

Factors influencing childcare workers' promotion of physical activity in children aged 0–4 years: a qualitative study

Sarah Wilke, Claudia Opendakker, Stef P.J. Kremers and Jessica S. Gubbels*

Department of Health Promotion, Maastricht University, NUTRIM School for Nutrition, Toxicology and Metabolism, Maastricht, The Netherlands

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The present study examined the factors influencing childcare workers' promotion of physical activity (PA) among children aged 0–4 years, a particularly interesting context because of the increasing number of children attending childcare. Twenty Dutch childcare workers were interviewed. The interviews revealed some important barriers to the promotion of children's PA: lack of facilities and time; rules and policies regarding safety and daily duties; non-cooperative colleagues; a large range of ages of children; poor weather; unsuitable clothing and lack of communication with parents. The respondents identified the parents rather than themselves as persons responsible for promoting children's PA. Parents and childcare workers could improve their communication regarding children's PA. Childcare centres could review their internal policies and provide workshops teaching childcare workers how to promote children's PA.

Keywords: childcare; day care; physical activity; parents

1. Introduction

Physical activity (PA) has many favourable effects, especially among young children. It is associated with happiness and seems to be an important component of developing self-esteem, social contacts (Strauss et al. 2001) and a healthy weight status (Reilly et al. 2006). Furthermore, there is a reciprocal relationship between PA and motor skills: PA supports the development of motor skills (Reilly et al. 2006), while children with better-developed motor skills spend less time in sedentary activities (Fisher et al. 2005; Williams et al. 2008). PA levels are established in childhood and correlate with health behaviour in adolescence and adulthood (Kelder et al. 1994; Nader et al. 2006). With this knowledge in mind, early and effective promotion of PA becomes important.

A crucial determinant influencing PA is the environment in which a child lives. Ecological models assume that environments are multidimensional and that health is influenced by various facets of physical and social environments (Sallis and Owen 2002). For instance, the Ecological Model of Physical Activity identifies multiple environmental dimensions which influence and interact with each other (Spence and Lee 2003). In the early stages of life, the home environment and the childcare environment play important roles (Bronfenbrenner and Morris 1998;

*Corresponding author. Email: jessica.gubbels@maastrichtuniversity.nl

Certain and Kahn 2002). According to the social learning theory, children begin to observe and imitate the behaviour of their parents and adopt family habits very early (Sallis and Nader 1988), so parents partially influence the behaviour of their children (Welk, Wood, and Morss 2003). Since the amount of time children spend in childcare is currently increasing (Portegijs, Hermans, and Lalta 2006), the role of childcare workers is becoming ever more important and the quality of professional caregiving impacts children's development (Lamb and Ahnert 2006).

The physical performance of preschool children and the outdoor environment as pedagogical space for toddlers have been described previously (Krombholz 2006, 2012; Moser and Martinsen 2010). Furthermore, previous studies in childcare settings have mostly quantified children's PA or described the association between PA and the facilities available at the centres (e.g. Bower et al. 2008; Gubbels et al. 2011). A longitudinal study in the Netherlands showed that children attending childcare are at increased risk of becoming overweight compared with those who do not attend childcare centres (Gubbels et al. 2010). According to observational studies, children's activities at childcare centres can be described as mainly sedentary (e.g. Bower et al. 2008; Gubbels et al. 2010). Gubbels et al. (2011) recently found that the presence of staff members has an unfavourable influence on children's PA: when more staff members were present in the room, children were less physically active.

Only a few recent studies have examined childcare workers' beliefs (Berthelsen and Brownlee 2007; Cashmore and Jones 2008; Copeland et al. 2009; Van Zandvoort et al. 2010). These studies indicate, for instance, that practitioners see caring as their most important task (Berthelsen and Brownlee 2007), that they perceive the indoor childcare facilities as unsuitable (Cashmore and Jones 2008) and that children's clothes are often a source of conflict with parents (Copeland et al. 2009). However, all of these studies were performed in the USA, Canada or Australia; European studies are currently lacking.

Formulating clear implications for possible interventions in the childcare setting, to promote PA, requires considering the factors which influence the motivation of the childcare workers who have a direct influence on the children's behaviour. Therefore, the current study tried to find answers to the following research questions: How do childcare workers perceive their role in promoting PA in children aged 0–4 years? What factors do childcare workers identify as influences on the way PA is promoted?

2. Methods

2.1. Study sample and recruitment

Childcare workers from four different childcare centres operated by an organisation in Maastricht, the Netherlands, were interviewed. The Dutch childcare system distinguishes between different age groups among children aged 0–4 years: the baby group (0–2 years), the toddler group (2–4) and the so-called vertical group (0–4 years). Four different centres were contacted to achieve 24 interviews. Eight interviews were planned for each age group. No specific inclusion criteria were set.

The general manager of the organisation gave informed consent and acted as an intermediate by contacting the different centres to briefly introduce the purpose of the study and to ask the staff if they were willing to participate. A flyer presenting a short explanation of the research and introducing the researcher, with contact

details for possible further questions, was provided to the childcare workers and parents. The days on which the locations were visited were selected at random. Two interviews in the baby groups could not take place because of miscommunication between the manager and the contact person at the childcare centre, and only seven childcare workers were interviewed in both the toddler and vertical groups, because of data saturation in these groups. Data saturation was identified when three subsequent interviews did not reveal any new information. This resulted in a total of 20 interviews. There were no marked differences between the various centres regarding the methods used by the childcare workers or their socio-economic background.

2.2. Measurement instruments

Qualitative research was used to answer the research questions. The basic philosophy used in the study was phenomenology, a theoretical perspective which is most often associated with qualitative research. The phenomenological perspective seeks to understand phenomena in a specific context and uses a naturalistic approach to study the experiences of individuals (Bogdan and Biklen 1982; Husserl 1980). As no specific theoretical framework has as yet been developed for the topic of the current study, an extended version of the theory of planned behaviour was developed and used as a theoretical background (Ajzen 1991). Additional aspects were added: barriers and skills, derived from the I-Change Model (Vries et al. 2005); reinforcement and social support, derived from social cognitive theory (Bandura 1986); habits (Verplanken, Aarts, and van Knippenberg 1997), perceived responsibility, i.e. ‘diffusion of responsibility’ (Darley and Latane 1968) and motivation, emphasised by self-determination theory (Amorose and Anderson-Butcher 2007). Figure 1 provides a schematic overview of the theory.

Qualitative data were collected through direct encounters with individuals. In line with the phenomenological perspective, individual interviews were used. First, the theoretical background was translated into a research model that would be suitable for the situation and the setting, in order to place the questions in a more global context. For instance, ‘perceived support/barriers’ was translated into ‘perceived role of colleagues and parents’. This model was used as a basis to construct the interview questions. Individual interviews were chosen because of the possibly sensitive topic. Before conducting the first interview, two pilot interviews were done to test the structure of the interview. All interviews were conducted by the same, trained, interviewer.

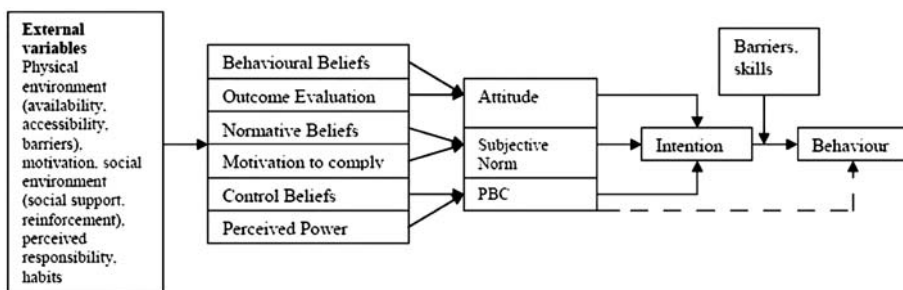


Figure 1. Theoretical framework.

Before each interview, the researcher was guided around the childcare facility and observed its routines over several hours to get acquainted with the childcare centre and its practices, as well as with the interviewee. These observations increased the interviewer's understanding of the work environment of the childcare workers. During the interview, the childcare workers were encouraged to reflect on their behaviour at the childcare setting and the observations helped the interviewer to interpret these reflections. Observations were guided by a self-constructed checklist, based on an existing instrument, the Environment and Policy Assessment and Observation instrument (Ball et al. 2005).

2.3. Data collection

Two childcare workers per group were interviewed during one day. The childcare workers decided among themselves who would participate. The researcher was present in the group to carry out the observations, but was careful to disturb the group process and the childcare workers' routines as little as possible. Observations lasted an average of two to three hours.

The interviews with the childcare workers were preferably done in a quiet and separate room. Due to circumstances, five interviews had to take place in a noisier room, e.g. the break room. The interviewer first explained some details regarding the interview, for instance that it would be recorded, that the information would be processed anonymously, and that the interview would take approximately 30 min. The respondents were allowed to ask questions and interrupt the interviewer. After the first interviews, some questions that needed adjustment were subdivided or expanded. The childcare workers were interviewed in Dutch, and the interviews were recorded using audiotape. Notes about some relevant situations or non-verbal responses were written immediately after the interview. Data collection took place between March and April 2011.

2.4. Analyses

The taped interviews were typed out within one day after the interview. All interviews were checked twice by listening to the tapes again. The interviewer consulted a second person if recorded words or sentences were unclear. Conventional transcription codes (Poland 1995) were used to clarify and accentuate breaks, laughing or missing information. Names of individuals or locations were rendered anonymous. The data were then analysed using the qualitative data analysis software programme N-Vivo (Version 2.0, QRS International). First, all interview transcripts were imported to N-Vivo. A coding system based on the theoretical framework (see Figure 1) as described above was used to classify answers into categories. Nodes were made for each category. One answer could be coded to multiple nodes if necessary. Additionally, nodes could be moved or deleted during the coding process. An answer or concept was coded by highlighting the text and moving it to the relevant node.

3. Results

3.1. Respondents

The interviews lasted on average about 20 min (ranging from 15 to 35 min). All respondents were female and the majority of them were permanent employees.

The average age of the respondents was 31 years ($SD=9$). About three-quarters of the childcare workers worked full time and the average number of years of experience as a childcare worker was eight ($SD=7$). Almost all respondents had completed their childcare worker training to pedagogical staff level, which is an intermediate vocational education, and had started working at a childcare organisation directly after graduation. Although some of the childcare workers had a different background, all workers graduated from the same childcare worker training. There were no noticeable differences in responses from people working with different age groups. Since childcare workers had worked or were working in different age groups, they could, through experience, identify advantages and disadvantages of other age groups.

3.2. *Perceived role in PA promotion*

The respondents felt that children need to be free to move: ‘it is important that you don’t put a baby in a box very often’, but they also thought that children do not need any encouragement to be physically active when they are outdoors. Children appeared to be active enough to the childcare workers but they indicated that it is difficult to start a collective game. Furthermore, the interviewees indicated that ‘it is important to just let them play’. In addition, childcare workers perceive being outside as an opportunity to meet up with other colleagues: ‘You meet all your colleagues there’. Furthermore, childcare workers did not feel responsible for the PA level of the children because they believed that, ‘children are already active enough.’ Although childcare workers believed that children are not at risk of being inactive, they did indicate several benefits of being physically active. Childcare workers mentioned that PA is beneficial to prevent overweight: ‘A child that is sturdy and has started to walk ... you can see that he or she loses weight’, to enhance children’s confidence to be active, to get over their anxieties, and to release energy. Especially this last benefit of being physically active (release of energy) appeared to be a good motivation for childcare workers to be physically active with the children.

PA was liked and found important by the majority of the childcare workers: ‘I like being active with children if we have enough time’, but the interviewees also indicated that they found it difficult to be physically active with the children because of safety issues or because of age differences within the group.

3.3. *Factors affecting promotion of PA*

3.3.1. *Facilities and rules*

Respondents whose centre did not have a collective indoor playground perceived this as a barrier to promoting children’s PA: ‘It’s a pity that they can only run outside’, ‘we’re much more restricted indoors’. Another respondent said that she would like more ‘attractive (...) objects’ to promote children’s PA, especially for the baby group. According to a colleague, varied and challenging materials were very important, ‘toddlers (...) who come here twice or three times a week (...) get bored very quickly’. Another respondent said that indoor activities made the group atmosphere ‘too turbulent’.

The conditions outside were also criticised: ‘It would be nice to have more natural things like hills or grass where they can use their imagination (...)’. Another

respondent commented on the toys: ‘We just have bikes and a slide and a swing (...) I’d like to have things like balls or a skipping rope so that I can ask them [the children] to do things’.

The respondents also felt that they were dependent on the weather. ‘You can’t go outside when it’s rainy’. However, according to the rules, children were only allowed to run outside and had to walk indoors: ‘It is very difficult for me to remind the children that they’re not allowed to run indoors (...) sometimes, they just have to’. Rules were necessary for safety reasons, but ‘I sometimes just turn a blind eye to it [running in the group]’. A new policy that had been introduced, providing more space indoors, was perceived as contradicting the rules (no running allowed in the group): according to the respondents, more free space invited children to run and be active.

Furthermore, ‘We should be aware of being physically active with children but we do not have time (...) to prepare for it (...)’. Respondents also indicated that they do not *make* time for it, especially when there are many children to look after: caring for and supervising infants took a lot of time, which was at the expense of time to play with the children. In addition to the caring tasks, ‘we have to clean up and do the administration’. One respondent said that they did not do anything that was not included in the printed regulations. In addition, the respondents saw supervising and instructing substitute childcare workers as time consuming.

In addition, ‘It is difficult to provide structured activities for all children (...). You tend to pay more attention to the younger ones’. Another barrier was that infants could not concentrate on a specific task for a long time. Infants with different eating and sleeping rhythms could not be taken outside ‘I just open the window so they can get some fresh air’. It was nearly impossible for young children, who could not manage the stairs, to play outside. ‘We can’t help all the children go up and down the stairs’. Beyond playing outside, only older children were allowed to go to the indoor playground, for instance, otherwise it would be ‘too dangerous. We often put the infants in the playpen or put them in a chair while we’re playing with the older children’.

Moreover, one respondent mentioned that she did not feel supported by her peers, ‘(...) when we’re outside, many colleagues just sit there and drink their coffee’. Another said that ‘children are already active anyway (...) we just let them play’. According to the respondents, going outside with the children was also a chance to talk to colleagues who they normally did not see. The respondents also reported that children often refused to participate if they tried to organise a collective activity, ‘it’s difficult to get them together’.

3.3.2. *Parents*

Some respondents said that parents often did not have the time or were not interested in promoting PA. ‘Parents carry their children from the car to the room [at the childcare centre] (...) they’re in a hurry (...)’. Parents also tend to underestimate their children’s abilities and skills, which could lead to a lower level of activity. ‘Parents often don’t know that their child (...) can go up the stairs independently, which means to me that they’re not involved in those activities’.

Childcare workers indicated that parents could also influence their children’s PA at the childcare centre indirectly by dressing them inappropriately. Shoes were often perceived as a problem. ‘We had a child whose shoes were too small, so she fell

over all the time (...) she just had no balance'; Tight-fitting clothes were also perceived to be obstacles to children's freedom to move. 'I would prefer children wearing a tracksuit all the time'. According to the respondents, some children always had very dressy clothes which were not supposed to get dirty, restricting the children's opportunities for exercise.

One respondent mentioned that they, the childcare workers, had time to concentrate on the children throughout the day, while 'parents (...) have to cook and clean up at home (...) the television will often be used as a babysitter (...)'. Furthermore, parents tended to use the car and take an infant in a buggy to go shopping. 'But if you wanted to be a good role model, you'd have to use your bike to go to work'. According to one respondent, parents often did not feel the need to engage their children in activities at home, but 'it depends on the type of parents'.

Once a year, childcare workers had a parent-carer talk to review important events where 'some parents react more positively than others'. Parents were also often in a hurry when they came to pick up their child, making it difficult for the childcare workers to go over the events of the day with them. Two respondents mentioned that they did not really have any contact with parents, one because she worked part time, which restricted regular contacts, while the other indicated that 'it's very busy in the morning when parents bring their children (...) we actually need one person who can concentrate on the parents and what they tell us about the child and what they expect'. Respondents said that it was really important to have a conversation with the parents because 'you then know better what to expect from their child'. But 'some parents say nothing at all'.

Most of the respondents indicated that it was difficult to give parents advice, because there are no defined rules or instructions the childcare workers can rely on. Furthermore, 'you have to be careful, it is a sensitive topic for parents'. Childcare workers mostly gave the parents advice about paying attention to shoes, and normally talked about general things. 'It is mostly about eating, sleeping, playing' and 'abnormal behaviours', to a lesser extent about PA.

According to the respondents, parents did not clearly express what they want the childcare workers to do and what they should feel responsible for, 'I think parents are OK with everything', 'it is important to them that we take care of their children'. 'The majority of the parents perceive us as babysitters (...)'. By contrast, one respondent said that she had noticed that parents had come to expect more during the last 12 years, also because of the rising costs of childcare. 'Parents expect professionalism (...), being attentive to the child and the parents', '(...) being a good role model for children.'

4. Discussion

The purpose of the present study was to examine the factors influencing childcare workers' motivation to promote PA among children aged 0–4 years attending childcare. The findings suggest that childcare workers perceive a number of barriers to the promotion of PA, including a lack of facilities and time; rules and policies regarding safety and daily duties; non-cooperative colleagues; a broad range of children's ages; poor weather and unsuitable clothing. With regard to their own role in promoting children's PA, the respondents identified parents as influential and as important role models. The current study extends the findings of Canadian and Australian qualitative research in this field (Cashmore and Jones 2008; Van Zandvoort

et al. 2010), and confirms the results of previous observational studies (Gubbels et al. 2010, 2011).

The childcare workers in our study indicated that they often had no time to promote PA actively: their actions tended to concentrate on caring rather than on promoting PA, which is in line with a previous study (Berthelsen and Brownlee 2007). Furthermore, childcare workers sometimes criticised the available facilities, although the observations showed they actually had an abundance of suitable playing facilities. Some found it more enjoyable to talk to their colleagues than to play with the children and initiate PA, or they thought it would take too much time or effort to help the children take the stairs to the well-equipped playground. These new findings extend the results of previous qualitative studies. Some respondents reported that the rooms were too cluttered with toys and other materials, which made it difficult to use them for PA. On the other hand, various observational studies have reported that greater availability of toys and materials was associated with increased PA (e.g. Bower et al. 2008; Gubbels et al. 2011), probably because these toys work as cues to action for the children. The childcare workers in our study appeared to externalise the problem by blaming the environment. This phenomenon can be understood in terms of the theory of 'locus of control' (Rotter 1966): the childcare workers perceived their lives or personal events in their environment to be determined by the environment or other persons. People with a high external locus of control are less inclined to act and solve problems (Rotter 1966). In addition, the childcare workers perceived playing outside as a moment for themselves to have a break, and nobody felt responsible for initializing PA outdoors. This is in line with previous studies (Cardon et al. 2008; Cashmore and Jones 2008). Furthermore, others (Cashmore and Jones 2008; Lagacé-Séquin and d'Entremont 2005; Skinner, Yantzi, and Rosenberg 2009; Van Zandvoort et al. 2010), showed that respondents did not feel they could go outside when it was raining. Unfavourable weather combined with a lack of appropriate facilities inside (e.g. an indoor playground) meant that children were not allowed to run around on a rainy day.

There seemed to be a contradiction between the general policies determined by the organisation running the centres on the one hand and the rules applied within each individual childcare centre on the other. A new policy that had recently been introduced by the organisation meant that more open, uncluttered space had to be made available in the rooms for the groups, as this invited children to run. This, however, clashed with the rule in individual centres saying that the children were not allowed to run indoors. This led to uncertainty among children and childcare workers and meant that the children did not feel free to move around.

The childcare workers indicated that parents did not dress their children in an appropriate way to allow them to move comfortably, which is in line with the findings of a previous study (Copeland et al. 2009), stressing the need for clothing rules and guidelines in the policies of childcare organisations. Respondents indicated that it was difficult to give advice because parents were still the main guardians of their children's upbringing. According to the childcare workers, parents did not state clearly what they expected the childcare workers to do. Although, previous research (Powell 1978) showed that about half of the parents in the USA are satisfied with the communication they have with their childcare centre, parents might be afraid to express their dissatisfaction with the childcare facility (Benjamin et al. 2008). They do not want to look like bad parents for sending their child to a low-quality childcare centre. This might inhibit communication. Unclear expectations or

communication can lead to insufficient goal setting which may consequently lead to unspecified behaviour patterns (De Ridder and de Wit 2006).

In line with a previous study (Cashmore and Jones 2008), the respondents experienced difficulties in including children of all age ranges in collective activities: older children often had to be careful with infants and therefore had to limit their activities. Thus, although different ages within the same group can support children's social development (Rothstein-Fisch and Howes 1988), it can also inhibit their PA and hence their motor development.

Another novel finding of the current study is that working with substitute or temporarily employed colleagues was perceived as not supportive. According to attachment theory, the quality of interaction with early attachment figures is a determinant of later behaviours (Bowlby 1973). De Schipper, Tavecchio, and Van Ijzendoorn (2008) adapted the attachment theory to a childcare setting and concluded that children need sensitive care providers who take time to help the children feel confident. Previous research indicated that children who spend a longer time at the childcare facility were more likely to have a secure attachment with the childcare worker (Ahnert, Pinquart, and Lamb 2006). Furthermore, Ullrich-French, Smith, and Cox (2011) showed that attachment relationships seemed to be relevant predictors of PA motivation.

4.1. Strengths and limitations

The current study was subject to certain limitations. Firstly, only one researcher conducted, transcribed and analysed the interviews. Also, the fact that the data collection took place in March and April, during nice weather, could have resulted in seasonal bias. Most of the observations were done in the morning, which may also restrict the generalisability of the results. However, the observations were merely used as additional reference points to improve the reliability of this study, and to contribute to honest answers and to a convivial and informal atmosphere during the interviews. A final limitation is that only childcare centres affiliated to a single organisation were included. However, it is reasonable to hypothesise that the childcare centres of this organisation do not differ significantly from others.

Nonetheless, the current study extends our insights into the barriers and challenges to promoting PA in childcare settings. Furthermore, previous qualitative studies regarding PA in childcare centres were conducted in Australia and Canada, however, very few such studies have been carried out in Europe. A total of 20 interviews were conducted, providing a broad range of perceptions, attitudes and motives. Previous studies used focus groups to investigate childcare workers' perceived barriers, but interviews can lead to more extensive and honest answers than focus groups (Mariampolski 2001) which may in turn lead to profound conversations.

4.2. Implications

Several implications for practice can be derived from our findings. It was remarkable that PA was not scheduled as a daily activity at the childcare centres. In line with the implications from a previous study (Copeland et al. 2009), we would thus recommend that childcare include PA in daily routines, like regular eating and sleeping patterns, since PA can provide health benefits in the short term, by

improving happiness, the development of self-esteem, social contacts (Strauss et al. 2001), and motor skills (Reilly et al. 2006), as well as long-term health benefits; prevention of bone fractures and osteoporosis (Heidemann et al. 2013) and of other chronic diseases (e.g. cardiovascular diseases, diabetes, cancer, hypertension and depression) (Warburton, Nicol, and Bredin 2006). Furthermore, the Dutch Guidelines for Healthy Movement indicate that children aged up to one year old, who cannot walk on their own, should be physically active for at least several periods during a day. Children aged 1–3 years, who can walk on their own, should be physically active for at least three hours a day. Inspiration for how to be physically active with young children can be found in other interventions, for example *Bewegkriebels*, a Dutch intervention which provides childcare workers with tips for being active with young children (Nederlands Instituut voor Sport & Beweging 2010). Furthermore, contradictions between management policies and local rules at individual centres have to be minimised. Because stairs leading to the playground were perceived as a serious barrier to engaging the children in mobility and PA, it would be helpful if younger groups could be accommodated on the ground floor, making it easier for them to go outside. Although this might be an ideal situation, it is not possible for all childcare facilities. Therefore, the management should provide time and assistance to move the children between indoor and outdoor spaces. In addition, the current study may suggest placing children in specific age groups (horizontal age groups). This makes it easier for the childcare workers to adjust the PA activities to the children's age and the children are less restrained in their activities. However, children evidently benefit from mixed age groups (Rothstein-Fisch and Howes 1988). It is a challenge for childcare workers and the organisation to structure and handle mixed age groups and promote their PA on the one hand and their social interactions on the other. If childcare workers or childcare managers cannot solve problems or barriers hampering outdoor activities, indoor PA or excursions should be encouraged or scheduled to offer alternative opportunities for children to be physically active. Furthermore, management can provide support for childcare workers by providing workshops and continuing education (e.g. how to involve different age groups and how to deal with challenging circumstances, for instance rainy weather) which can be expected to stimulate childcare workers to initiate PA. Childcare centres should also try to assign at least two permanent employees per group to ensure regular communication among them, thus creating a convivial atmosphere within the group. When it is not possible to assign two permanent employees, the communication and information transfer between employees should be improved in order to increase PA. In addition, more attention should be given to PA during the education of childcare practitioners. The benefits of PA, both for health and for the overall development of children, should be addressed. Education should enable practitioners to incorporate PA into daily routines and should make them more aware of their role in supporting children's PA.

Since direct surroundings influence each other and consequently influence a child's behaviour as a whole (Bradley 2010), we recommend that childcare workers and parents communicate and work together. First, a policy on comfortable clothing (e.g. a dress code) and clearly formulated rules on promoting PA would help childcare workers to give advice to parents. Second, childcare workers should dedicate additional time at the beginning and end of the day for communication with parents. Third, parents and childcare workers should cooperate and express their

expectations about what they want each other to do, especially with respect to promoting PA.

Further qualitative research should concentrate on the role of parents in promoting PA, as well as on parents' experiences and motivation, and the interaction between parents and childcare workers. It would also be interesting to compare behaviours and motivation with those in other types of childcare (e.g. half-day childcare centres, playgroups, school care and home-based day care).

In conclusion, the present study underlines the importance of identifying factors which influence childcare workers' promotion of PA since they are in direct contact with children. Taking the barriers that childcare workers face in promoting PA among young children into account should ultimately enable researchers to provide recommendations regarding basic conditions to promote PA among children aged 0–4 years. Moreover, the environment was once again identified as an important facilitator or barrier to promoting health behaviours.

References

- Ahnert, L., M. Pinquart, and M. E. Lamb. 2006. "Security of Children's Relationships with Nonparental Care Providers: A Meta-Analysis." *Child Development* 77 (3): 664–679. doi: 10.1111/j.14678624.2006.00896.x.
- Ajzen, I. 1991. "The Theory of Planned Behavior." *Organizational Behavior and Human Decision Processes* 50 (2): 179–211.
- Amorose, A. J., and D. Anderson-Butcher. 2007. "Autonomy-Supportive Coaching and Self-Determined Motivation in High School and College Athletes: A Test of Self-Determination Theory." *Psychology of Sports and Exercise* 8 (5): 654–670.
- Ball, S. C., S. E. Benjamin, D. P. Hales, J. Marks, C. P. McWilliams, and D. S. Ward. 2005. *The Environment and Policy Assessment and Observation (EPAO) Childcare Nutrition and Physical Activity Instrument*. Chapel Hill: University of North Carolina, Center for Health Promotion and Disease Prevention.
- Bandura, A. 1986. *Social Foundations of Thought and Action*. Englewood Cliffs, NJ: Prentice-Hall.
- Benjamin, S. E., J. Haines, S. C. Ball, and D. S. Ward. 2008. "Improving Nutrition and Physical Activity in Childcare: What Parents Recommend." *Journal of the American Dietetic Association* 108 (11): 1907–1911. doi: 10.1016/j.jada.2008.08.018.
- Berthelsen, D., and J. Brownlee. 2007. "Working with Toddlers in Childcare: Practitioners' Beliefs about Their Role." *Early Childhood Research Quarterly* 22 (3): 347–362.
- Bogdan, R. C., and S. K. Biklen. 1982. *Qualitative Research for Education: An Introduction to Theory and Methods*. Boston, MA: Allyn and Bacon.
- Bower, J. K., D. P. Hales, D. F. Tate, D. A. Rubin, S. E. Benjamin, and D. S. Ward. 2008. "The Childcare Environment and Children's Physical Activity." *American Journal of Preventive Medicine* 34 (1): 23–29. doi: 10.1016/j.amepre.2007.09.022.
- Bowlby, J. 1973. *Attachment and Loss: Vol. 1 Attachment*. New York: Basic Books.
- Bradley, R. H. 2010. "From Home to Day Care: Chaos in the Family/Childcare Mesosystem." In *Chaos and Its Influence on Children's Development*, edited by G. W. Evans and T. D. Wachs, 135–153. Washington, DC: American Psychological Association.
- Bronfenbrenner, U., and P. A. Morris. 1998. "The Ecology of Developmental Processes." In *Handbook of Child Psychology: Theoretical Models of Human Development*, edited by R. M. Lerner, 993–1028. New York: Wiley.
- Cardon, G., E. Van Cauwenberghe, V. Labarque, L. Haerens, and I. De Bourdeaudhuij. 2008. "The Contribution of Preschool Playground Factors in Explaining Children's Physical Activity during Recess." *The International Society of Behavioral Nutrition and Physical Activity* 5: 11. doi: 10.1186/1479-5868-5-11.
- Cashmore, A. W., and S. C. Jones. 2008. "Growing up Active: A Study into Physical Activity in Long Day Care Centers." *Journal of Research in Childhood Education* 23 (2): 179–191.

- Certain, L. K., and R. S. Kahn. 2002. "Prevalence, Correlates, and Trajectory of Television Viewing among Infants and Toddlers." *Pediatrics* 109 (4): 634–642.
- Copeland, K. A., S. N. Sherman, C. A. Kendeigh, B. E. Saelens, and H. J. Kalkwarf. 2009. "Flip Flops, Dress Clothes, and No Coat: Clothing Barriers to children's Physical Activity in Child-Care Centers Identified from a Qualitative Study." *International Journal of Behavioral Nutrition and Physical Activity* 6: 74–78. doi: 10.1186/1479-5868-6-74.
- Darley, J. M., and B. Latane. 1968. "Bystander Intervention in Emergencies: Diffusion of Responsibility." *Journal of Personality and Social Psychology* 8 (4): 377–383.
- De Ridder, D. T. D., and J. B. F. de Wit. 2006. "Self-Regulation in Health Behaviour: Concepts, Theories, and Central Issues." In *Self-Regulation in Health Behaviour*, edited by D. T. D. De Ridder and J. B. F. De Wit, 1–124. West Sussex: John Wiley & Sons.
- De Schipper, J. C., L. W. C. Taveccio, and M. H. Van Ijzendoorn. 2008. "Children's Attachment Relationships with Day Care Caregivers: Associations with Positive Caregiving and the Child's Temperament." *Social Development* 17 (3): 454–471.
- Fisher, A., J. J. Reilly, L. A. Kelly, C. Montgomery, A. Williamson, J. Y. Paton, and S. Grant. 2005. "Fundamental Movement Skills and Habitual Physical Activity in Young Children." *Medicine and Science in Sports and Exercise* 37 (4): 684–688.
- Gubbels, J. S., S. P. Kremers, A. Stafleu, P. C. Dagnelie, N. K. de Vries, S. van Buuren, and C. Thijs. 2010. "Child-Care Use and The Association with Body Mass Index and Overweight in Children from 7 Months to 2 Years of Age." *Int J Obes (Lond)* 34 (10): 1480–1486.
- Gubbels, J. S., S. P. Kremers, D. H. van Kann, A. Stafleu, M. J. Candel, P. C. Dagnelie, C. Thijs, and N. K. de Vries. 2011. "Interaction between Physical Environment, Social Environment, and Child Characteristics in Determining Physical Activity at Childcare." *Health Psychology* 30 (1): 84–90. doi: 10.1037/a0021586.
- Heidemann, M., C. Molgaard, S. Husby, A. J. Schou, H. Klakk, N. C. Moller, R. Holst, and N. Wedderkopp. 2013. "The Intensity of Physical Activity Influences Bone Mineral Accrual in Childhood: The Childhood Health, Activity and Motor Performance School (the CHAMPS) Study, Denmark." *BMC Pediatrics* 13: 32. doi: 10.1186/1471-2431-13-32.
- Husserl, E. 1980. *Phenomenology and the Foundations of the Sciences*. The Hague: Martinus Nijhoff.
- Kelder, S. H., C. L. Perry, K. I. Klepp, and L. L. Lytle. 1994. "Longitudinal Tracking of Adolescent Smoking, Physical Activity, and Food Choice Behaviors." *American Journal of Public Health* 84 (7): 1121–1126.
- Krombholz, H. 2006. "Physical Performance in Relation to Age, Sex, Birth Order, Social Class, and Sports Activities of Preschool Children." *Perceptual and Motor Skills* 102 (2): 477–484.
- Krombholz, H. 2012. "The Impact of a 20-Month Physical Activity Intervention in Childcare Centers on Motor Performance and Weight in Overweight and Healthy-Weight Preschool Children." *Perceptual and Motor Skills* 115 (3): 919–932.
- Lagacé-Séquin, D. G., and M.-R. L. d'Entremont. 2005. "Weathering the Preschool Environment: Affect Moderates the Relations between Meteorology and Preschool Behaviors." *Early Child Development and Care* 175 (5): 379–394.
- Lamb, M. E., and L. Ahnert. 2006. "Nonparental Childcare: Context, Concepts, Correlates, and Consequences." In *Handbook of Child Psychology: Child Psychology in Practice*, edited by W. Damon, R. M. Lerner, K. A. Renninger, and I. E. Siegel, 950–1016. Hoboken, NJ: Wiley.
- Mariampolski, H. 2001. *Qualitative Market Research: A Comprehensive Guide*. Thousand Oaks, CA: Sage.
- Moser, T., and M. T. Martinsen. 2010. "The Outdoor Environment in Norwegian Kindergartens as Pedagogical Space for Toddlers' Play, Learning and Development." *European Early Childhood Education Research Journal* 18 (4): 457–471.
- Nader, P. R., M. O'Brien, R. Houts, R. Bradley, J. Belsky, R. Crosnoe, S. Friedman, Z. Mei, and E. J. Susman. 2006. "Identifying Risk for Obesity in Early Childhood." *Pediatrics* 118 (3): e594–e601. doi: 10.1542/peds.2005-2801.
- Nederlands Instituut voor Sport & Beweging. 2010. "Beweegkriebels." Accessed March 27, 2012 from <http://www.beweegkriebels.nl>.

- Poland, B. D. 1995. "Transcription Quality as an Aspect of Rigor in Qualitative Research." *Qualitative Inquiry* 1 (3): 290–310.
- Portegijs, C., B. Hermans, and V. Lalta. 2006. *Emancipatiemonitor 2006. Veranderingen in leefsituatie en levensloop* [Monitor of Emancipation 2006. Changes in Social Situation and Course of Life]. Den Haag: Sociaal en Cultureel Planbureau & centraal Bureau voor Statistiek.
- Powell, D. R. 1978. "The Interpersonal Relationship between Parents and Caregivers in Day Care Settings." *American Journal of Orthopsychiatry* 48 (4): 680–689. doi: 10.1111/j.1939-0025.1978.tb02573.x.
- Reilly, J. J., L. Kelly, C. Montgomery, A. Williamson, A. Fisher, J. H. McColl, R. Lo Conte, J. Y. Paton, and S. Grant. 2006. "Physical Activity to Prevent Obesity in Young Children: Cluster Randomised Controlled Trial." *BMJ* 333 (7577): 1041. doi: 10.1136/bmj.38979.623773.55.
- Rothstein-Fisch, C., and C. Howes. 1988. "Toddler Peer Interaction in Mixed-Age Groups." *Journal of Applied Developmental Psychology* 9 (2): 211–218.
- Rotter, J. B. 1966. "Generalized Expectancies for Internal versus External Control of Reinforcement." *Psychological Monographs* 80 (1): 1–28.
- Sallis, J. F., and P. R. Nader. 1988. "Family Determinants of Health Behaviors." In *Health Behaviour: Emerging Research Perspectives*, edited by D. S. Gochman. New York: Plenum Press.
- Sallis, J. F., and N. Owen. 2002. "Ecological Models of Health Behavior." In *Health Behaviour and Health Education. Theory Research and Practice*, edited by K. Glanz, B. K. Rimer, and F. M. Lewis, 465–482. San Francisco, CA: Jossey-Bass.
- Skinner, M. W., N. M. Yantzi, and M. W. Rosenberg. 2009. "Neither Rain Nor Hail Nor Sleet Nor Snow: Provider Perspectives on the Challenges of Weather for Home and Community Care." *Social Science & Medicine* 68 (4): 682–688.
- Spence, J. C., and R. E. Lee. 2003. "Toward a Comprehensive Model of Physical Activity." *Psychology of Sports and Exercise* 4: 7–24.
- Strauss, R. S., D. Rodzilsky, G. Burack, and M. Colin. 2001. "Psychosocial Correlates of Physical Activity in Healthy Children." *Archives of Pediatrics and Adolescent Medicine* 155 (8): 897–902.
- Ullrich-French, S., A. L. Smith, and A. E. Cox. 2011. "Attachment Relationships and Physical Activity Motivation of College Students." *Psychol Health* 26 (8): 1063–1080. doi: 10.1080/08870446.2010.530123.
- Van Zandvoort, M., P. Tucker, J. D. Irwin, and S. M. Burke. 2010. "Physical Activity at Daycare: Issues, Challenges and Perspectives." *Early Years* 30 (2): 175–188.
- Verplanken, B., H. Aarts, and A. D. van Knippenberg. 1997. "Habit, Information Acquisition, and the Process of Making Travelmode Choices." *European Journal of Social Psychology* 27 (5): 539–560.
- Vries, H., I. Mesters, H. van de Steeg, and C. Honing. 2005. "The General Public's Information Needs and Perceptions Regarding Hereditary Cancer: An Application of the Integrated Change Model." *Patient Education and Counseling* 56 (2): 154–165. doi: 10.1016/j.pec.2004.01.002.
- Warburton, D. E., C. W. Nicol, and S. S. Bredin. 2006. "Health Benefits of Physical Activity: The Evidence." *CMAJ* 174 (6): 801–809. doi: 10.1503/cmaj.051351.
- Welk, G. J., K. Wood, and G. Morss. 2003. "Parental Influences on Physical Activity in Children: An Exploration of Potential Mechanisms." *Pediatric Exercise Science* 15: 19–33.
- Williams, H. G., K. A. Pfeiffer, J. R. O'Neill, M. Dowda, K. L. McIver, W. H. Brown, and R. R. Pate. 2008. "Motor Skill Performance and Physical Activity in Preschool Children." *Obesity (Silver Spring)* 16 (6): 1421–1426.