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# Early years professionals' perceptions and practices of motor skill development, physical activity and healthy eating

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## ABSTRACT

This study presents the perceptions and practices of fundamental movement skills (FMS), healthy eating habits and physical activity (PA) in early years professionals (EYP). An online mixed-method survey comprising questions relating to practices of FMS, healthy eating habits and PA was completed by 137 EYPs (128 females). Frequency analysis assessed and reported responses to fixed-response questions, and thematic analysis was used for open-ended questions. Results indicated that EYPs understood FMS and were compliant with national guidelines in relation to PA and healthy eating. However, EYPs identified considerable barriers to developing FMS, PA and healthy eating in preschoolers.

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Preschoolers; nutrition; survey; health behaviours; motor skills

## Introduction

The Government of the United Kingdom (UK) has a focus on optimising the lifelong health of people. This focus starts from the very first years of life, by providing and enforcing guidelines to promote health behaviours for policy makers, health professionals and people working in the early years' sector. Dietary, physical activity (PA) and educational guidelines are inherent policy tools in facilitating optimal practices to positively enhance children's health and development. The UK Chief Medical Officer's recommendations suggest that, throughout the day, preschool children (under the age of 5 years old) should be physically active for at least 180 min, with 60 of those minutes reaching moderate-to-vigorous PA (MVPA) levels (Department of Health and Social Care (DHSC 2019)). Likewise, there are key guidelines for the promotion of physical development and healthy eating by virtue of the statutory framework for the Early Years Foundation Stage (EYFS, Department for Education 2021).

Ensuring children develop fundamental motor skills (FMS) in early childhood is important to enable them to access a range of PA opportunities throughout life (Clark and Metcalfe 2002; Stodden et al. 2008; Barnett et al. 2016). Research suggests that FMS are associated with and predictive of a range of health-related variables including PA, physical fitness, weight status and academic outcomes (Holfelder and Schott 2014; Haapala 2013). There is also evidence that FMS developed during the early years tracks longitudinally and influences subsequent PA (Duncan et al. 2021). It is for these reasons that early childhood development curricula worldwide include the development of motor skills as a key feature. In particular, the importance of FMS in the early years has specifically been acknowledged in the EYFS in the United Kingdom.

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The EYFS places physical development, with an explicit focus on the development of motor skills, as one of its three prime areas of learning, alongside communication as well as language, personal, social and emotional development (Department for Education 2021). The development of FMS within the EYFS is key in developing children's skills to engage in PA and meet the current recommendations in terms of total PA and MVPA. Despite this, a recent expert statement on behalf of the International Motor Development Research Consortium (Duncan, Fowweather, et al. 2022) suggested that FMS were poor in British preschoolers highlighting a crucial need to explore strategies for FMS development in the early years and beyond. It has been previously suggested that FMS are acquired naturally through play and the different activities that are provided for children in early years settings (Pot and van Hilvoorde 2014). Despite this and the fact that many opportunities are provided for preschoolers to develop their FMS, there is considerable evidence that early years' children do not develop ontogenic FMS (Gallahue, Ozmun, and Goodway 2012). In actuality, to learn and master FMS children need a combination of instruction, modelling and practice (Gallahue, Ozmun, and Goodway 2012).

Similarly, Public Health England (2017) acknowledge that food preferences and eating habits are formed early in life, positioning early years settings as key in providing the appropriate amounts of energy and nutrients, while also encouraging the development of healthy eating habits. This latter point is emphasised to ensure appropriate development and reduce obesity (Public Health England 2017). Activity undertaken by early years professionals (EYP) regarding eating behaviours is also informed by the EYFS welfare requirements to provide healthy, balanced and nutritious meals for children, whilst also supporting them to make healthier food and beverage choices (EYFS 2021). A focus on developing healthy eating and drinking habits, alongside developing FMS to facilitate adequate PA is essential in the early years to create positive trajectories of health for children, particularly in the context of overweight and obesity in England. The National Child Measurement Programme (NCMP 2019) shows that, 1 in 3 children that leave primary school in England have excess weight. Moreover, prospective analyses performed by Geserick et al. (2018), demonstrated that 90% of 3-year-old obese children were also overweight in adolescence with the most rapid weight gain occurring between 2 and 6 years of age. These statistics demonstrate the importance of establishing effective guidance and promotion of movement and nutrition early in children's development.

Key in this process is EYP (Roscoe, James, and Duncan 2017) who can provide an effective environment and activities to develop FMS, healthy eating habits and PA behaviours. This is especially important, considering the significant amount of time young children spend in early years settings where EYP are role-models and can positively influence healthy behaviours (Ward et al. 2017). Consequently, it makes it particularly important to explore what people working in such settings think, know and understand regarding the health behaviours of children in their care. Understanding this is an inherent step before putting interventions in place. If any knowledge gaps and/or misconceptions amongst EYP are identified, this would better inform researchers, policy makers and organisations in developing health-related programmes (Rapson, Conlon, and Ali 2020). However, the extent to which EYP in England understand and undertake activities specifically designed to optimise PA, motor development and healthy eating habits, has not yet been examined.

Early years professionals have a unique opportunity to foster FMS, develop healthy eating habits and instil PA behaviours. It is thus important to investigate their perceptions and practices concerning these critical aspects of child development. This will assist in developing informed strategies for the development of practices in early years settings, and ultimately benefit the children involved. This study, therefore, assessed perceptions and practices of FMS, healthy eating habits and PA behaviours in EYP.

## Methods

### Design

This study used an anonymous online survey, designed for EYP to describe, and explain their practices and perceptions related to FMS, healthy eating habits and PA behaviours. The design of the survey (i.e. protocol, structure, items) was based on psychometrically valid guidelines for constructing questionnaires as well as on the methods utilised in other relevant studies with EYP (Rapson, Conlon, and Ali 2020), sports coaches (Duncan, Weldon, et al. 2022) and teachers (Morgan and Hansen 2008). The survey was developed using the Bristol Online Survey administration application. The study was approved by the Research Ethics Committee of \*\*\*Removed for peer review\*\*\* (Reference Number: 121098).

### Participants

To target the relevant population for this study, an NHS community trust and local government public health department covering two metropolitan areas in the west midlands of England, acted as gatekeepers when distributing invitations to participate. The invitations were sent via e-mail to the administration team or manager of 402 early years' settings. Invitation e-mails included a brief explanation of the study (i.e. objectives, aims and rationale), and the hyperlink to the survey. A follow-up reminder e-mail was sent a month after the launch of the survey and each setting on the list provided by gatekeepers, received a phone call reminder to participate during this period to aid with survey completion rates.

From those settings contacted, 137 EYP (34%) participated and completed the survey. The population sample comprised of 128 (93.5%) female and 7 male (5.1%) EYP and two chose not to disclose their gender (Table 1). From the roles listed in Table 1, the greatest representation was from EYPs (35.7%,  $n = 49$ ) followed by managers of EYS (28.5%,  $n = 39$ ). All other background information and characteristics of participants (e.g. age bands, ethnicity, etc.) are displayed in Table 1.

### Survey

Content validity of the survey was also assessed and confirmed by corresponding and receiving feedback from a panel of experts in the current study field (i.e. promotion and evaluation of eating, PA behaviour and FMS in early years children, based in NHS community trusts, local authority public health and working as EYP's) as recommended when developing survey-based research (Terwee et al. 2018). Items of the survey were reviewed in terms of their context, validity, applicability and complexity (Rapson, Conlon, and Ali 2020). The final version of the survey was agreed upon through consensus within the panel (Terwee et al. 2018). The survey took approximately 10–15 min to complete. This timescale was chosen intentionally to provide a balance of maximising the information provided by respondents whilst optimising the time the respondents would likely spend completing the survey. This process is congruent with other studies that have used similar methodology with other populations including EYP, sports coaches and teachers (Rapson, Conlon, and Ali 2020; Duncan, Weldon, et al. 2022; Morgan and Hansen 2008).

The survey comprised of 24 questions in four sections: (1) participant information and informed consent; (2) participants' demographics and characteristics (i.e. years of working in EYS, current role, etc.) (3) nutrition knowledge and perspectives; (4) PA and FMS knowledge and perspectives. A brief description of the survey's aims, purpose and information on confidentiality and relevant contacts in case of any concerns was provided at the beginning of the survey. The content of the survey was based on the UK pre-schoolers' PA and nutrition guidelines and FMS development provided by Public Health England and the EYFS (Public Health England 2017; Department for Education 2021).

### Statistical analysis

All responses from the Bristol Online Survey were downloaded into an Excel 2016 spreadsheet (Microsoft Corporation, Redmond, WA). Fixed response questions were assessed using frequency

**Table 1.** Participant characteristics.

	<i>n</i> (%)
<b>Gender</b>	
Male	7 (5.1%)
Female	128 (93.4%)
Choose not to disclose	2 (1.5%)
<b>Ethnicity</b>	
White (English/Welsh/Scottish/Northern Irish/British)	100 (72.9%)
Any other White background	2 (1.5%)
Mixed/Multiple ethnic groups	9 (6.6%)
	2 (1.5%)
Asian/Asian British	3 (2.2%)
Indian	6 (4.4%)
Pakistani	8 (5.8%)
Bangladeshi	1 (0.7%)
Black/African/Caribbean/Black British	2 (1.5%)
Arab	3 (2.2%)
Prefer Not To Say	1 (0.7%)
<b>Age</b>	
18–24	11 (8.1%)
25–34	37 (27%)
35–44	48 (35%)
45–54	20 (14.6%)
55–64	18 (13.1%)
65–74	3 (2.2%)
<b>Experience working in EYS</b>	
<6 months	6 (4.4%)
6–11 months	6 (4.4%)
1–5 years	31 (22.6%)
>5 years	22 (16.1%)
>10 years	72 (52.5%)
<b>Current role</b>	
EY Manager	39 (28.5%)
EY Deputy	19 (13.9%)
Senior Practitioner	9 (6.6%)
EYP	49 (35.7%)
Assistant Practitioner	6 (4.4%)
Trainee/Student	0 (0%)
Other	14 (10.2%)
Choose not to answer	1 (0.7%)

Note: EY, early years'; EYS, early years' settings; EYP, early years' practitioner.

analysis (Ritchie and Lewis 2003; Neale, Miller, and West 2014). Open-ended response questions were assessed using a thematic analysis approach (Braun and Clarke 2014), as previously used when examining EYP using the following six-stage process: (a) familiarisation with the data, (b) generating initial codes, (c) searching for themes, (d) reviewing themes, (e) defining and naming themes and (f) producing the report. This method of thematic analysis has been previously used in studies surveying sports coaches and those working in early years settings (Bentley et al. 2012; Roscoe, James, and Duncan 2017; Dobell et al. 2021; Duncan, Weldon, et al. 2022). Thereafter, overarching clear and identifiably distinct themes, representing the main ideas or patterns emerging from the raw data were generated for each open-ended question and agreed upon by two of the researchers XX and XX (removed for review). A deductive method of analysis was employed to analyse the open-ended responses.

## Results

### *Knowledge of nutrition and physical activity guidelines*

For the EYPs who responded, the correct responses (*n* (%)) on nutrition and PA knowledge are shown in Table 2. The majority of participants (*n* = 89, 64.8%) were aware of the recommended number of

**Table 2.** EYPs' responses on nutrition and PA knowledge items.

Question content	Correct response	<i>n</i> (%)
<b>Nutrition</b>		
Snack serving	2	89 (64.8%)
Pre-Schoolers' plate size	Based on Public Health England Guidelines	61 (44.5%)
<b>PA</b>		
Daily PA	180min	86 (64.8%)
Daily HI PA	60min	58 (42.3%)

Note: F&V, fruit and vegetable; HI, high intensity; PA, physical activity.

snacks to give each day but slightly less than half ( $n = 61$ , 44.5%) could accurately describe the recommended portion size for preschoolers based on the current guidelines (Public Health England 2017). Most ( $n = 86$ , 64.8%) of respondents replied correctly to a 'Daily PA' question while less than half ( $n = 58$ , 42.3%) replied correctly regarding the amount of time preschoolers should spend in vigorous or high-intensity PA.

### Nutrition perspectives

The perspectives of EYPs related to eating behaviours are displayed in Table 3. The EYPs generally displayed a positive and correct outlook on nutrition and healthy eating behaviours which aligns with the values, perspectives and guidelines for the practices encouraged by Public Health England (2017). The responses of EYPs regarding what snacks and beverages and how frequently they are served in EYS are displayed in Table 4. Overall, responses suggest that the food and drinks served at EYS align with the guidelines and information provided and encouraged by Public Health England (2017).

### Knowledge of fundamental movement skills

Participants were asked if they *have heard of the term Fundamental Movement Skills (FMS) before*. Eighty (58.4%) participants responded that they had heard of the term whilst 57 (41.6%) said they had not heard of the term FMS before. Those EYPs that had heard of FMS before were asked to briefly, in their own words, describe what FMS is. Overall, almost all the FMS descriptions referred to various FMS dimensions demonstrating an adequate EYPs' understanding of the term. Word frequency analysis revealed that the most repeated words used by the EYPs, were skills ( $n = 54$ ), balance ( $n = 17$ ), running ( $n = 14$ ), jumping ( $n = 13$ ), throwing ( $n = 11$ ) followed by motor and movement ( $n = 9$ ). The three main categories (i.e. locomotor, stability and manipulative skills) were identified within the FMS description as used by the local authorities in which respondents were based. The frequency order of the usage of these words by EYPs is as follows: locomotor ( $n = 12$ ), manipulative ( $n = 9$ ) and stability ( $n = 8$ ). Most frequent combinations of two words were 'running, jumping' ( $n = 10$ ), ball and movement skills ( $n = 7$ ) followed by balance, gross motor and manipulative skills ( $n = 7$ ).

The FMS definition used by the local authorities in which data collection took place was: 'Fundamental Movement Skills (FMS) are the vital foundation movement skills on which all future movement experience is built. There are three main areas of FMS – Locomotor, Stability and Manipulative skills'. This definition was used as a theoretical basis to perform a deductive thematic analysis (TA) approach on the qualitative responses provided by respondents (Startwell 2020). A deductive TA approach was performed to analyse the open-ended question regarding the description of the FMS and identified an overarching theme related to 'basic movement skills associated with PA'. The way FMS was described was similar across the EYPs. For instance, 'Fundamental movement skills (FMS) are the basic movements traditionally associated with human physical activity. The most common FMS include skills such as running, jumping, throwing, catching, skipping, and

**Table 3.** EYPs' perspectives on pre-schoolers' nutrition and its practises (five-point Likert scale).

Perspectives and practises on nutrition <sup>1</sup>	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
<b>I ensure I only drink water around the children</b> ( <i>n</i> = 137)	3 (2.2)	21 (15.4)	31 (22.6)	31 (22.6)	51 (37.2)
<b>I try and drink more water when being around children</b> ( <i>n</i> = 137)	6 (4.4)	17 (12.4)	24 (17.5)	45 (32.8)	45 (32.8)
<b>I am aware of the most appropriate drinking vessels for children and their health</b> ( <i>n</i> = 137)	2 (1.5)	2 (1.5)	15 (10.9)	56 (40.8)	62 (45.3)
<b>I am confident what a healthy lunchbox of a pre-schooler should look like</b> ( <i>n</i> = 137)	2 (1.5)	0 (0)	2 (1.5)	66 (48.1)	67 (48.8)
<b>I feel comfortable eating together with the children</b> ( <i>n</i> = 137)	2 (1.5)	0 (0)	4 (3)	53 (38.6)	78 (56.9)
<b>I always make sure mealtimes are fun and I encourage discussions about healthy eating choices</b> ( <i>n</i> = 137)	2 (1.5)	2 (1.5)	12 (8.8)	64 (46.6)	57 (41.6)
<b>Children and staff members always eat together</b> ( <i>n</i> = 137)	8 (5.8)	19 (13.9)	37 (27)	42 (30.7)	31 (22.6)
<b>Children should always finish all of their food on their plate</b> ( <i>n</i> = 137)	32 (23.3)	65 (47.4)	28 (20.4)	11 (8.1)	1 (0.7)
<b>Dessert is only offered if the main course is finished</b> ( <i>n</i> = 135)	34 (24.8)	42 (30.6)	38 (27.2)	13 (9.4)	8 (5.8)
<b>I always offer seconds of food regardless if the children have asked for more</b> ( <i>n</i> = 135)	36 (26.2)	38 (27.7)	30 (21.8)	20 (14.5)	11 (8.1)
<b>I always role model healthy eating to pre-schoolers</b> ( <i>n</i> = 137)	2 (1.5)	2 (1.5)	6 (4.4)	68 (49.6)	59 (43)
<b>I always talk to children about what they are eating and why</b> ( <i>n</i> = 137)	2 (1.5)	0 (0)	25 (18.3)	55 (40.1)	55 (40.1)
<b>I always encourage children to try new foods</b> ( <i>n</i> = 136)	2 (1.5)	1 (0.7)	11 (8)	57 (41.6)	65 (47.4)
<b>I would not offer the same food to a child again if they have refused it before</b> ( <i>n</i> = 137)	42 (30.7)	50 (36.5)	33 (24.1)	5 (3.6)	7 (5.1)
<b>I use characters or visual tools to help me to encourage children to eat more healthily and try new foods</b> ( <i>n</i> = 137)	16 (11.7)	24 (17.5)	24 (17.5)	41 (29.9)	32 (23.3)
<b>I use food to reward positive behaviour</b> ( <i>n</i> = 137)	68 (49.6)	46 (33.5)	9 (6.6)	11 (8)	3 (2.2)
<b>I always give enough opportunities for children to be involved in food preparation</b> ( <i>n</i> = 136)	8 (5.8)	13 (9.4)	18 (13.1)	59 (43)	38 (27.2)
<b>A pre-schooler's healthy eating is more of the parents' responsibility</b> ( <i>n</i> = 136)	28 (20.4)	44 (32.1)	30 (21.9)	26 (18.9)	8 (5.8)
<b>If parents bring a celebration cake to the setting, I would send it back home</b> ( <i>n</i> = 136)	32 (23.3)	50 (36.5)	21 (15.3)	22 (16.1)	11 (8.1)
<b>Settings should support parents with information and ideas on healthy eating</b> ( <i>n</i> = 136)	4 (3)	2 (1.5)	20 (14.6)	46 (33.5)	64 (46.5)
<b>I feel confident and skilled enough to have conversations with parents about healthy eating for children</b> ( <i>n</i> = 137)	2 (1.5)	4 (3)	9 (6.6)	67 (48.8)	55 (40.1)
<b>Celebrations and events in our setting are supporting healthy eating messages</b> ( <i>n</i> = 137)	5 (3.6)	2 (1.5)	54 (39.4)	46 (33.5)	30 (31.9)

hopping' and 'Locomotor skills – skills that involve moving the body from one place to another. Stability skills – body balancing, either static or while in motion. Manipulative skills – using equipment and controlling it with hands or feet' (EYP16) and 'Locomotor skills – skills that involve moving the body from one place to another. Stability skills – body balancing, either static or while in motion. Manipulative skills – using equipment and controlling it with hands or feet' (EYP13).

### Practices for FMS

Nearly half of the respondents (*n* = 67, 49%) said that *they base their planning of PA sessions on the development of FMS* whilst the remaining of EYPs did not. Participants were also asked to answer an



**Table 4.** EYPs' reporting on what snacks and drinks and frequency of serving at their setting.

	Never	Occasional (less than once per week)	Frequently (few times per week)	Daily	Not sure
	n(%)	n(%)	n(%)	n(%)	n(%)
<b>Fruits</b>	2 (1.5)	0 (0)	5 (3.7)	129 (94.1)	1 (0.7)
<b>Vegetables</b>	3 (2.2)	2 (1.5)	11 (8.1)	120 (87.5)	1 (0.7)
<b>Breadsticks</b>	24 (17.5)	28 (20.4)	46 (33.5)	24 (17.5)	15 (10.9)
<b>Plain Biscuits</b>	62 (45.2)	40 (29.2)	13 (9.5)	10 (7.3)	12 (8.8)
<b>Chocolate Biscuit</b>	103 (75)	29 (21.4)	3 (2.2)	1 (0.7)	1 (0.7)
<b>Yoghurt (plain)</b>	55 (40.1)	24 (17.5)	37 (26.9)	13 (9.5)	8 (5.8)
<b>Yoghurt (flavoured)</b>	57 (41.5)	17 (12.4)	39 (28.4)	13 (9.5)	11 (8.1)
<b>Cheese</b>	47 (34.3)	28 (20.4)	51 (37.2)	10 (7.3)	1 (0.7)
<b>Hard dried fruits (e.g. banana chips)</b>	109 (79.5)	17 (12.4)	8 (5.8)	0 (0)	3 (2.2)
<b>Soft dried fruits (e.g. raisins)</b>	46 (33.5)	35 (25.5)	25 (18.2)	21 (15.4)	10 (7.3)
<b>Water</b>	2 (1.5)	0 (0)	2 (1.5)	127 (92.6)	6 (4.4)
<b>Cow's milk (or alternative)</b>	12 (8.7)	0 (0)	9 (6.6)	108 (78.7)	8 (5.8)
<b>Hot chocolate</b>	100 (72.9)	27 (19.7)	2 (1.5)	0 (0)	8 (5.8)
<b>Flavoured milk</b>	118 (86.1)	9 (6.6)	1 (1.5)	1 (1.5)	8 (5.8)
<b>Fizzy drinks (including diet drinks)</b>	126 (91.8)	0 (0)	1 (1.5)	0 (0)	10 (7.3)
<b>100% pure fruit juice and/or smoothies</b>	104 (75.8)	20 (14.6)	4 (3)	0 (0)	9 (6.6)
<b>Diluted fruit juice</b>	104 (75.8)	16 (11.6)	3 (2.2)	6 (4.4)	8 (5.8)

open-ended question 'Are there any specific ways of how you encourage preschoolers to move more and sit less within your setting?'. The TA approach has revealed an overarching theme related to 'Facilitating PA opportunities' with sub-themes relating to the great outdoors, chairs are obstacles to PA, role modelling and movement through games. Most of the EYPs described their ways of how they encourage preschoolers to move more similarly across the group. For example,

Role modelling, open door access to outside and lots of physical equipment. Set physical activity each week along with a weekly dance and wake up, shake up song. Lots of active games played with children at nursery. Removing chairs so children do not sit for long periods.(EYP11)

or 'We do not have chairs apart from snack time. We spend as much time outdoors as possible. Always have a large area for physical play if indoors. Have games and dancing' (EYP14) or

I encourage children to move about when reading stories and don't tell them to sit still. I take books outside so children can act books out. The children can go into the large hall and practise large movement such as wheelbarrows, cartwheels and dancing with music. (EYP44)

Some EYPs have provided more specific type of responses such as 'We have an all-weather policy in which the children use the free flow system to play outside for the whole day' (EYP49) and 'We get alexa to play up beat songs to encourage the children to express themselves through movement' (EYP32) or 'Putting YouTube videos on which require children to move about such as washing mashing, yoga or walking through the forest' (EYP57).

The most frequent and consistently used terms and words combinations by the EYPs settings, across the generated theme were 'remove chairs', 'play', 'wake up shake up' 'activities' and 'outdoors' on  $n = 34$ ,  $n = 21$ ,  $n = 21$  and  $n = 19$  occasions, respectively.

### Perspectives on FMS

The perspectives of EYPs in relation to FMS and PA are displayed in Table 5. As a group, the EYPs' perspective on PA and motor competence aligned with the values, perspectives and guidelines for the practices encouraged by the EYFs. For example, nearly a third (30.6%,  $n = 42$ ) of respondents agreed that they *are able to define the term* 'fundamental movement skills' whilst nearly a



**Table 5.** EYPs' perspectives and practises on pre-schoolers' PA and motor competence (five-point Likert scale).

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
	n(%)	n(%)	n(%)	n(%)	n(%)
<b>I am able to define the term 'fundamental movement skills'</b>	4 (2.9)	38 (27.7)	33 (24.1)	23 (16.7)	19 (13.9)
<b>I understand the importance of the development of fundamental movement skills in early years settings</b>	2 (1.5)	15 (10.9)	7 (5.1)	68 (49.5)	35 (25.5)
<b>Physical activity is important for children's brain development</b>	3 (2.2)	1 (1.5)	0 (0)	41 (29.9)	92 (67.1)
<b>Physical activity is important for developing children's fine and gross motor skill development</b>	3 (2.2)	0 (0)	1 (0.7)	38 (27.7)	95 (69.3)
<b>I know which activities will develop key fundamental movement skills</b>	5 (3.6)	10 (7.3)	28 (20.4)	50 (36.5)	32 (23.3)
<b>I play a vital role in promoting pre-schoolers' physical activity and development</b>	2 (1.5)	4 (3)	17 (12.4)	62 (45.2)	51 (37.2)
<b>A pre-schooler's physical activity and development is more of the parents' responsibility</b>	29 (21.4)	55 (40.1)	17 (12.4)	19 (13.8)	7 (5.1)
<b>I have the skills, abilities and resources I need to support pre-schoolers' physical activity and development</b>	4 (3)	18 (13.1)	16 (11.6)	60 (43.7)	39 (28.4)
<b>I feel confident planning physical and movement activities sessions</b>	6 (4.4)	14 (10.2)	15 (10.9)	62 (45.2)	39 (28.4)
<b>I plan physical and movement activities daily</b>	6 (4.4)	13 (9.5)	23 (16.8)	63 (45.9)	32 (23.3)
<b>I always participate in the physical activities together with children</b>	4(3)	11 (8.1)	11 (8.1)	66 (48.1)	44 (32.1)
<b>I talk about the effects exercise has on our bodies before and after physical activities</b>	4 (3)	11 (8.1)	21 (15.3)	71 (51.8)	30 (21.9)
<b>I find it difficult to provide an appropriate environment for children to be active indoors</b>	27 (19.6)	59 (43.1)	13 (9.5)	31 (22.6)	7 (5.1)
<b>I find it difficult to provide an appropriate environment for children to be active outdoors</b>	40 (29.2)	64 (46.7)	13 (9.5)	15 (10.9)	2 (1.5)
<b>There are more active than sedentary activities in our setting (see above for the definition of sedentary)</b>	3(2.2)	24 (17.5)	47 (34.3)	47 (34.3)	12 (8.8)
<b>I ensure I am always active around the children</b>	2 (1.5)	2 (1.5)	49 (35.7)	52 (37.9)	30 (21.9)
<b>I encourage the children to move around when they sit for a prolonged period of time</b>	3 (2.2)	5 (3.6)	17 (12.4)	78 (51.9)	32 (23.3)
<b>I find it difficult to decrease sedentary time of pre-schoolers</b>	18 (13.1)	52 (37.9)	43 (31.3)	22 (16.1)	2 (1.5)
<b>I find it harder to decrease pre-schoolers' sedentary time indoors than outdoors</b>	17 (12.4)	35 (25.5)	48 (34.9)	35 (25.5)	2 (1.5)

quarter ( $n = 33$ , 24.1%) were neutral with their answer (i.e. gave a score of 3 on a 5 point Likert scale). One hundred and three respondents (75.1%) stated that *they understand the importance of the development of FMS in EYS*. There was also a collective agreement across the EYPs on statements regarding the importance of PA for children's cognitive development ( $n = 133$ , 96.9%) as well as fine and gross motor skill development ( $n = 133$ , 96.9%). The majority of the EYPs believed that they have the *skills, abilities and resources needed to support preschoolers' physical activity and development* (72.2%,  $n = 99$ ), *the confidence to plan physical and movement activities sessions* (73.6%,  $n = 101$ ) as well as the knowledge of *which activities will develop key fundamental movement skills* (59.7%,  $n = 82$ ).

Whilst a small number of the respondents felt that they find it difficult to *provide an appropriate environment for children to be active indoors* (27.7%,  $n = 38$ ), the majority reported that they did not find it difficult to *provide an appropriate environment for children to be active both indoors* (62.9%,  $n = 86$ ) and *outdoors* (75.8%,  $n = 104$ ). In agreement with the prior finding, more than half (51%,  $n = 70$ ) of the respondents felt that it is not difficult to *decrease sedentary time of preschoolers*; although, a third (31.3%,  $n = 43$ ) had a neutral view on the matter. A similar pattern of response was observed on

another perspective with nearly a half (43%,  $n = 59$ ) of EYPs agreeing that *there are more active than sedentary activities in their setting* with, another third (34.3%,  $n = 47$ ), interestingly, taking a neutral stance.

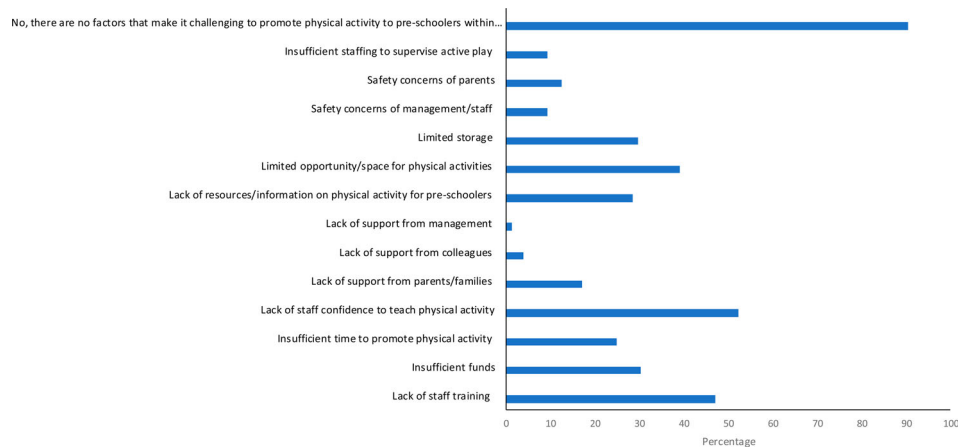
When expressing views on PA practices in EYS, the EYPs were mostly unanimous in indicating that they *always participate in the physical activities together with children* (80.2%,  $n = 110$ ), *talk about the effects exercise has on our bodies before and after physical activities* (73.7%,  $n = 101$ ).

**Barriers towards implementing healthy eating, physical activity and FMS in settings**

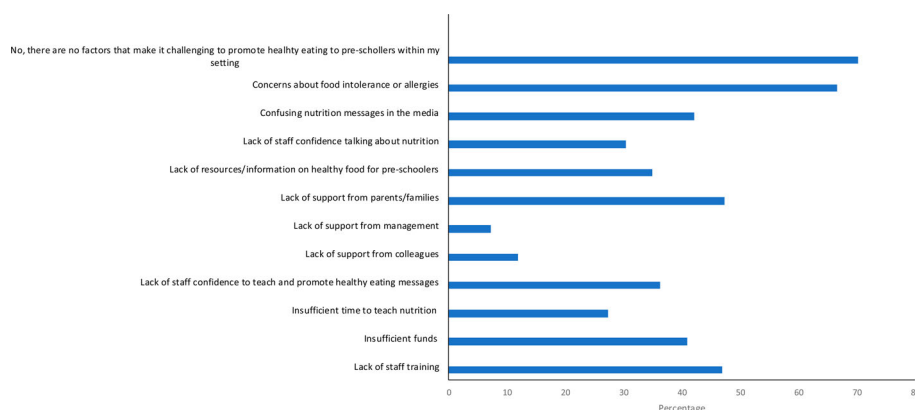
Figures 1 and 2 presents and compares EYPs’ answers when they were asked to identify if any of the factors make it challenging for them to promote healthy eating behaviours and PA to pre-schoolers within their setting. As seen below, the majority (90.4%) of practitioners reported that there were no factors that would prevent them from promoting PA while nearly two-thirds (70.3%) reported the same for the healthy eating aspect. Regarding other barriers ‘lack of staff training’ for healthy eating (46.9%%) and PA (47.1%), ‘lack of resources/information for PA’ (28.5%) and healthy eating (35%), and most markedly ‘lack of staff confidence to teach PA’ (52.4%) and healthy eating (30.4%) were identified as key barriers across both PA and healthy eating aspects of the survey. There were also some specific barriers identified for the healthy eating aspect by respondents where two-thirds (66.7%) cited ‘concerns about food intolerance and allergies’ as a barrier and nearly half (47.3%) cited lack of support from parents and families as a barrier to employing healthy eating practices in settings.

**Discussion**

This study explored the knowledge, perceptions and practices of EYPs working in England in relation to FMS, healthy eating habits and PA behaviours. Understanding the perceptions and practices of staff working in EYS is a key step in determining if the main constructs relating to motor development, PA and healthy eating are understood and being delivered as required by the EYFS. The present study also identifies barriers that might impact those practices from being implemented in the EYS. Such information is essential in informing the developers of interventions on how to approach EYPs and EYS more effectively when enhancing their confidence and knowledge in aforementioned aspects of healthy behaviours.



**Figure 1.** Factors that make it challenging for EYPs to promote PA in their settings.



**Figure 2.** Factors that make it challenging for EYPs to promote healthy eating in their settings.

### *FMS perceptions and practices*

As a group, the EYPs in the present study demonstrated some basic understanding and knowledge of the definition and implications of FMS. Some of the most common ways respondents used to describe FMS were words such as 'skills', 'balance', 'locomotor', 'manipulative' and 'movement' as well as word combinations such as 'running skills' and 'jumping skills'. This aligned with the FMS definition by Gallahue, Ozmun, and Goodway (2012) as well as the description used by the local authority the participants were working in Startwell (2020). The majority of EYPs in the study also responded agree or strongly agree to statements asking if they 'understood the importance of the development of FMS in early years settings' and 'I know which activities will develop key FMS'. This suggests a broadly adequate understanding of the FMS term. The aforementioned statements align with the key factors set out in EYFS framework (Department of Education (DoE 2021)). However, given the lack of support and the fact that the importance of the development of the FMS in EYFs is only considered within the broader construct of motor development within the framework (Dobell et al. 2021), our findings are positive as EYPs provided some basic, but adequate, understanding of FMS. Despite this, over 40% of the respondents had not heard of FMS before. These results are comparable to recent studies where primary school teachers demonstrated little to zero perceived comprehension on FMS, having any training on FMS (Eddy et al. 2021) and thus, lack of confidence in its upskilling in children (Dobell et al. 2021). Prior work by Ma et al. (2021) using the Collective-Intelligence science approach with relevant stakeholders (e.g. public health specialists, coaches, FMS researchers, schoolteachers), corroborate these insights suggesting that the FMS knowledge limitation might have been the cause of the lack of initial education and continuous professional development. Consequently, the results of the present study suggest a need for greater focus into creating effective training programmes/workshops to enhance EYPs' knowledge as well as the understanding of importance of FMS implications for preschoolers. Of note, over half of the survey participants did not know what FMS were. Given the explicit focus on gross motor development in the EYFS in England, this is somewhat worrying and is suggestive of the need for more specific training for EYP in relation to FMS.

### *Supporting PA and eating habits*

The positive impact of EYS as essential motivators in promoting healthy lifestyle for preschoolers such as reducing sedentary and encouraging healthy eating behaviours is established (Ward et al. 2017). Almost all the expressed views by EYPs surrounding both PA and eating behaviours were in compliance with EYFS and Public Health England's objectives, values, guidelines and resources

in relation to PA and healthy eating. It is, however, notable that far fewer EYPs understood the PA guidelines for MVPA compared to their understanding of the total PA guidelines. It has been demonstrated that self-efficacy (i.e. confidence), described as one's ability to execute certain practices (Bandura 1977), is a strong mediator of a health behaviour change as well as its maintenance (Dias et al. 2019; Strecher et al. 1986). Hence, the confidence levels that EYPs portrayed in PA, FMS and healthy eating behaviours promotion and practices may be held as fairly accurate representation of pre-schoolers' engagement and development of healthy behaviours in EYS. In relation to PA promotion, the EYPs generally felt confident in their skills and abilities with majority reporting that they 'have the skills, abilities and resources needed to support pre-schoolers' physical activity and development' and 'feel confident planning physical and movement activities sessions'. However, there was a greater proportion of EYPs expressing that it is harder for them to decrease sedentary behaviour indoors in contrast to outdoors. Considering the unpredictable UK weather, indoor areas are most likely used often which makes it crucial for EYP to become more confident in indoor PA provision. This calls for a potential shift of focus for policy makers and/or local authorities when developing intervention programmes involving EYP's training on PA.

Regarding barriers experienced by EYPs in developing FMS, PA and healthy eating, it is encouraging that a majority of EYPs reported that they face no factors when promoting healthy eating and PA. Although, compared to PA, our results suggest that promoting healthy eating behaviours is a bigger challenge for EYPs as larger percentages reported barriers for this aspect compared to PA. This was particularly the case for concern about allergies/food intolerances, perceived lack of support from parents, lack of confidence to talk about nutrition and lack of confidence to teach nutrition and healthy eating. Similar, to the points discussed above, in terms of the PA barriers, lack of staff training and confidence were one of the consistently reported barriers by the EYPs for PA promotion. Such observations align with the Dobell et al. (2021) findings which highlights the need for the action to improve the quality of PA and FMS provision resources and training for EYPs.

### ***Strengths, limitations and future directions***

The current study is not without limitations. Participants were restricted to EYPs within one geographical part of England and the data presented may be more reflective of the practice within that geographical region. However, all areas of England have to adhere to the EYFS so the standards and principles by which EYPs should practice are the same across the whole country. In recruitment we informed participants that we were 'conducting a survey focused on perceptions and practice of motor development, physical activity and healthy eating in preschoolers'. This may have unintentionally resulted in those EYPs who were more interested in this topic being more likely to participate. Furthermore, while the data present a snapshot of what EYPs believe and do regarding FMS, PA and healthy eating, future work building on the data presented here using a more in-depth qualitative methodology (e.g. interviews) would be useful in unpacking how strategies to develop these areas might be better embedded into early years training and practice. We are aware of the descriptive nature of the approach used in the current study. This approach is deliberate and useful as no prior work had examined the perceptions and practices of EYPs related to FMS, PA and healthy eating in England.

### ***Conclusion***

A key first step in effecting positive change is to establish the current perceptions and practices that are evident in early years settings. This study sought to take this key first step. Only when this form of information is available can informed strategies be put in place to advance early years training and practice. The present study demonstrates that EYPs in England demonstrate some basic understanding and knowledge of FMS, and are compliant with national objectives, values, guidelines and resources in relation to PA and healthy eating. However, a considerable number of EYPs remained

unaware of what FMS are and their understanding of PA guidelines for MVPA was not adequate. Considerable barriers to developing FMS, PA and healthy eating in preschoolers in England remain and there is a distinct need for additional training and intervention to help EYPs create positive trajectories of health for the children they support.

## Disclosure statement

The authors report there are no competing interests to declare.

## Data availability statement

Data from this research study are available from the lead author upon reasonable request.

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