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School staff experiences on involvement in a co-creation process: a Health CASCADE scoping review and thematic synthesis

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Abstract

Background Implementing public health interventions in schools requires active involvement of multiple stakeholders and adaptation of interventions to fit local contexts, to account for successful design, implementation, and consequently effectiveness of these interventions. Active collaboration, preferably in a co-creation process, with school staff is needed to enhance the implementation of school-based public health interventions. However, involving them in research through a co-creation process is challenging due to competing demands on their time. Hence, there is a need for insights into the factors facilitating or impeding co-creation processes involving school staff.

Methods To gain in-depth knowledge of school staff's experiences a scoping review and thematic synthesis have been conducted. Peer reviewed articles written in English and published between January 2012 and November 2023 were retrieved from ERIC, Education Database, Medline (PubMed interface), Embase, Web of Science, Scopus, and Health CASCADE Co-creation Database. Considering the high amount of search results the title and abstract screening was performed using ASReview. A thematic synthesis was conducted on the included articles.

Results Ten scientific peer reviewed articles were included and thematically synthesised. Six descriptive themes described factors influencing the co-creation process, including competing work roles and responsibilities of school staff, multistakeholder collaboration, benefits of participation in the co-creation process, power imbalances between different stakeholders, and school staff's lived experiences. Additionally, four analytical themes emerged indicating that demands of the co-creation process outweigh its benefits. To tackle excessive demands school staff preferred a guided process in which high-level participation was less important. School staff joined the co-creation process to serve students and emphasised the importance of being heard and taken seriously.

Conclusions School staff indicated that excessive demands outweigh the benefits experienced during the co-creation process. Therefore, school staff preferred less time-intensive processes. Improving students outcomes was school staff's motivation to be involved, which asks for processes with student-related goals and observable student

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benefits. Moreover, school staff needs to be acknowledged as an expert and valued for their involvement. These results should be considered to make co-creation processes involving school staff more feasible and satisfactory.

Keywords Co-production, Co-design, Teachers, Perceptions, School-based intervention, Implementation

Background

Globally, there is a growing belief that the involvement of stakeholders in the co-creation of public health interventions ensures better tailoring to their needs and context [1, 2]. In public health, there has indeed been a shift from Mode 1 research where knowledge production is informed by theory-building and testing and primarily driven by academic researchers and institutions, to Mode 2 research where knowledge is produced in the context of its utilisation, involving key stakeholders [3]. The reason for this shift is that only a few public health interventions, often developed using a Mode 1 paradigm, have been extensively implemented [4, 5]. Moreover, public health interventions that are implemented on a large scale often fail to replicate effects that were found in more controlled conditions, as they lack contextual alignment [5, 6]. To overcome this so-called implementation gap, active collaboration with key stakeholders is necessary to consider contextual factors influencing public health problems while developing, implementing, and evaluating public health interventions [7, 8]. Co-creation refers to “the collaborative approach of creative problem solving between diverse stakeholders at all project stages” [9], including development, implementation, and evaluation. Therefore, co-creation is believed to enhance the effectiveness and impact of public health interventions and to address complex problems in public health [2, 10].

While Mode 2 research approaches—such as co-creation, co-design, co-production, participatory research, and collaborative research—are often praised for their potential to bridge research and practice, few studies have evaluated how these approaches work in practice or their impact on research, practice, policy, or population outcomes [11]. Additionally, the application of co-creation poses challenges for both researchers and key stakeholders [12]. For instance, co-creation can lead to misunderstandings or conflict, it requires substantial resources, and research objectives may not always be clear or shared by all participants. Furthermore, researchers and key stakeholders may interpret findings differently, leading to disagreements on their application [12].

Due to its interdisciplinarity, co-creation is a broad and diffuse concept, allowing researchers to apply it in different ways, depending on their specific context and goals [13]. While this flexibility can be perceived as an advantage, it also makes co-creation vulnerable to misinterpretation or misuse [14]. Some researchers may claim to use co-creation, but actually implement it in a limited way. For example, instead of truly involving service users

(e.g., citizens) co-creation may be reduced to a partnership between organisations [14]. This goes against the core idea of co-creation, which emphasises shared decision-making and active participation of service users [10, 14]. To ensure a shared understanding of co-creation, providing details on the co-creation process is essential. Leask and colleagues [10] identified five key principles that should guide a co-creation process (i.e., framing the aim of the study, sampling, manifesting ownership, defining the procedure, and evaluating the process and intervention) and identified the conditions necessary for implementing these principles, including transparency, shared power, equal status, active contribution, and shared expertise between all involved in the research. In this study, a process was classified as co-creation process if researchers adhered to these key principles.

Schools are suggested an ideal context for health promotion, providing opportunities to implement interventions that address health determinants [15] and encourage healthy lifestyles and choices among youth [16]. Schools can reach students from diverse sociodemographic backgrounds and offer a structured environment that supports health-promoting behaviours through classroom intervention facilities and school staff who can facilitate implementation [17, 18]. However, schools are complex systems [19] and often struggle with implementing evidence-based public health interventions [20]. As such, Mode 2 research approaches, such as co-creation, are particularly relevant for developing, implementing, and evaluating school-based public health interventions. By actively involving key stakeholders, co-creation can help address the challenges schools face in integrating these interventions into their daily practice [21]. Previous research on co-created school-based public health interventions has mainly focused on involving the population of interest—typically students—within the co-creation process [22–24]. However, involving other key stakeholders, such as school staff, as co-creators is equally important. School staff are often responsible for the implementation of school-based public health interventions [25–27], as part of their standard practice in the educational system [21]. Therefore, they can assess the feasibility of the intervention components, make necessary adaptations, and co-create an implementation plan to ensure contextual appropriateness. Research indicates that intervention developers often fail to consider contextual factors, such as competing demands, making it difficult for school staff to implement interventions with high fidelity [27, 28], leading to suboptimal students outcomes

[29, 30]. In addition, school-based interventions may not align with school staff's teaching styles or classroom contexts [31]. Thus, understanding the context in which interventions will be implemented—and actively involving school staff in the co-creation process—is fundamental to ensure that these interventions are both feasible and effective in practice [21, 32].

Involving school staff in the co-creation of school-based public health interventions, poses challenges due to a highly demanding nature of the school environment [33]. These challenges stem from a heavy workload originating from non-teaching responsibilities, such as administrative tasks, frequent meetings, and educational reforms, in addition to their teaching duties [34, 35]. Furthermore, co-creation requires a significant amount of time from school staff, diverting attention from their primary responsibilities [12, 36, 37], as it is inherently a time-intensive process [38]. Given the critical role of school staff as stakeholders and intervention deliverers, their involvement in co-creation processes is crucial. These processes should be tailored to their needs by addressing barriers for participation, such as minimising the time demands. Gaining deeper insights into school staff's experiences can help refine co-creation processes and enhance their effectiveness. Since the co-creation process impacts its outcome (e.g., a co-created intervention or implementation plan), a better understanding of school staff's experiences may also improve the implementation of school-based public health interventions, which often demonstrate limited effects [39]. Therefore, this study aims to provide a comprehensive overview of school staff's experiences as documented in scientific literature, highlighting factors that either facilitate or impede co-creation processes of school-based public health interventions.

Method

To address the aim of the study a scoping review and thematic synthesis have been conducted, following a preliminary search for existing scoping and systematic reviews on this topic in Open Science Framework (OSF) and PROSPERO. An innovative selection methodology involving the use of Artificial Intelligence (AI) software

has been used to support researchers during the title and abstract screening to select relevant studies from an extensive amount of literature [13]. The utilised AI software was ASReview [40]. Afterwards, the full-text screening was conducted using Rayyan [41]. The protocol of this scoping review was registered in OSF [42]. To ensure transparency of findings the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) [43] was completed (see Additional File 1).

Search strategy

To develop the eligibility criteria the Sample, Phenomenon of Interest, Design, Evaluation, and Research type (SPIDER) tool was used (see Table 1). This tool has been developed for the synthesis of qualitative studies and has proven to be more efficient with qualitative and mixed-methods research questions contrary to the PICO acronym [44].

A literature search of qualitative studies was conducted in the following databases: ERIC, Education Database, Medline (PubMed interface), Embase, Web of Science, Scopus, and Health CASCADE Co-creation Database. The latter database is an open-access database concerning co-creation [13], originated within the Health CASCADE project, a European-funded project to develop the methodological foundation of evidence-based co-creation [45]. The search was conducted on November 21st, 2023. All references retrieved from the search were imported in EndNote. The EndNote deduplication function was used to indicate possible duplicates which were then assessed by one researcher (JB). Next, all unique references were downloaded in Microsoft Excel format and imported in ASReview, which was used for the study selection process (see section below). Articles that did not include an abstract due to formatting errors were removed and listed for manual screening, as this is a requirement for ASReview.

The search strategy was limited to peer-reviewed articles published in English from January 1st, 2012 onwards, which is in line with other Health CASCADE reviews such as Messiha and colleagues [46]. This data restriction was applied as we were interested in contemporary views of co-creation in the school context. The search strategy was peerreviewed by an information specialist from the Knowledge Centre for Health Ghent (see Additional File 2), after which authors improved the search strategy and finalised it. The search strategy was tailored to each database and included terms related to school staff, co-creation/co-creator, and qualitative research (see Additional File 3).

Table 1 Eligibility criteria based on the SPIDER acronym

SPIDER	Description
Sample	School staff involved as co-creator in the co-creation of school-based public health interventions
Phenomenon of Interest	Being a co-creator in the co-creation process of a school-based public health intervention
Design	Qualitative research designs
Evaluation	School staff's experiences towards the phenomenon of interest (i.e., what is it like to be a co-creator)
Research type	Qualitative study, Mixed-methods study

ASReview

ASReview is an open-source AI software aiming to support researchers in getting an overview of the literature matching their selection criteria efficiently and transparently by using active learning and multiple machine learning models [40]. Due to the active learning and machine learning models, ASReview can detect what articles are relevant and irrelevant based on the method of screening applied by the researcher, therewith reducing the amount of literature that needs to be screened by the researcher. Its learning process starts by providing preliminary knowledge (i.e., relevant and irrelevant articles retrieved from the full set of studies extracted from all consulted databases) [47]. To prevent ASReview from excluding relevant literature, researchers were instructed to adopt a widely accepted and more inclusive terminology of co-creation, as defined in the inclusion criteria.

Inclusion criteria

To guide the study selection process, inclusion criteria were defined and aligned with the PCC framework (Population, Concept, and Context) [48]. Qualitative studies and mixed methods studies were included if they explored the experiences of school staff (population) as co-creators in a school-based intervention (concept). In case of mixed methods studies, qualitative data were only examined if they could be separated from the quantitative data. Furthermore, studies about school-based interventions needed to have a public health focus (concept) and the study needed to be conducted at primary schools or secondary schools to be included (context). Studies were only included if the co-created school-based intervention entailed one of the following, (1) the intervention was developed at school, (2) the intervention was (partially) implemented at school, (3) the implementation plan of the intervention was developed at school, (4) the intervention was evaluated at school, (5) the evaluation plan of the intervention was developed at school (concept).

Studies were included if they adhered to the definition of co-creation defined as “an evidence-based methodology for the development, implementation, and evaluation of actions as a result of continuous, open collaboration, interactional knowledge production and shared decision-making among key stakeholders” [49]. A co-creator was defined as “an equal partner of the research team who accomplishes some or all of the research activities related to the school-based intervention alongside or independent of academic researchers” [50]. A co-creation experience was defined as “stakeholders’ psychological states, feelings, and perceptions associated with their involvement and interaction with other stakeholders before, during, and after the co-creation process” [51]. This was assessed by the key principles of the co-creation process [10], since it was predicted that the presence or absence

of these key principles influenced the level of participation and therefore school staff’s overall co-creation experience (concept). An overview of all inclusion criteria can be found in Additional File 4.

Title and abstract screening

A total of five researchers (JB, LRD, LMCC, QA, MK) conducted the title abstract screening using ASReview [40]. The full set of literature was divided into two subsets to perform a double-blind screening on the same subset (subset 1, 2505 articles screened by LRD, LMCC and subset 2, 5004 articles screened by JB, QA, MK). Since JB screened twice the amount of articles as compared to LRD, LMCC, QA, and MK, both subsets contained a different amount of articles. To start ASReview’s learning process five relevant and five irrelevant articles were imported [47]. For both subsets identical articles were imported. Next, researchers started screening titles and abstracts until one of the predetermined stopping rules was met. It might occur that researchers assigned to the same subset did not screen the same articles before complying with the stopping rules. The following two stopping rules were applied: (1) each researcher had to screen 10% of the articles within their subset, and (2) once they had screened 10% of the articles, researchers were required to identify 100 consecutive articles as irrelevant. If a relevant article was encountered, the count of irrelevant articles restarted until reaching the specified threshold of 100.

During the screening process in ASReview, three potential outcomes were possible, the article was (1) included, (2) excluded, and (3) not shown to the researcher before complying with the stopping rules. Since a double-blind screening was performed, every article could be screened by two researchers, resulting in six possible combinations of decisions (i.e., the number of outcomes multiplied by two researchers). Figure 1 shows all possible combinations of decisions. To include an article both researchers needed to label the article as relevant [1]. To exclude an article, there were three possibilities: both researchers needed to label the article as irrelevant [3], the article was labelled irrelevant by one of the researchers and not shown to the other researcher by ASReview [5] or the article was not shown to both researchers by ASReview [6]. Since ASReview can learn what articles to include and what articles to exclude based on the screening method applied by the researcher, ASReview not showing articles equals an article’s exclusion. In case of a conflict, meaning both researchers screened the article but did not share the same opinion about its relevance [2] or the article was included by one researcher but not shown to the other researcher by ASReview [4], a third reviewer (JB, LRD, MV, BD, TA, GC) assessed whether the article should be included or excluded for full-text screening.

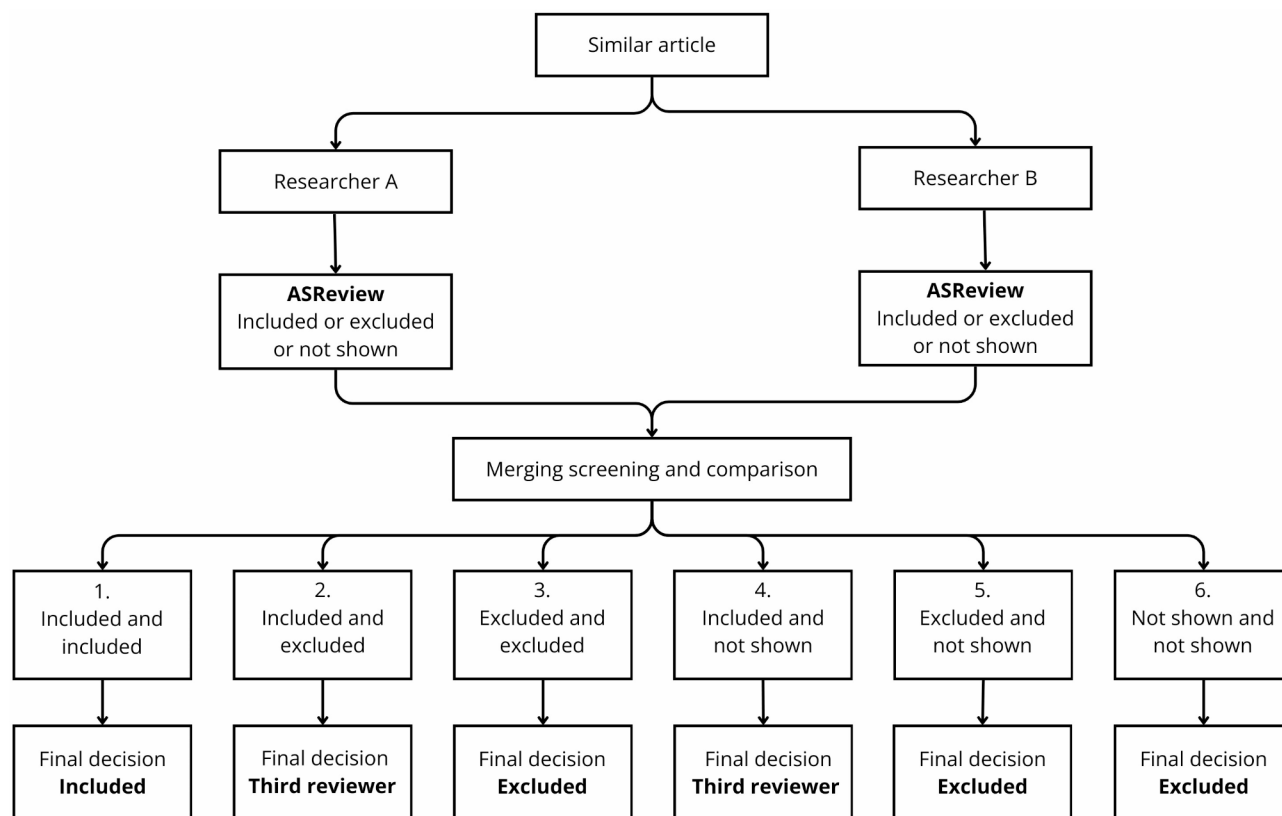


Fig. 1 Decision tree double-screening articles in title abstract screening based on Agnello and Loisel and colleagues [13]

Additionally, a double-blind screening was performed manually for the articles without an abstract by JB and LRD. Conflicts were resolved through discussion and consensus.

Full text screening process

All relevant articles were uploaded in Rayyan [41] to conduct the full-text screening. Double-blind screening was performed by the same researchers (JB, LRD, LMcC, QA, MK) as those responsible for title and abstract screening. For full-text screening the same inclusion criteria applied as for title and abstract screening (see Additional File 4). Conflicting viewpoints regarding an article's relevance were resolved through discussion and consensus.

Quality assessment

Although a quality assessment is not required for scoping reviews [52], the quality of the included articles was assessed to ensure the reliability of the thematic synthesis, as recommended by Thomas and Harden [53]. To assess the quality of the included articles the Critical Appraisal Skills Programme (CASP) Qualitative Checklist [54] was used. This 10-item checklist is frequently used in systematic reviews of qualitative evidence [55]. CASP items included assessment of the following ten items: study aims, methods used, study design,

recruitment strategies, data collection, relationships between researchers and participants, ethical issues, data analysis, clear statement of findings, and the value of the research. Items could be rated as either “yes”, “can't tell”, or “no” based on the criteria set for each item in the checklist. When authors clearly reported on a specific item and adhered to the set criteria it was rated as “yes”, when authors just briefly mentioned something related to a specific item but it did not become clear if they adhered to criteria set for this item it was rated as “can't tell”, and when authors did not report on a specific item it was rated as “no”. Articles were rated as “high quality” if they met a minimum of eight criteria, as “medium quality” if they met five to seven criteria, and as “low quality” if they met four criteria or less [56]. Two researchers (JB and LRD) performed the quality assessment independently and discussed conflicting assessments. If necessary, a third reviewer (MV or VVO) was consulted.

Data extraction

A Microsoft Excel template was developed to extract information about the conducted studies, including the public health problem and description of the co-created solution, school setting, how school staff's experiences were evaluated, what participatory approach was used, the aim of the co-creation process with school staff, and

what the co-creation process looked like (i.e., amount of school staff and other stakeholders involved, number of sessions, duration of sessions). Data were extracted by JB.

Data synthesis

A thematic synthesis was conducted by two independent researchers (JB and LRD) to investigate school staff's experiences of their involvement in the co-creation process. All relevant data regarding the experiences of school staff during the co-creation process were extracted from the included articles (i.e., all text in the results sections of the relevant articles, containing participants' quotes and authors' reporting of the findings) and entered into NVivo 14. The approach of Thomas and Harden [53] was used to thematically synthesise all relevant data. This three-stage approach enables transparent accumulation of existing qualitative evidence and facilitates the formation of new interpretive constructs, meanings, and hypotheses [53]. During the first stage, all relevant data retrieved from the included articles were inductively coded line-by-line by JB and LRD. Inconsistencies in coding between researchers were solved through discussion. During the second stage, descriptive themes were generated by structuring the codes of the first stage into subthemes. Descriptive themes closely align with the qualitative data presented in the articles. This stage was performed first by both researchers independently after which they combined their findings and through discussion developed the final descriptive themes. During the third stage, the formation of analytical themes occurred by verifying conceptual relations across themes to go past the findings of the primary studies to answer the research question. This stage was conducted first by both researchers independently after which they combined their findings and through discussion developed the final analytical themes.

Results

Search results

The PRISMA flowchart (Fig. 2) provides an overview of the study selection process. In total, 10 articles were included [36, 57–65].

Study characteristics

Table 2 gives an overview of the study characteristics of all included articles. Six studies were conducted in Europe [36, 60–63, 65], and one in Australia [59], one in South-Africa [64], one in the United States [57], and one study was conducted in three countries (United Kingdom, India, Sierra Leone) [58]. Four studies were conducted in secondary schools [59, 60, 62, 63] and three in primary schools [36, 64, 65]. Other studies were conducted in middle school [57], early years foundation stage [58], and one study did not specify the type of school

[61]. The majority of co-created interventions focused on students' health, with students as the primary population of interest [36, 57–64], while one study focused on teachers as the population of interest, however students' were exposed to teachers' obtained skills [65]. The number of school staff reported to be involved in the co-creation process ranged from 1 [58] to 60 [59]. The co-creation process ranged from 3 sessions [61] to 5 sessions [63] with a duration of 45 min [64] to 375 min [61] per session. To evaluate school staff's experiences various combinations of methods were used, some methods explicitly evaluated the process with the co-creators using semi-structured interviews [36, 58, 62–65], focus groups [57, 58], open-ended questionnaires [58], diaries completed by teachers [61], and teacher feedback [61, 65]. Whereas for other methods the co-creation process was reflected upon by researchers using transcriptions or recordings of co-creation sessions [59, 60], classroom observations [61, 64], perceptions of the co-facilitator or student assistant [60, 63], attendance logs [65], and reflective workshops [64].

Quality assessment of studies

Table 3 presents the results of the quality assessment conducted for each study. Nine studies were assessed to be of "high quality", and one of "medium quality". Criteria on which studies scored lower were recruitment because of limited reporting on the selection procedure, relationships due to a lack of consideration of the researcher-participant relationship, and analysis because of limited reporting on how the analysis process was conducted.

Thematic synthesis

To thematically organise the data on school staff's co-creation experiences, a thematic synthesis was conducted. Through line-by-line coding 20 subthemes emerged from the data. Structuring these subthemes resulted in six descriptive themes, which closely align with the original research data. Next, conceptual relations across descriptive themes were verified resulting in four analytical themes. Descriptive and analytical themes are described below. Additional File 5 provides an overview of the descriptive themes and subthemes, including references to the articles in which the subthemes were identified, along with examples of findings and quotes.

Descriptive themes

The theme "competing work roles and responsibilities of school staff" [36, 57, 58, 61–65] captured the constant pressure of job demands and a lack of time experienced by school staff which limited their ability to contribute to the co-creation process and also diminished their motivation. The theme "multistakeholder collaboration" [36, 57, 58, 61–65] highlighted the involvement of additional

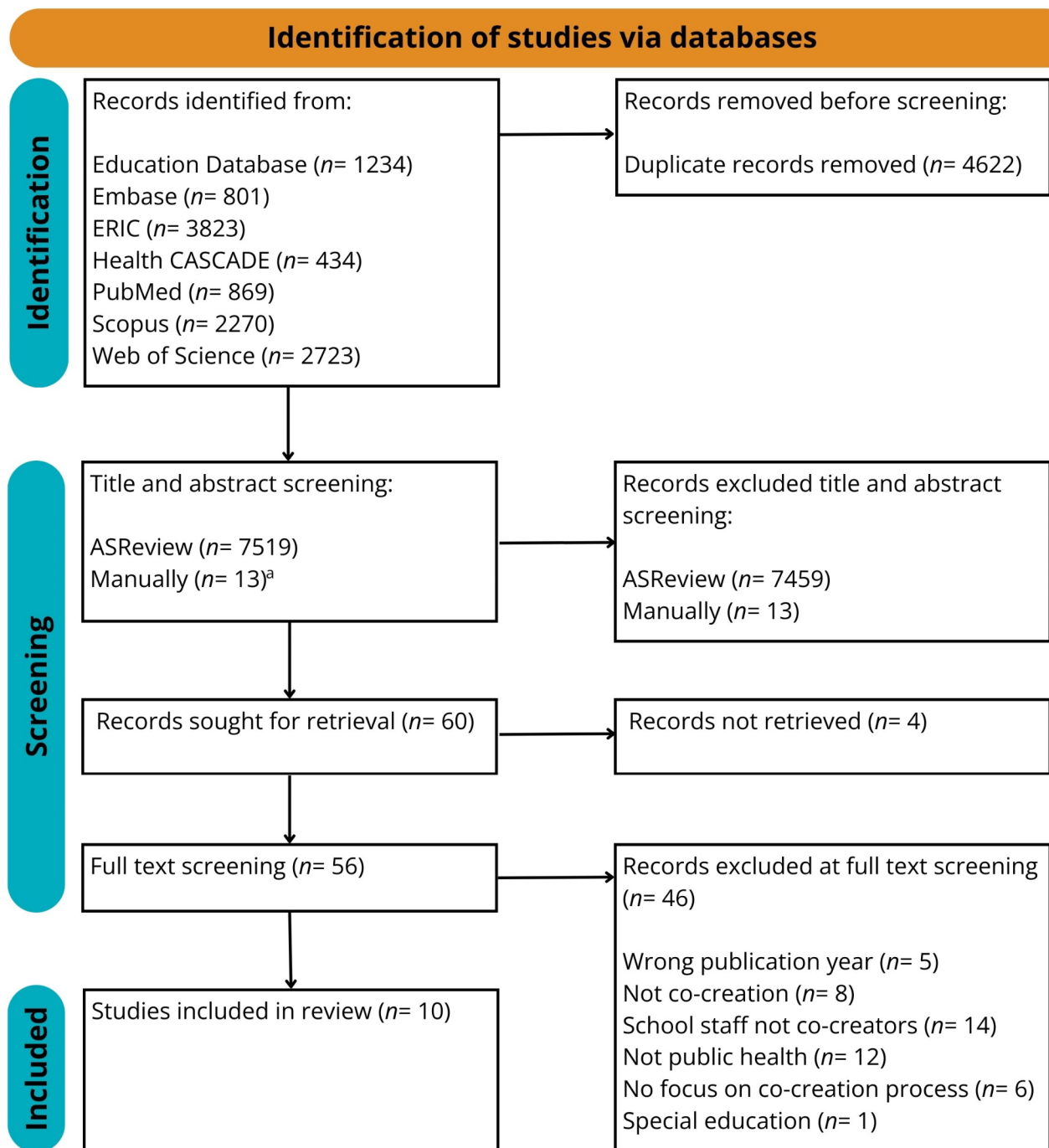


Fig. 2 PRISMA flowchart study selection process [66]. ^a the manual screening contained articles without abstract due to formatting errors

stakeholders such as researchers, students, or parents in the co-creation process, which benefited the development of co-created interventions. School staff appreciated the shared decision-making process, however, the representation of multiple voices could also slow down the process. The theme “benefits of participating in the co-creation process” [36, 57, 58, 60, 61, 63, 64] described school staff’s willingness to engage with the co-creation process when there was a perceivable benefit for

students or when they could develop their own skills. The theme “power imbalances between different stakeholders” [36, 63–65] was more evident between school staff and students than between school staff and researchers. The findings suggest that a lack of inclusivity from the researchers during the co-creation process led to unclear objectives for school staff, resulting in differing expectations. Furthermore, school staff did not consistently integrate scientific evidence into the intervention

Table 2 Characteristics included studies

Source characteristics	Public health focus co-created solution	Study design	Educational institution	Sample characteristics		Participatory approach	Role school staff in co-creation process	Characteristics co-creation process school staff	Evaluation method experiences
				School staff	Other stakeholders				
Bearman et al. [57]; 2020; USA	Act & Adapt is a school-based programme focusing on strengthening coping strategies in vulnerable youth.	Mixed methods	Public middle school	School-based behavioural health providers (n = 6, 100% female, 50% Black/African American, 50% White/ Caucasian)	6th Grade students	Co-design	Co-researchers in adaptation process of intervention implementation	3 sessions of 3 h and 1 session of 6 h	Focus groups
Clifford et al. [36]; 2023; UK	Move Well Feel Good is a programme focusing on improvement of mental health through development of motor competence and psychosocial skills.	Qualitative	Primary school	School leaders (n = 5), Year 4 teachers (n = 5)	-	Co-creation	Co-researchers in the development of the Move Well Feel Good programme	2 sessions of 1 h, 1 session of 2 h, and 1 session of 3 h	Semi-structured interviews
Crosby et al. [58]; 2020; UK, India, Sierra Leone	A Gem's Journey focuses on teaching young children about gem transmission and handwashing.	Qualitative	EYFS	EYFS teacher (n = 1, female), characteristics other school staff not reported.	Learning and Engagement Officer (n = 1, male), Assistant Director: Office of International Relations and Projects (n = 1, male), Project Coordinator (n = 1, male), Marketing Professional (n = 1, male)	Combination of co-creation, user-led research, and PAR	Co-researchers in adaptation process of intervention implementation	Not reported	Semi-structured interviews, focus groups, and open-ended questionnaires
Durl et al. [59]; 2021; Australia	Blurred Minds is a programme focusing on reducing alcohol intake in adolescents.	Qualitative	Secondary school	HPE teachers (n = 60, 3 sessions with 20 HPE teachers)	Students aged 13–16 (n = 120)	Co-design	Co-researchers with the aim to refine the Blurred Minds programme	1 session of 90 min	Transcription of the co-design sessions
Goss et al. [60]; 2022; Ireland	Health literacy intervention for designated socio-economically disadvantaged post-primary schools.	Qualitative	Secondary school	School staff (n = 31)	Students aged 12–15 (n = 32)	Co-design	Co-researchers with a focus on implementation	1 session of maximum 2 h	Co-facilitator perceptions of school staff, recordings of the sessions
Kalma et al. [61]; 2022; Estonia	Schools in Motion is a programme focusing on decreasing sedentary behaviour and increasing physical activity during the school day.	Mixed methods	School, not specified	Teachers (n = 15, 100% female)	-	Co-creation	Co-researchers with the aim to develop an implementation plan	1 session of 375 min, 1 session of 255 min, duration last session not reported	Diaries completed by teachers, teacher feedback, and classroom observations

Table 2 (continued)

Source characteristics	Public health focus co-created solution	Study design	Educational institution	Sample characteristics		Participatory approach	Role school staff in co-creation process	Characteristics co-creation process school staff	Evaluation method experiences
				School staff	Other stakeholders				
Neill et al. [62]; 2023; UK	The R.E.A.C.T. programme focuses on the reduction of anxiety particularly around exam time by increasing coping mechanisms.	Qualitative	Grammar school and secondary school	Teachers (n = 10), Principal (n = 1), School wellbeing coordinator (n = 1)	Students of boys grammar school, post-primary school students, representative Queens University Belfast, representative Royal Belfast Academical Institution	Co-production	Co-researchers focusing on implementation	Not reported	Semi-structured interviews
Prack & Strobl [63]; 2021; Germany	Co-created intervention stimulates physical activity in students by strengthening their health-related knowledge and understanding.	Qualitative	Secondary school	2 PE teachers per school (n = 8; 50% female, 50% male), School principals (n = 4)	Students from Grade 7 – Grade 10, Scientists	Co-creation	PE teachers were co-researchers focusing on implementation, School principals provided implementation support	5 sessions, duration not reported	Interviews and perceptions of student assistant
Scott et al. [64]; 2014; South Africa	African Sexual Knowledge of Aids is a programme to develop a HIV and Aids curriculum.	Mixed methods	Primary school	Life Orientation Teachers (n = 3)	Researcher (n = 1), 6th Grade students (n = 4), parents (n = 2), HIV and Aids consultant (n = 1)	PAR	Co-researcher with the aim to facilitate workshops in which a curriculum was developed	Number of sessions not reported, duration of each session was around 45 min	Classroom observations, semi-structured interviews, and reflective workshop
Sormunen et al. [65]; 2012; Finland	Intervention to improve teachers' skills for health education.	Mixed methods	Public primary school	Classroom teachers (n = 9), Health education teachers (n = 2), School nurses (n = 2), Principal (n = 2)	Students aged 11–13, parents	PAR	Co-researcher with a focus on implementation	Not reported	Interviews, attendance logs, teacher feedback, and the sessions themselves

Abbreviations: EYFS - Early Years Foundation Stage; HPE - Health and Physical Education; PAR - Participatory Action Research; PE - Physical Education

Table 3 Quality assessment included studies

	Aims	Methods	Design	Recruitment	Data collection	Relation-ships	Ethical issues	Analysis	Findings	Value of research	Over-all score
Bearman et al. [57]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10
Clifford et al. [36]	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	8
Crosby et al. [58]	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	9
Durl et al. [59]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	9
Goss et al. [60]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10
Kalma et al. [61]	Yes	Yes	Yes	Yes	Yes	No	Yes	Can't tell	Yes	Yes	8
Neill et al. [62]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	9
Ptack & Strobl [63]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10
Scott et al. [64]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	9
Sor-munen et al. [65]	Yes	Yes	Yes	Yes	Yes	No	Can't tell	Can't tell	Yes	Yes	7

design, prioritising pedagogical aspects instead. This, in turn, prompted researchers to adjust the intervention by integrating more scientific evidence, which disrupted shared decision-making. In addition, power imbalances emerged between school staff and students, who were less involved and not always treated as equal partners. The theme “school staff’s lived experiences” [36, 57–63] described the crucial role school staff played as experts by providing numerous recommendations for refining and implementing interventions. The last theme “support from principals” [61, 63] captured the importance of principal support on school staff’s motivation and engagement. The level of support, however, varied across schools. Some school staff noted that their principal was highly motivated to participate in the process, while others observed that their principal did not perceive the added value of co-creation leaving them feeling unappreciated.

Analytical themes

Four analytical themes were generated time and job demands outweigh personal benefits, reaching a high level of participation is not of utmost importance,

serving students as main motivation, and feeling heard (see Fig. 3).

Time and job demands outweigh personal benefits

All school staff in the included studies highlighted the negative influence of time and job demands on the co-creation process. The school environment is demanding and school staff felt obliged to complete their school-related tasks first and adhere to the curriculum before engaging in other activities like co-creation. Even though they recognised the personal benefits of involvement in the process such as skill development, personal growth, and sharing their lived experiences to enhance the development and implementation of co-created interventions, these benefits did not outweigh the pressure experienced by time and job demands.

Reaching a high level of participation is not of utmost importance

School staff saw the value of enhancing the development and implementation of school-based public health interventions using their lived experience. However, they also experienced that committing to all the key principles of co-creation was not needed due to a lack

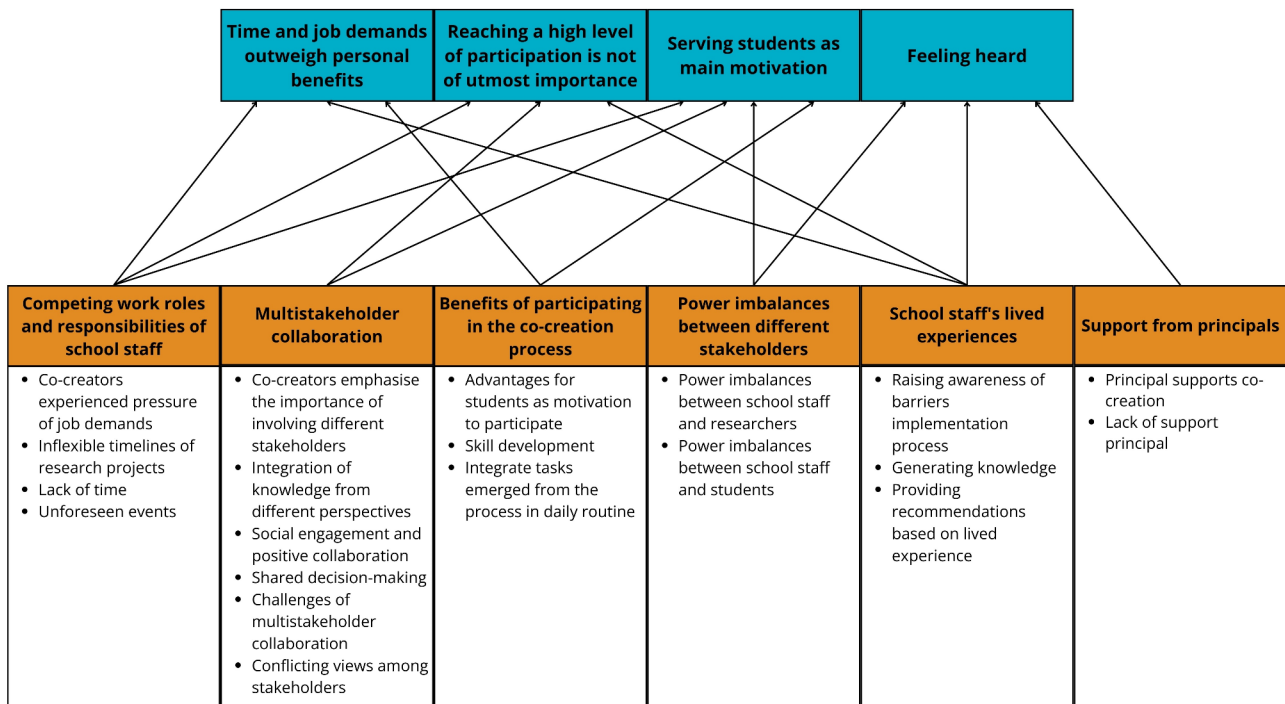


Fig. 3 Overview of analytical themes, descriptive themes, and subthemes

of time. Therefore, reaching a high level of participation was not of utmost importance. Furthermore, they highlighted the need for someone who takes on a leadership role and guides them through the process. This provided them with more clarity and increased process efficiency, which made the process more time-efficient and less demanding.

Serving students as a main motivation

Serving students was the main motivation of school staff to participate in the co-creation process. Even though they experienced a lot of pressure from job demands and time was lacking, school staff were intrinsically motivated to improve student outcomes and circumstances. Some staff were even willing to work on the co-creation project outside of working hours. Although they were motivated by the thought of making a difference for students it was sometimes difficult for staff to collaborate with students on an equal level due to the hierarchical school structure.

Feeling heard

Most of the time, school staff felt that their voices were heard during the co-creation process. Recommendations and feedback provided based on their lived experiences were appreciated and school staff was acknowledged for their contribution to the process not only during the co-creation process but also at the school level. When school staff felt their voices were silenced by other stakeholders, such as academic researchers and school principals,

power imbalances emerged, leaving them with the feeling that their input and efforts in the co-creation process were not valued.

Discussion

In this scoping review, we aimed to identify factors that facilitate or impede a co-creation process with school staff by conducting a thematic synthesis of their experiences during involvement in the co-creation of school-based public health interventions. The findings of this study inform the design of future co-creation processes involving school staff.

A robust and systematic search was performed to provide a comprehensive overview of school staff’s experiences with co-creation, as documented in scientific literature. Although a large amount of literature was retrieved, only 10 studies met the inclusion criteria, highlighting the underrepresentation of school staff’s experiences in scientific literature. Evaluating co-creation experiences is essential for tailoring co-creation processes and interventions to the specific needs of co-creators, as well as for underpinning effect evaluations which explain why certain intervention effects occur [7, 67, 68]. This finding aligns with a review conducted by Longworth and colleagues [69], which emphasises the importance of evaluating co-creation experiences to refine and improve co-creation efforts. Therefore, researchers conducting process evaluations should assess and report the experiences of all co-creators involved.

Our findings showed that school environments are highly demanding. Job demands resulting in a lack of time, were the most commonly experienced barriers for school staff involvement in the co-creation process. The substantial amount of job demands and resulting lack of time highlight the challenges of engaging school staff in co-creation, as the process diverts time and resources from their primary responsibilities [12], creating an inter-role conflict. These challenges are not unique to involving school staff in co-creation; competing demands and time constraints are well-documented barriers to implementing school-based public health interventions [70]. Therefore, school staff noted that there is never an opportune time to collaborate with schools, as other obligations consistently compete for their time [36]. This raises important questions about how to apply co-creation for public health in the school context, since this context is recognised as a popular setting for health promotion in scientific literature [16, 71, 72]. Since co-creation processes are time-intensive [73], they often conflict with the demanding nature of the school environment. As Oliver and colleagues [12] argue, researchers must carefully assess whether co-creation is the most effective methodology to meet their research aims. To support this decision, Health CASCADE developed a decision tree to guide researchers in determining whether co-creation is appropriate [74]. Therefore, researchers and key stakeholders should discuss whether co-creation is the most appropriate approach to address a problem, considering the resources needed for proper application of co-creation.

For school staff to be willing and able to engage in a co-creation process, sufficient job resources are necessary to mitigate stress and prevent burnout caused by high workloads [36, 61]. During the co-creation process, school staff indicated that they experienced various job resources, including social support from principals, opportunities for personal or professional development through capacity building, autonomy, and shared decision-making [75]. However, these resources were considered insufficient to counterbalance the pressure of job demands, such as time pressure, work overload, work pressure, and role conflict [75]. To ensure that adequate job resources are available for a successful co-creation process, researchers should engage in early discussions with adopters, such as school principals and teachers, to ensure essential resources upfront—such as social support, clear goals, opportunities for skill utilisation, and appropriate rewards. Additional resources, including shared decision-making, personal or professional development through capacity building, autonomy, and team cohesion [76], can then naturally emerge from the co-creation process itself.

To address school staff's limited time to engage in a co-creation process, a guided process facilitated by a researcher should be implemented. Since taking the lead in the co-creation process to reach a high level of participation was not a priority for school staff, they prefer a facilitator to help manage the process effectively. Guided processes may lead to better outcomes when participants lack the skills or time to guide the process themselves. This is evident in research on youth participation, where adult-supported activities were more successful because young participants lacked experience and resources to oversee complex projects [77]. However, it is crucial that guided processes adhere to the key principles of co-creation [10]. School staff emphasised the importance of power distribution among stakeholders, recognising their expertise from lived experiences and ensuring their voices were heard throughout the process. For instance, when their contributions were valued by the school principal, they felt respected and motivated, which enhanced their co-creation experience [61, 63]. Conversely, when these conditions were violated, school staff's co-creation experience deteriorated [63], illustrating that school principal support can be seen as a resource that positively affects the co-creation process.

Most of the articles included in this study perceived students as the primary population of interest of the intervention. While school staff indicated that serving students was their main motivation for participating in the co-creation process, this focus may have influenced their level of participation. Co-creation aims to address problems raised by key stakeholders to ensure that the research topic is relevant to the co-creators [78]. However, the co-created public health interventions in the included articles often prioritised students' needs over those of school staff, as students were the primary population of interest. This may explain why a high level of participation is not needed for school staff. School staff's intrinsic motivation to serve students can also be further understood through the lens of the Self-Determination Theory (SDT). The co-creation process, along with its student-focused outcomes, provides a sense of meaning and purpose [79], as it aligns with school staff's personal values and desires to improve student wellbeing [80]. Notably, some school staff were willing to dedicate their free time to work on the co-creation project [57, 65]. To maximise school staff engagement in future co-creation processes, researchers should clearly communicate the project's aims and align them with school staff's commitment to support student well-being. By doing so, researchers can encourage self-determined behaviour and foster meaningful participation in future co-creation projects.

Avenues and recommendations for future research

This study is among the first to investigate teachers' co-creation experiences, offering valuable insights for the design of future co-creation processes involving school staff. As the number of included studies in this review was limited, future research should examine school staff's experiences throughout the co-creation process using formative evaluation to adjust the co-creation process to school staff's needs if necessary. Furthermore, researchers planning to use co-creation in the school context are recommended to be clear about their expectations and also highlight the downsides of participating in such processes, for example that participation is time-intensive. They should ensure transparency and collaboratively plan the co-creation process with key stakeholders to consider everyone's needs. This approach would provide a deeper understanding of the factors influencing their participation, allowing for further refinement of co-creation process designs to better meet the needs of this specific group of stakeholders.

Strengths and limitations

Strengths of this study are the use of a rigorous methodology for both the scoping review and the thematic synthesis, clearly defined selection criteria, and the use of ASReview during the title and abstract screening to mitigate bias [81]. However, a limitation is the potential for bias, as the results rely on quotes and interpretations reported by the authors of the primary studies. Additionally, despite developing the search strategy in collaboration with an information specialist, relevant search terms used by other researchers conducting similar research might have been missed.

Conclusion

In conclusion, school staff reported that excessive time and job demands outweigh the personal benefits of the co-creation process. To address these time and job demands school staff preferred a guided process which is less time-intensive. Moreover, school staff's main motivation to engage in co-creation is to benefit student outcomes. Therefore, co-creation must have a clearly stated student-related goal for which the student benefits are evident. Additionally, school staff needs to be acknowledged as an expert and valued by their principal for their involvement in the co-creation process, as this enhances their co-creation experience. Researchers who are planning to conduct co-creation with school staff should consider these factors to make their co-creation process more feasible and satisfying.

List of Abbreviations

AI	Artificial Intelligence
OSF	Open Science Framework

PRISMA-ScR	Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews
SPIDER	Sample, Phenomenon of Interest, Design, Evaluation and Research type
PCC	Population, Concept, and Context
CASP	Critical Appraisal Skills Programme
EYFS	Early Years Foundation Stage
HPE	Health and Physical Education
PAR	Participatory Action Research
PE	Physical Education
SDT	Self-Determination Theory

Supplementary Information

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Supplementary Material 1

Supplementary Material 2

Supplementary Material 3

Supplementary Material 4

Supplementary Material 5

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Author contributions

The study was designed by JB, BD, TA, MV, and GC and JB led the study. MK reviewed the search strategy used during the study. QEAL prepared the title and abstract screening in ASReview. The article screening was performed by JB, LRD, QA, LMCC, and MK. Results from the title and abstract screening were analysed by JB and QEAL. Thematic synthesis was conducted by JB and LRD. JB drafted the manuscript. LRD, QA, QEAL, LMCC, MK, VVO, SFMC, BD, TA, MV, and GC provided feedback on the manuscript. All authors read and approved the final manuscript.

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Data availability

The datasets used and analysed during the current study are available from the corresponding author on reasonable request. The search strategy and inclusion criteria used during the current study are available in the supplementary files.

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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