147]. Tailoring these insights to

incorporate diverse veteran populations and various sport settings could significantly enhance the applicability of sports as a holistic intervention.

Secondary impacts on families

Research into the effects of sports on improving family functioning and the rehabilitation of the whole family unit is currently limited and requires further examination [147]. While sports have been acknowledged for their benefits to veterans, less attention has been given to their families, who play crucial support roles to the veteran. Establishing robust, randomised controlled trials could illuminate how sports involvement might address mental, physical, and social health needs within veteran families, thereby extending the benefits observed in veterans to their supporting networks effectively [170]. Such comprehensive evaluations are likely to inform more effective program development and implementation strategies for the veteran family members themselves, ultimately aiding in their transition from military to civilian life.

There is also a need to diversify what we mean by the phrase 'veteran family'. There are types of military and veteran families which are consistently underrepresented or excluded from research due to their lower prevalence in the community. These include families with male spouses/partners, childless couples, LGBTQ couples and families, parents of serving and ex-serving personnel, single parents, and veterans who do not access veteran affairs services [171]. Future research should take family structure into account as a potential moderating factor in understanding the relationship between sport and mental health, as well as social wellbeing.

Promotion and advocacy

There is a need to clearly articulate and advocate for the role of sports as an adjunct to traditional mental health therapies. Developing this narrative involves revising study designs to measure long-term impacts on quality of life, rather than focusing solely on symptom reduction, and accounting for and measuring other concurrent psychological and pharmacological interventions. It also involves a consideration of where sport sits in an overall stepped care model of veteran health care which provides tiered, cost-effective and individualised approach to treatment based on the severity and specific needs of the individual veteran (Torres et al, 2023). Understanding and promoting how sports can complement and support first line mental health treatments in this way, rather than portraying sport as a panacea to veteran's mental health and wellbeing, is likely to result in greater acceptance of the benefits of sport in the clinical community which could lead to a more comprehensive care strategies for veterans.

Evaluation and outcome measurement

There is a pressing need to broaden and diversify the outcomes measured in veteran sports programs to gain a comprehensive understanding of their impact across the interconnected domains of physical, mental, and social health. While existing studies highlight the benefits of exercise on anxiety, depression, stress, substance use, and pain, they often overlook crucial outcomes like community integration, employment, and quality of life [9, 75]. Incorporating frameworks such as the Quality Parasport Participation Framework [168] could assist in designing programs that holistically support veterans' wellbeing. Future research should capture data on health and wellbeing before and beyond participation in sports events, considering factors like sleep and other health markers during training camps to optimise recovery and performance [165]. In relation to families, frameworks that have been developed around the role of family in competitive adapted sport should be examined further in other sporting models [147]. Additionally, reassessing how mental and wellbeing benefits are measured, using standardised tools such as the WHO Disability Assessment Schedule 2.0 (WHODAS), could facilitate meta-analyses and strengthen the evidence base by ensuring consistency in outcome assessment. This comprehensive approach would help quantify the value of sports in enhancing purpose, resilience, and social wellbeing, ultimately improving the overall health and wellbeing of veterans. Finally, there is a need to capture specific harms of adaptive sports programs associated with participation as few studies to date have done this [172].

Sample diversification

There is a need to diversify and examine the impacts of sport on a diverse range of veteran populations considering factors such as age, service branch, gender, sexual orientation, as well as mental and physical injury type—to help ensure the findings are generalisable and applicable to various subgroups within the veteran community. According to a recent systematic review, a large proportion of the research to date, has focussed on veterans with multiple comorbidities (i.e. PTSD, depression, substance use disorders and obesity) which affects the applicability of these findings to other veteran groups who are asymptomatic or without a diagnosed mental health condition [32, 173]. The authors of this study suggest the need for more research on asymptomatic veterans to examine the power of sport as a means of preventing the development or progression of mental and physical issues. Other research has highlighted the need to increase the evidence base around the type of sport programming most suitable for veterans with co-morbid physical and mental health challenges given the poorer physical health of this group, compared to those with a single disorder type [147]. Sport as a preventative measure is likely to have the greatest social and economic benefit to our military and veteran community in the long-term by reducing overall health care costs [32].

Exploring female-specific sports programs for veterans constitutes a crucial area for research, due to the current underrepresentation of women in studies of this nature. While a small number of female-only group programs (i.e. physical activity and creative arts

programs) have demonstrated positive impacts on mental health and wellbeing, most evaluations conducted thus far have been of low methodological quality and lack longitudinal follow-up [174]. This highlights the substantial potential for optimizing health outcomes among female veterans through tailored approaches and rigorous evaluation, underscoring the imperative for further investigation to comprehensively understand and address their distinct needs.

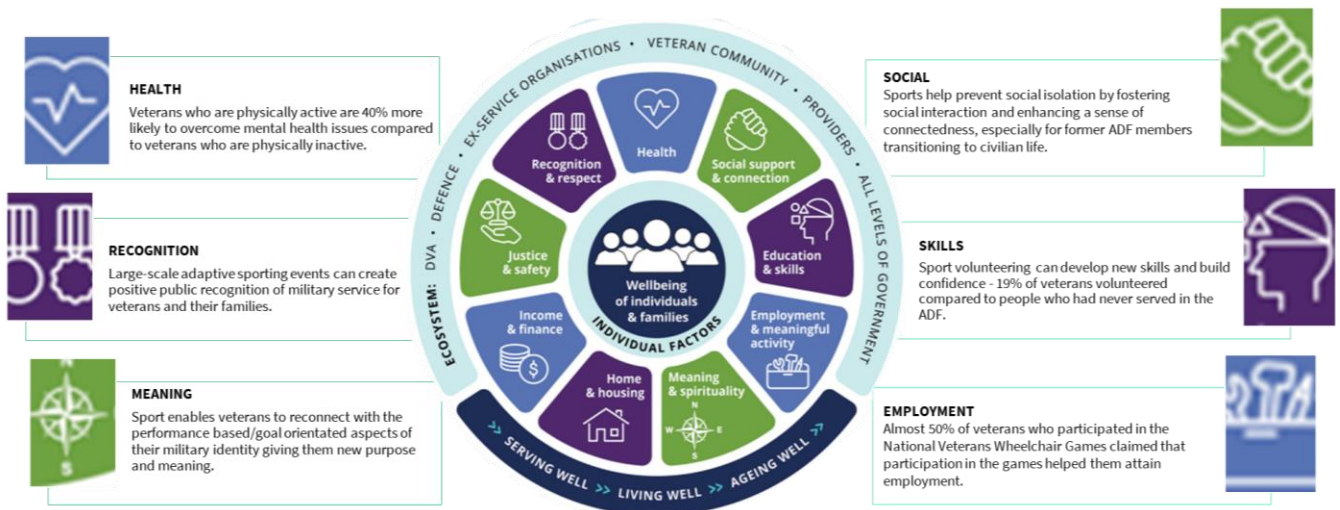
Finally, future research should include veterans who apply but are not selected for competitive sporting events such as the Invictus Games in order to rule out the impacts of event-imposed selection biases [147].

11 Conclusion

There is a currently a growing demand both internationally and nationally to shift from a disease-focussed healthcare model, which concentrates on diagnosing and addressing symptoms of specific mental and physical disorder, to a person centred “Whole Health” approach that emphasises the prevention of illness and disability while promoting overall wellbeing [175, 176]. This paradigm shift is particularly prominent in the veteran sector, with veteran’s affairs departments across the globe slowly starting to implement frameworks and strategies to support functioning across multiple, interconnected domains of mental, physical and social health wellbeing. The Whole Health approach to health care, is a change in focus from looking at what is wrong with a person to a more empowering narrative focussed on what the health system can do to support what each individual needs to flourish and optimise their own health and wellbeing [176]. This aims to enhance veterans' quality of life by promoting not only their physical health but also their social integration, economic stability, and personal development, ultimately fostering a supportive environment where they can thrive. In the context of the veteran community this requires the veteran, the veteran affairs’ administrations and service provides to consider what wellbeing looks like for them across multiple different domains.

The Defence and Veteran Families Wellbeing Strategy defines veteran wellbeing and functioning across nine key factors as shown below. The report highlights the contribution of sport to six of these nine factors (See Figure 3 below).

Figure 3: The contribution of sport to factors of wellbeing.



In conclusion, embracing sports as a vital part of rehabilitation and throughout their transition from military to civilian life can empower veterans and their families to reclaim their lives both fostering resilience, connection and re-integration. By integrating sports into various healthcare and psychological support services as an adjunct to established first line clinical pathways, veterans and their families can begin to benefit from a whole health approach to wellbeing that addresses many of the factors known to impede successful transition and recovery.

12 References

1. Cameron, A., et al., *The second report: Megatrends shaping the sport sector over coming decades*. 2022: Brisbane, Australia.
2. Care., D.o.H.a.A., *Sport Horizon, National Sport Strategy 2024-2034*. 2024, Commonwealth of Australia: Canberra, ACT.
3. Batts, C. and D.L. Andrews, 'Tactical athletes': *the United States Paralympic Military Program and the mobilization of the disabled soldier/athlete*. *Sport in Society*, 2011. **14**(5): p. 553-568.
4. Barcia, A.M., J.S. Shaha, and J.M. Tokish, *The Resilient Athlete: Lessons Learned in the Military*. *Sports Medicine and Arthroscopy Review*, 2019. **27**(3): p. 124-128.
5. Guttman, S.J., Ludwig., *Stoke Mandeville Hospital and Paralympic Games Journal of Medical Biography*, 2012. **20**(3): p. 1001-105.
6. Australia, C.o., *Adaptive sports programs for Australian Defence Force veterans*, F.A.D.a.T.R.C. The Senate, Editor. 2023: Canberra.
7. Brittain, I. and S. Green, *Disability sport is going back to its roots: rehabilitation of military personnel receiving sudden traumatic disabilities in the twenty-first century*. *Qualitative Research in Sport, Exercise and Health*, 2012. **4**(2): p. 244-264.
8. Brittain, I., *Military links to competitive sport and games as part of the rehabilitation and recovery process*. *Navigators*, 2016. **12**(23): p. 1008-115.
9. Oster, C., et al., *The health and wellbeing needs of veterans: a rapid review*. *BMC Psychiatry*, 2017. **17**(1): p. 414.
10. McFarlane, A.C., et al., *Mental health in the Australian Defence Force: 2010 ADF Mental Health and Wellbeing Study: Full Report*. 2011: Canberra.
11. Bryant, R., et al., *Mental Health Changes Over Time: a Longitudinal Perspective: Mental Health and Wellbeing Transition Study*. . 2019: Canberra.
12. Karre, J.K., Perkins, D. F., Morgan, N. R., Davenport, K. E., Aronson, K. R., Maury, R. V., Bradbard, D., Armstrong, N. J., Wright, A., Sargent, R., & Andros, M. , *What Do Successful Military-to-Civilian Transitions Look Like? A Revised Framework and a New Conceptual Model for Assessing Veteran Wellbeing*. *Armed Forces and Society*. , 2024. **(Accepted/In press)**. .
13. Spiro, A., 3rd, R.A. Settersten, and C.M. Aldwin, *Long-term Outcomes of Military Service in Aging and the Life Course: A Positive Re-envisioning*. *Gerontologist*, 2016. **56**(1): p. 5-13.
14. Barnett, A., et al., *Transitioning to civilian life: The importance of social group engagement and identity among Australian Defence Force veterans*. *Australian & New Zealand Journal of Psychiatry*, 2022. **56**(8): p. 1025-1033.
15. Lee, J.E.C., et al., *Correlates of perceived military to civilian transition challenges among Canadian Armed Forces Veterans*. *Journal of Military, Veteran and Family Health*, 2020. **6**(2): p. 26-39.
16. Caddick, N. and B. Smith, *Exercise is medicine for mental health in military veterans: A qualitative commentary*. *Qualitative Research in Sport, Exercise and Health*, 2017. **10**: p. 1-12.
17. Van Hooff M, et al., *Mental Health Prevalence, Mental Health and Wellbeing Transition Study*. 2018: Canberra.

18. Dhuli, K., et al., *Physical activity for health*. J Prev Med Hyg, 2022. **63**(2 Suppl 3): p. E150-E159.
19. Ward, P., et al., *Training perceptual-cognitive skills: Can sport psychology research inform military decision training?* Military Psychology, 2008. **20**(sup1): p. S71-S102.
20. Van Hooff, M., Lawrence-Wood, E., Hodson, S., Benassi, H., Hansen, C., Grace, B., Avery, J., Searler, A., Iannos, M., Abraham, M., Baur, J., McFarlane, A., *Mental Health Prevalence, Mental Health Prevalence and Wellbeing Transition Study*. 2018: Canberra.
21. Castro, C.A., *The US framework for understanding, preventing, and caring for the mental health needs of service members who served in combat in Afghanistan and Iraq: a brief review of the issues and the research*. European Journal of Psychotraumatology, 2014. **5**.
22. Binks, E. and S. Cambridge, *The Transition Experiences of British Military Veterans*. Political Psychology, 2018. **39**(1): p. 125-142.
23. Sheriff, R.S., et al., *Associations of childhood trauma and childhood mental disorder with past-year mental disorder in military and civilian employed men*. Psychiatry Res, 2019. **280**: p. 112482.
24. May, C.L. and B.E. Wisco, *Defining trauma: How level of exposure and proximity affect risk for posttraumatic stress disorder*. Psychological Trauma: Theory, Research, Practice, and Policy, 2016. **8**(2): p. 233-240.
25. Phoenix-Australia., *Specific Populations and Trauma Types: Military and ex-military personnel in Australian Guidelines for the Prevention and Treatment of Acute Stress Disorder, Posttraumatic Stress Disorder and Complex Posttraumatic Stress Disorder*. 2020, Phoenix Australia: Melbourne.
26. Steenkamp, M.M. and B.T. Litz, *Psychotherapy for military-related posttraumatic stress disorder: review of the evidence*. Clin Psychol Rev, 2013. **33**(1): p. 45-53.
27. Puetz, T.W., S.D. Youngstedt, and M.P. Herring, *Effects of Pharmacotherapy on Combat-Related PTSD, Anxiety, and Depression: A Systematic Review and Meta-Regression Analysis*. PLOS ONE, 2015. **10**(5): p. e0126529.
28. Duek, O., et al., *Early discontinuation of pharmacotherapy in U.S. veterans diagnosed with PTSD and the role of psychotherapy*. Journal of Psychiatric Research, 2021. **132**: p. 167-173.
29. Lane, J. and D. Wallace, *Australian military and veteran's mental health care part 1: an introduction to cultural essentials for clinicians*. Australas Psychiatry, 2020. **28**(3): p. 267-269.
30. Forbes, D., et al., *Pathways to Care, Mental Health and Wellbeing Transition Study*. 2018: Canberra.
31. Niles, B., A. Lang, and M. Olf, *Complementary and integrative interventions for PTSD*. European Journal of Psychotraumatology, 2023. **14**(2): p. 2247888.
32. Milanese, S., et al., *What are the physical and mental wellbeing benefits veterans achieve through participating in sporting activities? A Rapid Evidence Assessment. Technical Report prepared for the Australian Government Department of Veterans' Affairs*. . 2018.
33. Burling, T.A., et al., *Batter up! Relapse prevention for homeless veteran substance abusers via softball team participation*. J Subst Abuse, 1992. **4**(4): p. 407-13.
34. Laferrier, J.Z., E. Teodorski, and R.A. Cooper, *Investigation of the Impact of Sports, Exercise, and Recreation Participation on Psychosocial Outcomes in a Population of*

- Veterans with Disabilities: A Cross-sectional Study*. American Journal of Physical Medicine & Rehabilitation, 2015. **94**(12): p. 1026-1034.
35. Laferrier, J.Z., et al., *Investigation of the Impact of Sports, Exercise and Recreation (ser) Participation on Psychosocial Outcomes in a Population of Veterans with Disabilities Using the Sports Outcome Research Tool and Comprehensive Uniform Survey (Sportacus). A Longitudinal Study*. Journal of Novel Physiotherapies, 2017. **7**(5).
 36. Morgan, A., et al., *Can scuba diving offer therapeutic benefit to military veterans experiencing physical and psychological injuries as a result of combat? A service evaluation of Depththerapy UK*. Disability and Rehabilitation, 2019. **41**(23): p. 2832-2840.
 37. Caddick, N., B. Smith, and C. Phoenix, *The effects of surfing and the natural environment on the wellbeing of combat veterans*. Qual Health Res, 2015. **25**(1): p. 76-86.
 38. González-Devesa, D., et al., *Effectiveness of surfing on psychological health in military members: a systematic review*. BMJ Mil Health, 2024.
 39. Walter, K.H., et al., *The effectiveness of the National Veterans Summer Sports Clinic for veterans with probable posttraumatic stress disorder*. Front Psychol, 2023. **14**: p. 1207633.
 40. Wheeler, M., et al., *Outdoor recreational activity experiences improve psychological wellbeing of military veterans with post-traumatic stress disorder: Positive findings from a pilot study and a randomised controlled trial*. PLoS One, 2020. **15**(11): p. e0241763.
 41. Carless, D., et al., *Psychosocial outcomes of an inclusive adapted sport and adventurous training course for military personnel*. Disabil Rehabil, 2013. **35**(24): p. 2081-8.
 42. Greer, N., et al., *Adaptive Sports for Disabled Veterans*. 2019: Washington, DC.
 43. Gelkopf, M., et al., *Nature adventure rehabilitation for combat-related posttraumatic chronic stress disorder: a randomized control trial*. Psychiatry Res, 2013. **209**(3): p. 485-93.
 44. Crawford, R.T., *The Impact of Ocean Therapy on Veterans With Posttraumatic Stress Disorder*. . 2016, Grand Canyon University: Phoenix, AZ.
 45. Hyer, L., et al., *Effects of Outward Bound Experience as an adjunct to inpatient PTSD treatment of war veterans*. J Clin Psychol, 1996. **52**(3): p. 263-78.
 46. Angel, C.M., et al., *Team Red, White & Blue: a community-based model for harnessing positive social networks to enhance enrichment outcomes in military veterans reintegrating to civilian life*. Transl Behav Med, 2018. **8**(4): p. 554-564.
 47. Kelsall, H., Sim, M., Van Hooff, M., Lawrence-Wood, E., Benassi, H., Sadler, N., Hodson, S., Hansen, C., Avery, J., Searle, A., Ighani, H., Iannos, M., Abraham, M., Baur, J., Saccone, E., McFarlane, A. , *Physical Health Status Report, Mental Health and Wellbeing Transition Study*. 2018: Canberra.
 48. Bennett, J.L., *Addressing Posttraumatic Stress Among Iraq and Afghanistan Veterans and Their Significant Others: An Intervention Utilizing Sport and Recreation*. 2010, Brigham Young University: United States -- Utah. p. 121.
 49. Sporner, M.L., et al., *Psychosocial impact of participation in the National Veterans Wheelchair Games and Winter Sports Clinic*. Disability and Rehabilitation, 2009. **31**(5): p. 410-418.

50. Brittain, I., K. Bunds, and J. Bocarro, *The Contribution of Sport in the Rehabilitation Process of Disabled Military Veterans: A Case Study of the 2016 Invictus Games*. Journal of Global Sport Management, 2024. **9**(1): p. 62-85.
51. Hawkins, B.L.C., A.Lynne.; Crowe, Brandi M., *Effects of Participation in a Paralympic Military Sports Camp on Injured Service Members. Implications for Therapeutic Recreation*. Therapeutic Recreation Journal, 2011. **309**(4): p. 309-325.
52. Post, D., et al., *The physical, psychological, and social impacts of participation in the Invictus Pathways Program: A qualitative analysis of veterans' perceptions and experiences*. PLoS One, 2023. **18**(10): p. e0287228.
53. Otter, L. and J. Currie, *A long time getting home: Vietnam Veterans' experiences in a community exercise rehabilitation programme*. Disabil Rehabil, 2004. **26**(1): p. 27-34.
54. Havenetidis, K., et al., *Combining sport and conventional military training provides superior improvements in physical test performance*. International Journal of Sports Science & Coaching, 2023. **18**(5): p. 1567-1576.
55. Xu, X., et al., *Physical Activity and Disability: An Analysis on How Activity Might Lower Medical Expenditures*. J Phys Act Health, 2018. **15**(8): p. 564-571.
56. Serfioti, D. and N. Hunt, *Extreme sport as an intervention for physically injured military veterans: the example of competitive motorsport*. Disabil Rehabil, 2022. **44**(24): p. 7566-7574.
57. Besemann, M., et al., *Reflections on recovery, rehabilitation and reintegration of injured service members and veterans from a bio-psycho-social-spiritual perspective*. Canadian Journal of Surgery, 2018. **61**(6 Suppl 1): p. S219-S231.
58. Flack, M. and L. Kite, *Transition from military to civilian: Identity, social connectedness, and veteran wellbeing*. PLoS One, 2021. **16**(12): p. e0261634.
59. McCormick, W.H., et al., *Military Culture and Post-Military Transitioning Among Veterans: A Qualitative Analysis*. Journal of Veterans Studies, 2019.
60. Wakefield, J.R.H., et al., *Brothers and sisters in arms: A mixed-methods investigation of the roles played by military support and social identity processes in the mental health of veterans during the transition to veterancy*. Journal of Community & Applied Social Psychology, 2024. **34**(1): p. e2756.
61. Abbate, L.M., et al., *Older Veterans' perspectives on participation in a clinical exercise program: A qualitative study of the VA Gerofit exercise program*. SAGE Open Med, 2024. **12**: p. 20503121241271759.
62. Coulthard, J. and M. Therrien, *Building Connections through Sport and Physical Activity for Ill and Injured Military Members and Veterans: Determining the Optimal Time for Program Involvement*. Military Behavioral Health, 2022. **10**(1): p. 60-69.
63. Kay, C.W.P., H.L. Wingfield, and J. McKenna, *Mission Himalaya: Exploring the Impact of a Supported High-Altitude Mountaineering Expedition on the Wellbeing and Personal Development of UK Military Veterans*. Int J Environ Res Public Health, 2022. **19**(9).
64. Waldhauser, K.J., et al. *Purpose after service through sport: A social identity-informed program to support military veteran wellbeing*. Educational Publishing Foundation [doi:10.1037/spy0000255]. 2021.
65. Duvall, J. and R. Kaplan, *Enhancing the wellbeing of veterans using extended group-based nature recreation experiences*. The Journal of Rehabilitation Research and Development, 2014. **51**: p. 685-696.

66. Roberts, G.A., et al., *Military veteran athletes' experiences of competing at the 2016 Invictus Games: a qualitative study*. *Disability and Rehabilitation*, 2021. **43**(24): p. 3552-3561.
67. Chukwuemeka, N.A., et al., *Fifty Years After Nigerian Civil War: Social Support Is Associated with PTSD Symptoms Through Increased Self-Efficacy Among Biafran Veterans*. *J Interpers Violence*, 2024: p. 8862605241262239.
68. Soltani, M.A., R. Karaminia, and S.A. Hashemian, *Prediction of war veteran's mental health based on spiritual wellbeing, social support and self-efficacy variables: The mediating role of life satisfaction*. *J Educ Health Promot*, 2014. **3**: p. 57.
69. Hawkins, B.L., et al., *Identifying contextual influences of community reintegration among injured servicemembers*. *J Rehabil Res Dev*, 2015. **52**(2): p. 235-46.
70. Zerach, G., *Posttraumatic growth among Israeli female combat veterans: The mediating roles of posttraumatic stress symptoms and self-efficacy*. *Stress Health*, 2024. **40**(5): p. e3486.
71. Fischer, I.C., et al., *Posttraumatic stress and depressive symptoms and symptom clusters in a sample of treatment-seeking US veterans: Longitudinal associations with meaning in life and general self-efficacy*. *J Affect Disord*, 2023. **339**: p. 781-787.
72. Theal, R., J.L. Kerin, and M. Romaniuk, *Psychosocial Outcomes of Australian Male and Female Veterans Following Participation in Peer-Led Adventure-Based Therapy*. *Journal of Veterans Studies*, 2020.
73. Burke, S.M. and A. Utley, *Climbing towards recovery: investigating physically injured combat veterans' psychosocial response to scaling Mt. Kilimanjaro*. *Disabil Rehabil*, 2013. **35**(9): p. 732-9.
74. Colder Carras, M., et al., *Connection, meaning, and distraction: A qualitative study of video game play and mental health recovery in veterans treated for mental and/or behavioral health problems*. *Soc Sci Med*, 2018. **216**: p. 124-132.
75. Lewis, A., *More important than winning: A retrospective online research survey evaluating the effects of participating in an adaptive sports program for wounded, injured and ill Australian defence force veterans*. *Journal of Military and Veterans Health* 2022. **30**(3): p. 64-74.
76. Duong, A., et al., *I AM FAMILY: Understanding the adapted sport experiences of family members of military personnel with physical and psychological illnesses and injuries through the lens of the Invictus Games*. *Psychology of Sport and Exercise*, 2023. **68**: p. 102457.
77. Bull, F.C., et al., *World Health Organization 2020 guidelines on physical activity and sedentary behaviour*. *British Journal of Sports Medicine*, 2020. **54**(24): p. 1451-1462.
78. Caddick, N. and B. Smith, *The impact of sport and physical activity on the wellbeing of combat veterans: A systematic review*. *Psychology of Sport and Exercise*, 2014. **15**(1): p. 9-18.
79. Blumhorst, E.K., S; Cave, J., *An Exploratory Study of Adaptive Scuba Diving's Effects on Psychological Wellbeing among Military Veterans*. *Therapeutic Recreation Journal* 2020. **54**(2): p. 173-188.
80. Dustin, D., et al., *The promise of river running as a therapeutic medium for veterans coping with post-traumatic stress disorder*. *Therapeutic Recreation Journal*, 2011. **45**: p. 326-340.

81. Mowatt, R.A. and J. Bennett, *Veteran stories, PTSD effects and therapeutic fly-fishing*. Ther Recreation J, 2011. **45**(4): p. 286-308.
82. Varker, T., et al., *Problem anger in veterans and military personnel: Prevalence, predictors, and associated harms of suicide and violence*. J Psychiatr Res, 2022. **151**: p. 57-64.
83. Macmanus, D., et al., *Violent behaviour in U.K. military personnel returning home after deployment*. Psychol Med, 2012. **42**(8): p. 1663-73.
84. Kannis-Dymand, L., et al., *Dimensions of Anger Reactions-Revised (DAR-R): Validation of a brief anger measure in Australia and Spain*. J Clin Psychol, 2019. **75**(7): p. 1233-1248.
85. MacManus, D., et al., *Aggressive and violent behavior among military personnel deployed to Iraq and Afghanistan: prevalence and link with deployment and combat exposure*. Epidemiol Rev, 2015. **37**: p. 196-212.
86. May, K., et al., *Experiences of Parental PTSD for Children Aged 9–17 in Military and Emergency First Responder Families*. Journal of Child and Family Studies, 2023. **32**(12): p. 3816-3834.
87. Lee, Y. and S. Lim, *Effects of Sports Activity on Sustainable Social Environment and Juvenile Aggression*. Sustainability, 2019. **11**(8): p. 2279.
88. Hendrick, A., et al., *Unveiling the Influence of Competitive Sports on the Sense of Self and Identity of Disabled Veterans: A Systematic Review and Mixed-Methods Synthesis*. Identity, 2024. **24**(3): p. 194-212.
89. Tajfel, H., *Differentiation between social groups : studies in the social psychology of intergroup relations*. European monographs in social psychology. 1978, London ; New York: Published in cooperation with European Association of Experimental Social Psychology by Academic Press. xv, 474 p.
90. Tajfel, H. and J.C. Turner, *An integrative theory of intergroup conflict*. The Social Psychology of Intergroup Relations, 1979. **33**: p. 74.
91. Bennett, J.L., et al., *Addressing Posttraumatic Stress Among Iraq and Afghanistan Veterans and Significant Others: An Intervention Utilizing Sport and Recreation*. Therapeutic Recreation Journal, 2014. **48**(1): p. 74-93.
92. Turner, J.C., *Rediscovering the social group : self-categorization theory*. 1987, Oxford, UK ; New York, NY, USA: B. Blackwell. x, 239 p.
93. Lundberg, N.R., et al., *Identity Negotiating: Redefining Stigmatized Identities through Adaptive Sports and Recreation Participation among Individuals with a Disability*. Journal of Leisure Research, 2011. **43**(2): p. 205-225.
94. Lundberg, N.R., J. Bennett, and S. Smith, *Outcomes of adaptive sports and recreation participation among veterans returning from combat with acquired disability*. . Therapeutic Recreation Journal, 2011. **2**: p. 105-120.
95. Thompson, J.M., et al., *Veterans' Identities and Wellbeing in Transition to Civilian Life – A Resource for Policy Analysts, Program Designers, Service Providers and Researchers. Report of the Veterans' Identities Research Theme Working Group, Canadian Institute for Military and Veteran Health Research Forum 2016*. . 2017, Research Directorate, Veterans Affairs, Canada: Charlottetown PE.
96. Carless, D., et al., *Disability, inclusive adventurous training and adapted sport: Two soldiers' stories of involvement*. Psychology of Sport and Exercise, 2014. **15**(1): p. 124-131.

97. Carless, D., *Narrative Transformation Among Military Personnel on an Adventurous Training and Sport Course*. *Qualitative Health Research*, 2014. **24**(10): p. 1440-1450.
98. Albright, D.L., et al., *Civic engagement among student veterans*. *Journal of American College Health*, 2019.
99. Lawrence, K.A., M.M. Matthieu, and E. Robertson-Blackmore, *Completion of veteran-focussed civic service program improves health and psychosocial outcomes in Iraq and Afghanistan veterans with a history of traumatic brain injury*. *Military Medicine*, 2017. **182**(7): p. e1763-e1770.
100. Orazem, R.J., et al., *Identity adjustment among Afghanistan and Iraq war veterans with reintegration difficulty*. *Psychol Trauma*, 2017. **9**(Suppl 1): p. 4-11.
101. Shue, S., et al., *The career transition experiences of military Veterans: A qualitative study*. *Military Psychology*, 2021. **33**(6): p. 359-371.
102. Kay, C.W.P., et al., *Providing recovery support to wounded, injured, and sick UK military personnel throughout the COVID-19 pandemic*. *Mil Psychol*, 2023. **35**(5): p. 408-419.
103. Carra, K., et al., *Participation in occupations, health and adjustment during the transition from military service: A cross-sectional study*. *Military Psychology*, 2021. **33**(5): p. 320-331.
104. Kerr, K., et al., *Increased risk of attempted suicide in Australian veterans is associated with total and permanent incapacitation, unemployment and posttraumatic stress disorder severity*. *Australian & New Zealand Journal of Psychiatry*, 2018. **52**(6): p. 552-560.
105. Galily, Y. and P. Shimon, *The Transition of Retired Military Officers to a Second Career in Sport Management: The Israeli Case*. *Journal of Multidisciplinary Research*, 2012. **4**(2): p. 5-17.
106. Kim, W., et al., *Perception of Employment by the Veterans Participating in the National Veterans Wheelchair Games: A Survey Study*. *Pm r*, 2018. **10**(3): p. 263-268.
107. Lastuka, A. and M. Cottingham, *The effect of adaptive sports on employment among people with disabilities*. *Disability and Rehabilitation*, 2016. **38**(8): p. 742-748.
108. Freytes, I.M., et al., *Exploring the post-deployment reintegration experiences of veterans with PTSD and their significant others*. *Am J Orthopsychiatry*, 2017. **87**(2): p. 149-156.
109. Gil-Rivas, V., et al., *Facilitating successful reintegration: Attending to the needs of military families*. *Am J Orthopsychiatry*, 2017. **87**(2): p. 176-184.
110. Skomorovsky, A., et al., *Military to civilian transition challenges, caregiving activities, and wellbeing among spouses of newly released Canadian Armed Forces Veterans*. *Journal of Military, Veteran and Family Health*, 2020. **6**(1): p. 15-27.
111. Williams, A., et al., *Mental health of Canadian children growing up in military families: The parent perspective*. *Acta Psychologica*, 2023. **235**: p. 103887.
112. Cramm, H., et al., *The Mental Health of Military-Connected Children: A Scoping Review*. *Journal of Child and Family Studies*, 2019. **28**(7): p. 1725-1735.
113. Creech, S.K. and G. Misca, *Parenting with PTSD: A Review of Research on the Influence of PTSD on Parent-Child Functioning in Military and Veteran Families*. *Frontiers in Psychology*, 2017. **8**.

114. Cramm, H., et al., *Experiences of children growing up with a parent who has military-related post-traumatic stress disorder: a qualitative systematic review*. JBI Evid Synth, 2022. **20**(7): p. 1638-1740.
115. Gribble, R., et al., *The UK Veterans Family Study: Psychological health, wellbeing, and social support among UK veteran families*. 2023: United Kingdom.
116. Waddell, E., et al., *Families' experiences of supporting Australian veterans to seek help for a mental health problem: a linked data analysis of national surveys with families and veterans*. J Ment Health, 2023. **32**(5): p. 899-909.
117. Lawn, S., et al., *Families' experiences of supporting Australian veterans and emergency service first responders (ESFRs) to seek help for mental health problems*. Health Soc Care Community, 2022. **30**(6): p. e4522-e4534.
118. Muir, S., *Family Wellbeing Study, Part 2: Military Family Approaches to Managing Transition to Civilian Life*. 2018, Department of Defence and Department of Veteran Affairs: Canberra.
119. Maguire, A.M., et al., *Veteran families with complex needs: a qualitative study of the veterans' support system*. BMC Health Services Research, 2022. **22**(1): p. 74.
120. Evans, J., M. Romaniuk, and R. Theal, *Evaluation of mental health first aid training for family members of military veterans with a mental health condition*. BMC Psychiatry, 2021. **21**(1): p. 128.
121. Risi, A., et al., *A qualitative examination of the reintegration experiences of Australian Defense Force families*. Military Psychology, 2024. **36**(4): p. 410-421.
122. Rogers, M., et al., *Parental perceptions of social and emotional wellbeing of young children from Australian military families*. Aust J Rural Health, 2023. **31**(6): p. 1090-1102.
123. O'Toole, B.I., *Intergenerational Transmission of Posttraumatic Stress Disorder in Australian Vietnam Veterans' Daughters and Sons: The Effect of Family Emotional Climate While Growing Up*. Journal of Traumatic Stress, 2022. **35**(1): p. 128-137.
124. Gunter, H.N., et al., *Family emotional climate in childhood and risk of PTSD in adult children of Australian Vietnam veterans*. Psychiatry Res, 2020. **294**: p. 113509.
125. Forrest, W., B. Edwards, and G. Daraganova, *The intergenerational consequences of war: anxiety, depression, suicidality, and mental health among the children of war veterans*. Int J Epidemiol, 2018. **47**(4): p. 1060-1067.
126. McGuire, A.C., et al., *Effect of Multiple Deployments on Military Families: A Cross-Sectional Study of Health and Wellbeing of Partners and Children*. Mil Med, 2016. **181**(4): p. 319-27.
127. Berle, D. and Z. Steel, *Families of returned defence force personnel: a changing landscape of challenges*. Australas Psychiatry, 2015. **23**(4): p. 399-402.
128. Reynolds, A., *A Longitudinal Evaluation Of Surf Action's Impact In Using Surf Therapy To Support The Physical And Psychological Wellbeing Of 374 Young People From The Armed Forces Community: 2014-2019*. 2020: United Kingdom.
129. Bradshaw, C.P., et al., *School Transitions Among Military Adolescents: A Qualitative Study of Stress and Coping*. School Psychology Review, 2010. **39**(1): p. 84-105.
130. Bennett, J.L., *Addressing Posttraumatic Stress Among Iraq and Afghanistan Veterans and Their Significant Others: An Intervention Utilizing Sport and Recreation*. (M.Sc.). 2010: United States -- Utah.
131. Johnson, H.A., R.B. Zabriskie, and B. Hill, *The Contribution of Couple Leisure Involvement, Leisure Time, and Leisure Satisfaction to Marital Satisfaction*. Marriage & Family Review, 2006. **40**(1): p. 69-91.

132. Cho, M.S., *The influence of family's participation in recreational sports on its resilience and communication facilitation*. J Exerc Rehabil, 2014. **10**(5): p. 313-8.
133. Duquette, M.-M., H. Carbonneau, and C. Jourdan-Ionescu, *Young people with disabilities: the influence of leisure experiences on family dynamics*. Annals of Leisure Research, 2016. **19**(4): p. 405-423.
134. English, P., et al., *'Masters of your fate and the captains of your soul': media representations of the 2018 Invictus Games*. Sport in Society, 2021. **24**(7): p. 1217-1232.
135. Banks, J. and J.G. Cole, *Diversion drives and superlative soldiers: gaming as coping practice among military personnel and veterans*. Game Studies, 2016. **16**(2).
136. Roberts, G.A., et al., *Predictors of military veterans' engagement in bespoke recovery pathways and health and wellbeing outcomes*. Rehabil Psychol, 2022. **67**(1): p. 79-89.
137. Duvall, J., et al., *A review of adaptive sport opportunities for power wheelchair users*. Disability and Rehabilitation: Assistive Technology, 2021. **16**(4): p. 407-413.
138. Lee, K.K. and M.J. Uihlein, *Adaptive Sports in the Rehabilitation of the Disabled Veterans*. Physical Medicine and Rehabilitation Clinics of North America, 2019. **30**(1): p. 289-299.
139. Papinczak, Z.E., et al., *Behaviour change techniques, barriers and facilitators for promoting self-managed physical activity in Australian defence force veterans: A mixed-methods study*. Journal of Military and Veterans Health, 2024. **32**(3): p. 22-30.
140. Roberts, G.A., et al., *A Longitudinal Examination of Military Veterans' Invictus Games Stress Experiences*. Frontiers in Psychology, 2019. **10**.
141. Military and Emergency Services Health Australia, *Evaluation of the Group Emotional And Relationship Skills (GEARS) intervention among Australian Veterans*. 2023: Canberra.
142. Hawkins, B.L. and B.M. Crowe, *Contextual Facilitators and Barriers of Community Reintegration Among Injured Female Military Veterans: A Qualitative Study*. Archives of Physical Medicine and Rehabilitation, 2018. **99**(2, Supplement): p. S65-S71.
143. Arincorayan, D., et al., *Resilience-enhancing relationships: what we can learn from those with a history of adverse childhood experiences*. US Army Med Dep J, 2017(2-17): p. 25-32.
144. Gazmin, S., et al., *What about the family? Onboarding athletes' entourage into professional sport organizations*. Journal of Applied Sport Psychology, 2023. **35**(3): p. 392-411.
145. Shirazipour, C.H., A.E. Latimer-Cheung, and A.B. Aiken, *Quality physical activity experiences for military Veterans with a physical disability: Exploring the relationship among program conditions, elements, and outcomes*. Journal of Military, Veteran and Family Health, 2019. **5**(1): p. 80-92.
146. Shirazipour, C.H. and A.E. Latimer-Cheung, *Pathways for Long-Term Physical Activity Participation for Military Veterans With a Physical Disability*. Adapt Phys Activ Q, 2021. **38**(1): p. 1-24.
147. Shirazipour, C.H., et al., *Research report: Beyond the finish line*. 2024, Invictus Games Foundation: United States.

148. Scorza, F.A., et al., *Medical research: Are e-Sports really sports?* Clinics (Sao Paulo), 2023. **78**: p. 100190.
149. Zayeni, D., J.P. Raynaud, and A. Revet, *Therapeutic and Preventive Use of Video Games in Child and Adolescent Psychiatry: A Systematic Review*. Front Psychiatry, 2020. **11**: p. 36.
150. Rodrigo-Yanguas, M., et al., *Serious Video Games: Angels or Demons in Patients With Attention-Deficit Hyperactivity Disorder? A Quasi-Systematic Review*. Front Psychiatry, 2022. **13**: p. 798480.
151. Monteiro Pereira, A., et al., *Associations Between Esports Participation and Health: A Scoping Review*. Sports Med, 2022. **52**(9): p. 2039-2060.
152. Kelly, S. and J. Leung, *The New Frontier of Esports and Gaming: A Scoping Meta-Review of Health Impacts and Research Agenda*. Front Sports Act Living, 2021. **3**: p. 640362.
153. Marques, L.M., et al., *Escaping through virtual gaming—what is the association with emotional, social, and mental health? A systematic review*. Frontiers in Psychiatry, 2023. **14**.
154. Elliott, L., et al., *More than Just a Game? Combat-Themed Gaming Among Recent Veterans with Posttraumatic Stress Disorder*. Games for Health Journal, 2015. **4**(4): p. 271-277.
155. Foust, J., R, *Play, Kill, Recruit: Videogames and Strategic Communication in the US Military: Phd Dissertation*. 2024.
156. Tuan, S.H., et al., *Assessing the Clinical Effectiveness of an Exergame-Based Exercise Training Program Using Ring Fit Adventure to Prevent and Postpone Frailty and Sarcopenia Among Older Adults in Rural Long-Term Care Facilities: Randomized Controlled Trial*. J Med Internet Res, 2024. **26**: p. e59468.
157. Krishnan, S., et al., *Perceptions of stroke survivors regarding factors affecting adoption of technology and exergames for rehabilitation*. Pm r, 2023. **15**(11): p. 1403-1410.
158. Chanpimol, S., et al., *Acceptability and outcomes of an individualized exergaming telePT program for veterans with multiple sclerosis: a pilot study*. Arch Physiother, 2020. **10**: p. 18.
159. Lazarus, R.S. and S. Folkman, *Stress, Appraisal, and Coping* 1984, New York: Springer.
160. Allan, J., et al., *Health and Wellbeing in an Outdoor and Adventure Sports Context*. Sports, 2020. **8**(4): p. 50.
161. Peacock, S.M., et al., *Outcomes from a One-Week Adapted Sport and Adapted Adventure Recovery Programme for Military Personnel*. Sports (Basel), 2019. **7**(6).
162. Kaiseler, M., C. Kay, and J. McKenna, *The Impact of an Outdoor and Adventure Sports Course on the Wellbeing of Recovering UK Military Personnel: An Exploratory Study*. Sports (Basel), 2019. **7**(5).
163. Sidiropoulos, A.N., et al., *Acute influence of an adaptive sporting event on quality of life in veterans with disabilities*. PLoS One, 2022. **17**(11): p. e0277909.
164. Kay, C.W.P. and J. McKenna, *The enduring wellbeing impacts of attending the Battle Back Multi Activity Course for the lives of recovering UK armed forces personnel*. Mil Psychol, 2022. **34**(4): p. 410-421.
165. Castle, C.L., N. Heinze, and R.S.M. Gomes, *A cross-sectional study of sleep, mood, wellbeing, motivations, and perceived support in Ukrainian veterans and active-*

- duty military personnel with disability, and their supporters, preparing for a sporting event.* *Frontiers in Psychology*, 2023. **14**.
166. Kemp, C., et al., *Sleep in Habitual Adult Video Gamers: A Systematic Review.* *Front Neurosci*, 2021. **15**: p. 781351.
 167. Aitchison, B., et al., *The experiences and perceived health benefits of individuals with a disability participating in sport: A systematic review and narrative synthesis.* *Disabil Health J*, 2022. **15**(1): p. 101164.
 168. Evans, M.B., et al., *Integrating insights from the parasport community to understand optimal Experiences: The Quality Parasport Participation Framework.* *Psychology of Sport and Exercise*, 2018. **37**: p. 79-90.
 169. Liang, M.H., *Longitudinal Construct Validity: Establishment of Clinical Meaning in Patient Evaluative Instruments.* *Medical Care*, 2000. **38**(9): p. II-84-II-90.
 170. Turgoose, D. and D. Murphy, *A systematic review of interventions for supporting partners of military Veterans with PTSD.* *Journal of Military, Veteran and Family Health*, 2019. **5**(2): p. 195-208.
 171. Gribble, R., et al., *Are we family? A scoping review of how military families are defined in mental health and substance use research.* *Journal of Military, Veteran and Family Health*, 2020. **6**(2): p. 85-119.
 172. Greer, N., et al., *VA Evidence-based Synthesis Program Reports, in Adaptive Sports for Disabled Veterans.* 2019, Department of Veterans Affairs (US): Washington (DC).
 173. Whitworth, J.W. and J.T. Ciccolo, *Exercise and Post-Traumatic Stress Disorder in Military Veterans: A Systematic Review.* *Military Medicine*, 2016. **181**(9): p. 953-960.
 174. Lawn, S., et al., *Women veteran transition mental health and wellbeing support group programs: A scoping review.* *Womens Health (Lond)*, 2024. **20**: p. 17455057241275441.
 175. Fischer, I.C., et al., *Wellbeing domains in U.S. military veterans: identifying modifiable factors to promote whole health.* *International Psychogeriatrics*, 2024: p. 1-7.
 176. Kligler, B., et al., *The Whole Health Transformation at the Veterans Health Administration: Moving From "What's the Matter With You?" to "What Matters to You?".* *Medical Care*, 2022. **60**(5): p. 387-391.