



Movement inequities: How Race, Class, and Gender Shape Access and Participation in Sport and Rehabilitation

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Abstract

Physical activity is a critical component of health and longevity, yet access to high-quality movement experiences, through sport, in early childhood and adolescence is unevenly distributed across social groups [1, 2]. For girls and women – particularly those with marginalized race, class, and gender identities – early inequities in physical activity contribute to physical and psychosocial disparities later in life [3-5]. Using an intersectional approach, we identify who is allowed to participate in sport and thus who has increased opportunities to develop physical literacy. Lower rates of physical activity among girls leads to increased risk for developing low bone density, cardiovascular disease, musculoskeletal injuries, and chronic pain as women age [6, 7]. Girls and women of color, in particular, are less likely to meet recommended physical activity levels, putting them at increased risk for sedentary-related cardiometabolic conditions [8]. Many girls and women from socioeconomically disadvantaged communities are also less likely to access necessary rehabilitative care [9]. Psychosocial consequences associated with physical inactivity (e.g., depression, reduced social connection, impaired cognitive functioning, elevated stress vulnerability) further compound these health disparities [10, 11]. As such, we argue that inequitable access to physical activity, through sport, functions as one upstream determinant of health and highlights the need for early intervention. Ensuring that all girls and women have meaningful opportunities to move is essential to improving health outcomes across the lifespan. Fewer childhood and early adolescence movement experiences can influence the prevalence and severity of conditions and responsiveness to treatment in adulthood. We offer evidence-based strategies for practitioners to reframe physical activity and exercise through sport access as a rehabilitation and health equity priorities.

Keywords: Girls of Color, Social Determinants of Physical Activity, Rehabilitation Outcomes, Youth Sport

Introduction

Physical activity is widely recognized as a foundational determinant of health and overall quality of life. A 2020 overview of 150 systematic reviews demonstrated a 13% reduction in mortality rates risk ratio among participants that engaged in a range of physical activity types, frequencies, and durations [12]. Physical activity has also been shown to improve important biological markers associated with chronic diseases such as hypertension, insulin-mediated glucose uptake, bone and muscle strength, and blood clotting/fibrinolysis [13]; it acts as both a prevention and intervention strategy for a variety of health outcomes.

For more than seven decades, scientific data has also highlighted the health consequences of physical inactivity. A sedentary lifestyle has been identified as an independent risk factor for chronic morbidity in adults [14]. Yet, the majority of Americans remain insufficiently active. More than 50% of children, 90% of adolescents, and 95% of young adults in the United States do not meet physical activity recommendations [15]. The results of a lack of movement over time are significant with physical inactivity estimated to cause 11% of premature mortality, 7% of disease burden from coronary heart disease, and 12% from colon cancer, among others [16].

Thus, the need to identify structures and pathways to increase activity levels across the lifespan and explore barriers that limit access to physical activity remains high. For practitioners in physical and occupational therapy as well as cardiac rehabilitation, these trends underscore not only the importance of engaging in rehabilitation but also in prevention efforts that foster physical literacy "movement competence and motivation" in childhood and early adolescence. Organized sport is one such arena in which young people in the United States may develop motoric competence, so examining inequities or barriers that limit access to sport and maximizing movement opportunities through sport are important areas for educational and advocacy efforts in rehabilitation settings. Often, sociocultural determinants (e.g., race, class, gender, ability status) are left out of

analyses of physical activity engagement, rehabilitation processes, and long-term health. This gap will be addressed, in part, by examining how the structural exclusion of girls and young women from early sport and movement experiences contributes downstream to rehabilitation disparities. Practical, evidence-based strategies to advance equitable rehabilitation and health outcomes will be offered.

Sport Involvement as an Upstream Determinant of Health

One of the largest structures for early physical activity engagement is youth sport participation. In the United States – with children increasingly engaged in organized, adult-supervised activities – more than half of, or twenty-seven million, youth aged six to seventeen play at least one sport [17]. Data from the National Survey of Children's Health (2022) indicated that, in seven states, at least 63% of their youth participate in sport. Of note, all seven states are majority White, economically affluent populations. One benefit of sport is the amount of movement involved. Research often demonstrates that when adolescents participate in organized sport, they attain higher rates of physical activity [18]. For example, in a study of six- to twelve-year-old boys, participants moved their bodies for an additional thirty minutes on days when they played organized sport when compared to nonsport days [19]. Girls may spend even more time in moderate to vigorous physical activity (MVPA) during practices with approximately 20 minutes per hour involving MVPA [20]. Data (mostly from Europe) demonstrates that early sport involvement leads to increased physical activity levels across the lifespan [21-23]. Malm and colleagues [24] found that developing a sport habitus by age 15 resulted in higher physical activity levels later in life as well. Early and sustained sport participation has the potential to foster foundational movement competencies and increased physical activity, which are both critical health determinants.

Sport participation is consistently associated with positive physical health and motor development outcomes across the lifespan. Results from over 8,000 adolescents from the National Longitudinal Study of Adolescent Health showed that playing organized sport during adolescence was associated with increased subjective health [25]. When surveyed, students in elementary school through high school also reported being involved in athletics improved their quality of life [26]. For girls and women, in particular, the benefits of sport participation and a concomitant increase in physical movement is associated with physical, psychological, and social benefits [27]. Specifically, physically active girls have higher cardiorespiratory fitness levels, lower obesity risks, and lower blood pressure levels [14]. Studies have also found that participating in karate and other weight-bearing activities at young ages can lead to higher bone mineral density for women, which is critical given that women are increased risk for developing bone diseases as they age [28]. Through practices and competition, young people also develop critical motor skills. The American Academy of Pediatrics reported that skills such as kicking, jumping, and throwing – often developed in athletics – are associated with better cardiovascular fitness into adolescence [29]. Thus, engaging in sport and physical activity provides girls and women with enduring physical benefits that extend beyond adolescence.

Sport participation has also been associated with improved mental health among girls and women. A recent meta-analysis demonstrated sport-involved adolescents reported significantly fewer anxiety-related symptoms [30]. Sport offers increased physical activity and social support from teammates that helps mitigate and reduce irritability and excessive worry or rumination, which are commonly associated with anxiety. Active girls and women report greater life satisfaction and a stronger sense of belonging as well [27]. These findings underscore that, among the many benefits of sport, athletic pursuits promote increased physical activity among girls and young women; and, importantly, support psychosocial wellbeing, which is an important determinant of long-term health and quality of life.

The intent is not to suggest that sport is a panacea or that the only way to improve health and quality of life among girls and women is to increase athletic opportunities. Even when sport is accessible, not all sport experiences are positive. Some female athletes, for example, mostly associated their college sport experiences with positive health outcomes, but they also reported low mobility and increased anxiety about quality of life [31]. And, former NCAA Division I athletes have indicated that college sport injuries negatively impacted their life by requiring pain interventions in adulthood as well as increasing physical functioning difficulties, rates of depression, anxiety, and sleep disturbances [32]. In addition, with a growing number of reports outlining abuse and neglect at the youth sport level [33], discontinuing sport participation may represent a health enhancing behavior in some circumstances. This limited but representative sample of studies highlights the need for positive, health-promoting sporting experiences that focus on using sport to increase physical activity levels and developing physical literacy and competency. In fact, doing so, might improve health outcomes, especially for girls and women.

Risks and Barriers in Youth Sport Engagement and Rehabilitative Care

Despite the documented benefits, everyone does not have equal access to sport and, therefore, many children and adolescents miss out on critical opportunities to develop motoric competence. Though boys are participating at lower rates than they have in the last eight years; the gendered sport participation gap is well documented and remains intact with 41% of boys and only 35.6% of girls aged 6-17 playing sport in the United States [17, 34]. A Women in Sport report [35] suggested that 43% of teenage girls who previously identified as “sporty,” disengaged from sport after primary school. The patterns of disengagement hold true when considering the impact of race as well. Approximately 40% of White youth play sport in the U.S.; whereas, only 34% of Black youth and almost 37% of Hispanic youth participate [17]. For girls and women of color, the numbers are even more deleterious. In a recent report of U.S. teen girls, White girls were significantly more likely to play a sport than Black or Hispanic girls with more than 50% of Black girls and 52.5% of Hispanic girls suggesting they are not engaged in athletics [36]. In the same report, fewer than one third of all girls play multiple sports with Black and Hispanic girls being least likely to compete in two or more sports (2021). This latter finding highlights the importance of an intersectional lens when viewing participation trends. As family income increases, so, too, do sporting opportunities. When the household income is less than \$50,000, fewer than one in three youth participate [17]. Race and economic differences change not only the number of opportunities available to play but also the quality of those experiences. White girls were three times more likely to play sport through a private organization while African American girls were far more likely to only engage in school-provided athletic programs [37]. These percentages and gaps reflect additional inequities and structural barriers that further constrain sport engagement.

Many girls and women face “triple jeopardy,” based on their marginalized gender, race, and class identities [38]. As a result, they face persistent risks and structural barriers that undermine their access to, and sustained engagement in, youth sport. By centering their unique, lived experiences, the sociocultural and structural factors impacting sport involvement and rehabilitative engagement can be better understood. Participation gaps exist for reasons other than “girls are not as interested in competing as boys” or “girls’ needs are being met by the current number of athletic opportunities offered” as many people might suggest. As Mann and Hacker [38] noted, the very real barriers that girls and women face exist at the macro (e.g., sport structure, gendered expectations, racism, classism, geographic location), meso (e.g., interpersonal interactions with coaches, friends, family, peers), and micro (e.g., personal factors like confidence, body image, motoric competence) level.

Cultural and attitudinal beliefs about sport impact girls' athletic experiences. In her recent book, Martin [39] argued that racial stereotypes and expectations are embedded into the sports fabric; and, this division and coding of sports along racial lines impact who is "allowed" to play which sports. This macro level barrier is further evidenced by a report that found Hispanic girls have the highest participation rates in soccer while Black girls were more likely to engage in basketball, cheerleading, and track and field than their White or Hispanic peers [36]. And, NCAA data indicated Black women make up less than 8% of female collegiate athletes outside of basketball and track [40]. Martin also demonstrates there are fewer (and different) sport types offered for girls in rural and urban areas and suggests that Black youth are more likely to grow up in "sport deserts" than their peers [39]. Where young women live, then, dictates the number and, often, the type of movement experiences available to them as well. These dynamics matter because they not only limit access but also impact community resources and self-perceptions.

Interactions with peers and coaches can also impact persistence and dropout rates. Meso- level factors often include interpersonal relationships. The coach-athlete relationship is a powerful indicator of sport persistence, and coaches often become key influencers of athletes by adolescence. Girls and women of color have noted that relationship biases and microaggressions negatively impacted their sport involvement decisions [41]. Peer groups can also influence athletic engagement. Lopez [42] found that Latina girls quit playing sport, in part, because they were teased by friends in school. Micro or individual level factors can also influence the sporting experiences of girls and women. For example, girls of color cited concerns about "sweating out" hairstyles and the time or cost to maintain hair after activity as a culturally specific personal barrier to sport and physical activity participation [43]. These interrelated barriers – occurring at the macro-, meso-, and micro- level – form a web that limits girls' athletic opportunities.

As a result, many girls and women have fewer opportunities to develop physical literacy during childhood and are, therefore, less likely to be active in adulthood. Only 36% of adult Black women achieve the national physical activity guidelines whereas 46% of White women achieve the recommendations [43]. Socioeconomically disadvantaged girls and women are far less likely to be physically active and an umbrella review found that it was particularly impactful to intervene with this group in childhood by expanding their movement experiences [44]. As a result, girls and women are also less likely to experience the aforementioned psychosocial and health benefits that often stem from early sport involvement and are more likely to experience health conditions associated with physical inactivity. Chronic diseases are disproportionately more prevalent in Latinas than in their White counterparts [45]. And, Black women are at increased risk for cardiometabolic diseases with 48.3% diagnosed with cardiovascular disease [46] and 9.9% with Type II diabetes [47]. Rehabilitation scholars and practitioners should be particularly interested about upstream lifestyle determinants of health and mobility such as physical activity and the factors that might help promote exercise (i.e. sport) as well barriers that limit access to movement experiences. These data suggest that the individuals most likely to need rehabilitative care are also the least likely to engage and persist in structured health-promoting and exercise-inducing environments. It will be important to educate and advocate for physical activity and sport, especially at an early age, as a risk reduction strategy.

An initial review of existing data suggests that similar barriers may limit girls' and women's access to, participation in, and experiences of rehabilitative care. Globally, men and women experience a similar prevalence of chronic conditions, but women live longer with the disease or disability [48]. As such, identifying strategies to promote care-seeking behaviors and improve experiences in recovery settings might be particularly impactful for women. In a scoping review of 65

sources, Ott et al. [49] found that women had lower rehabilitation access, use, adherence, and outcomes as well as a higher burden of caregiving among when compared to men. Sociocultural factors (at the macro level) such as identity-based biases impacting physician referrals and patient treatment as well as physical distance to rehabilitation facilities have been found to impact rehabilitation access and adherence in women [50]. Meso- level factors (e.g., high social support) positively impact the exercise behavior of women [51] and, to the contrary, in patients with chronic low back pain, a perceived lack of social support was associated with earlier disengagement from exercise sessions [52]. Some personal (micro) factors (e.g., increased body size and rates of depression) have also been associated with lower adherence in cardiac rehabilitation among women [53]. However, as is the case in the sport literature outlined above, personal factors often stem from and are related to macro-level factors. Taken together, these findings are especially important for girls and women who may also be less likely to reach out and engage in physical rehabilitation services in the first place. Paradoxically, those who stand to benefit most from sport and rehabilitation girls and women are also those most likely to encounter systemic barriers and individual vulnerabilities that impede equitable access, use, and persistence rates.

Evidence-Informed Strategies for Change in Function-focused Care Settings

Focusing on girls' and women's experiences has offered a pathway for understanding the web of barriers that works to limit and negatively impact their experiences in both sport and rehabilitation settings. These points are particularly salient as we know that developing physical literacy early in life and maintaining self-belief in one's movement competence across the lifespan positively impacts long-term health and quality of life. Rehabilitation professionals are uniquely positioned to implement evidence-informed strategies to remove access barriers, strengthen engagement, and promote sustained recovery for patients and clients who identify as girls and women.

Although rehabilitation practitioners do not typically work in athletic domains, their broader role in health promotion positions them to support and advocate for high-quality, meaningful sport and physical activity experiences as a way to increase physical activity across the lifespan. Doing so, may disproportionately benefit the same girls and women who are at greater risk for injury and chronic illness associated with physical inactivity. Structured, multicomponent activity programs, including sport and recreation, improve physical, cognitive, and socioemotional outcomes. The evidence offered earlier in this article supports the notion that sport and physical activity should be part of evidence-based rehabilitative care and not solely viewed as a peripheral "extra." To do so, clinicians and practitioners could encourage engagement in sport and other meaningful forms of physical activity, tailored to the needs and abilities of the individuals they serve. A qualitative study of physical therapists found that many practitioners view physical activity promotion as part of their role but often overlook or underutilize opportunities to connect patients with sport and recreation resources [54]. These advocacy efforts matter for many women, especially those with minoritized racial identities and those from economically disadvantaged households who also happen to be least likely to engage and yet would benefit most.

Access to sport may be limited for these groups, and rehabilitative care offers a critical touchpoint where they might learn about sustainable, community-based sport or physical activity opportunities. Focusing on local, community-based programming also lessens the impact of macro level barriers such as transportation and cost. Developing a professional network and building partnerships with YMCAs, Parks and Recreation leaders, and other recreational leagues to ensure timely information about upcoming sport seasons is offered is important. When appropriate, practitioners can support patients'

health by familiarizing themselves with local, accessible, affordable sport and physical activity options (e.g., running clubs, dance studios) and sharing that information in recognition of their professional responsibility to engage with the broader literature to promote health beyond traditional rehabilitation. Part of the education effort must also include problem-solving with patients and ensuring support staff are prepared to engage in solutions to barriers such as cultural concerns or cost. By integrating these practices into routine care, rehabilitation professionals ensure that girls and women not only recover effectively but also build sustained, health-promoting relationships with physical movement. Intentionally embedding sport in these settings and interactions has the potential to strengthen adherence, address disparities, and prevent or reduce future disease burden among girls and women.

Similar evidence-based strategies could directly advance equitable access, engagement, and recovery in rehabilitative care settings as well. One tactic is to implement culturally responsive, gender-inclusive programming and communication to address many of the sociocultural barriers that women face that make physical recovery more challenging. A review of the literature found biases concerning who will adhere to cardiac rehabilitation protocol can impact referrals [49] and women are less likely than men to be recommended for physical therapy in response to experiences of chronic pain [55]. Although Engel's [56] biopsychosocial model is oft used in medical and rehabilitation settings, in practice, scholars argue psychological and biological factors are frequently the focus rather than social and cultural elements that may impact clinical guidelines or performance indicators [57]. And, yet, we know that cultural experiences, for example, can influence how people interpret and relate to their pain. Accordingly, Reis et al. [58] argue that practitioners should use culturally appropriate examples, metaphors, and images to educate patients about pain as well as share culturally adapted evidence-based materials and resources. Normalizing women's competing roles (e.g., work, caregiving) and problem-solving with patients to reduce role conflict as well as offering more flexible treatment plans would also reduce the structural and cultural barriers at-play. These behaviors might improve adherence rates among culturally diverse girls and women, in particular. Ott and colleagues' [49] review also found that female providers are more likely to refer women patients for critical rehabilitative care, so a related strategy would be to review all organizational hiring policies to try to increase the gender diversity among practitioners in sports medicine, physical and occupational therapy, as well as cardiac rehabilitation settings. Targeted strategies such as these recognize the lived experiences of diverse girls and women and help foster more effective, culturally attuned care.

To address meso-level barriers, a second strategy is to integrate group- or peer-supported rehabilitation activities that provide shared experiences, accountability, and a sense of belonging. While practitioners often discuss the importance of social or peer support with patients, it is far less common to see these approaches integrated into treatment plans. This approach would address the lack of social support and isolation that many girls and women report as a barrier. Peer or group support might be particularly useful during transitions from inpatient rehabilitative care settings. As Mugasi & Papadimitriou (2021) suggested, there are many considerations for implementing this type of change into the rehabilitation process such as ideal times or moments for implementation, preferred environment for support (e.g., in therapy clinics, conference rooms), and modalities (e.g., in person, phone). Offering small group or partner-based exercises or creating culturally-specific rehab spaces might be beneficial for promoting adherence to treatment among girls and women specifically.

It is also imperative to address personal barriers that might influence adherence. For example, practitioners could implement strategies

that improve exercise competence among patients. In a recent review of the literature, reinforcement from clinicians was on adherence-boosting strategies [59]. In addition, studies have found that offering both progressions and variations as well as opportunities for correction can be helpful [60, 61]. If skill development is intentionally designed as well as recognized and reinforced by the practitioner, then patients' perceived competence would be enhanced. Girls and women may be more likely to adhere to rehabilitation protocols when they experience these conditions since perceived competence is a relevant personal variable.

Each of these evidence-based strategies could help promote sport and physical activity as part of healthy living. An approach to rehabilitation that targets and reduces macro-, meso-, and micro-level barriers to engagement and adherence to exercise can benefit practitioners working in rehabilitative care settings as they work to positively impact health outcomes and recovery for girls and women.

Conclusion: Sport and Physical Activity as a Rehabilitation Priority

As outlined in this paper, promoting sport participation among girls and women can increase overall physical active levels, a well-established determinant of health and quality of life. For rehabilitation practitioners, understanding the relationship between sport engagement and lifelong physical activity is essential as it provides the broader context shaping patients' health outcomes. By recognizing sport as a meaningful arena in which sustained activity might be established and promoted, professionals contribute to health-promoting interventions that extend beyond the clinical setting and support girls and women in achieving functional health capabilities throughout their lives.

Second, we addressed macro-, meso-, and micro-level barriers that limit girls' and women's access to and participation in sport as well as their engagement and adherence in rehabilitation. Structural inequities often stemming from cultural norms, social interactions, and personal factors interact to constrain opportunities and shape adherence trends. Practitioners are encouraged to connect clients and patients with local and recreational sport opportunities, integrate education and advocacy for these resources into patient-centered care practices, and develop professional networks that allow them to remain informed about relevant, culturally-appropriate, community-based programs. Such efforts have the potential to reduce both personal and structural barriers to physical activity and facilitate opportunities for girls and women to develop physical literacy and competence.

Finally, strategies to reduce disparities within rehabilitation settings themselves must account for multilevel barriers and influences. Although not an inclusive list, a number of strategies were offered to practitioners in this paper. Offering progressive and adaptable treatment plans and exercise protocols, reinforcing skill development, providing partner-supported rehabilitation formats, and reducing gender and cultural biases would promote engagement and adherence among girls and women. By incorporating these evidence-informed approaches, rehabilitation specialists and related practitioners can create environments that not only restore function but also influence positive health outcomes for women throughout the lifespan.

Conflicts of Interest: The authors declare no conflicts of interest.

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