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Developmental Outcomes for Young People Participating in Informal and Lifestyle Sports: A Scoping Review of the Literature, 2000–2020

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Abstract: The aim of this study is to review the literature on lifestyle sports and lifestyle sport contexts with regard to the developmental potential they may represent in young people's everyday lives. The review applies a relational developmental systems approach to youth development. The eligibility criteria are based on the phenomenon of interest and outcomes. Hence, we include studies examining the associations between young people performing lifestyle sports and potential developmental outcomes: mental, biological, social, and behavioral. The present study shows that the volume of research on informal lifestyle sport is rather extensive and that studies on the way these activity contexts may affect developmental processes in youth are diverse and wide ranging. The studies suggest that performing lifestyle sports may have several beneficial health and skills outcomes. Furthermore, positive associations are suggested between involvement in lifestyle sport contexts such as climbing, snowboarding, parkour, tricking, kiting, and surfing and (a) mental outcomes such joy, happiness, freedom, euphoria, motivation, self-efficacy, and well-being; (b) social outcomes such as gender equality, network building, social inclusion, interaction, friendship; and (c) behavioral outcomes such as identity, creativity, and expressions of masculinity and/or femininity. The review performed indicates that lifestyle sport contexts are flexible according to needs and desires that exist among the practitioners and that the human and democratic origins of these contexts make them supportive for positive movement experiences and for positive youth development. The findings have implications for PE teachers, social workers, policymakers, sport organizations, and urban architecture, in that providing lifestyle sport opportunities in the everyday lives of young people will foster a holistic development in a positive way.

Keywords: youth sport; lifestyle sports; sporting behavior; literature review; leisure sport

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1. Introduction

Research has confirmed positive associations between participation in organized, traditional, and competitive youth sports and various variables promoting youth development (Agans et al. 2014; Green et al. 2015; Högman and Augustsson 2017). In line with these associations, governments and policymakers have funded national sport federations and promoted traditional sport contexts to support developmental processes in individuals and to combat health problems and social challenges in society (e.g., criminality and unemployment among youths), as well as means for educational attainment (Lindsey 2020; Strittmatter and Skille 2017).

However, during the last 50 years, the Western world has witnessed a change in societal movement cultures. Traditional and organized competitive sports still dominate the public domain, yet the movement culture has become more diverse in terms of new

activities and thus new activity contexts based on different values and aims compared to traditional Olympic sports (see also King and Church 2015). In this new diversity, the growth of activities categorized under the umbrella term "lifestyle sports" (e.g., skateboarding, snowboarding, surfing, parkour, tricking, freeride skiing, longboarding, rock climbing, and other types of informal, explorative, and expressive movement activities) has garnered increased attention (Bignold 2013; Jonasson and Eriksson 2022; Rindler et al. 2022; Säfvenbom et al. 2018; Van Bottenburg and Salome 2010; Wheaton 2004; Wheaton et al. 2017). Research has shown that despite public concern regarding a lack of adult leaders and structure, the number of young people involved in these types of activity contexts has been steadily growing in many nations (Howell 2008; Jeanes et al. 2022; King and Church 2015; Thorpe 2012; Wheaton 2013) all over the world. In the early part of the research on lifestyle sports, these contexts were associated with some kind of subcultural positioning, but recent research has shown that the image of nonconformist outsiders has diminished. During the last 10 years, lifestyle sports have emerged and expanded in many ways. Yet, despite commercialization, sportification, and industrialization (Edwards and Corte 2014; Strittmatter et al. 2018), many young practitioners today who are involved in tricking, skateboarding, parkour, and other action- or adventure-oriented activities defend and practice the grassroots idea of participating in an independent, self-organized, and commitment-based alternative to traditional and competitive youth sports. Due to what seems to be a preferred absence of an authorized adult or instructor (Säfvenbom and Stjernvang 2020) and despite lack of governmental support (Jeanes et al. 2019), commitment-based, peer-oriented, and self-organized lifestyle sport contexts seem to persist as alternatives to traditional competitive youth sports, instructed by an appointed and formal authority.

The 20 years between 2000 and 2020 were characterized by an increasing interest in lifestyle sports. Although many studies during the last 20 years have considered lifestyle sport contexts as developmental assets for young people, this research has so far not been reviewed. This may have to do with a remaining notion of lifestyle sports as deviant, and of lifestyle sport contexts as unstructured groups of young people who engage in transgressive behaviors and who challenge existing values in sports (Midol and Broyer 1995, p. 210). The aim of this study is therefore to review the literature on lifestyle sports and lifestyle sport contexts with regard to the developmental potential they may represent in young people's everyday lives.

A Relational Developmental Systems Approach

Studying the developmental outcomes of involvement with any potential developmental asset such as self-organized lifestyle sports requires an idea of what human development is. In other words, assessments of movement contexts as developmental contexts require an understanding of what human development processes require and thus what can be considered developmental outcomes.

Within contemporary developmental science, variants of relational developmental system (RDS) theories have been claimed as being at the cutting-edge of the field (Lerner 2018). RDS theories are anchored in a process-relational paradigm (Overton 2015), acknowledging that human development cannot be understood without focusing on developmental processes and interaction. From an RDS perspective, human development is a result of "person $\leftrightarrow$ context relations within a certain culture and time of history" (Säfvenbom et al. 2018, p. 1992), and from this perspective, plasticity at both ends of the relationship is considered crucial for optimizing development processes. RDS theories offer this perspective to the study of development among young people in school and leisure contexts (Lerner et al. 2015; Lerner 2018) by analyzing "the goodness of fit" between individual characteristics of the person and current contextual specificities (e.g., lifestyle sports).

RDS models seek to understand human development by considering all parts of the person (biological, mental, social, and behavioral dimensions) and all parts of the environment (local, national, and international dimensions) as dynamic and relational systems (Lerner et al. 2015). Because these systems both affect each other and receive influence

from each other in a mutual relationship within a given historical period, they cannot be considered independently of each other. Development occurs because of changes in and between these systems. Not all changes lead to development in a young person, but for development to occur, a change must occur in one of the many relational systems. Based on this process-relational understanding of human development, the present review approaches the existing literature on lifestyle sport contexts from an integrative human development perspective incorporating biological, psychological, sociological, and historical perspectives. The lifestyle sport contexts studied in this review represent the historical dimension in terms of being something new and different compared to traditional sports, whereas outcomes are studied as biological, social, mental, and behavioral outcomes.

2. Materials and Methods

This study is an overview of peer-reviewed publications examining lifestyle sports and developmental outcomes in youth published between 2000 and April 2020. We have performed a literature search in seven databases because we aimed to include the majority of publications in this period. The aim of the study was to determine the scope of the literature, allowing for multiple methodological approaches, participants, and activities. As such, the review qualifies as a scoping review and not a systematic review (see Munn et al. 2018).

2.1. Literature Search

One researcher (G. P. B.), with help from a librarian, searched for peer-reviewed publications in the databases of PubMed, Web of Science, PsycINFO, ERIC, SPORTDiscus, EMBASE, and CINAHL in April 2020, using the following search words and combinations: (lifestyle sport* OR action sport* OR adventure sport* OR informal sport* OR alternative sport* OR extreme sport* OR self-organized sport* OR skateboard* OR snowboard* OR surfers or surfing OR bouldering OR rock climbing OR sport climbing OR traditional climbing OR indoor climbing OR parkour or tricking OR mountain bike OR beach volleyball OR street dance OR death diving OR frisbeegolf OR bossaball OR spikeball OR pickleball OR stand-up paddle surfing OR trampoline OR break dance OR circus OR drone racing OR freeski OR BMX OR longboard OR inline skating OR scootering OR ultimate frisbee OR bike polo OR capoeira) AND (youth* OR adolescent* OR young people OR young adult* OR children OR child OR teenager*). Where possible, the search was limited to peer-reviewed publications, publication year (2000 to April 2020), English language, and studies on humans.

2.2. Inclusion Criteria and Study Selection

One researcher (G. P. B.) assessed the retrieved studies for eligibility by reviewing the titles and/or abstracts using the software Distiller SR by Evidence Partners (Ottawa, ON, Canada, https://www.evidencepartners.com/products/distillersr-systematic-review-software, accessed on 1 April 2020), whereas full texts were divided between all authors and assessed for eligibility at the final stage. If there was uncertainty regarding inclusion or data extraction, this was discussed with the other authors before any decisions were made.

The eligibility criteria were as follows: Phenomenon of interest and outcomes: we included studies examining the associations between performing lifestyle sports and potential developmental outcomes (mental, biological, social, and behavioral). Although we recognize the importance of acquiring an overview of the literature examining the risk of injuries related to performing lifestyle sports, this was beyond the scope and feasibility of this review. Studies that examined injuries in lifestyle sports were therefore excluded from this overview article. *Sample:* the sample had to include participants between 10 and 25 years old, and they had to perform lifestyle sports. We excluded studies only examining competing athletes. We included both youth with and without disabilities/other health constraints. *Design*: we included qualitative and quantitative studies and had no exclusion criteria on study design. *Publication type*: we excluded theoretical or conceptual publi-

cations, publications not published in peer-reviewed journals, conference abstracts, and publications not written in English. *Publication year:* we excluded publications published prior to 1 January 2000.

The main reasons for the exclusion of publications at abstract and full-text screening were that the included participants did not perform lifestyle sports or studied competitive athletes; the publications were theoretical or conceptual papers or conference abstracts; there was no eligible outcome (mainly publications examining injuries).

The search resulted in 3866 potentially relevant studies after elimination of possible duplicates. From the initial search, 499 publications were included in the full-text assessment after screening the titles and abstracts. In total, 173 studies met the inclusion criteria and were included in the present overview of the literature. We divided all the included publications into categories based on outcome (biological, performance, mental, social, and behavioral). If a publication included more than one of the outcome categories (e.g., biological and mental), it was included in all relevant categories (Figure 1).

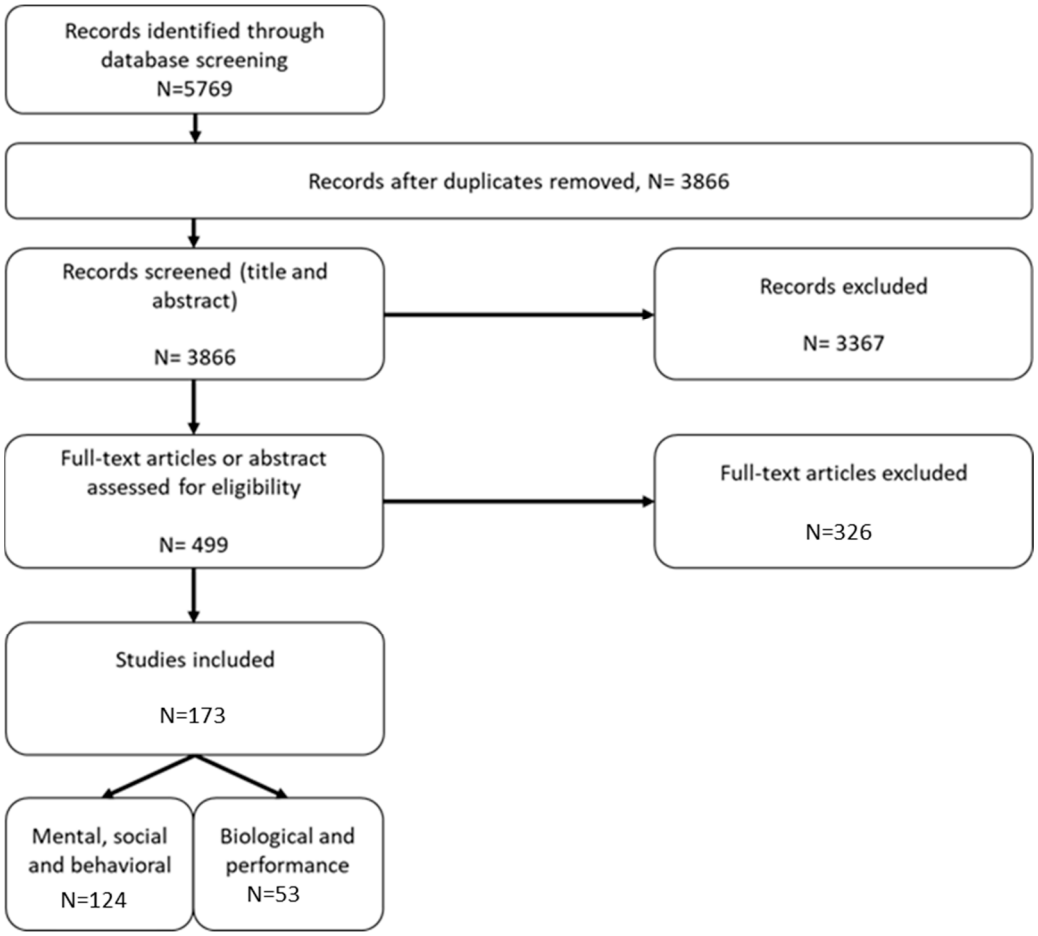

Figure 1. Flow chart of the included articles. Note: some of the publications (n = 3) include both biological/performance outcomes and mental/social/behavioral outcomes and are included in both categories at the final stage in the figure.

2.3. Data Extraction

Three researchers (R. S., A. M. S., and G. P. B.) shared the publications and extracted the following information: first author's name, year of publication, sports performed, study design, outcome category, outcome, and main result.

3. Results

In line with our theoretical understanding of human development, we structured the results of our study in form of (a) biological and performance outcomes and (b) mental, social, and behavioral outcomes for young people's participation in lifestyle sports. In this section, we provide a more descriptive overview before digging deeper and discussing the insights in the section that follows.

3.1. Biological and Performance Outcomes

Overall, the literature search resulted in 53 unique studies with biological and performance outcomes. The results from the studies are provided in Table 1 and were categorized as either beneficial, mixed (the study included several measures for the outcome and suggested both beneficial and no association), or having no association. Table 2 provides the references. The most studied outcome was metabolic cost or training intensity, and the results suggested that performing lifestyle sports is associated with an intensity or metabolic cost equivalent to the physical activity recommendations (at least moderate intensity). This applied for all the studied sports, except paragliding (Wilkes et al. 2018). Six out of eight studies suggested that performing climbing, trampolining, or surfing is associated with a more beneficial body composition or body weight. Twelve of fourteen studies suggested performing lifestyle sports benefits motor skills, including randomized controlled trials (RCTs) suggesting effects of trampolining on jumping height (Atiković et al. 2018; Arabatzi 2018; Giagazoglou et al. 2013) and balance (Arabatzi 2018; Giagazoglou et al. 2013; Zhong et al. 2019), effects of inline skating on balance and jumping height (Muehlbauer et al. 2013), and effects of climbing on balance (Aykora 2019). Three studies suggested the benefits of performing climbing (Aras and Akalan 2016) or surfing (Clapham et al. 2020; Hignett et al. 2018) on cardiorespiratory fitness, whereas nine of fourteen studies suggested an association between performing lifestyle sports and muscle strength/endurance. Of these, one RCT study suggested muscle strength and endurance effects of rock climbing on left elbow flexion and extension, and right elbow extension, but not right elbow flexion (Aras and Akalan 2016); one RCT suggested effects of indoor climbing on core muscle and hand-grip strength (Muehlbauer et al. 2012); and one RCT suggested an effect of trampoline training on knee-muscle strength (Zhong et al. 2019). We found eight studies that examined the association between lifestyle sports (climbing, surfing, and trampolining) and flexibility. Overall, five of these studies suggested a beneficial association between performing these sports and flexibility (Clapham et al. 2018; Aykora 2019; Giagazoglou et al. 2013; Koca et al. 2019; Muehlbauer et al. 2012), whereas two showed mixed results (Armitano et al. 2015; Siegel et al. 2015). We found few studies examining lifestyle sports in relation to systolic and diastolic blood pressure (Hignett et al. 2018), bone mineral density (Sherk et al. 2010), and markers of inflammation (Momesso dos Santos et al. 2015). One RCT showed that trampolining might benefit cystic fibrosis patients by reducing disease symptoms (Kriemler et al. 2016), whereas other studies were unclear on the medical benefits of performing lifestyle sports in children and adolescents with cerebral palsy (Böhm et al. 2015) or cystic fibrosis (Currant and Mahony 2008). Three studies suggested that participation in climbing or skateboarding might improve skills in other sports (i.e., ice climbing and snowboarding, respectively; Kunzell and Lukas 2011).

Table 1. Biological and performance outcomes categorized by outcome sample, lifestyle sport, study design, kind of outcome, and study participants.

Outcome Category	Outcome Sample	Lifestyle Sport	Study Design	Beneficial Association (Number of Articles)	Mixed Results [1] (Number of Articles)	No Association (Number of Articles)	Participants within Category
Biological benefits (unique studies = 48)							
	Body composition/body weight	Climbing	RCT	2			
			Experiment [2]	1	1		
			Cross-sectional	1			
		Trampolining	Experiment [2]	1			
		Surfing	Case report			1	Autism spectrum disorder: 1
			Experiment [2]	1			
	Motor skills [3]	Capoeira	Experiment [2]		1		Hearing disabilities: 1
		Circus arts	Experiment [2]	1			
		Climbing	RCT	2			Cerebral palsy: 2
			Experiment [2]	1	1		
		Inline Skating	RCT	1			
		Mixed activities	Experiment [2]	1			
		Parkour	Cross-sectional	1			
		Snowboarding	Experiment [2]			1	
		Trampolining	RCT	4			Intellectual disability: 1
			Experiment [2]	1			
	Cardiorespiratory fitness	Climbing	RCT	1			
		Surfing	Experiment [2]	2			Disabilities:1
	Muscle strength/endurance	Climbing/bouldering	RCT	1	1		Cerebral palsy: 1
			Experiment [2]	2	2	1	
			Cross-sectional	2			
		Parkour	Cross-sectional	1			
		Surfing	Experiment [2]:	1	1		Disabilities: 2
			Case-report	1			Autism spectrum disorder: 1
		Trampolining	RCT	1			

Table 1. *Cont.*

Outcome Category	Outcome Sample	Lifestyle Sport	Study Design	Beneficial Association (Number of Articles)	Mixed Results [1] (Number of Articles)	No Association (Number of Articles)	Participants within Category
	Flexibility	Climbing	RCT	2			
			Experiment [2]		1	1	
		Surfing	Experiment [2]		1		Disabilities: 1
			Case-report	1			Autism spectrum disorder: 1
		Trampolining	RCT	1			
			Experiment [2]	1			
	Metabolic cost/training intensity [4]	Capoeira	Cross-sectional	1			
		Climbing	Cross-sectional	6			Autism spectrum disorder: 1
		Paragliding	Cross-sectional			1	
		Scootering	Cross-sectional	1			
		Skate-/long-boarding	Cross-sectional	2			
		SUP	Cross-sectional	1			
		Surfing	Cross-sectional	3			Autism spectrum disorder: 1
			Case-report	1			
		Trampolining	Cross-sectional	1			
		Ultimate Frisbee	Cross-sectional	1			
	Systolic/diastolic BP	Surfing	Experiment [2]			1	
	Inflammation	Circus arts	Experiment [2]	1			Overweight/obese children: 1
	Bone mass/bone mineral density	Climbing	Cross-sectional			1	
	Medical conditions	Climbing	RCT			1	Cerebral palsy
		Trampolining	RCT	1			Cystic fibrosis: 2
			Cross-sectional		1		

Table 1. *Cont.*

Outcome Category	Outcome Sample	Lifestyle Sport	Study Design	Beneficial Association (Number of Articles)	Mixed Results [1] (Number of Articles)	No Association (Number of Articles)	Participants within Category
Performance (unique studies = 7)							
	Skills in other sports	Climbing	Cross-sectional	2			
		Skateboarding	Experiment [2]	1			
	Sport-specific skills	Climbing	Experiment [2]	2			Cerebral palsy: 1
			Cross-sectional	1			
		Surfing	Cross-sectional	1			

Note. [1] Mixed results: reported beneficial associations for some of the outcome measures, but not for others. [2] Experiment with no randomization or no control group. [3] Motor skills include basic locomotor motor skills, mostly jumping length/height and balance. [4] Metabolic cost/intensity at least at moderate intensity while performing the sport; moderate intensity consistent with physical activity recommendations. BP = blood pressure; RCT = randomized control trial; SUP = stand-up paddleboard.

Table 2. References on biological and performance outcomes included in the study.

Outcome Category	Outcome Sample	Lifestyle Sport	Beneficial Association (References)	Mixed Results (References)	No Association (References)
Biological benefits					
	Body composition/body weight	Climbing	(Aras and Akalan 2016; Aykora 2019; Balas et al. 2009; Sherk et al. 2010; Siegel et al. 2015)	(Siegel et al. 2015)	
		Trampolining	(Aalizadeh et al. 2016)		
		Surfing	(Clapham et al. 2020)		(Clapham et al. 2018)

Table 2. *Cont.*

Outcome Category	Outcome Sample	Lifestyle Sport	Beneficial Association (References)	Mixed Results (References)	No Association (References)
	Motor skills	Capoeira		(Lima 2017)	
		Circus arts	(Kriellaars et al. 2019)		
		Climbing	(Aykora 2019; Böhm et al. 2015; Gallotta et al. 2015)	(Schram Christensen et al. 2017)	
		Inline skating	(Muehlbauer et al. 2013)		
		Mixed activities	(De Araujo et al. 2012)		
		Parkour	(Grospretre and Lepers 2016)		
		Snowboarding			(Klos et al. 2019)
		Trampolining	(Arabatzi 2018; Atiković et al. 2018; Giagazoglou et al. 2013; Zhong et al. 2019; Aalizadeh et al. 2016)		
	Cardiorespiratory fitness	Climbing	(Aras and Akalan 2016)		
		Surfing	(Clapham et al. 2020; Hignett et al. 2018)		
	Muscle strength/endurance	Climbing/bouldering	(Balas et al. 2009; Fryer et al. 2017; Lirgg et al. 2006; Muehlbauer et al. 2012; Wong and Ng 2008)	(Aras and Akalan 2016; Gallotta et al. 2015; Schram Christensen et al. 2017)	(Siegel et al. 2015)
		Parkour	(Grospretre et al. 2018)		
		Surfing	(Clapham et al. 2018, 2020)	(Armitano et al. 2015)	
		Trampolining	(Zhong et al. 2019)		
	Flexibility	Climbing	(Aykora 2019; Muehlbauer et al. 2012)	(Siegel et al. 2015)	(Gallotta et al. 2015)
		Surfing	(Clapham et al. 2018)	(Armitano et al. 2015)	
		Trampolining	(Giagazoglou et al. 2013; Koca et al. 2019)		

Table 2. *Cont.*

Outcome Category	Outcome Sample	Lifestyle Sport	Beneficial Association (References)	Mixed Results (References)	No Association (References)
	Metabolic cost/training intensity	Capoeira	(Moreira et al. 2018)		
		Climbing	(Fencl et al. 2011; Oriel et al. 2018; PanáČková et al. 2014; Siegel et al. 2015; Theodosiou et al. 2000; Watts and Ostrowski 2014)		
		Paragliding			(Wilkes et al. 2018)
		Scootering	(Kijima et al. 2007)		
		Skate-/longboarding	(Board and Browning 2014; Hetzler et al. 2011)		
		SUP	(Willmott et al. 2020)		
		Surfing	(Barlow et al. 2014; Bravo et al. 2016; Clapham et al. 2018; LaLanne et al. 2017)		
		Trampolining	(Budzynski-Seymour et al. 2019)		
		Ultimate Frisbee	(Madueno et al. 2017)		
	Systolic/diastolic BP	Surfing			(Hignett et al. 2018)
	Inflammation	Circus arts	(Momesso dos Santos et al. 2015)		
	Bone mass/Bone mineral density	Climbing			(Sherk et al. 2010)
	Medical conditions	Climbing			(Böhm et al. 2015)
		Trampolining	(Kriemler et al. 2016)	(Currant and Mahony 2008)	
Performance					
	Skills in other sports	Climbing	(Seifert et al. 2013; Seifert et al. 2016)		
		Skateboarding	(Kunzell and Lukas 2011)		
	Sport-specific skills	Climbing	(Blasing et al. 2014; Espana-Romero et al. 2012; Schram Christensen et al. 2017)		
		Surfing	(Barlow et al. 2014)		

3.2. Mental, Social, and Behavioral Outcomes

In the literature search, 124 unique studies that focused on mental, social, and behavioral outcomes were identified. The results of these studies are provided in Table 3, and they were categorized as either positive, negative, or neutral based on whether the outcome was considered favorable. Table 4 provides the references of the included studies. Although some studies only focused on one type of outcome, a major part of the literature found a mix of outcomes (see Table 3). Of the total numbers of studies, 13 unique studies showed positive associations between practicing lifestyle sports and changes in mental systems. Examples of mental outcomes from practicing lifestyle sports are joy and happiness, freedom, euphoria, motivation, self-efficacy, and well-being (e.g., Carlman and Hjalmarsson 2019; Motl et al. 2000). For example, Eckstein and Rüth (2015) found that activities such as rock-climbing have positive outcomes on attention and affect regulation for children and adolescent psychiatric inpatients. In addition to the 13 mentioned studies, we found 12 studies that solely included social outcomes, such as gender equality, network building, social inclusion and exclusion, interaction, and friendship (see, e.g., Müller and Mutz 2019; Sisjord 2012; Spencer-Cavaliere et al. 2017), and 13 studies that included only behavioral outcomes, such as identity, creativity, expressions of masculinity and/or femininity, knowledge development, risk taking, sporting behavior, and use of alcohol (see, e.g., Cheng and Tsaur 2012; Oriel et al. 2018; Säfvenbom and Stjernvang 2020).

However, the most frequent identified outcomes are the combination of social and behavioral outcomes (37 articles). One of the most identified outcomes was building of community, social participation, and identity construction, such as studies that showed lifestyle sports enhance the construction of gender identity—both masculinity and femininity—in skateboarding, snowboarding, and parkour (Atencio et al. 2013; Dupont 2014; Kelly et al. 2005; Kidder 2013; Thorpe 2010), which also affect social hierarchy. These mechanisms were shown in Dupont's (2014) study on core and consumer skateboarders and in Sisjord's (2009) study on various identities of female snowboarders. The outcome "identity within a community" was classified as a positive outcome because it enhances community and comradery (see e.g., Bradley 2010) and negative as a show of status (Edensor and Richards 2007) and enhancing social class differences. Table 3 shows additional examples of the identified outcomes.

One-fifth of the 124 studies reviewed included a mix of mental, behavioral, and social outcomes connected to lifestyle sports. An example is Wheaton et al.'s (2017) qualitative study identifying improved life chances, self-improvement, self-management, self-governance, and self-reliance among the young participants of a surfing program. Other examples of positive outcomes of this category are resilience, self-esteem, interpersonal relationships, and increased school attendance, which Momartin et al. (2018) identified among young refugees practicing capoeira. Loiselle et al. (2019) found increased self-perception and self-efficacy, enhanced participation levels, and decreased parental bonding among young people living with physical disabilities practicing circus activities.

Although most of the included studies are qualitative, several experiments and mixed-method studies were also examined. The study participants showed a variation of young people who were already regularly active in lifestyle sports, but also young people in general without specified physical activity behavior. Several studies covered marginalized young people (e.g., Ugolotti 2015), as well as people with physical and mental disabilities (e.g., Loiselle et al. 2019).

Table 3. Mental, social, and behavioral outcomes categorized by outcome sample, lifestyle sport, study design, type of association, and study participants.

Outcome Category	Outcome Sample (Examples)	Lifestyle Sports Sample (Examples)	Study Design	Beneficial Associations (Number of Articles)	Negative Associations (Number of Articles)	Neutral Association/No Outcome (Number of Articles)	Participants within Category
Mental outcomes (unique studies = 13)	Joy, freedom, euphoria efficacy, satisfaction, confidence, perception of self, motivation, self-efficacy, emotion, well-being	Climbing, caving, circus arts, surfing, sailing, street dance, trampolining, surfing	Qualitative study	5		1	Children and adolescent psychiatric inpatients, young people participating in lifestyle sports
			Experiment	5			(School) children, young people; autism spectrum disorder
			Cross-sectional	1			Young people participating in lifestyle sports
			RCT			2	Children with special needs
Social outcomes (unique studies = 12)	Gender equality, network building, social capital, social inclusion, democratic values, teamwork, health equity, social esteem, interaction with other young people, friendship, sport skills	Circus arts, snowboarding, parkour, urban football, skateboarding	Qualitative study	9	2		Marginalized youths; children and young people participating in lifestyle sports
			Cross-sectional	1			Young people
			Mixed methods	1			Street-involved youths
Behavioral outcomes (unique studies = 13)	Identity (construction), creativity, expressions of masculinity/femininity, taking risks, sporting behavior/sport participation, use of alcohol, environmental consciousness	Surfing, rock climbing, Ultimate Frisbee, parkour, street dance, capoeira, dance	Qualitative	5	2	1	Children and young people participating in lifestyle sports
			Cross-sectional	2	1	1	Children and young people; young people participating in lifestyle sports
			Experiment	2		1	Adolescents with autism spectrum disorder; at-risk adolescents

Table 3. *Cont.*

Outcome Category	Outcome Sample (Examples)	Lifestyle Sports Sample (Examples)	Study Design	Beneficial Associations (Number of Articles)	Negative Associations (Number of Articles)	Neutral Association/No Outcome (Number of Articles)	Participants within Category
Mental/behavioral (unique studies = 14)	Hyperthymic temperament; self-regulation, learning of skills, attention, hedonic balance, and life satisfaction; mix of above examples	Street dance, trampolining, surfing, extreme sports, trolley surfing, capoeira, skateboarding, snowboarding	Qualitative study	6		1	Children associated with attention-deficit/hyperactivity disorder; young people; young people living and learning in a risk society
			Experiment	4			Young people with mental health needs who are experiencing social exclusion; minority schoolchildren (predominantly Black and economically disadvantaged); at-risk youth
			RCT	1			Young adults with anxiety disorders
			Multiple-baseline across skills design	1			A family of three children: 11-year-old boy with autism spectrum disorder and his two siblings
			Case-control			1	Young people engaging in extreme or/and high-risk sports, and age- and sex-matched control group
Mental/social (Unique studies = 10)	Freedom, identity, disciplinary power, spatial limitations; mix of above examples	Kitesurfing, rock climbing, circus arts, freeriding, skateboarding, skiing	Qualitative study	8	2	1	Youth in Gaza, Indigenous youth, children and young people participating in lifestyle sports, young people
			Cross-sectional	2		1	Youth with disabilities; young people participating in lifestyle sports

Table 3. *Cont.*

Outcome Category	Outcome Sample (Examples)	Lifestyle Sports Sample (Examples)	Study Design	Beneficial Associations (Number of Articles)	Negative Associations (Number of Articles)	Neutral Association/No Outcome (Number of Articles)	Participants within Category
Social/behavioral (unique studies = 37)	Autonomy, community, gender equality, social class equality, interpersonal skills, youth engagement, trust, gender identity, social hierarchy, social inclusion and exclusion; mix of above examples	Martial arts, mountain biking, longboarding, tricking, wakeboarding, windsurfing, roller derby, skateboarding, snowboarding, snowshoeing	Qualitative study	23	4	6	Young people participating in lifestyle sports, children of immigrants' identity, marginalized youth, children and their families from socially disadvantaged areas, parents of children with disabilities
			Cross-sectional	3		2	Young people
			Experiment	3			Refugees, students
			Mixed methods	5	1	1	Young people, marginalized youth, young people participating in lifestyle sports
Mental/Social/behavioral (unique studies = 25)	Mix of the above; reduced trauma, achieving goals, empathy towards new culture, mental well-being	Dance, kayaking, paddle boarding, sailing, unicycling, quidditch, capoeira, rock climbing, skateboarding, parkour, circus arts	Qualitative study	16			Children and adults requiring physical, cognitive, and/or psychosocial supports; at-risk disengaged youth; Indigenous youth in Australia; young people living with physical disabilities; young males diagnosed with high-function autism; youth in sites of war, conflict, and disaster; young people participating in lifestyle sports
			Cross-sectional	1			Young people participating in lifestyle sports
			Experiment	4			Schoolchildren, young people facing mental health issues or social exclusion; refugees
			Mixed methods	3			Children who experienced abuse with families
			Quasi-experiment	1			Young people

Note. Beneficial, negative, and neutral outcomes can occur in the same study.

Table 4. References on mental, social, and behavioral outcomes included in the study.

Outcome Category	Outcome Sample (Examples)	Lifestyle Sports Sample (Examples)	Beneficial Associations (References)	Negative Associations (References)	Neutral Association/No Outcome (References)
Mental outcomes (unique studies = 13)	Joy, freedom, euphoria efficacy, satisfaction, confidence, perception of self, motivation, self-efficacy, emotion, well-being, addiction withdrawal symptoms	Climbing, caving, circus arts, surfing, sailing, street dance, trampolining, surfing	(Agans et al. 2014; Carlman and Hjalmarsson 2019; Cavanaugh and Rademacher 2014; Ceciliani et al. 2008; Clapham et al. 2018; Eckstein and Rüth 2015; Fletcher and Prince 2017; Heirene et al. 2016; Kriellaars et al. 2019; Motl et al. 2000; Seifert and Hedderson 2010)		(Heirene et al. 2016; Mazzoni et al. 2006, 2009)
Social outcomes (unique studies = 12)	Gender equality, network building, social capital, social inclusion, democratic values, teamwork, health equity, social esteem, interaction with other young people, friendship, sport skills	Circus arts, snowboarding, parkour, urban football, skateboarding	(Atencio et al. 2019; Spencer-Cavaliere et al. 2017; Geertman et al. 2016; Heller and Taglialatela 2018; King and Church 2015; L'Aoustet and Griffet 2001; Leather and Nicholls 2016; Müller and Mutz 2019; Sisjord 2012; Skille 2005; Spiegel et al. 2015)	(Anderson 2001; King and Church 2015)	
Behavioral outcomes (unique studies = 13)	Identity (construction), creativity, expressions of masculinity/femininity, taking risks, sporting behavior/sport participation, use of alcohol, attitude towards environment	Surfing, rock climbing, Ultimate Frisbee, parkour, street dance, capoeira, dance	(Bowers et al. 2014; Cheng and Tsaur 2012; Cross 2002; Gieseler and Sheppard 2019; Holland-Smith et al. 2013; Moore and Werch 2005; Schwamberger and Curtner-Smith 2017; Säfvenbom and Stjernvang 2020; Oriel et al. 2018; Waitt 2008)	(Halldorsson et al. 2014; Moore and Werch 2005; Waitt 2008)	(Kern et al. 2014; Schwamberger and Curtner-Smith 2017; Stapleton and Terrio 2012)
Mental/behavioral (unique studies = 14)	Hyperthymic temperament, self-regulation, learning of skills, attention, hedonic balance and life satisfaction; mix of above examples	Street dance, trampolining, surfing, extreme sports, trolleysurfing, Capoeira, skateboarding, snowboarding	(Arvidsen et al. 2020; Kutty et al. 2017; Lau et al. 2016; Levin 2016, 2018; Marshall et al. 2019; McCulloch et al. 2010; McGuire and Harrison 2008; Morrissey 2008; Mutz et al. 2019; Taylor 2013; Thomas et al. 2019)	(Siweck et al. 2015)	(Spowart 2019)

Table 4. *Cont.*

Outcome Category	Outcome Sample (Examples)	Lifestyle Sports Sample (Examples)	Beneficial Associations (References)	Negative Associations (References)	Neutral Association/No Outcome (References)
Mental/social (Unique studies = 10)	Freedom, identity, disciplinary power, spatial limitations; sexism; increased well-being, peers and social support; mix of above examples	Kitesurfing, rock climbing, circus, freeriding, skateboarding, skiing, rock climbing	(Beal 2001; Ennis and Tonkin 2018; Frumberg et al. 2019; Frühauf et al. 2020; Rynne 2016; Smits 2019; Thorpe and Ahmad 2015; Thorpe 2016; Vazou et al. 2015; Whittington et al. 2011)	(Beal 2001; Smits 2019)	(Frumberg et al. 2019; Frühauf et al. 2020)
Social/behavioral (unique studies = 37)	Autonomy, community, gender equality, social class equality, interpersonal skills, youth engagement, trust, gender identity, social hierarchy, social inclusion and exclusion; mix of above examples	Martial arts, mountain biking, longboarding, tricking, wakeboarding, windsurfing, roller derby, skateboarding, snowboarding, snowshoeing	(Atencio et al. 2013; Backstrom 2013; Bradley 2010; Dupont 2014; Evin et al. 2014; Gilchrist and Wheaton 2011; Harper and Webster 2017; Hollett 2019; Hortiguela et al. 2017; Jones 2011; Kelly et al. 2005; Kidder 2013; King and Church 2020; Light and Nash 2006; Mom et al. 2019; Moore et al. 2017; Morgan 2010; Petracovschi et al. 2011; Petrone 2010; Rannikko et al. 2016; Schori et al. 2017; Shannon and Werner 2008; Skille and Waddington 2006; Singer 2019; Spiegel and Parent 2018; Son et al. 2017; Sutherland and Stroot 2009; Säfvenbom et al. 2018; Ugolotti 2015, 2017; Ugolotti and Moyer 2016; Walker et al. 2014)	(Backstrom 2013; Beal and Wheaton 2003; Dupont 2014; Edensor and Richards 2007; Sisjord 2009; Skille and Waddington 2006)	(Atencio et al. 2013; Beal and Wheaton 2003; Edensor and Richards 2007; Kidder 2013; Rannikko et al. 2016; Rhea and Martin 2010; Schori et al. 2017; Sisjord 2009; Thorpe 2010)

Table 4. *Cont.*

Outcome Category	Outcome Sample (Examples)	Lifestyle Sports Sample (Examples)	Beneficial Associations (References)	Negative Associations (References)	Neutral Association/No Outcome (References)
Mental/social/behavioral (unique studies = 25)	Mix of the above; reduced trauma, achieving goals, empathy towards new culture, mental well-being	Dance, kayaking, paddle boarding, sailing, unicycling, quidditch, capoeira, rock climbing, skateboarding, parkour, circus arts	(Ashworth 2017; Backstrom and Sand 2019; Bernadowski 2017; Bignold 2013; Cohen and Peachey 2015; Cotterill and Brown 2018; Dumas and Laforest 2009; Fernández-Río and Suarez 2016; Godfrey et al. 2015; Henstock et al. 2013; Hignett et al. 2018; Lai et al. 2020; Loiselle et al. 2019; Méndez-Alonso et al. 2015; Merrick et al. 2020; Momartin et al. 2018; Norton et al. 2019; Petracovschi 2012; Radicchi et al. 2019; Stephens and Delamont 2014; Spiegel et al. 2019; Stevens et al. 2019; Sutherland and Stroot 2010; Thorpe 2017; Wheaton et al. 2017)		

4. Discussion

We conducted the present review of the existing literature on potential developmental outcomes of lifestyle sports involvement among young persons because of the following: (a) the number of lifestyle sports, lifestyle sport practitioners, and thus lifestyle sport contexts is growing; (b) the informal structure, the nonconformist practice, and the lack of adult leaders within these contexts have been questioned regarding their effects on developmental processes among youth; and (c) a review of studies on informal lifestyle sport contexts and their developmental potential is lacking.

Initially, the present study shows that the volume of research on informal lifestyle sports is rather extensive and that studies on how these activity contexts may affect developmental processes in youth are diverse and wide ranging. The number of studies retrieved in our literature search shows that lifestyle sports are well established within the movement culture in Western societies and that this part of the movement culture has received an increase in scientific attention during the last decade. The final samples of 53 unique studies on biological and performance outcomes and 124 unique studies on mental, social, and behavioral outcomes have proven that alternative activities and thus alternative activity contexts have increasingly reached the interest of not only sports researchers but also researchers representing preventive and clinical medicine, sociology, psychology, and behavioral research.

The trajectory of published studies is one source of proof of this increased interest. Our findings from the literature review allow us to identify four distinct periods in the development of studies on lifestyle sports and youth participation: 2000–2005, 2006–2010, 2011–2015, and 2016–2020. The number of articles focusing on lifestyle sports and young people has steadily increased from period to period.

In 2000–2005, ten studies were found, of which only one focused on biological and performance outcomes. Among the studies during this time period, two-thirds only focused on one type of outcome and mostly on social or behavioral outcomes.

In the period between 2006 and 2010, we found 25 articles that qualified for inclusion in our review. Among these, we can see that the number of studies focusing on mental outcomes has increased. However, the majority still handle behavioral and social outcomes. Only five articles focused on biological and performance outcomes.

In the period of 2011–2015, 54 articles were found. In this period, studies on biological and performance outcomes increased to 21 in total. Among the other 33 articles, we found mixes of relational outcomes such as mental, behavioral, and social outcomes. Here, we can see that studies published during this time period include more complex outcomes that affect developmental processes in young people.

From 2016 to 2020, we witness a big jump in the number of published articles: 88 in total. However, the bigger jump is made in the articles with mental, behavioral, and social outcomes (61) than in the articles handling biological and performance outcomes (26). Regarding the former, more than half of the studies identified mental outcomes combined with other outcomes. This shows that mental outcomes have garnered increased attention within lifestyle sport research over the past decade. Also, in the most recent period, mostly positive associations were identified. This can be explained by an increase in knowledge about lifestyle sports (and their benefits) as a research area in general. We did not find any typical pattern regarding the type of outcomes in the biological and performance publications. However, it appears to be a tendency of a shift from cross-sectional studies in the early years, to a larger proportion of experimental studies from 2010 onward. Furthermore, the studies published in recent years also show a larger variety in the sports studied, whereas the vast majority of the earlier studies were performed on climbers.

The biological and performance publications suggest that performing lifestyle sports may have several beneficial health and skills outcomes. The different types of sports may have various health and fitness outcomes based on which body system is affected. For example, trampolining is suggested to increase jump performance (Aalizadeh et al. 2016;

Arabatzi 2018; Giagazoglou et al. 2013), whereas climbing, an activity with a greater load on muscles in the upper body, is subsequently associated with improved grip and core strength (Muehlbauer et al. 2012), and so on. As long as the activity has an adequate intensity, load, or challenge, it has the potential to cause subsequent physiological adaptation and increased performance. It is therefore promising that several of the typical lifestyle sports, such as capoeira (Moreira et al. 2018), climbing (Siegel et al. 2015), skateboarding (Hetzler et al. 2011), and surfing (Bravo et al. 2016; LaLanne et al. 2017)—to mention a few—are associated with at least moderate intensity. In youth, moderate to vigorous physical activity (MVPA) is associated with several health outcomes, and the World Health Organization (2020) recommends that children and adolescents accumulate at least 60 min of MVPA per day and that adults accumulate at least 150 min of MVPA per week. The age period, ranging from adolescence to early adulthood, is characterized by a rapid decline in the proportion meeting the recommended physical activity level (Steene-Johannessen et al. 2020). This decline is possibly largely explained by changes in activity pattern and domain, where the activities typically transition from being organized and competitive to more internally paced and noncompetitive (Van Der Zee et al. 2019). Lifestyle sports may therefore be an important arena when promoting movement activity to youth.

Although most of the studies included in this overview suggest beneficial biological and performance outcomes, it is also important to note that some studies have not (e.g., Gallotta et al. 2015; Siegel et al. 2015; Wilkes et al. 2018). However, some of the studies that showed no association were built on rather high-risk hypotheses. For instance, no effects were seen on the gait function of cerebral palsy patients performing climbing (Böhm et al. 2015). It should also be noted that none of the 53 reviewed studies indicated unbeneficial associations.

Based on existing knowledge on biological effects as dose–response relationships, some of the abovementioned associations between lifestyle sports and biological and performance outcomes were expected. However, although a dose–response relationship (Pate 1995) governs most biological benefits of movement activities, associations between such activities and mental, social, and behavioral systems are far more complex. Possible mental, social, and behavioral associations are not necessarily the result of the activity itself in terms of duration or intensity but may as well be related to norms, values, aims, power relations, and other dimensions that may affect the total context and thus also the relationship between the persons involved and the movement context. From a relational perspective, the possible mental, social, and behavioral associations rely on a relational fit between developmental trajectories of persons involved in a context, as well as what this particular context may offer to and require from the persons involved. Mental, social, and behavioral effects of involvement in movement contexts reflect a certain alignment between strengths of the youth (internal developmental assets) and developmental qualities in the movement context or asset (external developmental assets: (Benson et al. 2019): it reflects a match between what the youth must progress in during their ongoing developmental process, as well as how well the contexts satisfy these needs.

The presented review of 124 unique studies on possible mental, social, and behavioral outcomes of lifestyle sport involvement showed that 12 studies revealed negative associations and that 112 had positive associations. A majority of the studies indicating negative associations were conducted explicitly looking for unbeneficial associations, such as the work of Halldorsson et al. (2014), who investigated the relationship between adolescent sport participation and alcohol use, focusing on differences in sport contexts. Examples for neutral associations include the study by Kern et al. (2014), who identified that informal sports, such as skateboarding and free skiing, are associated with higher risk-taking among participants. We did not judge this outcome as either positive or negative for developmental processes; therefore, we labeled these studies as having neutral associations.

The remaining studies (N = 112) showed positive associations between involvement in lifestyle sport contexts, such as climbing, snowboarding, parkour, tricking, kiting, and surfing, and the following developmental outcomes: (a) mental outcomes such as joy,

happiness, freedom, euphoria, motivation, self-efficacy, well-being, and so on; (b) social outcomes such as gender equality, network building, social inclusion, interaction, friendship, and so on; (c) behavioral outcomes such as identity, creativity, expressions of masculinity and/or femininity, knowledge development, risk-taking, sporting behavior, and alcohol consumption.

As already mentioned, the most frequent associations identified in the review were mixed associations that include various fusions of mental, social, and/or behavioral associations. Outcome variables such as improved life chances, self-improvement, self-management, self-governance, and self-reliance, as well as resilience and increased school attendance, rely on a variety of within-person resources that may develop in interaction with functional external developmental assets, and they represent typical comprehensive internal developmental assets that are of great importance for further development.

Prior research has argued that potential external developmental assets such as movement contexts must be flexible to the needs of their participants (Högman and Augustsson 2017) in order to become functional assets and that movement contexts do not become functional external assets until individuals undergo core developmental experiences with these assets. The present review supports prior research arguing that lifestyle sport contexts may function as an external asset and thus provide asset-building energy to young persons who are involved. The performed review indicates that skateboarding, snowboarding, surfing, parkour, tricking, B-boying, freeride skiing, longboarding, rock climbing, and other types of informal and expressive movement activities do have characteristics that are applicable for human development, not despite but because of the relaxed and easygoing format. The present review confirms prior research arguing that the dominant understanding of lifestyle sports as unorganized and unstructured rather than self-organized and self-structured is a misinterpretation (Säfvenbom et al. 2018). Even if the activities in many of the studies reviewed were not performed in their original contexts but moved into more organized or semiorganized formats, studies have indicated that the flexibility, exploration, and coactive production remained as major characteristics.

The diversity in the samples of youth involved in the studies reviewed is perhaps the most interesting finding. In the total sample of studies reviewed, almost one-third were conducted on minority groups such as the following: (a) youth requiring physical, cognitive, and/or psychosocial supports; (b) at-risk disengaged youth; (c) disabled youth facing mental health issues or social exclusion; and (d) refugees and youth in sites of war, conflict, or disaster. This unexpectedly high number of studies focusing on minorities and vulnerable groups of young people indicates that lifestyle sport contexts are considered an appropriate alternative to help young people not necessarily to become more physically active but to develop a better everyday life.

5. Limitations, Conclusions, and Implications

The inclusion and thus mix of subjects, activity contexts, and outcome variables studied from a mix of scientific approaches and designs are seen as both the strengths and limitations of the review presented. It embraces a wide range of combinations that exist, yet it also compares and counts results from what are usually seen as incompatible designs. Some of the publications have methodological limitations that preclude the possibility of making firm conclusions, and although the total number of publications could be considered substantial, few studies have examined each specific outcome. Therefore, further well-designed studies examining these associations are warranted.

However, in line with what scoping reviews have worked toward, we have indicated that the volume and pattern of the available literature covering a field have not yet been reviewed and that this unveils a rather large and heterogeneous nature (Peters et al. 2015). The relational developmental systems approach applied in the present study provides a rather complex picture of relationships between a variety of activity contexts (that represent possible external developmental assets), a variety of developmental variables (representing internal developmental systems), and a variety of human samples (that represent multiple

developmental trajectories and developmental processes). The review performed includes all studies performed on lifestyle sports that advocate developmental outcomes of being involved over the period from 2000 to 2020. Therefore, it includes (a) all types of qualitative and quantitative studies performed; (b) all types of random, purposive, convenient, and other types or research samples that exist; (c) all types of movement activities and movement contexts that cover a very large spectrum of activities under the umbrella definition of lifestyle sports; and, finally, (d) all types of people that cover the very large spectrum under the umbrella definition of youth. This means that the present study includes RCTs on, for instance, how climbing can affect muscle strength and endurance among participants with cerebral palsy, but it also includes qualitative and cross-sectional studies on a variety of behavioral outcomes among random children and young people participating in lifestyle sports such as surfing, climbing, Ultimate Frisbee, parkour, street dance, and capoeira. Although we have performed a comprehensive literature search aiming to include the majority of publications in this field, we cannot guarantee that we have not overlooked some publications. It was beyond the scope of this manuscript to perform a systematic review on such a broad topic, and as such, many of the criteria for a systematic literature search have not been fulfilled. As a next step, systematic reviews with narrower research questions, e.g., focusing on one specific outcome and study design, are warranted.

The review performed indicates that lifestyle sport contexts are flexible according to the needs and desires that exist among the practitioners and that the human and democratic origins of these contexts make them supportive for positive movement experiences (Agans et al. 2014) and for positive youth development. The findings have implications for PE teachers, social workers, policymakers, sport organizations, and urban architecture. It is reasonable to conclude that the very first review of literature on lifestyle sports and youth development highlights the importance of promoting lifestyle sports as something different from and thus an alternative to both organized sport contexts and fitness contexts.

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