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Review

A Systematic Review of Factors Associated with Sport Participation Among Adolescent Females

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Abstract: Sports participation provides a direct means to attain health-enhancing physical activity, however, participation in sport declines during adolescence and over 85% of adolescent females fail to meet recommended levels of physical activity. Given the importance of overcoming barriers to sport and increasing equity in women's sports, the purpose of this systematic review was to identify factors associated with sport participation among adolescent girls and operationalize those factors into theoretical constructs to guide future research. Six databases were systematically searched and 36 records were included for review. Factors impacting girls' sport participation were categorized as personal, peer, family, socioeconomic, environmental, or other factors. The variables most frequently associated with sport participation were personal, including self-perceptions and desirable personal outcomes related to sport. Most research on girls' sports participation lacks theoretical framework, so to aid future studies this review categorized important participatory factors into the constructs of the theory of planned behavior. Future research would benefit from theory-driven prospective approaches to make clear and consistent predictions about factors impacting sport participation as well as mixed method approaches aimed to provide more robust understanding of girls' experiences with and perceptions of factors impacting their participation in sports.

Keywords: sport participation; adolescents; females; sport dropout; theory of planned behavior; physical activity

1. Introduction

Adolescence is a transformational time of life between childhood and adulthood from around ages 10 to 19 years when rapid physical, cognitive, and psychosocial growth takes place. Laying the groundwork for healthy behaviors is paramount during these formative years (WHO, 2021). Adolescents who are active in sports have better outcomes across the lifespan with regard to physical, mental, social, and emotional health (U.S. Department of Health and Human Services, 2018). Sports encourage physical activity among adolescents by providing a structured environment where expectations are defined and goals are shared between youth and involved adults, namely coaches and parents (Crane & Temple, 2015). The health benefits of physical activity gained through sports are extensive, from improving emotional health through fostering social relationships (Kohl & Cook, 2013), encouraging resilience and self-esteem (Gardner, Magee & Vella, 2016), positively impacting academic performance (Keathley, Himelein & Srigley, 2013), to decreasing risks of physical disease and disability (Gucciardi & Jackson, 2015). Despite decades of data to support the benefits of physical activity through sports participation and efforts from global public health organizations to encourage physical activity, involvement in sports continues to decline at the greatest rate during adolescence with the average adolescent dropping out of sports at 11 years of age (Project Play, 2019).

According to the World Health Organization, adolescents should engage in 60 minutes of moderate to vigorous exercise daily; but sadly, 81% of adolescents ages 11-17 are not sufficiently physically active (WHO, 2021). While adolescence has been identified as a prominent time for sports drop-out in both males and females (Delorme, Chalabaev, & Raspaud, 2011), adolescent girls are at a greater risk of dropping out of sports at an earlier age than their male counterparts (Sobkin et al., 2006). Globally, 85% of female adolescents are not meeting recommended levels of physical activity (WHO, 2021). Interestingly, girls have higher injury rates than boys when competing in most sports including increased risks in sustaining both overuse and traumatic injuries (Stracciolini et al., 2014 & Stracciolini et al., 2015). While the risk and experience of injuries are

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important factors associated with sport participation among girls, the factors contributing to the sex disparity in sports participation are most certainly multifaceted and involve interactions between complex socioeconomic, psychological, and biophysical influences. Thus, reviewing the factors contributing to female adolescents' sport involvement is important so relevant stakeholders including public health officials, educators, coaches, parents, and healthcare providers may be able to provide resources to enhance the experience of female adolescent athletes and promote positive atmospheres for regular physical activity. The most recent Women's Sports Foundation (2020) publication on equity in women's sports called for research to identify factors impacting sport participation among girls for the purpose of overcoming barriers to sport and physical activity in communities. Therefore, the purpose of this systematic review is to identify factors associated with sport participation among adolescent girls and to operationalize those factors into theoretical constructs to guide future research.

2. Methods

Theoretical Framework

The theory of planned behavior provided the theoretical framework for this review. This theory is appropriate as it has been widely applied to predict human behavior, including adolescents' behavioral intentions (Ajzen, 1991; Hamilton & White, 2008; Saunders et al., 2004; Mummery, Spence, & Hudec et al., 2000). Using the theory of planned behavior allowed us to organize and synthesize findings from a broad sample of relevant literature to examine factors that influence intentions among girls in sports.

The theory of planned behavior includes three constructs that predict *intention* to engage in behaviors: *attitudes*, *subjective norms*, and *perceived behavioral control* (Ajzen, 1991). *Attitudes* are defined as the beliefs one has about behaviors (Ajzen, 2020). Behavior beliefs are an individual's perception of how certain behaviors will result in certain outcomes (Fishbein & Ajzen, 1997). Behavior beliefs can lead to associating positive or negative attitudes toward a behavior (Ajzen & Sexton, 1999). For example, an adolescent girl may think "Practicing soccer gives me exercise which keeps me healthy and that is good." *Subjective norms*, or an individual's perception of whether other people believe they should perform a behavior, can be divided into two categories: injunctive and descriptive normative beliefs (Fishbein & Ajzen, 2010). Injunctive norms are the perception that a particular group will approve or disapprove of a behavior (Conner & Armitage, 1998; Curtis, Cowcher, & Greene, 2018). For example, "My parents think it is good for me to play soccer." Descriptive norms are informed by an individual's perception of what is being done by others (Fishbein & Ajzen, 2010). For example, "Most of the other girls in my class play soccer." Therefore, subjective norms may impact one's intentions through their perceptions of what ought to be (injunctive norms) and what is (descriptive norms). Finally, *perceived behavior control* is defined as an individual's belief that they will be able to perform the behavior considering the factors that either facilitate or impede on partaking in that behavior (Montano & Kasprzyk, 2015). For example, an adolescent girl may consider all the factors in her life that may impact her involvement in sport and conclude, "Playing soccer over the next three months will be easy for me." For the purposes of this review, we attempted to organize each of the influential factors on sport participation that were identified in the selected records into one of the three constructs of the theory of planned behavior.

Data Sources

The following databases were searched in October 2020 to conduct this review: PubMed, CINAHL, Academic Search Complete, SportsDISCUS, APA PsychInfo, and Medline. The search strategy was aimed to find articles examining factors associated with sport participation and attrition among adolescent girls. Search terms included: "Girls" or "females" or "adolescent girls" or "female adolescents" AND "sport participation" or "sport involvement" or "sport attrition" or "sport dropout." There were no limits placed on the date of publication for the search. Search records were saved in Refworks. The search strategy was also saved to be able to recreate the results of the review.

Inclusion/exclusion criteria

Articles were considered for inclusion if they were peer-reviewed, original research articles addressing factors associated with sport participation or attrition in female adolescents and were published in English. Articles were excluded if 1) the focus was on individuals with intellectual or developmental disabilities and did not address adolescents with normal development, and 2) there was no stratification for differences between sex if the study included males and females.

Search Process

A total of 2899 records were identified with the initial search of the databases using the terms above. After removing duplicates there were 2158 records. Records were excluded if they were not published in English, did not address an adolescent population, and were not empirical research articles. To filter records for the adolescent population we set a search parameter within the databases to include records studying subjects under the age of 17. Following these exclusions, 517 records remained. Screening of titles and/or abstracts yielded the exclusion of 406 records that were not relevant to the objective of the review. The remaining 111 records were reviewed in entirety for content. Records were excluded if sport participation or attrition was not a dependent variable of the study, the findings were not stratified for gender, the population was largely made up of adults (over age 17) or children (under age 10) and did not stratify for age. Finally, there were 36 remaining records addressing factors associated with female adolescent sport participation that were included in this systematic review. A flow diagram based on

recommendations from The PRISMA Group for reporting items for systematic reviews illustrating the record selection process is provided in **Figure 1** (Moher et al., 2009).

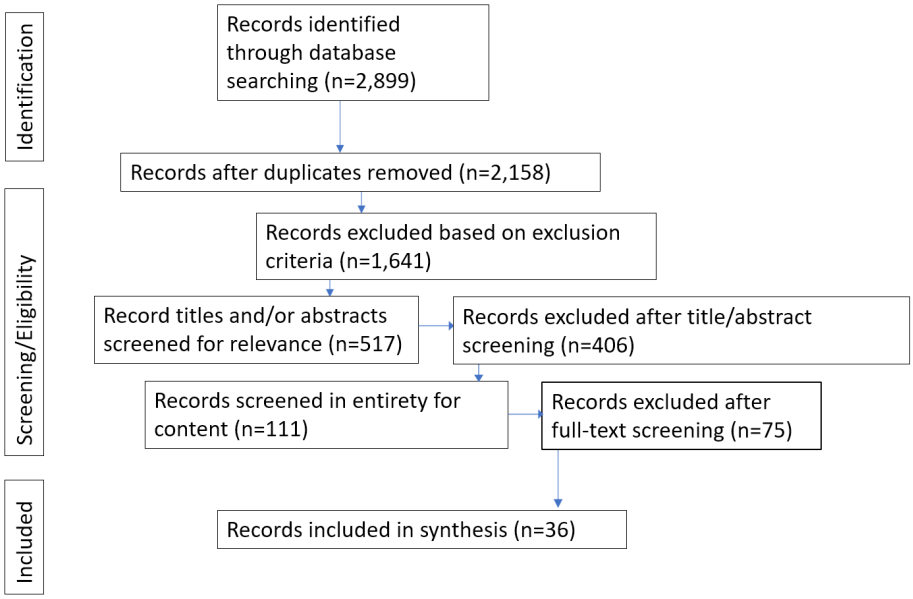

Figure 1. The PRISMA Group for reporting items for systematic reviews illustrating the record selection process.

Quality appraisal

Data quality of the 36 records was assessed by each author individually using the Joanna Briggs Institute Checklist for Critical Appraisal of Analytical Cross-Sectional Studies and Critical Appraisal of Cohort Studies (2017). The records were assessed for methodological quality, trustworthiness, and relevance. Additionally, the level of evidence for each record was assessed by the authors using the Johns Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal Tool in order to determine the strength and quality of each record (Dang & Dearholt, 2018). The critical appraisal and level of evidence for each record is provided in **Appendix**. The authors collaboratively reviewed findings from the quality appraisals of each record. Based on the level of evidence assigned to each record, 21 were considered high quality, indicating they produced consistent, generalizable results with definitive conclusions, adequate controls, and sufficient sample size. The remaining 15 records were considered to be good quality indicating they produced reasonably consistent results with fairly definitive conclusions, some control, and had a sufficient sample size. If records were scored as low qualitythey would have been excluded from the review. Consensus was reached among the authors and the decision was made to move forward with the review of all 36 records.

3. Results

The 36 records reviewed consisted of various study designs all of which were quantitative. Small studies using cross-sectional surveys were reviewed as well as studies conducting secondary analyses of large data sets. There was no limit placed on the year of publication so that we could evaluate the current state of science and how the science has progressed over the years. Included records ranged in year of publication from 1976 through 2020 with 61% of records having been published since 2010. Record origination spanned the globe representing countries in Europe, Asia, North and South America, Africa, and Australia. Twenty-five of the studies included both male and female participants and 11 studies included only females. Ages of participants ranged from 5 to 21 years. These studies stratified for sex and age; therefore, we were able to compile a list of factors impacting sport participation among female adolescents. A descriptive comparison of study characteristics is provided in **Table 1**.

Record #	First Author (Year)	Topic/title	Study design	Population	N	Country
1	Agata (2018)	Body composition, fitness, and social correlates and sport participation	Secondary analysis	Males and females age 14-15 years	238	South Africa
2	Atkins	Parental and peer influences on	Cross	Females age	227	United

	(2013)	girls' continuation in sports	sectional survey	10-14 years		States
3	Balaguer (2012)	Self perceptions, self worth, and sport participation	Cross sectional survey	Males and females age 11-16 years	917	Spain
4	Bedard (2020)	Sport participation and social competence	Secondary analysis	Males and females age 9-14	2278	Canada
5	Cleland (2005)	Parental exercise association with child sport participation	Secondary analysis	Males and females age 9-15	5929	Australia
6	Daniels (2006)	Sport participation, peer acceptance, and self esteem	Secondary analysis	Males and females age 12-21	10500	United States
7	Deflandre (2001)	Physical activity and sport involvement in high school students	Cross sectional survey	Males and females age 16-19 years	48	France
8	DeJonge (2019)	Sport commitment and physical self-concept	Prospective longitudinal	Females age 12-15 years	215	Canada
9	Delorme (2011)	Age and sport dropout in basketball players	Secondary analysis	Males and females age 7-17 years	74,645	France
10	Dishman (2006)	Self-concept, self esteem, sport participation, and depression in girls	Cross sectional survey	Females age 17-18	1250	United States
11	Dollman (2010)	Socioeconomic position and sport participation	Cross sectional study	Males and females age 10-15 years	1737	Australia
12	Eime (2013)	Relationship between family support, access, socioeconomic status and sport participation	Cross sectional survey	Females age 11-20 years	732	Australia
13	Engel (1994)	Gender role and stereotypes in women's sports	Cross sectional survey	Females age 12-16 years	200	England
14	Garn (2016)	Perceived teammate acceptance and sport commitment in adolescent female volleyball players	Cross sectional survey	Females age 12-16 years	209	United States
15	Gill (1983)	Participation motivation	Cross sectional survey	Males and females age 8-18 years	1138	United States
16	Guedes (2013)	Participation motivation	Cross sectional survey	Males and females age 12-18 years	1517	Brazil
17	Guzman (2012)	Self-determination theory to predict sport dropout	Prospective longitudinal study	Males and females age 11-19 years	857	Spain
18	Higginson (1985)	Socializing agents and female sport participation	Cross sectional survey	U13, junior high and senior high females	587	United States
19	Howie (2019)	Early life factors associated with trajectories of sport participation	Secondary analysis	Males and females age 5-17	1679	Australia
20	Kanters (2013)	Impact of race, gender, and socioeconomics on sport participation	Cross sectional survey	Males and females age 11-14 years	2582	United States
21	Longhurst (1986)	Motivation for participation in sports	Cross sectional survey	Males and females age 8-18 years	404	Australia

22	Luiggi (2018)	Trends in sport participation	Cross sectional survey	Males and females age 14-18 years	3218	France
23	McDonough (2005)	Friendship quality, self-concept and sport participation motivation	Cross sectional survey	Females age 11-14 years	227	Canada
24	McMillian (2016)	Family structures and sport participation	Secondary analysis	Males and females age 11-15 years	21,201	Canada
25	Michaud (2006)	Extracurricular sport participation among Swiss adolescents	Secondary analysis	Males and females age 16-20 years	7428	Switzerland
26	Murphy (2017)	Impact of sport domain on future physical activity	Longitudinal	Males and females age 10-18 years	873	Ireland
27	Saunders (2004)	Social variables and physical activity	Cross sectional survey	Females age 13-14 years	4044	United States
28	Scurr (2016)	Influence of breasts on sport and exercise participation	Cross sectional survey	Females age 11-18 years	2089	UK
29	Seabra (2008)	Socioeconomic variables and sport participation	Cross sectional survey	Males and females age 10-18 years	3352	Portugal
30	Sit (2006)	Situational state balances and participation motivation	Cross sectional survey	Males and females age 14-20 years	1235	Hong Kong
31	Snyder (1976)	Sport participation correlates among girls	Cross sectional survey	High school girls	500	United states
32	Tiggelman (2015)	Parental beliefs as determinants of sport participation in adolescents with asthma	Cohort study	Males and females age 12-15 years	253	Netherlands
33	Toftegaard-Stockel (2011)	Factors associated with sport participation	Cross sectional survey	Males and females age 12-16 years	6356	Denmark
34	Vella (2016)	Associations between sport participation and mental health	Secondary data analysis	Males and females age 12 & 14 years	4023	Australia
35	Wattie (2014)	Age-related sport participation and dropout trends	Secondary data analysis	Males and females age 11-20 years	3426	Germany
36	Yabe (2019)	Verbal abuse from coaches and sport motivation	Cross sectional study	Males and females age 6-15 years	6791	Japan

Table 1. Description of study characteristics.

Each variable identified in the studies that impacted girls' sport participation was recorded. The variables were grouped into categories of contributing factors including personal, peer, family, socioeconomic, environmental, and other factors that impacted sport participation. A comprehensive list of all factors and the study in which each variable was identified is included in **Table 2**. Factors were predominantly personal in nature and were mostly related to desirable outcomes related to sport (i.e. enjoyment, skill development, and fitness) and perceptions of self. Variables related to 'self' varied from issues of physicality and behaviors to psychological issues such as self worth and self determination. Family factors were the second most impactful variables impacting sport participation among girls. Characteristics of parents, from their employment status to their level of physical activity, along with the support offered from the family play a major role in whether girls participate in sports. Next, the number of biologic (age, BMI, height) and peer-related factors were equally identified in this review as impacting sport participation among girls. These factors were followed by socioeconomic and environmental factors, which often related to limited resources or accessibility to participate in sports. Lastly, factors specific to the type of sport or coaching influences were also found to impact sport participation.

Factor Categories Study Variables	Total # of data sources	Data source (study number reported in Table 1)
Personal Factors	19	
Enjoyment		2, 14, 15, 30
Skill development		15, 16, 21, 30
Fitness		16, 21, 30
Competition		15, 21
Athletic competence		3, 31
Physical self concept		8, 10
Personal satisfaction		17, 25
Social competence		4
Self esteem		6
Self perception		7
Self determination		17
Self worth		23
Perceived health		25
Perceived conflict between study and sport		17
Dieting		25
Substance use		25
Personal investment		12
Mental health		34
Challenge		21
Breast related concerns		28
Family Factors	12	
Family support		1, 7, 12, 27
Parental exercise		5, 29, 33
Traditional family structure		24, 25
Parent encouragement		7, 32
Sport involvement of father		7
Parent influence		18
Parent worries/concerns		19
Perceived family wealth		24
Parent education level		25
Parent immigration status		33
Parent employment		33
Biologic/Physiologic Factors	9	
Age		7, 9, 13, 25, 33, 35, 36
Maximum oxygen uptake		7
Shorter height		19
BMI		34
Breastfed as infant		19
Previous injury		18
Peer Factors	9	
Friendship		16, 23, 30
Peer support		1, 7
Peer acceptance		6
Peer encouragement		7
Teammate acceptance		14
Being on a team		15
Socioeconomic Factor	6	
Socioeconomic status		11, 12, 14, 20, 22, 27
Resources/Environmental Factors	6	
Private equipment		7
Access to facilities		12
Co-ed physical education		13
Involvement opportunities		14
Sport club membership		25
Town of residence		33
Sport/Coach Factors	4	

Coach/teacher influence		18
Verbal abuse from coach		34
Type of sport played		26
Frequency of participation in games		34

Table 2. Factors associated with sport participation among adolescent girls by data source

The review of records was framed by the theory of planned behavior. The study variables impacting sport participation among adolescent girls were recorded and grouped by the constructs defined in the theory of planned behavior. All three constructs (*attitudes*, *subjective norms*, and *perceived behavioral control*) were represented in the included studies (Ajzen, 1991). We organized the variables into constructs in effort to guide future research aimed at operationalizing the variables within the theory of planned behavior. There were variables that did not align with the constructs of the theory of planned behavior, therefore, we conceptualized them as peripheral to the theory and depicted them as *other factors* having the potential to impact the constructs in **Figure 2.**

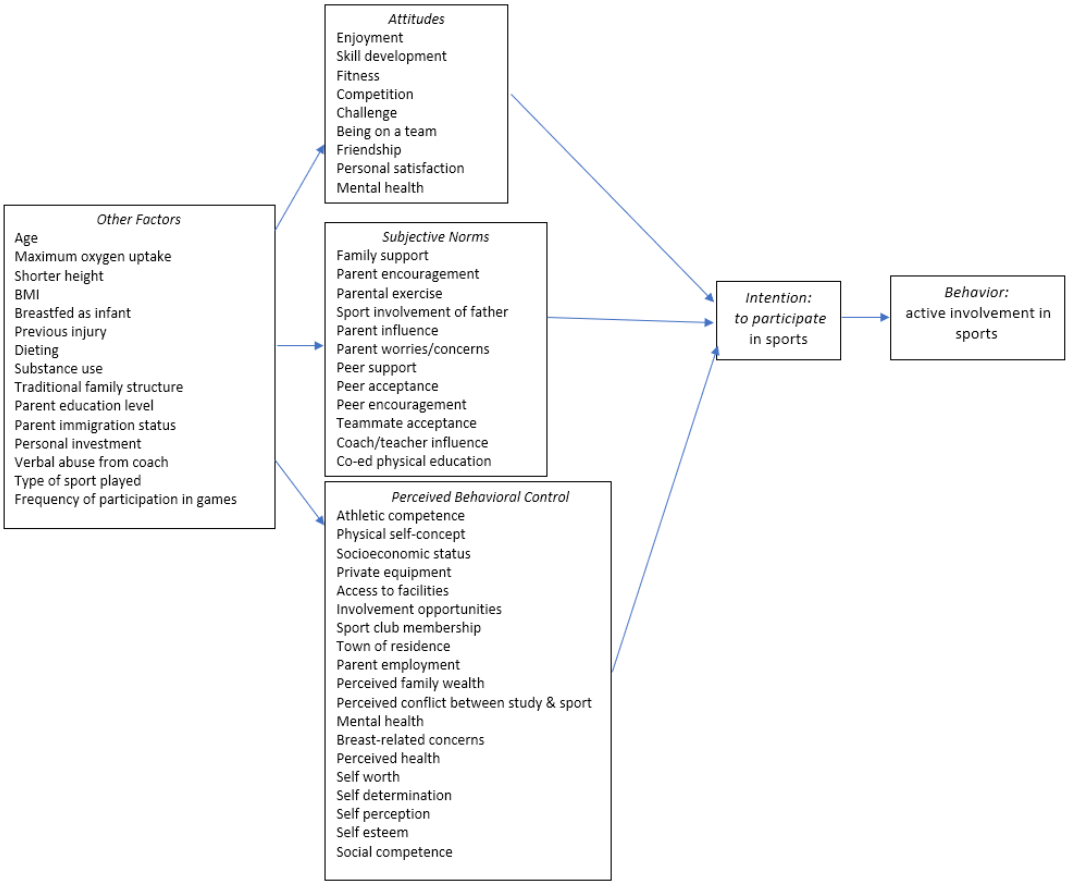

Figure 2. Adapted theory of planned behavior model with operationalized study variables

Attitudes. Nine of the variables were considered attitudes. Enjoyment and personal satisfaction were conceptually the same and were mentioned in six of the articles. These factors along with the beliefs that playing sports will lead to greater skill, fitness level, opportunities for challenge or competition, friendship, community (being on a team), and better mental health were operationalized into the construct of attitudes that impact behaviors.

Subjective norms. Twelve factors were operationalized into the subjective norms construct, with six of them being related to family, namely parental factors. Five factors involving perceptions of peer acceptance, support, and encouragement were included. Co-ed physical education was a factor included as a subjective norm because the premise of this study variable dealt with peer influence pertaining to perceived gender roles (Engel, 1994). Finally, coach and teacher influence was identified in one study and included as a subjective norm that impacts intentions to participate in sports among adolescent girls.

Perceived behavior control. Nineteen of the variables were included in the construct of perceived behavioral control. Mental health was included here as well as in the attitudes construct because of the bidirectional association between sport involvement and mental health that was found by Vella et al. (2016), whereas one may believe that participating in sports is desirable because it will improve their mental health and/or they may feel less perceived control over their ability to participate in sports due to their mental health status. Ten of the variables were personal factors of self worth, esteem, determination, competence, and other perceptions of self that could facilitate or impede an individual's perceived control to participate in sports. The other eight factors were either directly or indirectly related to socioeconomic status, including factors related to parental employment, perceived family wealth, access to facilities and equipment, opportunities to play, sport club membership, and physical location of the girls' residence.

Other factors. Fifteen variables were identified as being peripheral to the theory. These factors could influence attitudes, subjective norms, and/or perceived behavioral control, but were not able to be clearly operationalized into the constructs of theory of planned behavior. The *other factors* were largely related to biologic or physiologic variables such as age, maximum oxygen uptake, BMI, height, whether the child was breastfed or not or had ever sustained an injury. Decisions to engage in dieting and substance use may influence the constructs predicting girls' intentions and thus were included here. Traditional family structure, parents' immigration status, parents' education level, and having experienced verbal abuse from a coach were also included as being factors likely to impact the attitudes, subjective norms, and perceived behavioral control of girls. Lastly, one's personal investment, the type of sport played, and the frequency of involvement were peripheral to the theory and may impact the constructs that predict intention.

4. Discussion

The majority of factors identified to impact female adolescents' sport involvement may be operationalized within the constructs of the theory of planned behavior. The construct of perceived behavioral control encompasses many of these factors including female adolescents' perceptions of their competence and self worth as well as their perceptions of available resources and opportunities to be involved in sports. Additionally, female adolescents' self perceptions surrounding sport participation were often discussed with regard to body image. Murphy et al. (2017) noted body image was commonly reported as a reason for uptake of a sport. Some female athletes take up a new sport to improve body image, while others do not participate due to body image concerns (Michaud et al., 2005; Scurr et al., 2016). Specific body related concerns were related to breasts and thinness. Girls with concerns related to breasts bouncing during exercise or being embarrassed when changing due to breasts or bras were less likely to participate in sports (Scurr et al., 2016). Girls may think that society expects them to have thin bodies and that participating in certain sports may cause them to have a more athletic, muscular body that would make them less feminine (Balaguer et al., 2012). Michaud et al. (2005) found female students often indicated a desire to lose weight when taking up new sports and were more likely to engage in dieting while participating in sports to achieve their weight loss goals. The cultural norms communicated through media influence body image (Slater & Tiggelman, 2011). Present-day media tends to cover women's sports by focusing on appearance over athletic performance (Slater & Tiggeman, 2011). Given the prevalence of social media and the implications it has on adolescent girls, further research should be done to understand the implications of social media on girls' self perceptions and self esteem, and how those factors predict intentions to participate in sports. Interestingly, Dishman et al. (2006) found perceptions of appearance and body fat were related to physical self concept, a strong predictor of sport participation, but when they controlled for fitness and body mass index, appearance and body fat were unrelated to sport participation. These findings are encouraging as they indicate physical activity and sport participation positively influence self-concept independent from perceptions of physical appearance (Dishman et al., 2006).

Perceived competence was also included in the construct of perceived behavioral control. Girls' perception of athletic competence helps predict sport and exercise intention months and years later, because higher feelings of athletic competence encourage girls to maintain competence by continuing in a sport (Bedard et al., 2020). Girls who believe that they can handle the fitness load, skill level, and time spent playing a sport have an increased intention of sport continuation (Murphy et al., 2017). A study by Melman et al. (2007) reported significant stress among girls when attempting to manage the demands of school work, extracurriculars, and leisure activities. As girls grow older, they may feel more committed to their academic studies or take up other non-sport extracurricular activities (Deflandre et al., 2001; Michaud et al., 2005; Murphy et al., 2017). This shift in commitments may decrease time spent training and their perceived competence in a given sport (Delorme et al., 2011).

Certainly, socioeconomic status and other related aspects including access to facilities, equipment, parental education level and employment status, town of residence, and perceived family wealth were a common theme throughout the literature. We grouped these variables into the construct of perceived behavioral control as girls may perceive their participation in sports to more or less attainable based on socioeconomic factors. Female adolescents with a lower socioeconomic status participated in sports at a lower rate than their peers with higher socioeconomic status (Dollman et al., 2010; Eime et al., 2013; Kanters et al., 2013; Luiggi et al., 2018, Seabra et al., 2008). Low socioeconomic status has been observed to be associated with girls' poorer perceived outcomes of sports participation, lower perceived parental support, and greater barriers to participating in sports (Dollman et al., 2010; Eime et al., 2013). Multiple studies suggested increasing access to sports opportunities for girls with low socioeconomic status by improving or creating neighborhood recreational facilities, transportation to sporting venues, and awareness of local sports programs and opportunities (Dollman et al., 2010; Eime et al., 2013). Kanters et al.

observed less socioeconomic status inequities among boys who attended middle schools with intramural sports programs as opposed to interscholastic sports, however, the increased access to sports opportunities gained through intramural programs did not positively influence participation among girls (2013). This gender difference may be due to the intramural sports programs' use of mixed-gender sports, as middle school girls may be less inclined to participate in mixed-gender sports (Engel, 1994). Improving adolescent girls' access to sports opportunities through intramural sports programs may be more successful in promoting girls' participation if they were not mixed-gender. In addition to reducing barriers to sports participation among girls with low socioeconomic status, improving the parental support they receive may reduce the socioeconomic-related inequities in sports participation. Girls with low socioeconomic status receive lower parental support for sports participation (Dollman et al., 2010), and this is especially true for older girls who tend to receive less sports-related praise and joint participation from parents compared to younger girls (Beets et al., 2006). Efforts to improve parental support for sports participation may empower girls with greater perceived competence and self-efficacy to capitalize on existing sporting opportunities or seek new opportunities.

Several variables were operationalized as subjective norms, or social influences, that impacted sport participation. These influences included both injunctive norms and descriptive norms. Injunctive norms, such as receiving approval or encouragement from family members and peers, were positively associated with girls' sports participation (Agata et al., 2018; Deflandre et al., 2001; Eime et al., 2013; Saunders et al., 2004). Descriptive norms, which are formed by an individual's perceptions of others' behavior, were also important factors associated with girls' sports participation. Girls were more likely to participate in sports if their parents provided encouragement (Deflandre et al., 2001; Eime et al., 2013), were sports participants (Deflandre et al., 2001; Eime et al., 2013; Saunders et al., 2004; Seabra et al., 2008) or regularly engaged in physical activity (Cleland et al., 2005). Eight of the articles identified parent, peer, or coach influence to be related to sport participation among girls. In one study, peer acceptance was found to mediate the association between self-esteem and sport participation, with other important aspects of peer relationships including support and encouragement being noted as reasons girls take up and continue with sports (Agata et al. 2018; Daniels & Leaper, 2006; Deflandre et al., 2001). With regard to parental factors, Eime et al. (2013) found family support to be the strongest and most consistent mediator between dimensions of socioeconomic status and sport participation. That is, the degree to which girls perceive or receive support from family is the most important channel through which the effects of socioeconomic status influence sport participation (Eime et al., 2013). Aside from socioeconomic status, in several of the articles support from family was associated with continued physical activity and participation in team sports among adolescent girls (Agata et al., 2018; Deflandre et al., 2001; Saunders et al., 2004; Tiggelman et al., 2015).

Finally, attitudes were found to impact sport participation. Girls' physical fitness, ability to improve their skills and time spent playing the sport all influenced their intention to continue to play a sport (Longhurst & Spink, 1987; Balaguer et al., 2012; Agata & Monyeki, 2018). Level of fun and the enjoyment of sport has been associated with continued sport participation many times throughout the years (Atkins et al., 2013; Garn, 2016; Gill et al.,1983; Sit & Lindner, 2006). Sport enjoyment has been directly related to teammate acceptance which in turn has predicted sport commitment among adolescent girls (Garn, 2016). When girls believe sport participation to be a way of developing friendships, they are more likely to take up and continue in sports (Guedes & Netto, 2013; McDonough & Crocker, 2005; Sit & Lindner, 2006). Positive attitudes about being part of a team and competing are associated with sport participation (Gill et al., 1983; Longhurst & Spink, 1987). Of the nine studies included in this review that were specifically analyzing motivation, seven identified variables that were subsequently operationalized as attitudes for the purposes of this review (Atkins et al., 2013; Guzman & Kingston, 2012; Gill et al., 1983; Guedes & Netto, 2013; McDonough & Crocker, 2005; Longhurst & Spink, 1987; Sit & Lindner, 2006). This finding highlights the importance of adolescent girls' attitudes or behavior beliefs when considering their motivation to be involved in or continue sports over time.

This systematic review had several limitations. First, the records included in this review represented diverse study populations employing a range of methodologies over a timespan of several decades and evaluated participation in varying types of sports. We did not attempt to control for heterogeneity, which could impact our conclusions. Second, we limited the results to those records published in English which could represent language bias. Third, we are limited by the constraints of our theoretical framework. There may be aspects of sports participation among girls that we may not have considered as we focused our attention on operationalizing variables into constructs within the theory of planned behavior. Applying other theories may illuminate other variables that would provide a greater understanding of this phenomenon.

5. Conclusions

The theory of planned behavior suggests that intentions to perform behaviors can be predicted by attitudes toward behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). Through performing this systematic review, we sought to identify the factors associated with sport participation among girls and then group those factors into the theory of planned behavior constructs. By operationalizing the identified factors, we provide a list of variables that may be tested to better understand which are most predictive of girls' intentions to participate in sports. While the science surrounding sport and physical activity among adolescent girls has progressed tremendously over the last decade with respect to methodology and analytics, of the 36 records included in this review only seven were guided by theory and all were quantitative studies. Future research would benefit from theory-driven prospective approaches to make clear and consistent predictions about factors impacting sport participation as well as

mixed method approaches aimed to provide more robust understanding of girls' experiences with and perceptions of factors impacting their participation in sports. Advancing the science with greater understanding of the multifactorial barriers and facilitators to sport involvement among girls will allow for implementation of appropriate and sustainable interventions aimed to support sport participation among girls across different populations and communities.

Author Contributions: Dr. Casey Hopkins and Dr. Chris Hopkins were responsible for conceptualizing and outlining the methods used for this review. Dr. Casey Hopkins and Dr. Chris Hopkins systematically reviewed the literature and, along with Ms. Samantha Kanny, and Ms. Amanda Watson, critically appraised the records included in the review. Dr. Casey Hopkins, Dr. Chris Hopkins, Ms. Samantha Kanny, and Ms. Amanda Watson collaboratively drafted the original manuscript, reviewed the manuscript, and made edits to prepare the final draft. Dr. Casey Hopkins was responsible for overseeing this project. Dr. Casey Hopkins and Dr. Chris Hopkins were responsible for securing funding to support this research. All authors have read and agreed to the published version of the manuscript.

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Appendix. Quality appraisal of records.

Critical Appraisal of Analytical Cross-Sectional Studies										
First Author (Date)	Appraisal Questions									
	Were the criteria for inclusion in the sample clearly defined?	Were the study subjects and the setting described in detail?	Was the exposure measured in a valid and reliable way?	Were objective, standard criteria used for measurement of the condition?	Were confounding factors identified?	Were strategies to deal with confounding factors stated?	Were the outcomes measured in a valid and reliable way?	Was appropriate statistical analysis used?	Include in review?	Level of Evidence
Agata (2018)	Y	Y	Y	Y	NA	Y	Y	Y	Y	IIIA
Atkins (2013)	Y	Y	NA	Y	Y	Y	Y	Y	Y	IIIB
Balaguer (2012)	Y	Y	NA	Y	NA	Y	Y	Y	Y	IIIA
Cleland (2005)	Y	Y	Y	Y	Y	Y	Y	Y	Y	IIIA
Deflandre (2001)	Y	Y	NA	Y	Y	Y	Y	Y	Y	IIIB
Dishman (2006)	Y	Y	Y	Y	Y	Y	Y	Y	Y	IIIA
Dollman (2010)	Y	Y	NA	Y	Y	Y	Y	Y	Y	IIIA
Eime (2013)	Y	Y	NA	Y	NA	Y	Y	Y	Y	IIIB
Engel (1994)	Y	Y	NA	Y	NA	Y	Y	Y	Y	IIIB
Garn (2016)	Y	Y	NA	Y	Y	Y	Y	Y	Y	IIIA

Gill (1983)	Y	Y	NA	Y	Y	Y	Y	Y	Y	IIIB
Guedes (2013)	Y	Y	NA	Y	Y	Y	Y	Y	Y	IIIA
Higginson (1985)	Y	Y	Y	Y	Y	Y	Y	Y	Y	IIIB
Kanters (2013)	Y	Y	NA	Y	Y	Y	Y	Y	Y	IIIA
Longhurst (1986)	Y	Y	Y	Y	NA	Y	Y	Y	Y	IIIB
Luiggi (2018)	Y	Y	NA	Y	NA	Y	Y	Y	Y	IIIA
McDonough (2005)	Y	Y	NA	Y	Y	Y	Y	Y	Y	IIIA
Saunders (2004)	Y	Y	NA	Y	Y	Y	Y	Y	Y	IIIA
Scurr (2016)	Y	Y	Y	Y	NA	Y	Y	Y	Y	IIIB
Seabra (2008)	Y	Y	Y	Y	Y	Y	Y	Y	Y	IIIA
Sit (2006)	Y	NA	Y	Y	Y	Y	Y	Y	Y	IIIB
Snyder (1976)	Y	Y	NA	Y	N	N	Y	Y	Y	IIIB
Toftegaard-Stockel (2011)	Y	Y	Y	Y	Y	Y	Y	Y	Y	IIIA
Yabe (2019)	Y	Y	Y	Y	Y	Y	Y	Y	Y	IIIA

Y = Yes; N = No; U = Unclear; NA = Not applicable

Critical Appraisal of Cohort Studies													
First Author (Date)	Appraisal Questions												
	Were the two groups similar and recruited from the same population?	Were the exposures measured similarly to assign people to both exposed and unexposed groups?	Was the exposure measured in a valid and reliable way?	Were the groups/participants free of the outcome at the start of the study?	Were confounding factors identified?	Were strategies to deal with confounding factors stated?	Were the outcomes measured in a valid and reliable way?	Was the follow up time reported and sufficient to be long enough for outcomes to occur?	Was follow up complete, and if not, were the reasons to loss to follow up described and explored?	Were strategies to address incomplete follow up utilized?	Was appropriate statistical analysis used?	Include in review?	Level of Evidence

Bedard (2020)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	IIIA
Daniels (2006)	Y	Y	Y	NA	Y	Y	Y	Y	Y	Y	Y	Y	IIIA
DeJonge (2019)	Y	Y	Y	NA	NA	Y	Y	Y	Y	N	Y	Y	IIIB
Delorme (2011)	Y	Y	Y	N	NA	Y	Y	Y	Y	Y	Y	Y	IIIB
Guzman (2012)	Y	Y	Y	NA	Y	N	Y	Y	Y	N	Y	Y	IIIB
Howie (2019)	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	IIIA
McMillian (2016)	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y	Y	IIIA
Michaud (2006)	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y	Y	IIIA
Murphy (2017)	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y	Y	IIIA
Tiggelman (2015)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	IIIA
Vella (2016)	Y	Y	Y	N	Y	NA	Y	Y	Y	Y	Y	Y	IIIB
Wattie(2014)	Y	Y	Y	Y	Y	NA	Y	NA	NA	NA	Y	Y	IIIB

Y = Yes; N = No; U = Unclear; NA = Not applicable

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