

Title: Caregivers' perspectives on the social and physical environmental factors associated with the play of their children with palliative care needs: A Q methodology study

Abstract

Children living with palliative care needs are less engaged in play, despite its importance in their lives. The environment may have a crucial role in supporting these children's play. Understanding the importance and impact of environmental factors on children's play is essential to being able to support their participation in play.

Data were collected from caregivers (mostly parents) of children living with life-threatening/limiting conditions, who were between 5-11 years old. Thirty-nine participants were recruited from two children hospitals and two hospices in Kuwait and in the UK. The participants' perspectives were explored using Q methodology. By-person factor analysis was used to explore the ranking of each statement. Content analysis was used to analyse the participants' verbal comments.

The most important environmental factors were the need for others to share play and get assistance to facilitate play. However, this is not always possible as these conditions, the life-threatening/limiting conditions may be socially isolating. Children also experience limitations in accessing play resources that match their abilities and meet their play needs. Being aware and responsive to children's play needs is essential for building appropriately supportive play environments for children living with life threatening / life limiting conditions.

Keywords: palliative care, life-threatening conditions, life-limiting conditions, play

Background

Palliative care is an advanced interdisciplinary care planning approach directed towards maintaining the QoL for children and their families (World Health Organisation 2019). Children living with palliative care needs experience deprivation in their play despite that they are entitled to have their play and to have their childhood (Boucher et al., 2014; Amery, 2016). Accordingly, play is being one of their unmet needs (Boucher et al. 2014)

Environmental factors, situations that surround children, could play a significant role in enabling children to participate in play (Law et al., 1996; Kielhofner, 2008). In particular, social and physical environments were found to act as enablers/barriers in a review study investigating children's play living with palliative care needs (Jasem et al., 2020).

The social environment is referred to as availability of people, their relationships, and norms and expectations within that group (American Occupational Therapy Association, 2014; Turpin and Iwama, 2011). Whereas the physical environment was the natural and constructed surroundings including buildings, design feature of spaces and objects, or geographical features and their properties (Kielhofner, 2008; Turpin and Iwama, 2011; Law et al., 1996; American Occupational Therapy Association, 2014).

There is limited research focussing on the environmental factors that may facilitate, support and preserve children's right to play (Jasem et al., 2020). Two available studies, conducted in the UK and the United States, have highlighted that for children with palliative care needs, receiving inpatient healthcare services made them feel lonely, miss their family, friends and pets (Nabors et al., 2019; Aldiss et al., 2009) which are part of their social surrounding. It has also been reported in UK, Ireland and Germany that children find difficulty in using some play spaces, or there is a need for more play areas to access while hospitalised (Gibson et al., 2010; Witt et al., 2019; Lambert et al., 2014). This forms the physical factors that could be related to their play. In addition to these physical aspects, we already know that children miss their toys (Nabors et al., 2019; Lambert et al., 2014) and desire

more age- and gender-appropriate toys when in a hospital or hospice setting (Gibson et al., 2010; Lambert et al., 2014; Aldiss et al., 2009; Kirk and Pritchard, 2012).

These very few available studies show the lack of knowledge in regard to the environmental factors that could promote participation in play for children living palliative care needs which need further investigation in particular to areas other than the western countries.

Caregivers' perspectives are frequently investigated when studying issues related to their children (Jasem et al., 2020). Despite the fact that they may not be exactly as their children's views (James et al., 1998); this is however, provides a diversity in understanding the phenomenon from variety of angles. They can provide useful insights into children's day-to-day patterns including their play. In particular to children with palliative care needs, their caregivers often observe and detect their play and changes may occur regarding the situation of their play.

Aim

We explored caregivers' perspectives in regard to the important aspects within the social and physical environments that their children need at hospital/hospice setting to be able to engage in play. Thus, in order to foster an environment that meets children's needs, it is necessary to have a greater knowledge about other environmental factors to add to our understanding of aspects matter most to their play participation.

Methods

Study design

A mixed-methods research approach, Q methodology, was used in this study. Such approach combines qualitative and quantitative data to answer the research question which can be a main advantage of mixed-methods research design {Bryman, 2016 #2020}. Participants were asked to prioritise environmental factors according to their un/importance for their children to play. This

research is part of larger project aiming at exploring required features of a supportive play environment with inpatient healthcare facilities (Jasem, 2019).

Inclusion criteria

Caregivers were recruited as primary person taking care of the child (e.g., parents, grandparents, or paid caregiver). The eligibility criteria of the participants were caring for a child diagnosed with a life-threatening/limiting condition, between the ages 5y and 11y to represent middle childhood ages. These children should be receiving inpatient care at either a children's hospital or hospice in Kuwait or the UK in order to account for the cultural aspect of the environment that infuses and influences both the social and physical aspects of the environment (Kielhofner, 2008). Additionally, the researchers had ample access to these two societies. Participants were not recruited on their first few days of their children's admission nor it was their first admission to the hospital. Eligible participants were identified by clinicians within each setting and were invited to participate.

Research instrument

The Q method involved the following steps: after crafting the research question, a concourse was designed, which included collecting possible views, attitudes and perspectives regarding the studied issue from variety of resources (e.g. academic literature and standardised questionnaire). The collected views were then formed into a concourse which was then refined to create the Q set; or a set of statements that are arranged by the participants into a Q sort (Watts and Stenner, 2012). Forty-five items were attained as a manageable number of the Q set (one extra item was used in Kuwait's set to account for cultural difference) (Jasem, 2019).

These statements in the Q set were then refined, translated (i.e., they were originally developed in English and then translated into Arabic), back translated and piloted to ensure reflecting a balanced coverage of a range of opinions, and concepts in both countries (Brown, 1993). Two mothers of

normally developing children, one from Kuwait and another one from the UK, participated in the pilot testing.

Data collection

After the development of the Q set, data were collected from the participants via Q sorting (i.e. the process of rank-order Q set cards on a Q matrix (Figure 1) according to their importance, from most important '+5' to most unimportant '-5'). During which, the participants' comments on each item was recorded using audio-recorders which assisted in analysing the results. They were asked about their rationale behind their positioning/ranking of the statements on the Q matrix. Each participant's arrangement of the Q sort was also recorded by writing down the exact location of each card. Data were gathered by one researcher (ZJ) between February and November 2018.

Analysis

Participants' Q sorts were analysed using by-person factor analysis via PQmethod software V.2.35 (Schmolck, 2015). Factors were extracted using Principal Component Analysis and rotated initially by varimax and then by hand to achieve maximum fit of data (Watts and Stenner, 2012). In which each resulted factor represents the viewpoint of participants who have similar arrangement of Q set (Watts and Stenner, 2012; Akhtar-Danesh, 2016).

The audio-recordings were analysed using card content analysis after transcribing them verbatim. This qualitative data helped in understanding the participants' rationale behind their positioning of the Q statements on the Q matrix (Gallagher and Porock, 2010).

Ethics and consent

Participants provided written informed consent prior to taking part in this study. The Ethics Committee at the University of Southampton approved this study (no. 27832). It was also approved by the Health Research Authority (REC reference: 18/WM/0127) and the two hospitals and hospices where data were collected.

Results

Thirty-nine caregivers participated in this study (Table 1); 19 participants were from Kuwait and 20 participants were from the UK. Majority of the participants were mothers. Their children's health conditions varied, with oncology, neurology and haematology being most common.

The factor analysis revealed two distinct factors. Each factor represents the views of participants from both Kuwait and the UK whose viewpoints were highly correlated. The Q set used is presented in supplementary material, which also shows statement's scores in each factor, called *factor array*.

The factor array demonstrates the level of importance of each item within the Q set from the perspective of the participants. For example, in supplementary material item #1 for factor 1 was important both in Kuwait (+4) and in the UK (+5). Thus, the following factor interpretation would be reported as: #1: +4, +5.

Factor 1: Being with others but concerned about the child's condition

Twenty caregivers were significantly associated with this factor (Table 2). Nine of them were from Kuwait, with majority recruited from the hospitals. Around half of their children were male and their average age was 6.9 years. Majority of the children were within the Yellow category according to the Spectrum of Children's Palliative Care Needs (Shaw et al., 2015), where children are expected to die before adulthood.

Being with others

In this factor, the children's needs of being with others and sharing good play time was a central point (#6: +5, +5; #8: +3, +4).

'Her father is more important than me because I'm with her during the treatment and injections but he's with her for entertainment' (participant 3).

This concept – *being with others* – was expanded by their comments on some play types as their children enjoy it with others (#36: 0, +1; #35: +2, +3; #34: 0, +2). P29 said:

'She loves being read to and having children around her being read too. She absolutely loves it.'

Accordingly, caregivers placed less importance on private play spaces (#21: 0, 0) than they did for a playroom (#18: +4, +4). Furthermore, their positive view of a play specialist (#8: +3, +4) reemphasised the caregivers' concern regarding their children's need for someone to be willing to share in their play. This factor in particular was consistently reported by the caregivers as a key in facilitating a positive relationship with their child and thus, positively influencing their child's care.

In fact, relationship building was the underpinning tenet when caregivers considered the play interaction with healthcare staff (#7: 0, +2). They suggested that it was not play, per se, that was particularly essential to children, but rather the relationship which may be developed through play and jokes (#11: +1, -1). One mother commented:

'He [the child] loves joking too much. He will not feel the injection if you were joking with him' (P5).

These interactions are believed to provide support and encouragement for the children (#1: +4, +5).

Precautions associated with the child's condition

Although caregivers placed great importance on certain types of social interaction, the children's health conditions and their low immunity appeared to negatively impact upon their participation in group activities, as reflected by the caregivers' ranking of activities with others (#9: -2, -2; #10: 0, +1).

'It's very nice when clowns coming in, with music and dancing for the children they change their moods ... [but] we cannot always join that and be with other people because of her [the child's] immunity.' (P2).

Such caution was also extended to children's interaction with pets, reflected by a lower ranking of importance (#20: -5, -1). Consistently, the caregivers believed in the importance of maintaining play areas and equipment and restrictions within the facility (#5: -2, -3; #24: +2, +2; #26: +3, +3) because

of the infection control, although they acknowledged that this would negatively influence their child's enjoyment of their play time.

The impact of the child's condition was reflected in other items concerning being out such as to a green or a blue area (#14: -1, -5; #15: -3, -5; #16: -4, -1#; 17: +1, -2).

'When my daughter is sick, I will not take her outside... when they are in pain; that's nothing. There are more important things than that.' (P15).

Play activities which require more active movement were ranked with lower (#39: -3, -4; #43: -3, -4; #44: -4, -2). On the other hand, play types that are more sedentary in nature were viewed more positively (#31: +3, +2; #32: +1, +1; #34: 0, +2; #40: -3, -1), particularly so when the children were instructed not to move. One of the participants mentioned:

'this is good, the music and stories when he needs to be absolutely still.' (P39).

Factor 2: Conditions of play according to the child's abilities

Thirteen caregivers were significantly associated with this factor (**Error! Reference source not found.**); six of them were from Kuwait, and majority were recruited from the hospices. Most of the children were male and were in the Amber category according to the Spectrum of Children's Palliative Care Needs (Shaw et al., 2015), where death is expected in a few months to years. The children's average age was 6.7 years.

Influence of child's abilities on play choices

The caregivers who significantly loaded on this factor were caring for children with very complex needs and considerable physical and cognitive impairments; accordingly, their children's special needs were reflected in their choices. When caregivers commented on being with others (#6: +5, +5; #7: +3, +3; #8: +3, +1; #45: +5), they emphasised the importance of grown-ups. Thus, having a playmate of a similar age or gender (#12: -2, -4; #13: +1, -3) was not one of their primary concerns. As such, caregivers place great importance on level of assistance (#2: +3, +4) their children needed in

order to play. One of the participants commented to highlight the role of grown-ups regards to reading and listening to stories item (#34: 0, +3):

'With an adult, an adult. And it's kind of a musical book then actually he'll spend a short period by himself, but it tends to be more adult-led.' (P10).

The caregivers did not give weighting to either the age- or gender-appropriateness of the play equipment (#29: -2, -1; #30: -3, -4). They did however highlight the importance of having play equipment that was appropriate to the child's abilities. Despite the availability of well-maintained and varying resources being considered important (#22: 0, +2; #26: +4, +1), they were essentially deemed useless if the children were unable to use them.

'They used to have a sensory room [at a hospital], but nothing ever worked... It tends to be a playroom but it's not always accessible, the playroom is up small steps so for someone in a wheelchair...' (P35).

Play types children can join

Play activities that did not require higher mental capacity were given higher rankings (#31: +2, +1; #34: 0, +3; #40: +4, +3).

'He [the child], for example, has got lots of different apps on it [the personal tablet] with lots of noise. It is about having noise really... It is just a bit different than TV all the time, I guess, and different to the musical instruments or listening to someone reading a story.' (P22).

When these sorts of play activities were compared to those that required more attention and active movement, a number of items were noted by the caregivers as not being applicable (#9: -3, +1; #11: +1, -3; #33: -2, -5; #36: -4, -5; #42: 0, -3). One of the participants commented:

'I don't think he really understands board games.' (P32).

Other play activities were less negatively ranked despite the multi-skills that might be such as arts and crafts, play with block and cooking (#19: +1, -1; #35: -3, -2; #37: -5, -1; #38: 0, -2; #39: 0, -3; #41: -1, 0; #44: -2, -2). This was due to the possible way of adapting ways of playing/using them.

'She wouldn't necessarily enjoy cooking or baking but she might enjoy the texture of the ingredients... she'll be holding some of the materials.' (P37)

Differences in the data

After presenting the defining features of the two factors, it is worth considering the differences in the data between the two countries and settings.

Differences between countries

As mentioned earlier, the findings were very similar between the two countries. This can be clearly demonstrated by looking at the factor array in supplementary material. However, some clear differences were found among two items. For item #13 – the availability of playmate of same age to my child – which was generally considered of less importance overall for factor two, when we compared across the two countries, it was clear that this item was given even less weighting in Kuwait than the UK. Another observed difference was with item #34 – my child to read and listen to stories – which was ranked more important in the UK than Kuwait.

Differences between settings

The participants who were recruited from the hospices, both from Kuwait and the UK, were caregivers who had lived-experienced of both healthcare settings in the course of their child's care and were therefore able to make direct comparisons between the settings. They primarily acknowledged the role of the healthcare team (#7) in interacting and playing with their children. The participants also acknowledged the different activities organised for the children at the hospice and the enjoyable atmosphere created. This can be linked to the children's free play time (#4):

'All his time is free for play' so it's always good to have different resources to occupy the child's time.' (P17).

Discussion

Participation in play is one of the unmet needs for children living with palliative care needs. In this study, we aimed at exploring the important aspects within the environments that could foster children's play from their caregivers' perspectives. This paper highlighted the relative importance of number of social and physical environmental factors for children to play while receiving care at hospitals or hospices. Data were collected from Kuwait and the UK.

The findings manifestly demonstrated the important of the social aspect, having a play partner, for children to play. However, restrictions were also acknowledged including infection precautions and the required conditions of play to match the children's play abilities.

The data showed that all participants highly emphasised their children's needs of being with anyone who is willing to share play, i.e. play specialist, clown, volunteer or musician. This could also explain their consistent high prioritising of encouragement and support item in the Q set for their children's play. Adistie et al. (2019) illustrated that a psychological need for children with terminal illness is motivation and entertainment. This importance of the social environment can be drawn from the possibility of enhancing children's well-being by undertaking activities with others, as playing with others (Hammell, 2017).

The way of interaction between the staff and the children was different in children's hospice and hospital. The caregivers primarily acknowledged the staff interaction with the children at the hospice as well as the different organised group activities. Such differences were expected due to the nature of the supportive service offered by the hospices and their aim to improve children's quality of life by addressing their physical, emotional, social and spiritual needs (International Children's Palliative Care Network, 2015). Given the suggested move towards the adoption of the biopsychosocial model in hospitals, the healthcare team style of interaction is expected to pay more attention to different aspects of the children's lives in order to supersede the traditional medical model (Lehman et al., 2017); all of which to contribute to enhancing the children's well-being.

Despite the children's needs of being with others, this current study confirms that infection was one of the issues leading to limitation in opportunities for a social play for these children in term of space and equipment to use including availability of pets, which was also demonstrated previously (Witt et al., 2019; Foster and Whitehead, 2019; Adistie et al., 2019; Gibson et al., 2010). Children's abilities and precautions due to their health conditions were recognised by the caregivers to impact their ranking on importance of play equipment to be available. An example of this is the importance placed upon toys with sounds and music for children with complex needs. Healey and Mendelsohn (2019) illustrated that play which matches the children's abilities is the best toys. This point was also reflected in this study's data where the needs of grown-up's assistant was in particular highlighted by those caring for children with more complex conditions.

This study expanded the emphasis of play spaces to focus directly on outdoor areas including green and blue spaces in relation to children's play. The participants were not really concerned about having such areas, which is in contrast to previous studies (Skar, 2002; Reeve et al., 2017). Despite this contrast, some researchers found such areas were not efficiently used by the patients which are in line with this study in the participants' explanations (e.g. weather, children's illnesses and accessibility limits of access to these spaces) (Weerasuriya et al., 2018; Skar, 2002; Leite et al., 2019; Sherman et al., 2005; Riet et al., 2014).

Although time of the year can create various assumptions about children's play, the participants were asked about periods of good weather or if the areas was accessible with all medical equipment the children were using, and they did not change their responses. These findings in regard to the green and blue areas are not suggesting their insignificant generally, rather, for the children's play particularly as their caregivers perceived, it was unimportant.

Evidence from this study can encourage re-thinking and figuring out how services are developed and delivered when considering the key message in the findings regarding the importance of having play partner for the children to play. Future studies can investigate new creative ways to consider this

aspect in children's play when in view of other restrictions. Nevertheless, there is a need to incorporate trials to evaluate the association between nourishing play environments within the healthcare settings on children's well-being and quality of life on the long term. This is through implementing the environmental enablers and creating opportunities of social play experience for getting children to play together despite the environmental barriers.

Study limitations

Some items which were ranked as less important may still require further investigation because of the scale used in the Q matrix. Some participants used around two third of the columns for the important cards (i.e. some of the cards which were under the neutral columns they believed were important as for example '-1'); accordingly, some of the important items were analysed as neutral. It also worth mentioning that the lack of interest by many participants in specific items (e.g. the outdoor) cards might be due to their psychological wellbeing: it would be very beneficial if a screening tool was used for measuring this aspect.

Implications for Practice

In order to take the findings of this study further and considering inpatient healthcare settings it is important to consider creating opportunities for social play while also respecting children's differences. Play activities does not necessarily have to be in the form of structured or organised group play; it is about facilitating being with others, to be in one place at one time. The physical factors could be utilised to in supporting social interaction. For example, this could be achieved through rearranging furniture which can allow for more contact with other patients as well as healthcare professionals. Additionally, respecting the differences in the patterns of the children's play requires understanding each child unique features and needs for play. It is essential to incorporate environments that account for the variations in children's preferences and abilities.

Conclusion

This study demonstrated the importance of number of environmental factors from the caregiver's perspectives for their children to play. Most importantly, having a play partner for children to enjoy their time playing with others regardless to their ethnic background, age or gender and where they are receiving their care. However, these children often need assistant, and for some it should be from grown-ups particularly for those living with more complex conditions. In addition, it seems that the life-threatening/limiting conditions are social isolating conditions and also left children unable to use the available play resources due to their affected abilities or restrictions to their use. Future work is needed to figure out how best services could be delivered to these children considering play and their play needs.

Declaration of conflicting interests

The authors have no competing interests.

Consent for publication

Consent was obtained from the participants to allow data to be shared anonymously.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Table 1 Characteristics of the participants

Characteristics		Kuwait's participants	UK's participants	All participants
		n (%)	n (%)	n (%)
Sample size		19 (48.7%) ¹	20 (51.3%) ¹	39 (100%)
Caregiver's age ² , mean (SD)		32.68 (6.6)	42 (11.3)	37.66 (10.62)
Caregiver's sex	Male	2 (10.5%)	6 (30%)	8 (20.5%)
	Female	17 (89.5%)	14 (70%)	31 (79.5%)
Research setting	Hospital	12 (63.1%)	12 (60%)	24 (61.5%)
	Hospice	7 (36.8%)	8 (40%)	15 (38.5%)
Educational level	Primary	4 (21.1%)	1 (5%)	5 (12.8%)
	Secondary	3 (15.8%)	3 (15%)	6 (15.3%)
	Higher education	12 (63.1%)	16 (80%)	28 (71.9%)
Relationship to the child	Father	2 (10.5%)	6 (30%)	8 (20.5%)
	Mother	13 (68.4%)	12 (60%)	25 (64.1%)
	Grandparent	-	1 (5%)	1 (2.6%)
	Paid caregiver	4 (21.1%)	1 (5%)	5 (12.8%)
Ethnicity		15 (78.9%) Arab 2 (10.5%) African 2 (10.5%) South Asian	18 (90%) White 1 (5%) Chinese 1 (5%) Mixed	
The caregivers' children details				
Children's sex	Male	10 (52.6%)	12 (60%)	22 (56.4%)
	Female	9 (47.4%)	8 (40%)	17 (43.6%)
Children's age ² , mean (SD)		6.5 (1.5)	7.6 (2.06)	7.08 (1.86)
Children's diagnosis	Neurology	3 (15.8%)	5 (25%)	8 (20.5%)
	Oncology	6 (31.6%)	5 (25%)	11 (28.2%)
	Haematology	6 (31.6%)	3 (15%)	9 (23.1%)
	Congenital	3 (15.8%)	2 (10%)	5 (12.8%)
	Genitourinary	1 (5.3%)	1 (5%)	2 (5.1%)
	Cardiology	-	2 (10%)	2 (5.1%)
	Metabolic	-	2 (10%)	2 (5.1%)
Spectrum of palliative care need ³	Yellow	11 (57.9%)	14 (70%)	23 (59%)
	Amber	8 (42.1%)	6 (30%)	16 (41%)

¹The percentage is calculated for the total sample size²Mean and standard deviation are used to present the descriptive data³According to the Spectrum of Children's Palliative Care Needs (Shaw et al. 2015): *yellow*: children expected to die before adulthood (18yrs old) and; *amber*: children where death is expected in a few months to years.

Table 2 factor matrix

Participant code	Factor loadings on Factor 1	Factor loadings on Factor 2	Caregiver's age ⁽¹⁾ & sex ⁽²⁾	Child's age ⁽¹⁾ & sex ⁽²⁾	Country ⁽³⁾ & setting
1.	0.1510	0.4467*	38, F	8, M	KW, hospital
2.	0.5809*	0.2536	26, F	6, F	KW, hospital
3.	0.6115*	-0.1189	37, F	7, F	KW, hospital
4.	0.4926*	0.1150	40, F	5, M	KW, hospital
5.	0.7032*	0.3159	28, F	7, M	KW, hospital
6.	0.5727*	-0.1959	37, F	7, M	KW, hospital
7.	0.0736	-0.0232	36, F	9, M	KW, hospital
8.	0.0637	0.1570	35, F	5, F	KW, hospice
9.	-0.0086	0.2832	30, F	7, M	KW, hospital
10.	0.2193	0.7624*	50, M	7, M	KW, hospice
11.	0.3149	0.6227*	23, F	5, M	KW, hospital
12.	-0.2325	0.5172*	27, F	6, F	KW, hospital
13.	0.0307	0.4956*	38, F	7, M	KW, hospice
14.	0.0480	0.4603*	34, F	5, F	KW, hospice
15.	0.5554*	0.3525	28, F	5, F	KW, hospital
16.	0.5253	0.5021	24, F	5, F	KW, hospital
17.	0.7144*	0.1218	30, F	10, M	KW, hospice
18.	0.5017*	-0.2490	30, F	5, F	KW, hospice
19.	0.5820*	-0.2883	30, M	5, F	KW, hospice
20.	-0.0182	0.7342*	66, F	8, F	UK, hospice
21.	0.3645	-0.1831	46, F	11, M	UK, hospital
22.	0.2192	0.6183*	39, F	6, M	UK, hospital
23.	0.5944*	0.2249	35, F	11, F	UK, hospital
24.	0.5602*	0.0052	40, M	8, M	UK, hospital
25.	0.7883*	-0.2147	45, M	7, M	UK, hospital
26.	0.7179*	-0.2756	29, F	10, M	UK, hospital
27.	0.6640*	0.1275	45, F	8, F	UK, hospital
28.	0.6177*	0.3913	44, F	5, M	UK, hospital
29.	0.7359*	0.0464	44, F	8, F	UK, hospital
30.	0.7988*	-0.1213	50, M	7, M	UK, hospital
31.	0.8083*	0.0526	37, F	9, F	UK, hospital
32.	-0.1261	0.5114*	29, F	5, M	UK, hospital
33.	0.4096	0.6657*	34, F	8, F	UK, hospice
34.	0.5703	0.4507	20, F	8, F	UK, hospice
35.	0.1999	0.7197*	42, F	7, M	UK, hospice
36.	0.3190	0.6914*	41, F	11, M	UK, hospice
37.	0.2347	0.6754*	40, M	5, F	UK, hospice
38.	0.6130*	0.2478	63, M	5, M	UK, hospice
39.	0.4732*	0.3170	61, F	5, M	UK, hospice

*indicates a defining sort (the significance factor loading calculated at P-value < 0.01)

⁽¹⁾Age calculated in years; ⁽²⁾M for male and F for female; ⁽³⁾KW is for Kuwait and UK for United Kingdom

Supplementary material: Rank scores of statements for views on social and physical environmental factors related to children's play

Item no	Q set / statements	Factor 1		Factor 2	
		Kuwait	UK	Kuwait	UK
1	People support & encourage my child to play	+4	+5	+4	+4
2	People assist my child to play	-1	0	+3	+4
3	How my community think children should be	-1	-4	-5	-4
4	My child to have time for free play	-2	1	0	0
5	Restrictions to play in this facility	-2	-3	0	-2
6	Availability of family members/ friends around my child	+5	+5	+5	+5
7	Staff playing with my child	0	+2	+3	+3
8	Availability of play therapist/ activity team	+3	+4	+3	+1
9	Availability of musical man/ clown/ volunteers	-2	-2	-3	+1
10	Organised group activities for children	0	+1	+1	-1
11	Telling jokes	+1	-1	+1	-3
12	Availability of playmate of same gender as my child	+2	-3	-2	-4
13	Availability of playmate of same age to my child	+4	0	+1	-3
14	The weather condition	-1	-5	-4	-1
15	Availability of outdoor blue space (e.g. beach or seaside)	-3	-5	-3	+2
16	My child to have easy access to outdoor area	-4	-1	-1	+3
17	Availability of outdoor green space	+1	-2	-1	+2
18	Availability of playroom	+4	+4	+2	0
19	Availability of playground equipment	+2	-3	+1	-1
20	Availability of pets	-5	-1	-1	0
21	Availability of private space for my child's play	0	0	+2	+2
22	The facility's accessibility to my child's to use/move around	0	+4	0	+2
23	Sufficient indoor space within the facility that allows active play	+1	+3	+2	+2
24	Sufficient space to accommodate number of children	+2	+2	+3	0
25	Availability of child size designed furniture	+1	0	+2	-2
26	Good maintenance within the facility for the equipment and the building	+3	+3	+4	+1
27	Availability of playing space where is it easy for me to supervise my child during play	+2	+1	-1	+1
28	Location of games and toy	-2	+2	+1	0
29	Availability of age-appropriate play equipment	+5	+3	-2	-1
30	Availability of gender appropriate play equipment	+3	0	-3	-4
31	My child to watch TV, videos & DVDs	+3	+2	+2	+1
32	My child to play with personal tablet (ipad)	+1	+1	-2	+4
33	My child to play videogames	-1	0	-2	-5
34	My child to read and listen to stories	0	+2	0	+3
35	My child to do art & craft	+2	+3	-3	-2
36	My child to play board & card games	0	+1	-4	-5
37	My child to do cooking & baking	-1	-3	-5	-1
38	My child to play with blocks, trains, cars & puzzles	0	-1	0	-2
39	My child to play different ball games	-3	-4	0	-3
40	My child to play with musical instruments	-3	-1	+4	+3
41	My child to sing & dance	-4	-2	-1	0
42	My child to participate in imaginative/ pretend play	-2	-2	0	-3
43	My child to engage in water play/ swim	-3	-4	-4	+5
44	My child to participate in active play (run, bike, hide & seek)	-4	-2	-2	-2
45	Availability of paid caregiver	-5	-	+5	-

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