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Educator-Perceived Barriers and Facilitators to Structured-Physical Activity in Early Childhood Centres: A Systematic Review

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ABSTRACT

Purpose: Physical activity (PA) and motor competence development are vital for young children, yet many early childhood education and care (ECEC) centers struggle to successfully implement PA programs, particularly those organized and led by educators. This review aimed to synthesize qualitative literature to (1) identify educator-perceived barriers and facilitators to structured-PA in ECEC centers, and (2) map these to the COM-B model and Theoretical Domains Framework (TDF). **Methods:** Following PRISMA guidelines, a systematic search of five databases was conducted in April 2021 and updated in August 2022. Records were screened in Covidence software using predefined eligibility criteria. Using the framework synthesis method, data extraction and synthesis were conducted in coding forms in Excel and NVivo. **Results:** Of 2382 records identified, 35 studies were included, representing 2,365 educators across 268 ECEC centers in 10 countries. Using the COM-B model and TDF, an evidence-informed framework was developed. Findings revealed the greatest barriers concerned educator "*opportunity*" (e.g. competing time and priorities, policy tensions, indoor/outdoor space constraints) and "*capability*" (e.g. lack of PA knowledge and practical, hands-on skills) to implement structured-PA. Although fewer studies reported factors that influenced educator "*motivation*", several themes intersected across the three COM-B components illustrating the complexity of behavioral determinants in this setting. **Conclusions:** Interventions grounded in theory that utilize a systems approach to target multiple levels of influence on educator behavior, and are flexible and adaptable locally, are recommended. Future work should seek to address societal barriers, structural challenges in the sector, and the PA educational needs of educators. PROSPERO Registration: CRD42021247977

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COM-B model; motor competence; preschool; teacher; theoretical domains framework

Background

The health benefits of regular physical activity (PA) in childhood are well established (Carson et al., 2017; Poitras et al., 2016), yet globally many children are not sufficiently active to meet PA guidelines (Aubert et al., 2018). While less studied, PA in early childhood (age 0–5 years) is positively associated with health indicators such as bone and skeletal health, cardiovascular health, adiposity, cognitive development, and motor competence (Timmons et al., 2012). There is a lack of internationally comparable data for children who are sufficiently active in this age group; however, data at a national level indicate young children in some countries are less active than guidelines recommend (Christian et al., 2018; Jackson et al., 2021).

There is also evidence children's motor competence (MC), developed through PA and play, is lower than desirable (Barnett et al., 2013; Bolger et al., 2021). Acquisition of MC begins in early childhood through the development of fundamental movement skills, which include locomotor skills (e.g., running, jumping), stability skills (e.g., balancing), and object control skills (e.g., throwing, kicking) (Goodway et al., 2019). Importantly, the relationship between PA and MC is hypothesized to be bi-directional (Stodden et al., 2008), with early childhood a critical period for promoting both (Barnett et al., 2021) as these skills and behaviors can track into the school years and beyond (Barnett et al., 2016; Telama et al., 2014).

Early childhood education and care (ECEC) services, such as childcare and preschool, are valuable settings to promote PA and MC, with over 80% of 3–5-year-old children across Organization for Economic Cooperation and Development countries attending ECEC services (or have commenced elementary school) (OECD Family Database, 2021). As such, there has been increasing emphasis in the frameworks regulating ECEC settings toward the provision of health promoting environments that foster PA and MC, among other healthy behaviors (Australian Children's Education and Care Quality Authority, 2018; Childcare Canada, 2014). Best practice guidelines for ECEC services recommend a mix of unstructured PA (e.g. free active play) and structured-PA, which is organized and led by adults and designed to support MC development and moderate to vigorous PA (MVPA) (Institute of Medicine, 2011, p. 9). Whilst guidelines for how much PA varies by child age and between countries (Institute of Medicine, 2011; Okely et al., 2017; M. S. Tremblay et al., 2017), World Health Organization guidelines recommend 180 min of daily PA for children aged 1–5 years, with 60 min of energetic play (i.e. MVPA) recommended for children aged 3–5 years (World Health Organization, 2019).

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Evidence for how active children are in ECEC settings is inconsistent. Variability in the type of wearable accelerometer devices (the gold standard for this population) (Cliff et al., 2009; Truelove et al., 2018), data processing methods (e.g. wear time and cut-points applied) (O'brien et al., 2018), center characteristics, and geographical locations contribute to inconsistent results. Nevertheless, systematic reviews indicate sedentary behavior is high (O'brien et al., 2018; Truelove et al., 2018). Moreover, a large Australian study found that over a standard 8-h ECEC day, less than 12% of children aged 2–5 years met the recommended 180 min of PA (Christian et al., 2018). Additionally, children are reported as more active outside ECEC settings suggesting supporting children's PA in ECEC is warranted (Hinkley et al., 2016; O'neill et al., 2016).

A growing number of PA interventions have been developed for the ECEC setting, with both positive (R. A. Jones et al., 2011) and no effect on PA (Bellows et al., 2013), or MC (Bonvin et al., 2013). A meta-analysis found that although some expert-led interventions were effective, pragmatic interventions (delivered by in-center staff), were not effective at increasing children's PA in ECEC (Finch et al., 2016). Furthermore, the wider-uptake and sustainability of these initiatives outside the intervention period (and research conditions) appears limited (Wolfenden et al., 2016). The lack of effectiveness of pragmatic interventions has been attributed in part to poor implementation (Bonvin et al., 2013; J. Jones et al., 2017) and lack of consideration to the barriers and facilitators of sustained behavior change by educators (front-line staff, including teachers, in ECEC services) (Finch et al., 2016; Hesketh et al., 2017).

As pragmatic PA interventions are delivered by in-center staff, their perceptions, attitudes, and experiences are likely to play an important role in intervention success or failure (Sisson et al., 2017; L. Tremblay et al., 2012). However, the role of educators is not well understood (Hinkley et al., 2016; Tonge et al., 2016), with educator variables being the least studied in the quantitative literature (Tonge et al., 2016). Qualitative research has revealed a range of perspectives, including lack of clarity among educators regarding their role in children's PA, beliefs that children are sufficiently active in ECEC without adult intervention, low self-efficacy for engaging children in PA, and organizational policy barriers (Coleman & Dyment, 2013; Copeland, Kendeigh, et al., 2012; Hesketh et al., 2017; Sisson et al., 2017). While several reviews have examined barriers and facilitators to young children's PA across different settings (Hesketh et al., 2017), as well as implementation of environmental recommendations (Razak et al., 2019) and policies and practices (L. Tremblay et al., 2012) to promote PA in ECEC, to our knowledge, none have synthesized qualitative research exploring educators' perspectives on implementing structured-PA.

Structured-PA, being organized and led by educators, is an intentional behavior that can be influenced by a range of factors both within the individual and in their external environment. A useful method for examining factors that influence health behaviors is application of a validated behavioral science framework (French et al., 2012). One such theory is the Capability, Opportunity, Motivation-Behavior (COM-B) model, which demonstrates that behavior and behavior change occur through an interaction between an individual's capability, opportunity, and motivation (Michie et al., 2011). Importantly, the COM-B model recognizes that educator behavior is part of a wider interacting system that includes factors both within (capability, motivation) and outside (opportunity) the individual. For example, capability refers to an individual's physical and psychological capacities, while motivation refers to both automatic (e.g., emotional) and reflective (e.g., thinking) internal processes that drive behavior. Conversely, opportunity refers to factors outside the individual in either their physical or social environment.

The COM-B components can be further elaborated using the Theoretical Domains Framework (TDF), which consists of 14 domains and 84 constructs taken from 33 theories of behavior change, and was developed through a process of expert consensus and subsequent validation work (Cane et al., 2012). The TDF domains were considered to be representative of the range of relevant theoretical constructs which can influence behavior (Atkins et al., 2017). Figure 1 illustrates how domains of the TDF link to each COM-B component (Cane et al., 2012). Using the COM-B model and TDF, intervention designers can identify what drives certain behaviors (facilitators) and what needs to shift for the desired behavior to occur (barriers). The COM-B model and TDF have been used to synthesize barriers and facilitators to behavioral interventions in other health contexts and settings (Alexander et al., 2014; McDonagh et al., 2018) including PA (Flannery et al., 2018; McKeon et al., 2022).

Purpose

Guided by the COM-B model and TDF, the aim of this review was to examine qualitative research conducted with educators working in licensed childcare services in the context of educator-organized and led PA for children. Specifically, the aim of this review was to (1) identify educator-perceived barriers and facilitators to structured-PA in ECEC centers, and (2) map these to the COM-B model and TDF to provide a system-level behavioral analysis (French et al., 2012; Michie et al., 2014).

Methods

This qualitative systematic review was prospectively registered with PROSPERO (CRD42021247977) and conducted according to PRISMA guidelines (Page et al., 2021) and the Enhancing Transparency in Reporting the Synthesis of Qualitative Research (ENTREQ) statement (Tong et al., 2012) (Supplementary Material 1).

Eligibility criteria

Eligible studies had to explore educators' perspectives on implementing structured-PA in ECEC centers using qualitative research methods. Although barriers and facilitators may also be investigated quantitatively, such data are shaped by researchers pre-conceived ideas of potential influencing factors, rather than an open-ended enquiry into educator perspectives, therefore, we chose to focus exclusively on qualitative research (Green & Thorogood, 2018). An adapted

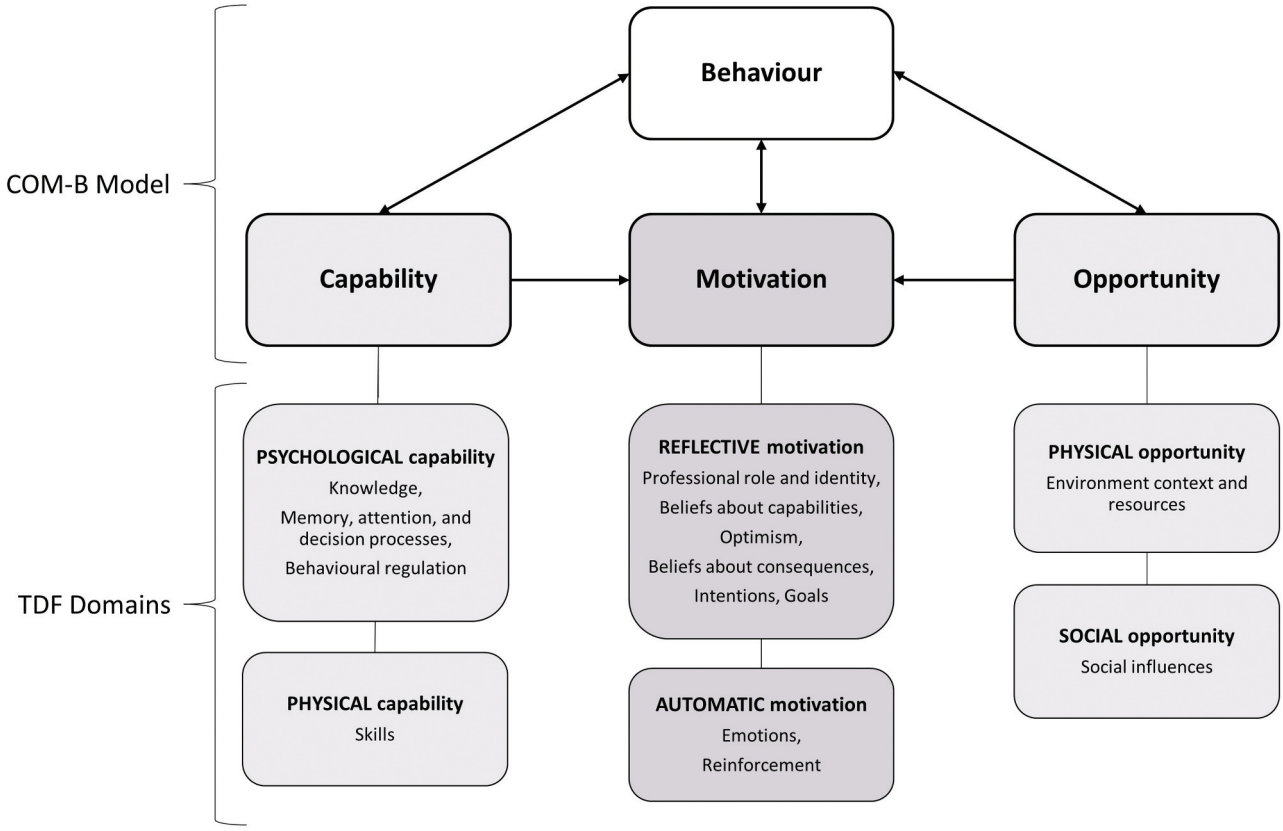

Figure 1. COM-B model and TDF. COM-B = capability, opportunity, motivation-behavior; TDF = theoretical domains framework. The COM-B model components and their links to the 14 domains of the TDF (Cane et al., 2012; Michie et al., 2011). Arrows show hypothesized directions of influence.

definition of structured-PA from the Institute of Medicine (2011, p. 162) was used: "*Structured-PA is a planned activity led by educators that involves short bouts of vigorous PA and/or light to moderate PA that supports the development of age-appropriate motor skills*". Although the distinction between unstructured-PA (e.g. active play) and structured-PA in young children is not clearcut given that all PA at this age is typically a form of play, the defining feature of structured-PA in this review is that it is an educator *organized* and *led* activity as opposed to child-initiated activity. With respect to eligible study types, we were interested in educator perspectives on implementing specific PA interventions (e.g., process evaluations) and structured-PA implementation in general (e.g., qualitative descriptive studies and formative evaluations).

Literature search strategy

A systematic search across five scientific databases was undertaken: Education Source, MEDLINE Complete, APA PsycInfo, SPORTDiscus, and Embase. A search strategy was developed and adapted for each database which combined terms for "childcare," "physical activity," and "educator" (Supplementary Material 2). The search was restricted to English language articles published from 2008 onwards, to account for the substantial changes in both the early childhood sector and movement guidelines for young children over the period (Australian Children's Educatiosn and Care Quality Authority, 2019; M. S. Tremblay et al., 2012, 2017). The original search was conducted in April 2021 and updated in August 2022. Reference lists of included studies were hand-searched for additional articles.

Study screening and selection

Database search results were imported, and duplicates removed, in Clarivate Analytics EndNote X9. Remaining records were imported into Covidence (Veritas Health Innovation, 2019) for screening and authors were trained using a screening tool that included predefined eligibility criteria (summarized in Table 1). Working independently in teams of two, title and abstract of all records were screened and discrepancies were discussed by the author team. If agreement was not reached, records were progressed to the next stage for further scrutiny. Likewise, full-text articles were screened independently by teams of two authors for inclusion, and discrepancies were discussed amongst the author team until consensus was reached. The process of inclusion and exclusion of articles is illustrated in the PRISMA flow diagram in Figure 2.

Data collection

Descriptive data for included studies were extracted using a standardized data extraction tool in MS-Excel by AJ and independently checked by TH for accuracy and completeness. Pre-agreed rules for extraction were developed and applied across all studies. Extracted data included: author and year of

Table 1. Eligibility criteria for inclusion of studies in the systematic review.

	Inclusion Criteria	Exclusion Criteria
Article type	Primary research published in peer-reviewed academic journals	Research protocols, reviews, articles not reporting primary data
Study setting	Early childhood education and care (ECEC) centers or equivalent settings, that are licensed public or commercial services that care for children from ages 0–6 years (e.g., childcare centers, preschool, kindergarten)	Home-based care such as family day care Elementary schools and school-related programs
Population	Educators, (e.g., teachers, carers, childcare providers, and other staff involved in the *direct* education and care of children in ECEC settings)	Directors or administrative staff; Pre-service teachers or students Specialist physical educators
Intervention	Structured-physical activity (Structured-PA) for typically developing children. This review uses an adapted version of the Institute of Medicine's definition: "*Stuctured-PA is a planned activity led by educators that involves short bouts of vigorous PA and/or light to moderate PA that supports the development of age-appropriate motor skills"(Institute of Medicine, 2011, p. 162)*. Study designs include qualitative descriptive, formative and process evaluations.	Unstructured physical activity: *"Child-initiated physical activity that occurs as the child explores his or her environment"(Institute of Medicine, 2011, p. 162)* (e.g., active play, outdoor play where the role of the adult is limited to encouragement or prompts). Structured-PA programs for non-typically developing children.
Research method	Any qualitative research method e.g., interviews, focus groups, surveys requiring text-based responses. Mixed methods studies where quantitative and qualitative data could be extracted and analyzed independently.	Quantitative methods e.g., surveys with pre-determined answer options.
Outcome: Barrier or Facilitator	Barrier is defined as: "*A circumstance or obstacle that keeps people or things apart or prevents communication or progress*"(Oxford University Press, 2021a). Alternative terms: challenge, issue, problem, obstacle. Facilitator is defined as: "*A person or thing that makes an action or process easy or easier*"(Oxford University Press, 2021b). Alternative terms: enabler, success factor or strategy.	Educator perspectives on structured-PA in ECEC beyond implementation barriers or facilitators e.g., in the context of outcomes for children.

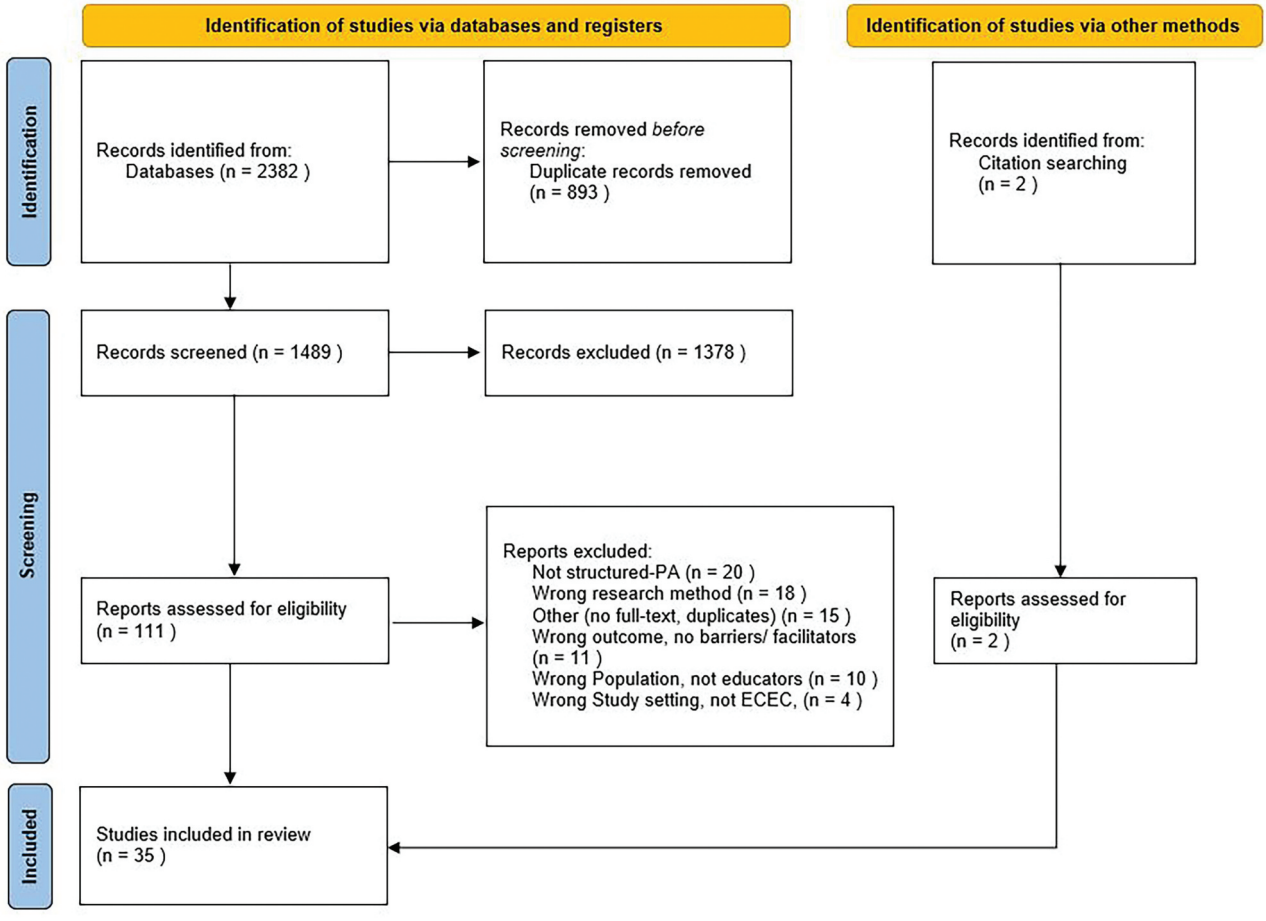

Figure 2. PRISMA flow diagram.

publication, country, region or city, study design, theoretical framework, setting type and characteristics, intervention characteristics (where applicable), participant characteristics, qualitative data collection and analysis techniques. Results were compared and discrepancies resolved by discussion. Included studies were then imported into QSR NVivo software (version-1.5) to facilitate data management and analysis, including extraction of main findings (i.e., barriers or facilitators) in

the primary studies. In this review, main findings were taken to be participant data (i.e., quotations) and researcher interpretations and themes.

Quality appraisal

The methodological quality and rigor of each article was independently evaluated by AJ and TH using either the Critical Appraisal Skills Programme (CASP) Checklist (Critical Appraisal Skills Programme, 2018) (for qualitative studies) or the Mixed Method Appraisal Tool (MMAT) (Hong et al., 2018) (for mixed methods studies). For both tools, criteria were developed and agreed by the author team for what constituted a complete answer for each item. Disagreements in appraisal were discussed and resolved amongst authors. Consistent with recommendations for use, individual studies were not scored for quality, but rather the appraisal provided a context in which the findings could be interpreted (Critical Appraisal Skills Programme, 2018; Hong et al., 2018). Regardless of appraisal results, no studies were excluded, in recognition of the diversity in qualitative research approaches and reporting styles, which can potentially lead to the quality of an article being underrated or overrated (Majid & Vanstone, 2018). Further explanation of the quality appraisal tools is provided in Supplementary Material 5.

Synthesis method

Main findings of primary studies were analyzed using the framework synthesis method, which is a systematic but flexible approach consisting of five overlapping stages (Brunton et al., 2020; Gough et al., 2017). Firstly, the *familiarization stage*, which involved immersion in the data through reading the included studies several times, and perusing reference lists and wider literature for the field. Secondly, *framework selection*, wherein a framework was identified to help understand and elucidate the review question. This stage was informed by published applications of two related behavioral science frameworks (COM-B model and TDF) (Cane et al., 2012; McDonagh et al., 2018; Michie et al., 2011; Nathan et al., 2018). Thirdly, at the *indexing stage*, data (i.e., educator perceived barriers or facilitators) were extracted, labeled, and indexed in NVivo using a codebook developed by the authors, based on the COM-B model and TDF (See Supplementary Material 3). This coding process was completed by AJ and independently checked and confirmed by TH in NVivo using the "annotations" and "Memos" functions. As indexing progressed, the codebook was tested and refined by the author team (Gough et al., 2017). Data were coded deductively (using the codebook) and inductively (to create sub-themes within each of the three COM-B components and 14 TDF domains—see Figure 1). For studies that included educators and other participants, only data relating to educators' perceptions were extracted. At the fourth, *charting stage*, subthemes were developed and revised iteratively in NVivo as patterns were identified across the data (Gough et al., 2017). At the final *mapping and interpretation stage*, the derived subthemes, representing educator perceived barriers and facilitators, were reviewed, and discussed in-depth by all authors and mapped using the COM-B model and TDF.

Positionality

To enhance trustworthiness and transparency in our research, it is important to provide context for our work such as professional backgrounds and worldview. This research is situated within a critical realist paradigm, wherein knowledge of reality is viewed as being shaped by our perception and beliefs (Barnett-Page & Thomas, 2009). Authors in this review have expertise in qualitative research methods and systematic reviews (AJ, LB, TH), as well as health promotion and public health (AJ, LB), physical literacy (AJ, LB), sport science and motor skill development (TH, LB).

Results

Included studies

The database search returned a total of 1986 records in April 2021, and a further 398 records in the updated search in August 2022. An additional two articles were identified through handsearching. After title abstract and full-text screening, 35 studies were identified that met eligibility criteria for inclusion in the review. Figure 2 illustrates the screening process, including how many records were screened at each stage and the predefined reasons studies were excluded at full-text screening.

Description of studies

Although two studies reported incomplete participant and setting data (Alhassan & Whitt-Glover, 2014; Hassani et al., 2020), we were able to estimate at least 2,365 teachers or educators across 268 ECEC centers (e.g., childcare, preschool, kindergarten) from 10 countries took part in the studies. Most participants were female, and other participant characteristics were inconsistently reported. Of 14 studies that reported socioeconomic status (SES) characteristics, nine were conducted in low-income communities, and five were conducted in a mix of low to high SES settings. A summary of included studies, including country, study design, theory, and data collection methods, is provided in Table 2. Notably, 20 studies did not report any theoretical framework, while six studies used behavioral theory (Chen et al., 2020; Connelly et al., 2018; Cotwright et al., 2017; Froehlich-Chow & Humbert, 2011; Howie et al., 2014; Vega-Perona et al., 2022), three an implementation science framework (Allar et al., 2017; Driediger, Vanderloo, Burke, et al., 2018; Hassani et al., 2020), and one study employed both (Hoffman et al., 2019). The characteristics of each study are summarized in Table 3 and comprehensively described in Supplementary Material 4. After communication with primary study authors, we identified that two sets of two studies were published from the same data sets (Coleman & Dyment, 2013; Dyment & Coleman, 2012; Tucker et al., 2011; van Zandvoort et al., 2010). For these articles, identified factors were not double extracted, and once data extraction was completed for one article, only additional factors were extracted for the second.

Table 2. Summary description of included studies.

	No.	Studies
Setting and sample	2,365	
Participants (educators or equivalent)		
ECEC centres	268	
Country		
Australia	4	(Cashmore & Jones, 2008; Coleman & Dyment, 2013; Dyment & Coleman, 2012; Petrunoff et al., 2009; Wenden et al., 2022)
Canada	7	(Connelly et al., 2018; Driediger, Vanderloo, Burke, et al., 2018; Froehlich-Chow & Humbert, 2011; Hassani et al., 2020; Szpunar et al., 2021; Tucker et al., 2011; van Zandvoort et al., 2010)
Cyprus	2	(Tsangaridou & Genethliou, 2016; Tsangaridou, 2017)
Hong Kong	1	(Capio et al., 2021; Cheung, 2010)
New Zealand	1	(McLachlan et al., 2017)
Norway	1	(Kippe et al., 2021; Skarstein & Ugelstad, 2020)
Singapore	1	(Chen et al., 2020)
Spain	1	(Martínez-Bello et al., 2021; Vega-Perona et al., 2022)
UK	2	(Foulkes et al., 2020; Malden et al., 2020)
USA	10	(Alhassan & Whitt-Glover, 2014; Alhassan et al., 2021; Allar et al., 2017; Bellows et al., 2008; Cotwright et al., 2017; Gehris et al., 2015; Hoffman et al., 2019; Howie et al., 2014, 2016; Kennedy et al., 2017; Park & Min, 2020)
Study design		
Qualitative descriptive	10	(Coleman & Dyment, 2013; Connelly et al., 2018; Froehlich-Chow & Humbert, 2011; Gehris et al., 2015; Martínez-Bello et al., 2021; Park & Min, 2020; Tsangaridou, 2017; Tucker et al., 2011; van Zandvoort et al., 2010; Vega-Perona et al., 2022)
Mixed method descriptive	3	(Chen et al., 2020; Kippe et al., 2021; Skarstein & Ugelstad, 2020)
Qualitative formative evaluation	6	(Alhassan et al., 2021; Bellows et al., 2008; Capio et al., 2021; Cashmore & Jones, 2008; Foulkes et al., 2020; Wenden et al., 2022)
Mixed method process evaluation	14	(Alhassan & Whitt-Glover, 2014; Allar et al., 2017; Cotwright et al., 2017; Driediger, Vanderloo, Burke, et al., 2018; Hassani et al., 2020; Hoffman et al., 2019; Howie et al., 2014, 2016; Kennedy et al., 2017; Malden et al., 2020; McLachlan et al., 2017; Petrunoff et al., 2009; Szpunar et al., 2021; Tsangaridou & Genethliou, 2016)
NR	2	(Cheung, 2010; Dyment & Coleman, 2012)
Theory		
SEM, Ecological model	5	(Chen et al., 2020; Connelly et al., 2018; Froehlich-Chow & Humbert, 2011; Howie et al., 2014; Vega-Perona et al., 2022)
Evaluation frameworks (RE-AIM, GOF, PRECEDE-PROCEED model)	3	(Allar et al., 2017; Driediger, Vanderloo, Burke, et al., 2018; Hassani et al., 2020)
SCT	2	(Cotwright et al., 2017; Hoffman et al., 2019)
TPB	1	(Hoffman et al., 2019)
Implementation frameworks (QIF)	1	(Hoffman et al., 2019)
Grounded theory	1	(Gehris et al., 2015)
Naturalistic framework	1	(Wenden et al., 2022)
Phenomenology	1	(Foulkes et al., 2020)
NR	20	(Alhassan & Whitt-Glover, 2014; Alhassan et al., 2021; Bellows et al., 2008; Cashmore & Jones, 2008; Cheung, 2010; Coleman & Dyment, 2013; Dyment & Coleman, 2012; Howie et al., 2016; Kennedy et al., 2017; Kippe et al., 2021; Malden et al., 2020; Martínez-Bello et al., 2021; McLachlan et al., 2017; Park & Min, 2020; Petrunoff et al., 2009; Skarstein & Ugelstad, 2020; Szpunar et al., 2021; Tsangaridou & Genethliou, 2016; Tsangaridou, 2017; Tucker et al., 2011; van Zandvoort et al., 2010)
Qualitative data collection methods		
Interviews	12	(Bellows et al., 2008; Cheung, 2010; Coleman & Dyment, 2013; Connelly et al., 2018; Dyment & Coleman, 2012; Froehlich-Chow & Humbert, 2011; Howie et al., 2016; Martínez-Bello et al., 2021; McLachlan et al., 2017; Tsangaridou & Genethliou, 2016; Tsangaridou, 2017; Vega-Perona et al., 2022)
Focus groups	9	(Allar et al., 2017; Capio et al., 2021; Cashmore & Jones, 2008; Chen et al., 2020; Gehris et al., 2015; Park & Min, 2020; Tucker et al., 2011; van Zandvoort et al., 2010; Wenden et al., 2022)
Survey	1	(Alhassan & Whitt-Glover, 2014)
Multi-qualitative method	13	(Alhassan et al., 2021; Cotwright et al., 2017; Driediger, Vanderloo, Burke, et al., 2018; Foulkes et al., 2020; Hassani et al., 2020; Hoffman et al., 2019; Howie et al., 2014; Kennedy et al., 2017; Kippe et al., 2021; Malden et al., 2020; Petrunoff et al., 2009; Skarstein & Ugelstad, 2020; Szpunar et al., 2021)

Note. GOF = Getting to Outcomes Framework; NR = Not Reported; QIF = Quality Implementation Framework; RE-AIM = Reach, Effectiveness, Adoption, Implementation, Maintenance framework; SCT = Social Cognitive Theory; SEM = Socio-Ecological Model; TPB = Theory of Planned Behavior; UK = United Kingdom.

Quality appraisal results

All 18 qualitative studies clearly stated their research aims and employed a research design that was appropriate to address these aims. Most studies clearly stated their findings, discussed the contribution they made to current practice, policy, and future enquiry, and reported ethics approval. However, only one study critically examined the authors own role and the potential for bias during the research (Tucker et al., 2011). Additionally, research methodology was reported inconsistently, particularly participant recruitment, data collection and analysis techniques. Two studies were assessed as lower quality in that they did not achieve "Yes-totally met" for at least than two-thirds (7) of the 10 appraisal items (Capio et al., 2021; Martínez-Bello et al., 2021).

For the mixed-method studies, all 17 provided clear research questions and a study design suited to answering those questions. Most employed appropriate qualitative research methods, although coherence between the qualitative data collection methods, analysis, and interpretation were mixed. Quantitative elements of the mixed methods studies were inconsistently reported, with less than half the studies adequately explaining whether the sample was representative of the target population or the risk of non-response bias. Rationale and application of

Table 3. Summary characteristics of included studies.

Author, Year	Location	Study Design	Theory	ECEC Setting & Child Age Range (n=number of services)	Participants (n = sample size)	Qualitative Method	Qualitative Analysis
Alhassan and Whitt-Glover (2014)	USA	Mixed method process evaluation		Preschools ($n = 5$), Child age: 2.9–5 years	Teachers (n=NR)	Survey	Narrative description
Alhassan et al. (2021)	USA	Qualitative formative evaluation		Childcare centers ($n = 3$), Child age: 1–3 years	Teachers ($n = 15$)	Focus groups, Survey	Variation of thematic analysis
Allar et al. (2017)	USA	Mixed method process evaluation	RE-AIM framework	Head Start centers ($n = 8$), Child age: NR	Teachers/Teacher aides ($n = 33$), Other staff ($n = 4$)	Focus groups	Thematic analysis
Bellows et al. (2008)	USA	Qualitative formative evaluation		Preschools and Head Start centers ($n = 17$), Child age: NR	Teachers ($n = 31$), Parents ($n = 45$)	Interviews, Focus groups	Variation of content analysis
Capio et al. (2021)	Hong Kong	Qualitative formative evaluation		Kindergarten ($n = 1$) Child age: NR	Teachers ($n = 5$)	Focus groups	Thematic analysis
Cashmore and Jones (2008)	Australia	Qualitative formative evaluation		Long Day-care centers ($n = 5$), Child age: 0–6 years	Childcare workers ($n = 20$)	Focus groups	Content analysis, using constant comparative method
Chen et al. (2020)	Singapore	Mixed method descriptive	SEM	Preschools ($n = 3$), Child age: 3–6 years	Teachers ($n = 12$)	Focus groups	Thematic analysis
Cheung (2010)	Hong Kong	NR		Kindergarten ($n = 3$), Child age: 5–6 years	Teachers ($n = 3$)	Interviews	Variation of framework analysis
Coleman and Dyment (2013)	Australia	Qualitative descriptive		Preschools ($n = 4$), Child age: 0–5 years	Educators & Frontline managers ($n = 16$)	Interviews	Thematic analysis
Connelly et al. (2018)	Canada	Qualitative descriptive	Ecological model	CPE centers ($n = 3$), Child age: 3–5 years	Educators ($n = 9$), Directors ($n = 3$)	Interviews	Thematic analysis
Cotwright et al. (2017)	USA	Mixed method process evaluation	SCT	Childcare centers ($n = 6$), Child age: 3–5 years	Teachers ($n = 13$), Directors ($n = 8$)	Focus groups, Interviews, Field notes	Thematic analysis
Driediger et al. 2018	Canada	Mixed method process evaluation	PRECEDE-PROCEED model	Childcare centers ($n = 11$), Child age: 2.5–4 years	Educators ($n = 49$)	Survey, Interviews	Content analysis
Dyment and Coleman (2012)	Australia	NR		Preschools ($n = 4$), Child age: 0–5 years	Educators & Frontline managers ($n = 16$)	Interviews	Thematic analysis
Foulkes et al. (2020)	UK (England)	Qualitative formative evaluation	Phenomenology	Preschools ($n = 4$), Child age: 3–5 years	Educators ($n = 19$), PA/PL Experts ($n = 9$)	Focus groups, Interviews	Thematic analysis
Froehlich-Chow and Humbert (2011)	Canada	Qualitative descriptive	Ecological model	Childcare centers ($n = 6$), Child age: 0–6 years	Educators ($n = 7$)	Interviews	Variation of thematic analysis
Gehris et al. (2015)	USA	Qualitative descriptive	Grounded theory	Head Start centers ($n = 19$), Child age: 3–5 years	Lead Teachers ($n = 20$), Assistant Teachers ($n = 17$)	Focus groups	Thematic analysis
Hassani et al. (2020)	Canada	Mixed method process evaluation	GOF, RE-AIM framework	Preschools, Childcare, family daycare (n=NR), Child age: NR	Early years providers ($n = 1819$)	Focus groups (n=NR), Interviews (n=NR), Survey ($n = 1819$)	Thematic analysis
Hoffman et al. (2019)	USA	Mixed method process evaluation	SCT, TPB, QIF	Head start centers ($n = 3$), Child age: NR	Teachers ($n = 11$), Supervisors ($n = 2$)	Interviews, Survey	Variation of thematic analysis
Howie et al. (2014)	USA	Mixed method process evaluation	SEM	Preschools ($n = 8$), Child age: 3–5 years	Teachers ($n = 24$)	Survey, Interviews, Field notes	NR
Howie et al. (2016)	USA	Mixed method process evaluation		Preschools ($n = 4$), Child age: 3–5 years	Teachers ($n = 6$)	Interviews	Variation of thematic analysis
Kennedy et al. (2017)	USA	Mixed method process evaluation		Preschools ($n = 9$), Child age: 3–5 years	Teachers ($n = 22$),	Survey, Interviews, Observations	Content analysis
Kippe et al. (2021)	Norway	Mixed method descriptive		Preschools ($n = 3$), Child age: 3–5 years	Pre-school staff ($n = 5$)	Focus groups, Interviews	Variation of thematic analysis
Malden et al. (2020)	UK (Scotland)	Mixed method process evaluation		Preschools ($n = 3$), Child age: 3–5 years	Preschool practitioners ($n = 9$)	Focus groups, Survey, Logbooks	Thematic analysis
Martínez-Bello et al. (2021)	Spain	Qualitative descriptive		ECE institutions ($n = 8$), Child age: NR	ECE teachers ($n = 12$), ECE teaching students ($n = 10$)	Interviews	Variation of content analysis
McLachlan et al. (2017)	New Zealand	Mixed method process evaluation		Childcare centers ($n = 2$), Child age: 0–6 years	Teachers ($n = 18$)	Interviews	Content and thematic analysis

(*Continued*)

Table 3. (Continued).

Author, Year	Location	Study Design	Theory	ECEC Setting & Child Age Range (n=number of services)	Participants (n = sample size)	Qualitative Method	Qualitative Analysis
Park and Min (2020)	USA	Qualitative descriptive		Preschools ($n = 4$), Child age: 2–5 years	Teachers ($n = 10$), Directors ($n = 4$), Other staff ($n = 2$)	Focus groups	Content analysis
Petrunoff et al. (2009)	Australia	Mixed method process evaluation		Long daycare ($n = 12$), Child age: mean age 4 years	Educators ($n = 52$), Directors ($n = 6$)	Surveys, Debrief diary	NR
Skarstein and Ugelstad (2020)	Norway	Mixed method descriptive		Kindergarten ($n = 9$), Child age: 3–6 years	ECE teachers ($n = 12$)	Focus groups, Questionnaire	Content analysis
Szpunar et al. (2021)	Canada	Mixed method process evaluation		Childcare centers ($n = 5$), Child age: 1.5–4 years	Early childhood educators ($n = 25$)	Interviews, Survey, Logbook	Thematic analysis, Content analysis
Tsangaridou and Genethliou (2016)	Cyprus	Mixed method, process evaluation		Preschools ($n = 2$), Child age: NR	Early childhood educators ($n = 4$)	Interviews	Thematic analysis
Tsangaridou (2017)	Cyprus	Qualitative descriptive		Preschools ($n = 2$), Child age: 4–5 years	Early childhood educators ($n = 4$)	Interviews	Thematic analysis
Tucker et al. (2011)	Canada	Qualitative descriptive		Daycare ($n = 9$), Child age: 2.5–5 years	Educators ($n = 54$)	Focus groups	Content analysis
van Zandvoort et al. (2010)	Canada	Qualitative descriptive		Daycare ($n = 9$), Child age: 2.5–5 years	Educators ($n = 54$),	Focus groups	Content analysis
Vega-Perona et al. (2022)	Spain	Qualitative descriptive	SEM	ECEC centers ($n = 6$), Child age: 2–3 years	Teachers ($n = 14$), Principals ($n = 6$)	Interviews	Variation of thematic analysis
Wenden et al. (2022)	Australia	Qualitative formative evaluation	Naturalistic framework	ECEC centers ($n = 11$), Child age: 0–6 years	Educators ($n = 55$), Directors ($n = 11$)	Focus groups	Variation of thematic analysis

Note. ECE = Early Childhood Education; ECEC = Early Childhood Education and Care; GOF = Getting to Outcomes Framework; NR = Not Reported; PA = Physical Activity; PL = Physical Literacy; QIF = Quality Implementation Framework; RE-AIM = Reach, Effectiveness, Adoption, Implementation, Maintenance framework; SCT = Social Cognitive Theory; SEM = Socio-Ecological Model; TPB = Theory of Planned Behavior; UK = United Kingdom. Complete description of studies is provided in Supplementary Material 4.

the mixed-methods design was adequate in just over half the studies. Four of the studies were assessed as lower quality in that they did not achieve "Yes" for at least two-thirds (10) of the 15 appraisal questions (Cotwright et al., 2017; Howie et al., 2014, 2016; Petrunoff et al., 2009).

Application of the COM-B model and TDF

Educator perceived barriers and facilitators identified across studies were mapped to the COM-B model and domains of the TDF (see Figure 3). Key barriers identified across one-third of studies or more (11+), are represented in bold underlined text in Figure 3. Notably, there were no facilitators that met this threshold. A summary of barriers and facilitators mapped to the COM-B model and TDF is provided in Supplementary Material 6, while the specific TDF domains mapped to barriers and/or facilitators for each study are provided in Supplementary Material 4.

Capability

Educators perceived several factors relating to their psychological and physical capabilities influenced their implementation of structured-PA in ECEC centers. This is defined within the COM-B model as the "*capability*" to engage in the activity concerned and includes four TDF domains. Factors were mapped to three of these; "knowledge," "behavioral regulation," and "skills," with no factors identified for the fourth domain "memory, attention, and decision processes" (Michie et al., 2011).

Psychological capability – knowledge of structured-PA

Limited knowledge of PA and physical education (PE) was described as a barrier by educators across one-third of studies. This included lack of awareness of PA guidelines, procedural knowledge for how to provide age-appropriate structured-PA, and/or understanding the significance of structured-PA for children (Bellows et al., 2008; Chen et al., 2020; Coleman & Dyment, 2013; Foulkes et al., 2020; Gehris et al., 2015; Martínez-Bello et al., 2021; McLachlan et al., 2017; Skarstein & Ugelstad, 2020; Szpunar et al., 2021; Tucker et al., 2011). As an American educator described: "*I don't know guidelines and what is appropriate for this age. I think there was a lack of specific education on physical activity for young children so teachers were not trained (on it)*" (Bellows et al., 2008, p. 173). Educators identified that this was due to limitations in both pre-service education and ongoing professional development, as a British educator described: "*It all comes down to training and education, because if you've got staff who don't realize, if they've never had the early education, the pre-school learning, then they'll go, 'Oh yes, just give them a ball,' and that's it*" (Foulkes et al., 2020, p. 12). While another American educator explained: "*My education on physical education or physical gross motor is what I learned [as a child] in elementary school and grade school*" (Gehris et al., 2015, p. 126).

Participants believed that addressing PA and PE knowledge gaps through education and ongoing professional development would improve their confidence in providing structured-PA (Skarstein & Ugelstad, 2020; Wenden et al., 2022) and have a positive influence on educator behavior and intentions (Foulkes et al., 2020; Gehris et al., 2015; Hoffman et al., 2019;

Howie et al., 2014, 2016; Kennedy et al., 2017; Tsangaridou & Genethliou, 2016). "*Just to try and provide me with more confidence and understanding on what needs to happen instead of a basic understanding, so that I may want to then implement and encourage and educate the children and parents as well*" (Wenden et al., 2022, p. 5) – Australian educator. A British educator emphasized the importance of developing a deeper understanding about the role of different types of PA for children: "*Maybe educate them [center staff] also about certain kind of activities, what it does to children, what it does to them, because every activity's different again, and there's so many*" (Foulkes et al., 2020, p. 11). Similarly, educators that participated in structured-PA interventions with a training component to improve knowledge, described how this deepened their understanding and challenged them to change their practices. As a Cypriot educator explained: "*It was a programme that brought up new pedagogical ideas and personally encouraged me to challenge myself, to develop my sense of judgment. It also helped to develop my creativity for modifying the curriculum based upon my needs*" (Tsangaridou & Genethliou, 2016, p. 389).

Behavioral regulation. In the behavioral regulation domain, one facilitating factor was identified. American educators in an evaluation of a pilot intervention perceived that the self-assessment and supervisor observation aspect of the program " *. . . stimulated new ideas, critical thinking, and creativity about how they lead and facilitate active play*" (Hoffman et al., 2019, p. 216).

Physical capability – skills needs and development for structured-PA

Closely related to knowledge and understanding of structured-PA for children, was the practical skills educators required to implement structured-PA in ECEC centers. Like the knowledge domain, educators perceived a lack of, or insufficient, training for structured-PA as the primary barrier to acquiring these skills (Alhassan & Whitt-Glover, 2014; Bellows et al., 2008; Capio et al., 2021; Cheung, 2010; Coleman & Dyment, 2013; Foulkes et al., 2020; Gehris et al., 2015; Kennedy et al., 2017; Martínez-Bello et al., 2021; McLachlan et al., 2017; Park & Min, 2020; Petrunoff et al., 2009; Skarstein & Ugelstad, 2020; Szpunar et al., 2021; Tsangaridou, 2017; Tucker et al., 2011). As a British educator illustrated: "*What am I supposed to be doing? I've got an hour here with ten two-year-old's. I need some ideas*" (Foulkes et al., 2020, p. 17). Some specific skills that educators perceived would help them effectively implement structured-PA, included the ability to integrate structured-PA into their existing curricula (Chen et al., 2020; Hoffman et al., 2019; Howie et al., 2016; Park & Min, 2020), to adapt games and develop new activities from existing resources (Cotwright et al., 2017; Hoffman et al., 2019), to find new resources (e.g., online) (Park & Min, 2020; van Zandvoort et al., 2010), and to provide assessment and feedback to children (Allar et al., 2017).

Some educators desired training for structured-PA that balanced theory and knowledge-building with experiential, practical skills-based sessions (Foulkes et al., 2020; Gehris et al., 2015; Howie et al., 2016; Tsangaridou & Genethliou, 2016). While others specifically wanted hands-on training, with "*lots of demonstration*" (Bellows et al., 2008, p. 173). As a Canadian educator described: "*[I want] more workshops, more about physical activity and new and different ways to provide it . . . I'd like to hear it from colleagues, like from other, you know, people that have been in the field and know what it's like*" (Tucker et al., 2011, p. 212). In addition to hands-on and interactive training (Bellows et al., 2008; Foulkes et al., 2020; Tsangaridou, 2017), educators suggested hiring guest PA instructors they could observe and learn from (Coleman & Dyment, 2013; Foulkes et al., 2020; Tucker et al., 2011), and regular refresher training and ongoing professional development workshops (Coleman & Dyment, 2013; Martínez-Bello et al., 2021; McLachlan et al., 2017; Tsangaridou & Genethliou, 2016; Tsangaridou, 2017; Tucker et al., 2011). Australian educators summed this up by explaining their repertoire of activities had become "*stale*" and "*monotonous*" and they needed "*professional development in that area just to update your skills and learn different and new ideas and things like that because you only know as much as you have learnt*" (Coleman & Dyment, 2013, p. 216).

Opportunity

Educators perceived numerous factors related to the physical and social environment in ECEC centers influenced their implementation of structured-PA. This is defined within the COM-B model as the "*opportunity*" to perform the behavior, and includes all the factors that lie outside the individual that make the behavior possible or prompt it (Michie et al., 2011). Opportunity includes the TDF domains of "environmental context and resources" and "social influences."

Physical opportunity – environmental context and resources (ECR)

Across studies, over half the barriers and facilitators reported by educators were in the "ECR" domain and concerned four TDF constructs: "organizational climate" (e.g., sector-wide influences), "organizational culture" (e.g., center-level influences), "person x environment" (e.g., features of the physical environment), and "resources" (e.g., material resources for implementing structured-PA).

Organizational climate and culture. Educators perceived several organizational factors at the sector- and center-level, that influenced their opportunity to implement structured-PA, including a lack of PA policy or curricula in ECEC needed to scaffold structured-PA into regular practice (Connelly et al., 2018; Foulkes et al., 2020; Froehlich-Chow & Humbert, 2011; Martínez-Bello et al., 2021), and the relative low status of PA and PE compared with other aspects of the ECEC curricula (Martínez-Bello et al., 2021; Tsangaridou, 2017). As a Cypriot educator explained: "*There is a tendency from the top, the department [of education], from the school's administration, to give emphasis to literature or math or other key learning areas and so physical education is neglected*" (Tsangaridou, 2017, p. 290). Commonly, educators faced competing priorities such as meeting academic curriculum requirements or achieving service quality ratings, which meant structured-PA slipped down their list of priorities (Bellows et al., 2008; Chen et al., 2020; Cotwright et al., 2017; Driediger, Vanderloo,

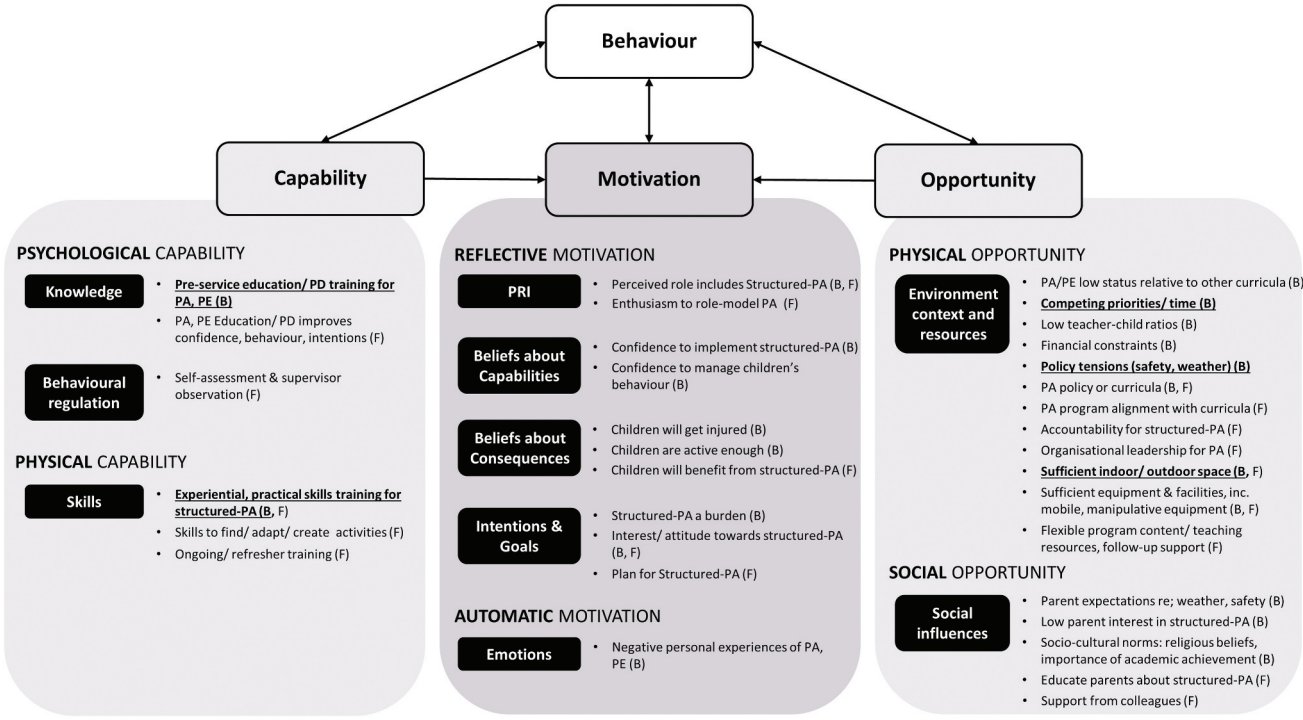

Figure 3. COM-B framework for educator perceived barriers and facilitators to structured-PA in ECEC centers. B = barrier; COM-B = capability, opportunity, motivation-behavior; F = facilitator; inc. = including; PA = physical activity; PD = professional development; PE = physical education; PRI = professional role and responsibility; TDF = theoretical domains framework. Educator perceived barriers and facilitators are mapped to the COM-B model and 11 of 14 TDF domains. No factors were mapped to the TDF domains 'memory, attention, and decision processes', 'optimism', or 'reinforcement'. Barriers or facilitators reported across one-third of studies or more (n = 11 +) are represented in bold underlined text. Arrows show hypothesized directions of influence. TDF and COM-B components were informed by the work of Cane et al. (2012), McDonagh et al. (2018) and McKeon et al. (2022).

Burke, et al., 2018; Foulkes et al., 2020; Malden et al., 2020; Martínez-Bello et al., 2021; Szpunar et al., 2021; Tsangaridou, 2017). Indeed, across almost half the studies educators perceived that insufficient time in the ECEC schedule was a key barrier to structured-PA implementation (Alhassan & Whitt-Glover, 2014; Allar et al., 2017; Bellows et al., 2008; Capio et al., 2021; Chen et al., 2020; Driediger, Vanderloo, Burke, et al., 2018; Howie et al., 2014, 2016; Malden et al., 2020; Martínez-Bello et al., 2021; McLachlan et al., 2017; Petrunoff et al., 2009; Skarstein & Ugelstad, 2020; Szpunar et al., 2021; Tsangaridou, 2017). This was clearly illustrated by an American educator: "*Time—not enough time to get, you know, as much done as we want to do because, of course, we have to do our curriculum, so not as much time to incorporate as much movement as we would like*" (Howie et al., 2016, p. 8). While a Spanish educator explained: "*Many times it's because of, I don't know if I can say lack of time, but because there are many other areas in the school schedule and the psychomotricity [structured-PA] class . . . is the one with the least amount of time*" (Martínez-Bello et al., 2021, p. 487). Likewise, educators participating in several structured-PA intervention evaluations reported the time required for transitions, to set up and pack down activities, was a significant barrier (Alhassan & Whitt-Glover, 2014; Driediger, Vanderloo, Burke, et al., 2018; Petrunoff et al., 2009; Szpunar et al., 2021). A Canadian educator summed this up: "*Just the frequent transitioning. It doesn't really mesh with our curriculum*" (Driediger, Vanderloo, Burke, et al., 2018, p. 941).

A related factor to the lack of policy or curricula for PA, was the influence of child-led pedagogy present in ECEC in countries such as Australia and Canada, which educators perceived to mean children should make their own choices about whether they participated in activities or not, and therefore some children missed out on structured-PA altogether (Coleman & Dyment, 2013; van Zandvoort et al., 2010). Another organizational-level tension reported by educators concerned other policies that constrained educators' ability to implement structured-PA, such as safety restrictions and weather-related policies. Weather policies and practices for outdoor activities during inclement weather were identified as a barrier to structured-PA across 13 studies (Alhassan et al., 2021; Cashmore & Jones, 2008; Coleman & Dyment, 2013; Driediger, Vanderloo, Burke, et al., 2018; Froehlich-Chow & Humbert, 2011; Hassani et al., 2020; Howie et al., 2016; Malden et al., 2020; Park & Min, 2020; Szpunar et al., 2021; Tsangaridou, 2017; van Zandvoort et al., 2010; Vega-Perona et al., 2022). For example, the time required to dress children for cold weather was perceived to be a barrier, as an American educator described: "*If you want to do something outside, you have to work around weather or snow . . . putting their snow clothes on can take up to like 15 to 20 min just to get them dressed to go outside*" (Alhassan et al., 2021, p. 323). In other centers, during very hot, cold, or wet weather that prevented outdoor activities altogether, educators reported a lack of suitable space indoors was a barrier to structured-PA (Cashmore & Jones, 2008; Coleman & Dyment, 2013; Froehlich-Chow & Humbert, 2011; Hassani et al., 2020; Malden et al., 2020; van Zandvoort et al., 2010). Additionally, safety policies constrained outdoor activities, as a Canadian

educator explained: "*We can go on walks except it's got to be a field trip, so it's a little more difficult in the sense that we can't go for [just] a neighborhood walk. It has to have a specific purpose, and then we have to get permission . . . we have to plan it so it's harder that way, in that sense, for safety concerns, obviously*" (van Zandvoort et al., 2010, p. 181). These issues also crossed over with "social influences" in the context of the attitudes of parents and colleagues, and educator "*motivation*" in the context of "belief about consequences" and children's safety (discussed below).

Finally, educators perceived government- or center-level financial constraints influenced their ability to cover the costs associated with structured-PA e.g., new equipment purchases, professional development workshops, or guest PA instructors to role-model activities (Foulkes et al., 2020; Froehlich-Chow & Humbert, 2011; McLachlan et al., 2017; Tucker et al., 2011; Wenden et al., 2022). "*You have to replace these balls that don't last. Well, it costs money, you know, and those are resources that we don't have, that we should have, that the school would have but we don't get that. The government gives us nothing*" (Tucker et al., 2011, p. 214) – Canadian educator. While a British educator explained: "*Funding is so tight, we've [children's center] got to justify everything that we do*" (Foulkes et al., 2020, p. 13). An associated theme reported across several studies related to the influence of low teacher to child ratios on educators' ability to implement structured-PA. For example, educators perceived supervision policies and ratios made it difficult to manage transitions associated with setting and packing up activities, preparing children to go outside, or providing activities in the afternoons when some staff and children had gone home for the day (Chen et al., 2020; Coleman & Dyment, 2013; Connelly et al., 2018; Driediger, Vanderloo, Burke, et al., 2018; McLachlan et al., 2017; Wenden et al., 2022). This was described by a Singaporean educator: "*It also depends on whether we have the teachers. It may be outdoor time . . . but I can't bring my children because we don't have teachers to bring them*" (Chen et al., 2020, supplementary material). While an Australian educator gave another example: "*I guess that if [supervision ratios] were purely for supervision, it would be fine. If you are meant to do programming and you are meant to be interacting with the kids and everything, it is not. It is really hard to interact with a group of five kids and play a game or something, [because] you've got another five kids that you are meant to be supervising as well, so it's quite difficult to do activities with them, and supervise them at the same time*" (Coleman & Dyment, 2013, p. 212).

Sector- and center-level factors that educators believed facilitated structured-PA, included alignment between PA program content and the ECEC curricula, to support educators to achieve wider educational objectives (Bellows et al., 2008; Malden et al., 2020; Vega-Perona et al., 2022), and to mandate policy for PA, which acted as a reinforcing factor to highlight the importance of, and improve accountability for, PA in ECEC centers (Connelly et al., 2018; Foulkes et al., 2020; Hassani et al., 2020; Szpunar et al., 2021; Tsangaridou, 2017; Wenden et al., 2022). "*PA takes more place in my job now with the new policy. I try to do PA at least once a day, but I prefer crafts*" (Connelly et al., 2018, p. 288) – Canadian educator. Furthermore, educators in two studies believed that committed leadership for PA was important among ECEC center managers (Foulkes et al., 2020; Wenden et al., 2022). As an Australian educator explained: "*Well, you need their [organizational] support, and this is the mind-set . . . making sure they're [directors and leaders] on par with what you're trying to implement*" (Wenden et al., 2022, p. 3). Additionally, educators in a British study perceived that collaboration between experts and educators to co-design a structured-PA program would also be important for success (Foulkes et al., 2020).

Physical environment and material resources. With respect to the physical environment and material resources, insufficient space for structured-PA was a significant barrier reported by educators across 17 studies (Alhassan & Whitt-Glover, 2014; Alhassan et al., 2021; Allar et al., 2017; Bellows et al., 2008; Capio et al., 2021; Cashmore & Jones, 2008; Foulkes et al., 2020; Froehlich-Chow & Humbert, 2011; Hassani et al., 2020; Howie et al., 2014, 2016; Malden et al., 2020; Martínez-Bello et al., 2021; Szpunar et al., 2021; Tsangaridou, 2017; van Zandvoort et al., 2010; Vega-Perona et al., 2022). As a British educator illustrated: "*We've only got a very small outdoor space in the children's center. It's like a postage stamp. So there's not much you can do*" (Foulkes et al., 2020, p. 9). While a Canadian educator explained: "*There's not enough space. There are 16 kids in here so if they are all running around, [they] are just colliding into each other and when we do large motor stuff, it's very supervised . . . I'd say space is the biggest [barrier]*" (van Zandvoort et al., 2010, p. 181). Furthermore, Spanish educators reported physical distancing measures during the COVID-19 pandemic exacerbated space constraints for structured-PA in ECEC centers (Vega-Perona et al., 2022). The other key environmental barrier reported by educators related to inadequate equipment and facilities for structured-PA (Bellows et al., 2008; Capio et al., 2021; Cashmore & Jones, 2008; Froehlich-Chow & Humbert, 2011; Martínez-Bello et al., 2021; McLachlan et al., 2017; Tsangaridou, 2017; van Zandvoort et al., 2010). "*We are a nonprofit center, and we don't have the extra resources or the extra funds at our disposal, so it would be great if we could use the community facilities for free*" (Froehlich-Chow & Humbert, 2011, p. 29) – Canadian educator.

Similarly, provision of varied equipment that offered flexible uses and could be moved around and manipulated by children was perceived to be a primary facilitator by educators (Cotwright et al., 2017; Foulkes et al., 2020; Hassani et al., 2020; Hoffman et al., 2019; Tsangaridou, 2017; Tucker et al., 2011). As a Cypriot educator explained: "*I believe that equipment can function as a motive for teachers as well as for students*" (Tsangaridou, 2017, p. 14). Flexibility in the space available for structured-PA was also desired or appreciated by educators as a key facilitator and solution to challenges such as inclement weather (Driediger, Vanderloo, Burke, et al., 2018; Foulkes et al., 2020; Hassani et al., 2020; Malden et al., 2020; Szpunar et al., 2021; Tsangaridou, 2017; Vega-Perona et al., 2022). Interventions that were flexible in content and dose and therefore adaptable to different group sizes, children's ages and different play spaces were also perceived to help overcome challenges with implementation (Allar et al., 2017; Bellows et al., 2008; Driediger, Vanderloo, Burke, et al., 2018; Hoffman et al., 2019; Howie et al., 2014; Malden et al., 2020; Szpunar et al., 2021; Wenden et al., 2022). An American

educator summed this up: "*I think the kids love it [structured-PA program] and you know, we like it. It's easy to follow, and it's easy to adapt to different days*" (Allar et al., 2017, p. 690). In describing the teaching resources that facilitated structured-PA implementation, educators explained sample activities should be varied and regularly refreshed (Kennedy et al., 2017; Tucker et al., 2011), available in both audio-visual and paper format (Alhassan & Whitt-Glover, 2014; Hoffman et al., 2019; Howie et al., 2016; Kennedy et al., 2017; Malden et al., 2020; van Zandvoort et al., 2010), and include implementation support such as onsite visits, e-mails, and newsletters (Howie et al., 2016; van Zandvoort et al., 2010).

Social opportunity—social influences

Key constructs in the "social influences" domain of the TDF included "social pressure" (e.g., parents' expectations or lack of support), "group norms" (such as attitudes and behavior of coworkers), "social norms" (e.g., societal and cultural factors), and "social support," (e.g., support from colleagues, managers, parents, and children).

Social pressure from parents. Parents expectations were front of mind for educators and influenced the implementation of structured-PA in several ways. Common barriers reported by educators included parents' attitudes to inclement weather, children getting dirty, and the associated safety concerns related with risk of injury or illness, for which educators believed they would be held responsible (Foulkes et al., 2020; Froehlich-Chow & Humbert, 2011; McLachlan et al., 2017; Park & Min, 2020; Wenden et al., 2022), e.g., "*Sometimes parents feel that the weather should be really good when their children go outside. So, there's a reluctance to go out even though our policy is you do go outside. Parents want their children to stay inside*" (Park & Min, 2020, p. 259) – American educator. Similarly, a New Zealand educator reported parents tell them: "*It's very sunny, they [children] should be kept inside and all this sort of thing*" (McLachlan et al., 2017, p. 220). Additionally, lack of knowledge, interest, or support for structured-PA amongst parents was also described as a barrier by educators across several studies (Bellows et al., 2008; Cashmore & Jones, 2008; Connelly et al., 2018; Foulkes et al., 2020; Froehlich-Chow & Humbert, 2011; Wenden et al., 2022). As an Australian educator revealed: "*Hardly any of them [parents] ask about the physical side of things, I have never had a parent say, 'Can you teach them how to catch a ball? Can you teach them how to kick?' Never*" (Cashmore & Jones, 2008, p. 185). While another Australian educator reported: "*The parents are bored about (sic) physical activity . . . they want to see things that are physically made and they want pictures of them playing with blocks and all the cognitive activities*" (Wenden et al., 2022, p. 4). A key strategy suggested by educators to overcome these barriers was to educate parents about the importance of structured-PA (Bellows et al., 2008; Foulkes et al., 2020; Martínez-Bello et al., 2021).

Socio-cultural norms. Educators in several studies reported socio-cultural factors such as religious beliefs and attitudes to some activities (e.g. dance, yoga) (Cashmore & Jones, 2008; Chen et al., 2020), and the priority of academic achievement in some cultures (Chen et al., 2020; Martínez-Bello et al., 2021), was a barrier to structured-PA in ECEC centers. "*I believe that society and specifically the school does not give importance to movement, it gives importance to subjects that will be more important in the future, such as mathematics and language*" (Martínez-Bello et al., 2021, p. 488) – Spanish educator.

Social support among colleagues. Educators described ways social support among colleagues would help them overcome challenges to the implementation of structured-PA. This was reported in both descriptive studies and process evaluations of Structured-PA interventions. Examples included having an opportunity to share ideas, role-model new practices and give and receive feedback in a non-judgmental way (Driediger, Vanderloo, Burke, et al., 2018; Froehlich-Chow & Humbert, 2011; Howie et al., 2014; Martínez-Bello et al., 2021; Park & Min, 2020; Skarstein & Ugelstad, 2020; Tsangaridou & Genethliou, 2016; van Zandvoort et al., 2010; Wenden et al., 2022). As a Cypriot educator participating in an evaluation illustrated: "*One of the most significant things, in my opinion, was the collaboration with my colleagues, the discussions and the sharing of ideas with them about the programme. We developed a nice partnership for processing ideas, finding solutions and modifying activities to suit our needs*" (Tsangaridou & Genethliou, 2016, p. 390). While a Canadian educator revealed: "*It is essential that you have a coworker that is willing to do it, because you can't do it on your own. It takes a lot just to get the kids ready and to have that up attitude*" (Froehlich-Chow & Humbert, 2011, p. 29).

Motivation

Educators perceived several factors influenced their motivation to implement structured-PA. In the COM-B model, "*motivation*" is defined as all the brain processes that energize and direct behavior, including both reflective and automatic mechanisms that influence individuals to undertake a given behavior over other competing behaviors (Michie et al., 2011).

Reflective motivation—thinking

Although far less commonly reported, educators perceived several barriers and facilitators related to reflective motivation, which concerned five TDF domains: "belief about consequences," "professional roles and responsibility," "belief about capabilities," "goals" and "intentions." These are explained below. There were no factors mapped to the domain "optimism."

Beliefs about consequences. Two commonly shared beliefs were perceived as barriers to structured-PA in ECEC centers. Firstly, perceptions amongst educators of children's propensity for injury and inability to keep themselves safe during structured-PA (Cashmore & Jones, 2008; Coleman & Dyment, 2013; Connelly et al., 2018; van Zandvoort et al., 2010; Vega-Perona et al., 2022; Wenden et al., 2022). This appeared to be related to parent expectations, as well as educators' own attitudes. Examples included perceptions that both outdoor spaces and indoor spaces were unsafe for PA (e.g., confined, or crowded spaces, too much furniture or equipment that could cause injury), and that active games could be unsafe.

As illustrated by a Canadian educator: "*As much fun as they can be and even active [games], are not always the most safe games so you have to think of the [children's] ability as well as what is safe*" (van Zandvoort et al., 2010, pp. 181–2). An Australian educator summed up the issue relating to parents: "'*Parents don't like their kids running around . . . [and] as soon as we start filling out an incident report . . . . that creates a - whole second set of problems*" (Wenden et al., 2022, p. 4).

The second barrier to structured-PA was the perception by some educators that children were already active enough in ECEC centers, and therefore, educator organized and led PA was unnecessary (Chen et al., 2020; Coleman & Dyment, 2013; Tucker et al., 2011). Conversely, beliefs that facilitated structured-PA implementation by educators were related to the expected benefits educators perceived, such as "*movement prepares children to succeed in school and life*" (Gehris et al., 2015, p. 127), that "*activities introduced in pre-school will also create to PA years later*" (Kippe et al., 2021, p. 5), and enhanced learning and development (Foulkes et al., 2020; Howie et al., 2016; Kennedy et al., 2017). As an American educator described: "*When they sit, they're good for about a minute or two and that's it, but when they're actually moving, they're learning and when we're singing and you do it, then it connects to the brain, I think it's amazing*" (Kennedy et al., 2017, p. 30).

Professional role and identity. Another barrier was the perception that teaching children about movement through structured-PA was not part of their role (Coleman & Dyment, 2013; Connelly et al., 2018; Martínez-Bello et al., 2021; McLachlan et al., 2017). Conversely, key facilitators included educators perception that supporting children's physical education and movement was an important responsibility (Alhassan et al., 2021; Coleman & Dyment, 2013; Connelly et al., 2018; Kippe et al., 2021; Martínez-Bello et al., 2021; McLachlan et al., 2017; Szpunar et al., 2021), and educators enthusiasm to role-model PA (Froehlich-Chow & Humbert, 2011; Kippe et al., 2021; van Zandvoort et al., 2010). As a Canadian educator illustrated: "I *am 52 years old and I go as hard and as strong as 20 year olds, I try to be a role model*" (Froehlich-Chow & Humbert, 2011, p. 29).

Belief about capabilities—self-confidence. Educators' confidence in their ability to implement structured-PA and manage children's behavior during structured-PA were barriers that could hinder motivation to implement structured-PA in ECEC centers (Alhassan et al., 2021; Dyment & Coleman, 2012; Foulkes et al., 2020; Kennedy et al., 2017; Martínez-Bello et al., 2021; McLachlan et al., 2017; Skarstein & Ugelstad, 2020). In some cases, educators linked this to insufficient knowledge and skills, and reported improved motivation and confidence after participating in training programs for structured-PA (Driediger, Vanderloo, Burke, et al., 2018; Dyment & Coleman, 2012; Foulkes et al., 2020; Hoffman et al., 2019; Martínez-Bello et al., 2021; Skarstein & Ugelstad, 2020)."*The staff training was really good because it kind of broke our fears toward physical activity. I can do it, so the children can do it*" (Driediger, Vanderloo, Burke, et al., 2018, p. 941) – American educator.

Goals and intentions. In the "goals" domain, American educators in one study described how they could improve their planning as a way to do more structured-PA "*I need to kick my . . . We go outside quite often, and the kids move by themselves, but we should do structured PA. I should plan and stick to my plan*" (Connelly et al., 2018, p. 289). Educators in another American study described how planning activities and creating a recording system could facilitate structured-PA (Hassani et al., 2020). In the "intentions" domain, a lack of interest in changing their practices, or seeing it as a burden, to implement structured-PA was a barrier (Connelly et al., 2018; Kennedy et al., 2017; Martínez-Bello et al., 2021; Wenden et al., 2022), whereas having a positive attitude to implementation was perceived as an enabling factor for overcoming challenges in another study (Driediger, Vanderloo, Burke, et al., 2018).

Automatic motivation—feeling

Educators perceived only one barrier related to automatic motivation, which concerned the TDF domain "emotions," with no factors mapped to the domain "reinforcement."

Emotions. Educators' negative personal experiences of, and attitudes to, PA and PE were identified as a barrier to implementing structured-PA with children (Connelly et al., 2018; Martínez-Bello et al., 2021; Wenden et al., 2022). As an Australian educator explained: "*I think there's personal views on for selecting [activities], too, if they don't like it [physical activity] then they . . . they're not going to be doing it*" (Wenden et al., 2022, p. 4).

Discussion

This is the first qualitative systematic review to conduct a theoretical analysis of educator perceived barriers and facilitators to structured-PA in ECEC centers using a behavioral science framework. As such, it provides novel insights and a system-level synthesis of factors that shape educator behavior in this setting, and consequently, offers direction for policymakers, managers, practitioners, and future research to promote young children's PA and MC development in ECEC centers. Application of the COM-B model and TDF to understand the determinants of educator behavior in the context of educators' own perceptions and experiences provides an evidence-informed and coherent framework to explain the factors that influence educator implementation of structured-PA. Accordingly, the findings and framework (Figure 3) are important to consider when designing new interventions for ECEC centers as well as for the development of implementation strategies to support uptake and sustainability of existing interventions.

Most factors influencing educator behavior were identified in the "*opportunity*" component of the COM-B model, which is notable considering this component relates to factors outside the individual that make the behavior possible or encourage it (see Figure 3) (Michie et al., 2011). The influence of the social and physical environment has been identified as a key factor in a review of daily PA policies in schools (Nathan et al., 2018) and a review of environmental recommendations for PA in ECEC (Razak et al., 2019); however, this is the first time it has been reported in the context of educator behavior and

educator perceptions of structured PA implementation. Moreover, this is the first review to provide examples from the qualitative literature for the ways the social and physical environment influence educator motivation and behavior. Three of the five most widely reported barriers (identified in more than one-third of studies) were mapped to the "environmental context and resources" domain within the "*opportunity*" component of the COM-B model (indicated in bold underlined text in Figure 3). They included (i) competing time and priorities, (ii) policy tensions, particularly in relation to safety and weather, and (iii) the practical challenges of small indoor and outdoor spaces in ECEC centers. Some of these barriers have been reported in earlier reviews (Hesketh et al., 2017; L. Tremblay et al., 2012), with other research suggesting wider contributing factors such as societal values and norms (Copeland, Sherman, et al., 2012) and the commercialization of the early childhood education and care sector (Morrissey & Moore, 2021). Moreover, positive change in the sector with respect to these challenges appears to be slow, with the three key environmental barriers described above consistently reported by educators across the 15-year timeframe we examined.

With respect to barriers in the "*opportunity*" domain, it may be important to consider the degree to which educator "*capability*" (knowledge and skills) influenced their perception of these barriers and the interplay with educator "*motivation*" to overcome them (Copeland, Kendeigh, et al., 2012; Michie et al., 2011). An earlier narrative review examining implementation of PA guidelines in ECEC settings, concluded that teachers' attitudes and personal preferences influenced their perception of some organizational barriers such as time, competing priorities, safety, and inclement weather (L. Tremblay et al., 2012). Moreover, there is emerging evidence that interventions co-designed with educators, using behavioral or implementation science frameworks, can help identify potential barriers and problem-solve ways to overcome them (Hoffman et al., 2019; J. Jones et al., 2017). Alternatively, interventions that are flexible and can be adapted at the local level also show promise for helping educators overcome contextual barriers (R. A. Jones et al., 2017). However, noting the wider societal and commercial influences described above, such strategies may be necessary but not sufficient to drive widespread change in educator behavior. Nevertheless, strategies specifically designed to target educator perceptions are warranted as these may be more amenable to change than wider structural constraints.

Supportive policies and procedures for PA have been identified as an important strategy to improve children's PA in ECEC centers (Driediger, Vanderloo, Truelove, et al., 2018) and may help overcome several barriers identified in the "*opportunity*" component of the COM-B model (Stacey et al., 2017). In addition to addressing frequently reported barriers (e.g., competing priorities and policy tensions around safety and weather), supportive policy for PA may also help overcome social barriers educators perceived relating to parent expectations (e.g., academic outcomes, safety, and weather practices). For example, in some jurisdictions, like Norway and Wales, outdoor learning and PA is integrated into early years' curricula that accounts for exposure to acceptable levels of risk, as well as inclement weather, by ensuring these factors are considered and planned for in daily routines (Sandseter et al., 2020; Welsh Government, 2009). Another evidence-based approach to help educators build wider support for PA, is for ECEC settings to engage parents and families in PA program and policy decision-making, which may help address societal norms that place a lower value on PA (World Health Organization, 2021b). An upstream factor influencing educators' physical and social opportunity to implement structured-PA may be the inconsistency in some jurisdictions between national PA guidelines, regulatory frameworks for ECEC, which recommend children's PA is supported, and the limited PA curricula and dearth of PA-related education and training, in both pre-service qualifications and ongoing professional development (Australian Children's Education and Care Quality Authority, 2018; Australian Government Department of Health, 2017; Brian et al., 2018; Driediger, Vanderloo, Truelove, et al., 2018; Vanderloo & Tucker, 2018). Tackling this inconsistency at a jurisdictional policy level may also help address barriers identified in the "*capability*" component of the COM-B, namely educator knowledge and skills to implement structured-PA.

Educator barriers identified in the "*capability*" component of the COM-B model were interrelated and concerned lack of, or insufficient, education and training to prepare educators psychologically and physically to implement structured-PA. Unlike previous reviews, we found educator knowledge and skills were key challenges, with two of the five most widely reported barriers (identified in more than one third of studies), mapped to educator "*capability*". These concerned the desire for education and training to improve (i) PA and PE knowledge (including PA guidelines and the role of PA in children's wellbeing and development), and (ii) practical, hands-on skills for implementing structured-PA. The need for greater attention to education and training for PA has been identified as a significant issue for the sector more widely in the literature (Brian et al., 2018; Driediger, Vanderloo, Truelove, et al., 2018; Martyniuk & Tucker, 2014); however, the most effective mechanisms for improving educator knowledge and skills are less clearly articulated. Moreover, PA guidelines for young children are usually not tailored to the time children spend in ECEC, although recent efforts to address this are underway in some jurisdictions (Christian et al., 2020; Driediger, Vanderloo, Truelove, et al., 2018).

A systematic review investigating professional learning models and how they impact on PA outcomes in ECEC found many studies under-report the length, mode and content of training programs, and therefore evidence for what model is most effective is lacking (Peden et al., 2018). Furthermore, quantitative literature indicates that although educator training is positively associated with a change in children's MVPA, the wide variation in training programs and limited program reporting mean the exact mechanism for this is not well understood (Hesketh et al., 2017, p. 1011). Similar findings have been reported for teacher training components of school-based PA interventions internationally, with more consistent and comprehensive reporting of teacher training also recommended for that setting (Lander et al., 2017). Challenges related to educator capability to implement

structured-PA are likely exacerbated by the variability in qualification level of educators and high employee turnover in the industry, which in turn, may be linked to the commercialized nature of the sector (Manning et al., 2019). Although ECEC settings are highly regulated in developed nations, the wages, qualifications, and ongoing training that underpin educator practices are not consistently commensurate with expected government standards nor societal expectations (Driediger, Vanderloo, Truelove, et al., 2018; Morrissey & Moore, 2021).

Compared with the "*capability*" and "*opportunity*" components of the COM-B model, factors for "*motivation*" were reported less frequently. This is the first review to examine the ways educator motivation to implement structured-PA is supported or hindered. The analysis identified that motivational facilitators were less commonly reported by educators than barriers, indicating there is a need for greater understanding of factors that may have a positive influence on educators motivation to implement structured-PA. Considering the hypothesized relationship between COM-B components, it may be that as educator "*capability*" (knowledge and skills) and "*opportunity*" (environmental and social influences) are improved, motivational factors, such as self-confidence and belief about the benefits of structured-PA for children, will be more widely identified and reported (Michie et al., 2011). For example, educators in several studies included in this review perceived that greater PA and PE knowledge contributes to improved confidence, behavior, and intentions to implement structured-PA (Foulkes et al., 2020; Gehris et al., 2015; Hoffman et al., 2019; Howie et al., 2014, 2016; Kennedy et al., 2017; Skarstein & Ugelstad, 2020; Tsangaridou & Genethliou, 2016; Wenden et al., 2022). Additionally, in the quantitative literature, research has showed that the ability/skill to overcome perceived barriers (e.g., time, competing priorities, poor weather) (i.e., capability) and social approval (i.e., opportunity) helped motivate Canadian educators to engage children in PA (Gagné & Harnois, 2014).

While most themes could be categorized into one COM-B subcomponent (and TDF domain), it is clear from our analysis that several intersected with other subcomponents, illustrating the interrelated nature of behavioral influences in this setting. For example, barriers such as safety concerns and inclement weather ran across policy tensions and parent expectations (opportunity), beliefs about consequences (motivation) and educator knowledge and skills (capability). This reflects the complexity of influencing behavioral change among educators in the ECEC setting, and points to the need for interventions that take a systems approach to target multiple behavioral determinants and acknowledge the wider structural and societal challenges in the sector (World Health Organization, 2021a). Accordingly, recommendations for policy and practice arising from this review, together with potential areas for future enquiry, are provided below.

Recommendations for policy, practice, and future research

(1) **Incorporate education for PA and PE in qualifications for the ECEC sector** and place a greater emphasis on ongoing professional development for PA and PE that is interactive and experiential to build educator capability (e.g., knowledge, skills) and motivation (e.g., confidence) to support children's PA and MC development.

(2) **Include all stakeholders (including families) in the development of evidence-based PA policies and practices in ECEC centers** to help overcome opportunity barriers faced by educators such as social and environmental challenges relating to safety and weather.

(3) **Ensure future interventions are grounded in behavioral or implementation science and consider the "system" which shapes educator behavior in the ECEC setting**. This could be achieved using validated frameworks (such as COM-B and TDF) to target multiple behavioral determinants, and the development of flexible interventions that can be adapted by educators to their local context.

(4) **Provide greater transparency and reporting of educator training programs and implementation support strategies** (e.g., content, mode, length, frequency) to better inform the design, implementation, and evaluation of future interventions.

(5) **Advocate for stronger alignment between government departments of education and health, and the regulatory frameworks that govern the ECEC sector**, on the importance of promoting children's PA and MC development, to achieve a consistent approach between national movement guidelines, early years' curricula, and qualifications, training and renumeration for educators in the field.

(6) **Improve methodological reporting of interventions**, including contextual information for study setting and participants, and research methods (e.g., sampling and recruitment practices, data collection and analysis techniques), and adopt best practices for future work.

Limitations

It's important that review findings are considered in the context of their methodological limitations. In this review, restriction of the search to English language studies and exclusion of grey literature, may mean potentially relevant papers were missed. Limitations in the primary studies included inconsistency in the reporting of (i) contextual or demographic information for participating educators and ECEC settings (such as geographical location, socio-economic status, educator qualifications), and (ii) the content, mode and dose of structured-PA interventions and educator training programs. Half the studies were from North America, 69% from anglosphere countries, and all were from high-income nations, which may limit the transferability of findings to other countries and cultures, especially lower- and middle-income nations (Draper et al., 2022). Additionally, educators' perception of factors that influence their implementation of structured-PA rely on self-reported data and are subject to social desirability bias (Driediger, Vanderloo, Burke, et al., 2018, p. 943). Over half of studies did not have a theoretical basis, and future work would benefit from the application of behavioral or implementation science. Finally, our analysis of educator barriers and facilitators may be limited by the analyses of the primary

studies (i.e., what data was reported and how it was interpreted), and notably, only one included study examined author positionality and the potential for bias in their research. Additionally, we acknowledge, our own world views, perspectives, and potential biases may have influenced the secondary analysis of data from the original studies.

Conclusions

This is the first qualitative systematic review to synthesize educator perceived barriers and facilitators to structured-PA in ECEC centers using a validated behavioral science framework. Unlike previous reviews, we used the COM-B model and TDF to develop a theoretically informed and coherent framework to explain the barriers and facilitators that influence educator implementation of structured-PA. Findings revealed educators perceive the greatest barriers pertain to their "*opportunity*" (e.g., competing time and priorities, policy tensions, indoor/outdoor space constraints in ECEC centers), followed by their "*capability*" (e.g., lack of PA and PE knowledge and practical, hands-on skills) to implement structured-PA. Relatively less evidence for factors that influence educator "*motivation*" were reported, particularly facilitating factors, indicating an area warranting further enquiry. The synthesis identified several themes intersected across COM-B components reflecting the complexity of behavioral determinants in this setting, particularly the interaction between wider societal and structural factors and educators capability and motivation to implement structured-PA. Interventions that utilize a systems approach to target multiple levels of influence on educator behavior, and are flexible and adaptable to local contexts, are recommended. Future policy development, research and advocacy should seek to address the wider structural challenges in the sector as well as the PA educational needs of educators.

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IRB approval

Being a systematic review of published research, IRB approval was not required for this project.

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