

## **Seeking consensus on a play-based intervention framework for promoting play of children with HIV/Aids in a low-resourced setting: A Delphi Study**

### **Abstract**

**Introduction:** Implementing occupation-based practice in low resourced settings can be challenging especially when working with children with HIV/Aids whose daily occupation of play is often affected by their health condition and other contextual factors such as poverty or stigma.

**Aim:** To obtain consensus from experts on the content and application of a play-based intervention for children with HIV/Aids living in a low resourced setting.

**Methods:** A Delphi study involving two rounds using an online survey format was conducted with experts from the field of child development, play and/or HIV/Aids. Consensus agreement was reached when at least 70% of Delphi experts rated each item at 3 or higher on a 5-point Likert scale.

**Consumer and Community Involvement:** This paper is part of a multi-stage study which involved input and feedback from families of children who were born HIV/Aids, occupational therapists working with families of children with HIV/Aids and input from local and international experts working with people with HIV/Aids.

**Results:** Thirty-seven experts completed round one and thirty-five completed the second round of the study. Consensus was achieved on the application of the Cooper's Model of Children's Play, techniques to be used and the structure of the intervention. Experts also agreed on the inclusion of a pre-intervention workshop as part of the play-based intervention.

**Discussion and conclusion:** The consensus on the content and application of a play-based intervention framework through a process of gaining expert perspectives provides confidence that the intervention planned to promote play for children with HIV/Aids living in low resourced settings is likely to be effective.

**Key Words:** Occupational Therapy, Play-based intervention, HIV/Aids, Context.

### **Key points for occupational therapy:**

- Occupation based practice is challenging when working with children with HIV/Aids in low resourced settings.
- Consensus was achieved on the play-based intervention's theoretical model, techniques to be used, and the structure.
- Consensus from experts provides confidence that the intervention planned is likely to be effective.

### **Introduction**

Play is recognised as an important part of child development (Gerlach et al., 2014). Through play children learn and develop fundamental motor, cognitive and socio-emotional skills (Lynch et al., 2016). Play forms a platform for children to learn survival skills, to build resilience in dealing with difficult life events, and to develop self-efficacy and adult life skills (Milteer et al., 2012). As such, occupational therapists have leveraged on this to use play as means to achieve therapeutic goals. On the other hand, occupational therapists also view play as an 'end' - an everyday occupation for children. The conceptualisation of play as an occupation, makes it a right for every child to engage, participate in and to experience despite personal or environmental limitations. Thus, play has since been incorporated in Article 31 of the United Nations convention of the rights of children as a fundamental right of childhood. Furthermore, the World Federation of Occupational Therapists endorsed the United Nations UN declaration of human rights (World Federation of Occupational, 2006) stating that every person has a right to engage in meaningful occupations, such as play in children.

### ***Children's play in the context of HIV/Aids***

Various studies have revealed that children with HIV/Aids are at risk of developing neurodevelopmental (Kandawasvika et al., 2011), cognitive, language, and motor delays (Hutchings & Potterton, 2014). A study by Brassell and Potterton (2019) highlighted some of these common developmental disabilities that affect children's engagement in play and school activities. Some children with HIV/Aids are also likely to fatigue easily and, hence, have difficulty engaging in prolonged physical play. As such, children with HIV/Aids and associated developmental delays and disabilities are at risk that their performance in meaningful play activities is affected (Ramugondo et al., 2018).

Prior to this Delphi study, Munambah et al. (2020a) carried out a research study using a test of playfulness to compare the level of playfulness of children with HIV/Aids against typically developing children in Zimbabwe. The study revealed that generally children with HIV/Aids were less playful outdoors compared to age and gender matched typically developing children. Due to fear of stigma, caregivers tend to also overprotect and control the play of the child making it difficult for the child to have control over their own play (Munambah et al., 2020). The above research findings point to the need of play-based interventions for children with HIV/Aids.

### ***Conceptual framework: Model of children's play***

A descriptive model of children's play developed by Cooper (2000) can be used as a workable way of conceptualising the underlying skills and behavioural elements characteristic of play, and the influences that both individual and environmental factors have on play (see Supplementary File 1). In this model, Bundy's definition is used to define play as "a transaction between an individual and the environment that is intrinsically motivated, internally controlled and free of many of the constraints of objective reality" (Skard & Bundy, 2008, p. 71). During play, the individual child brings developmental abilities (cognitive, motor, language and social skills) along with his or her personal play preferences and playfulness (internal control, freedom to suspend reality, intrinsic motivation and framing) to the play transaction, while the environment (play environment and cultural milieu) either encourages or limits play activities (Cooper, 2000).

In order to successfully engage in play, a child's own playfulness and developmental skills need to match the play task and environmental demands (Ramugondo et al., 2018). This means that play is partially dependent on the achievement of certain developmental skills such as gross motor skills that a child may use to play. For example, when children engage in physical activity, they develop and refine eye-hand coordination, locomotion and manipulation skills which enhance play performances. Cognitive play skills which include problem solving skills and logical reasoning skills will enable a child to use play materials in a more adaptive and elaborate manner (Cooper, 2000). However, children with cognitive difficulties engage more in repetitive, exploratory or stereotyped play and they lack skill to modify tasks or the environment during play (Cooper, 2000). Proficient social play skills underpin the child's ability to communicate and engage with peers during play (Barnes et al., 2017). Thus, a

persistent mismatch between a child's developmental skill level, playfulness, and environment may lead to withdrawal from play opportunities (Ramugondo et al., 2018).

Playfulness is a key aspect of play to explore in children with impairments, this construct focusing on the quality of play and the adaptability and coping mechanisms of a child, regardless of ability (Hamm, 2006). Playfulness goes beyond just the actual play scenario, to look at the child's disposition to play (Skard & Bundy, 2008). The construct of playfulness comprises of four fundamental elements: intrinsic motivation; internal control; the freedom to suspend reality; and framing (Skard & Bundy, 2008). Internal control suggests that the child is largely in control of his or her actions and some aspect of the activity's outcome (Hamm, 2006). This element may be observed through traits such as the child's ability to determine what happens and how or with whom she or he is playing (Bundy, 1997). Freedom to suspend reality refers to the child's ability to introduce non literal, pretend elements into play (Bundy, 1997). Here, the player is not bound by unnecessary constraints of reality and usual meanings of objects cease to apply (Cordier et al., 2009). For example, a child may use a brick as a car; driving it stopping to pick up passengers (this could be sticks). Intrinsic motivation refers to some unnamed aspect of the activity, rather than to an external reward (Bundy et al., 2001) for playing. Framing refers to the ability to appropriately give and read play cues from the environment and other playmates (Pearson et al., 2014). Responding to playmates requires an understanding of social rules, which allows the player to support playmates during play (Barnes et al., 2017; Cordier et al., 2010b). Some children with HIV/Aids have challenges in communicating with others, often stemming from hearing impairments (Brassell & Potterton, 2019). This poses a challenge for these children when trying to give cues or to respond to cues during play.

Apart from the child's abilities, the context in which play happens has potential to either promote or limit performance in the play of children with HIV/Aids. In the model of children's play by Cooper (2000), the context is referred to as both the child's immediate environment (physical setting, available play materials and social elements) and the surrounding cultural values and beliefs. A study conducted in Zimbabwe with caregivers caring for a child with HIV-related neurodevelopmental delays revealed that cultural and spiritual beliefs, as well as fear of stigma impacts on how caregivers support and influence the play of their children with HIV/Aids (Munambah et al., 2020b). Stigma, coupled with poverty further adds to the burden of caring for a child with HIV/Aids in low resourced settings (Steinert et al., 2017).

### ***Play-based interventions***

Although occupational therapists acknowledge the centrality of play occupation for children, little focus has been given to developing evidence-based interventions to promote play in children. Most psycho-social interventions have been criticised for not addressing play as an outcome (Wilkes-Gillan et al., 2016b). Few intervention studies that have focused on play as an outcome include a play-based intervention for children with ADHD (Cordier et al., 2009) and Wilkes-Gillan et al. (2016b) who pilot tested such an intervention. Similarly another play based intervention was developed for children with ASD (Henning et al., 2016). Stagnitti et al. (2012) conducted a learning to play program in schools. In South Africa, a play-informed, caregiver-implemented, home-based intervention (PICIHBI) was developed with the aim of promoting play of children with HIV/Aids (Ramugondo et al., 2018). The emphasis of the intervention was on supporting the caregiver to promote play in children with HIV/Aids and not directly on the individual child's play.

Over the years, there has been increasing focus on developing researched interventions to inform evidence-based practice (Wilkes-Gillan et al., 2016b). However, the development of an evidence-based play-based intervention is considered as a complex, often costly and time intensive process (Henning et al., 2016). The United Kingdom's (UK) Medical Research Council (MRC) has developed guidelines to provide structure for the development of complex interventions (Campbell et al., 2007; Craig & Petticrew, 2013). These guidelines emphasise a systematic phase-based approach to research starting from a theoretical phase, followed by pilot trials and later controlled definitive RCTs which have the capacity to be implemented in the community (Wilkes-Gillan et al., 2016b). Applying the MRC guidelines, the aim of this paper is to report on the findings of a Delphi study which was conducted as part of the initial phase of achieving consensus on the content and application of a play-based intervention for promoting play skills of children with HIV/Aids living in low resourced settings. In this case, play is used as a means to achieve the end (which is being more playful).

### ***The current study***

This study employed a Delphi technique involving experts in the area of child development, play and/ or HIV/Aids with the aim of obtaining consensus from experts on the content and

application of a play-based intervention for children with HIV/Aids living in a low resourced settings. The study's research questions included:

- 1) What is the theoretical framework applicable to development of a play-based intervention for children with HIV/Aids living in low resourced settings?
- 2) What treatment principles should be included in the play-based intervention for children with HIV/Aids?
- 3) What active ingredients/techniques should be included in the play-based intervention for children with HIV/Aids?

## **Methods**

Ethical approval was obtained from the [Removed for peer review] as well as from the [Removed for peer review] and Joint Research and Ethics Committee (JREC REF 163/18).

### ***Study Design***

A Delphi technique was used in this study to build consensus through a series of questionnaires to a global panel of selected experts (Hsu & Sandford, 2007) in the field of play and or HIV/Aids. The Delphi technique was chosen as it allows individuals from diverse locations and fields to give their opinions without influencing or overriding one another (Boulkedid et al., 2011).

### ***Positionality***

All the authors are occupational therapists who viewed the research through an occupational lens.

### ***Participants and Recruitment***

Participants were selected based on the inclusion criteria of having at least 5 years' experience of work in the professional field selected, with a demonstrable track-record of working with children. The experts included practicing clinicians, educators, researchers from the professional fields of occupational therapy, physiotherapy, speech and language therapy, education, psychology, doctors, and academia. Being knowledgeable about play and the use of play as a medium for intervention in children, having expertise on how HIV/Aids affects children's functional ability, or having worked with children in low resourced areas were some of the inclusion criteria used. Experience in dealing with children's issues, as well as in developing of guidelines for interventions was also considered.

Drawing on existing professional networks, the authors established a list of the proposed experts based on the professional categories above. Some recruited experts were asked to

identify other potential experts. Due to the experts' diverse locations and areas of expertise (Boulkedid et al., 2011), online survey questionnaires and emails were used for communication. However, for the Delphi to be successful, it was important that participants be willing and committed to making valuable contributions as experts (Hsu & Sandford, 2007). Thus, an email was sent to all the identified experts explaining the study, including timelines as well as inviting them to take part in the study. These experts were asked to accept taking part in the study and to confirm their availability and willingness to revise their work as the Delphi process unfolded. Experts who responded and showed willingness to take part in the study were sent an informed consent form which they were requested to sign and return. Telephone calls were made for follow-up whenever necessary.

### ***Procedures***

The primary author of the study facilitated the Delphi in collaboration with the other authors. All Delphi rounds were piloted with individuals with relevant experience including teachers, academics, and clinicians to check on the clarity of questions and the response burden on participants prior to rollout. Two Delphi rounds were conducted between April and August 2020. Round one involved open-ended and closed-ended questions and round two included mostly closed-ended questions. For closed-ended questions, experts were required to rate their level of agreement or importance of items on a 5-point Likert scale (i.e., 1 meaning "strongly agree" or "very important" and 5 meaning "strongly disagree", or "not important". Experts who responded "neutral", "disagree" or "strongly disagree", "of little importance" or "not important" to any of the questions were asked to provide their reasoning. Qualtrics software was used to design and generate the questionnaire as well as follow up emails. The Qualtrics is an online data collection and analysis survey application that can be accessed using any web browser or operating system (Snow & Mann, 2013). On the first page of the survey, experts were provided with study details and were asked to confirm consent to participation in the study prior to accessing the rest of the survey. The link to the questionnaire was then emailed to the experts and remained accessible for three to five weeks. It took approximately 30 to 45 minutes to complete each survey. A reminder was sent to all experts who had not yet completed the survey one week prior to the due date.

***Round One:*** Based on the literature review and previous research studies on play profiles of children with HIV/Aids (Munambah et al., 2020a), a survey questionnaire was developed for the first round of the Delphi study. The survey included three parts. The first part included

demographics and professional background of the experts. The second part asked questions relating to the application of the model of children's play (Cooper, 2000) to children with HIV/Aids. The third part asked experts to share some of the challenges that have potential to limit play and some of the techniques that can be used in promoting play of children with HIV/AIDS.

To assist the experts in responding to the survey, they were provided with a reference document, which explained the Children's play model and its application to children with HIV/Aids. The first round helped to establish whether experts felt constructs depicted in the children's play model were relevant, appropriate, and applicable to children with HIV/Aids as well as to determine whether these constructs should be targeted in the play-based intervention. Experts were encouraged to contact the primary author if they had any feedback, queries, or concerns. After collection of the experts' responses, the data was extracted and analysed. Feedback on information gathered was given to experts before the second round. Feedback is necessary in the Delphi process as it helps experts to view their position in relation to other experts (Boulkedid et al., 2011). Findings from round one of the Delphi were used to develop a questionnaire that was used in the second round.

**Round Two:** The second round focused on gaining expert consensus on the content, delivery, and feasibility of the play-based intervention guidelines for children with HIV/Aids living in low resourced settings. A questionnaire based on findings from stage one and the literature review was sent out to all the experts. This time the questionnaire had mainly closed-ended questions. Experts were asked to review the summary of findings from the first round and to rank the responses, thereby establishing preliminary priorities. Also in round two, experts were asked about the structure, frequency and intensity of both pre-intervention learning and the play-based intervention. At the end of round two, experts were sent a summary of results and informed that a third and final round was not required, as consensus had been achieved. Experts were sent a document with a summary of the findings from round two including an outline of how the findings would inform the development of the play-based intervention.

### **Data Analysis**

The Delphi process involved both quantitative and qualitative data. Quantitative data was analysed using descriptive statistics; qualitative data was analysed using content analysis. Survey responses were imported into the Statistical Package for the Social Sciences (SPSS)



(IBM Corporation, 2015) software version 26 and anonymised prior to analysis. Criterion used for establishing consensus was determined prior to the study based on Delphi literature (Boulkedid et al., 2011). Consensus was reached when at least 70% or more of experts selected “agree” or “strongly agree” or “important” or “very important” on Likert scale questions (i.e., a median score of 1 or 2 on a 5-point Likert scale and an inter-quartile range (IQR) of 1) on each item.

Participant responses to open-ended questions were analysed using conventional qualitative content analysis (Graneheim & Lundman, 2004). This process involved identifying meanings in participant comments and coding each comment by assigning a descriptor. These descriptive codes were considered alongside quantitative data in an excel spreadsheet to help develop subsequent survey rounds and identify reasons for lack of consensus.

## **Results**

***Demographics of the participants:*** Invitations were sent out to 87 experts and 50 responded. Of the experts who responded, 13 did not complete the survey and their data were removed from analysis, hence data from 37 experts was available for data analysis in the first round. In round two 35 experts responded to the survey giving a response rate of 94.6%. Table 1 presents the demographic data of experts who completed the first and the second round of the Delphi study.

The experts were drawn from various fields of practice including 21 Occupational therapists (38.1%), 14 Researchers (25.5%), eight Educationalists (14.5%) and four Speech and language therapists (7.3%). In terms of country of residence, most experts, nine, were from Zimbabwe (24.3%), followed by eight from Australia (21.6%), and seven from South Africa (18.9%).

### ***Common challenges that limit play of children with HIV/Aids***

Participants selected the most common challenges that might limit play of children with HIV/Aids from a list presented to them. Frequency of the common challenges selected was then converted into percentages. The most common challenges limiting play reported by experts with regards to children with HIV/Aids were fatigue (30; 26.4%), not skilled enough to play (26; 18.1%), inability to express oneself (24; 16.7%), lack of playmates (24; 16.7%), and other challenges (16; 22.1%). Several experts went on to specify (in open-ended responses) that children with HIV/Aids are likely to be exposed to limited play opportunities (mainly due to low resources), experience a lack of encouragement or stimulation from others in their environments, have a lack of time to play, and may be over protected by others in their

environment. In addition, time spent in hospital may also diminish playtime for children with HIV/Aids.

### ***Application of the Children's model of play***

Most experts 28 (84.8%) agreed that the proposed model of children's play is applicable for use in promoting play of children with HIV/Aids. Three experts were of the view that not all children with HIV/Aids would show play deficits as some children are asymptomatic, hence the model may not be applicable in that case. The other six experts did not give the reason why they thought the model was not applicable for use in promoting play of children with HIV/Aids.

### ***Principles for the play-based intervention***

The percentage agreement on aspects to be included in a play-based intervention for children with HIV/AIDS was relatively high on advocacy for more play opportunities (96.2%), inclusion of culturally sensitive practice (84.4%) and increasing social interaction (84.8%). Lower percentage agreement was also recorded on video modelling (33.3%), compliance with medication (57.6%), and provision of food (66.7%). We noted that participants' ratings for video modelling, food provision and compliance with medication as treatment principles were significantly influenced by whether participants were from high- or low-resourced settings. These three items were given back to experts with an explanation of each one of them. Experts were asked to rate them again and the percentage agreements were as follows; video Modelling (76.5%), compliance to medication (88.2%) and provision of food had (88.2%). Refer to Table 2 below.

Experts from low resourced settings were asked for their opinion on some of the culturally sensitive practices to be included in play-based interventions. These experts identified indigenous games (30%) and indigenous songs (30%). In addition, the experts agreed that the environment should be emotionally (34.0%) and physically (20.7%) safe, allow for interactions (20.1%) and there should be provision of a variety of low-cost toys (13.8%). No participant was of the view of involving adults in the play environment.

***Intervention Techniques*** In developing the play-based intervention, the experts were asked to rate the techniques which could be effectively used to address deficits experienced by children with HIV/Aids on the elements of playfulness (internal control, intrinsic motivation, freedom to suspend reality and framing). Peer modelling, therapist modelling and caregiver education were the most popular techniques, refer to Table 3.

### ***The pre-intervention learning***

In round one, some experts also suggested that a pre-intervention learning program be included as part of the play-based intervention. The pre-intervention learning will be targeting caregivers and their children with HIV/Aids. Table 4 below presents percentage agreements on the topics to be included in the pre-intervention learning.

### ***Delivery of the play-based intervention***

Most experts suggested that each session of the play-based intervention last for 31-60 minutes and the total number of sessions be 12 sessions (Full-Term). For pre-intervention learning it was suggested that 3-4 sessions take place. However, some experts suggested that a pre-intervention learning session should take place every time the child and caregiver were seen together prior to each play-based intervention. Others suggested that additional learning sessions should be provided intermittently after the initial session.

***Format of presentation of the pre-intervention learning:*** Face to face (73.5%) and workshops (61.8%) are the most commonly suggested presentation formats for the pre-intervention learning as indicated by the percentage agreements. Experts also recommended that presentation format should be highly dependent on the audience, the time that the caregiver can attend, the time of day and the context. It should also be flexible, for example, shorter sessions with salient points, and not too much information given at one time.

### **Discussion**

Although play-based interventions have been developed for children with ASD (Henning et al., 2016), children with ADHD (Wilkes-Gillan et al., 2016b) and children with developmental delays (Stagnitti et al., 2012), the challenges faced by children with HIV/Aids are different to other children (Meissner et al., 2017). The negative impact of HIV/Aids has been noted on physical, social, cognitive and academic learning, play and emotional development of children infected (Brassell & Potterton, 2019) and occupational therapy service provision to this population is a necessity (Meissner et al., 2017). This is in line with the call for emphasis on the centrality of occupation in occupational therapy practice (Hocking, 2020) which pushes the boundaries to view play as both a means and ends of intervention (Cordier et al., 2009). Occupational therapists are well positioned to provide this service as they have unique expertise to understand the person, his or her occupations and environment, as well as how to enable occupational performance and participation (Rodger et al., 2010).

### *Use of a conceptual framework*

The Delphi study aimed to obtain consensus from experts on the content and application of the children's play model (Cooper, 2000) as a theoretical framework to inform play-based education and the structure of a play-based intervention for children with HIV/Aids. Experts who participated in this study agreed that the model of children's play (Cooper, 2000) could be used to gain understanding of the play of children with HIV/Aids and as well guide the development of play-based intervention for these children. Most interventions have been criticised for lacking a strong theoretical rationale and some have minimal evidence to support their effectiveness (Kent et al., 2018). The theoretical framework ensures the best choice of intervention that targets constructs of interest, that clear research questions are asked and that appropriate outcome measures are selected to test the intervention's effectiveness (Campbell et al., 2007; Kent et al., 2018). The process of gaining expert consensus on a theoretical rationale for the intervention helped to provide conceptual clarity and consistent use of terminology for researchers and experts (Kent et al., 2018).

***Principles of intervention:*** Establishing intervention principles is an important process as they constitute the operationalisation of the theory that drives the intervention (Skivington et al., 2021). This will allow for factors related to HIV/Aids that influence children's play to be incorporated into the play-based intervention. Furthermore, intervention principles direct the outcomes that should be measured to determine the effectiveness of the intervention in future studies (Skivington et al., 2021). As such, intervention principles for the play-based intervention are important to ensure that the intervention meets the unique demands of children (Henning et al., 2016). However, the process of establishing intervention principles is dynamic and will need to be continuously refined when the intervention is tested in pilots and effectiveness trials.

***Techniques:*** Although there are many techniques that could be employed during the play-based intervention, the most common techniques that experts agreed were caregiver, therapist, and peer modelling. Previously, techniques of peer, therapist and caregiver modelling were found to be effective in the development of play and social skills (Wilkes-Gillan et al., 2016b). However, in contrast to a study by Wilkes-Gillan et al. (2016a), experts in this study agreed that video-modelling was not the best technique to use in promoting play in children with HIV/Aids. This play-based intervention is aimed for use in low resourced settings, where there may not be provisions of cameras or electricity to power the devices.

The context in which play occurs is important (Hocking, 2020). Of late, occupational therapists are increasingly becoming aware of how context shapes everyday occupation. Experts in this study agreed that the context should be culturally sensitive as well as be physically and emotionally safe for the children. These sentiments are supported by Cordier et al. (2010a) who state that children play more in their natural context within a supportive environment which is emotionally and physically safe. The physical environment (including the space, objects) and social context of play (playing alone/with others, supports, attitudes) are essential factors in children's play participation context (Miller Kuhaneck et al., 2013). In this study, some of the experts were drawn from low resourced settings, hence they understood the context in which the play-based intervention will be used. For example, opinions from experts with experience working in low resourced settings resulted in principles on provision of food and promoting compliance with medication to be included in this play-based intervention. This ensured that the play-based intervention is contextually relevant and feasible for implementation in low resourced settings.

Conducting a pre-intervention learning aimed at imparting knowledge to the caregivers about play and how to promote play in their children was viewed as important by experts. The pre-intervention learning supports continuity of skills development at home by the caregivers (Wilkes-Gillan et al., 2016a). This is important given that caregivers have been reported to bring about positive outcomes when involved in the interventions for their children (Meissner et al., 2017). Caregivers can also support and facilitate the child's play by creating more opportunities for play through restructuring time and space for play and providing the necessary resources (Rodger et al., 2010). Apart from the support of caregivers, experts also agreed that including a playmate in the play-based intervention would be important. Playmates play a crucial role in motivating and forming and maintaining relationships with the child (Cordier et al., 2010a; Wilkes-Gillan et al., 2016b). When engaging in play with their peers, children with HIV/Aids are likely to benefit from peer-learning and increased social interaction.

### **Limitations**

Although the study included experts from a variety of countries, some countries were not represented. The study sought to include as many experts as possible in the field of child development, play and/or HIV/Aids. However, of the 83 experts invited only 50 responded and of those who responded only 37 completed the first round of the study. This could have been due to the Delphi study being sent out in April 2020, when some countries were experiencing

a peak of the COVID 19 pandemic. Participant dropout over rounds poses a limitation in Delphi studies (Boulkedid et al., 2011). Thus, the authors ensured fewer dropouts between the first and second round through sending reminders and extending the timeframes experts had to respond to each survey.

## **Conclusion**

In this study, a play-based intervention for children with HIV/Aids was developed through a rigorous process of gaining consensus on the application of an existing framework from experts in the field of play and HIV/Aids. Experts agreed on the principles and techniques of the intervention, as well as the inclusion of a pre-intervention learning session for the caregivers as part of the intervention. The model of children's play is applicable for use as a theoretical framework to inform a play-based intervention for children with HIV/Aids. The process of drawing from experts employed in this study is crucial in designing and developing effective play-based interventions, thereby instilling confidence that the intervention will be effective in promoting the play of children with HIV/Aids.

### ***Authors' declaration of authorship contribution\*:***

All the co-authors listed have contributed to the research process and writing of the manuscript. [Removed for peer review]

### **Funding statement\*:**

Part funding for data collection was provided by the [Removed for peer review].

### **Conflict of interest statement\*:**

No conflict of interests.

### **Acknowledgements\*:**

The authors extend their gratitude to all the experts who volunteered their time to participate as well as [Removed for peer review] for assistance in developing the survey questionnaires.

## References

- Barnes, G., Wilkes-Gillan, S., Bundy, A., & Cordier, R. (2017). The social play, social skills and parent–child relationships of children with ADHD 12 months following a RCT of a play-based intervention. *Australian Occupational Therapy Journal*, *64*(6), 457-465.
- Boulkedid, R., Abdoul, H., Loustau, M., Sibony, O., & Albeti, C. (2011). Using and reporting the Delphi method for selecting healthcare quality indicators: a systematic review. *PloS one*, *6*(6), e20476.
- Brassell, S. E., & Potterton, J. (2019). Prevalence of disability in HIV-infected children attending an urban paediatric HIV clinic in Johannesburg, South Africa. *Vulnerable Children and Youth Studies*, *14*(2), 95-115.
- Bundy, A. (1997). Play and playfulness: What to look for. *Play in occupational therapy for children*, 52-66.
- Bundy, A. C., Nelson, L., Metzger, M., & Bingaman, K. (2001). Validity and reliability of a test of playfulness. *The Occupational Therapy Journal of Research*, *21*(4), 276-292.
- Campbell, N. C., Murray, E., Darbyshire, J., Emery, J., Farmer, A., Griffiths, F., . . . Kinmonth, A. L. (2007). Designing and evaluating complex interventions to improve health care. *Bmj*, *334*(7591), 455-459.
- Cooper, R. J. (2000). The impact of child abuse on children's play: A conceptual model. *Occupational Therapy International*, *7*(4), 259-276.
- Cordier, R., Bundy, A., Hocking, C., & Einfeld, S. (2009). A model for play-based intervention for children with ADHD. *Australian Occupational Therapy Journal*, *56*(5), 332-340. doi:<https://doi.org/10.1111/j.1440-1630.2009.00796.x>
- Cordier, R., Bundy, A., Hocking, C., & Einfeld, S. (2010a). Empathy in the play of children with attention deficit hyperactivity disorder. *OTJR: Occupation, Participation and Health*, *30*(3), 122-132.
- Cordier, R., Bundy, A., Hocking, C., & Einfeld, S. (2010b). Playing with a child with ADHD: A focus on the playmates. *Scandinavian Journal of Occupational Therapy*, *17*(3), 191-199.
- Craig, P., & Petticrew, M. (2013). Developing and evaluating complex interventions: reflections on the 2008 MRC guidance. *International journal of nursing studies*, *50*(5), 585-587.
- Gerlach, A., Browne, A., & Suto, M. (2014). A critical reframing of play in relation to Indigenous children in Canada. *Journal of occupational science*, *21*(3), 243-258.
- Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse education today*, *24*(2), 105-112.
- Hamm, E. M. (2006). Playfulness and the environmental support of play in children with and without developmental disabilities. *OTJR: Occupation, Participation and Health*, *26*(3), 88-96.
- Henning, B., Cordier, R., Wilkes-Gillan, S., & Falkmer, T. (2016). A pilot play-based intervention to improve the social play interactions of children with autism spectrum disorder and their typically developing playmates. *Australian Occupational Therapy Journal*, *63*(4), 223-232.
- Hocking, C. (2020). Occupation in context: A reflection on environmental influences on human doing. *Journal of occupational science*, 1-14. doi:<https://doi.org/10.1080/14427591.2019.1708434>
- Hsu, C.-C., & Sandford, B. A. (2007). The Delphi technique: making sense of consensus. *Practical Assessment, Research, and Evaluation*, *12*(1), 10.
- Hutchings, J.J., & Potterton, J.L. (2014). Developmental delay in HIV-exposed infants in Harare, Zimbabwe. *Vulnerable Children and Youth Studies*, *9*, 43 - 55.
- Kandawasvika, G. Q., Ogundipe, E., Gumbo, F. Z., Kurewa, E. N., Mapingure, M. P., & Stray-Pedersen, B. (2011). Neurodevelopmental impairment among infants born to mothers infected with human immunodeficiency virus and uninfected mothers from three peri-urban primary care clinics in Harare, Zimbabwe. *Developmental medicine and child neurology*, *53*(11), 1046–1052. <https://doi.org/10.1111/j.1469-8749.2011.04126.x>

- Kent, C., Cordier, R., Joosten, A., Wilkes-Gillan, S., & Bundy, A. (2018). Peer-mediated intervention to improve play skills in children with autism spectrum disorder: A feasibility study. *Australian Occupational Therapy Journal*, 65(3), 176-186.
- Lynch, H., Hayes, N., & Ryan, S. (2016). Exploring socio-cultural influences on infant play occupations in Irish home environments. *Journal of occupational science*, 23(3), 352-369.
- Meissner, R. J., Ferguson, J., Otto, C., Gretschesel, P., & Ramugondo, E. (2017). A play-informed, caregiver-implemented, home-based intervention for HIV-positive children and their families living in low-income conditions in South Africa. *World Federation of Occupational Therapists Bulletin*, 73(2), 83-87.
- Miller Kuhaneck, H., Tanta, K. J., Coombs, A. K., & Pannone, H. (2013). A survey of pediatric occupational therapists' use of play. *Journal of Occupational Therapy, Schools, & Early Intervention*, 6(3), 213-227.
- Milteer, R. M., Ginsburg, K. R., & Mulligan, D. A. (2012). The importance of play in promoting healthy child development and maintaining strong parent-child bond: Focus on children in poverty. *Pediatrics*, 129(1), e204-e213. doi:https://doi.org/10.1542/peds.2011-2953
- Munambah, N., Cordier, R., Chiwaridzo, M., & Ramugondo, E. L. (2020a). Play profiles of children with HIV/Aids: A comparative study. *Australian Occupational Therapy Journal*.
- Munambah, N., Gretschesel, P., & Sunday, A. (2020b). Being a mother of a child with HIV-related Neurodevelopmental Disorders in the Zimbabwean Context. *South African Journal of Occupational Therapy*, 50(1), 35-40.
- Pearnton, J. L., Ramugondo, E., Cloete, L., & Cordier, R. (2014). Playfulness and prenatal alcohol exposure: A comparative study. *Australian Occupational Therapy Journal*, 61(4), 259-267.
- Ramugondo, E., Ferreira, A., Chung, D., & Cordier, R. (2018). A feasibility RCT evaluating a play-informed, caregiver-implemented, home-based intervention to improve the play of children who are HIV positive. *Occupational therapy international*, 2018.
- Rodger, S., Ashburner, J., Cartmill, L., & Bourke-Taylor, H. (2010). Helping children with autism spectrum disorders and their families: Are we losing our occupation-centred focus? *Australian Occupational Therapy Journal*, 57(4), 276-280.
- Skard, G., & Bundy, A. C. (2008). Test of playfulness. In *Play in occupational therapy for children* (pp. 71-93): Elsevier.
- Skivington K, Matthews L, Simpson S A, Craig P, Baird J, Blazeby J M et al. A new framework for developing and evaluating complex interventions: update of Medical Research Council guidance *BMJ* 2021; 374: n2061 doi:10.1136/bmj.n2061
- Snow, J., & Mann, M. (2013). Qualtrics survey software: handbook for research professionals. *Qualtrics Labs, Inc.*
- Stagnitti, K., O'Connor, C., & Sheppard, L. (2012). Impact of the learn to play program on play, social competence and language for children aged 5–8 years who attend a specialist school. *Australian Occupational Therapy Journal*, 59(4), 302-311.
- Steinert, J. I., Cluver, L., Melendez-Torres, G. J., & Herrero Romero, R. (2017). Relationships between poverty and AIDS illness in South Africa: an investigation of urban and rural households in KwaZulu-Natal. *Global public health*, 12(9), 1183-1199.
- Wilkes-Gillan, S., Bundy, A., Cordier, R., & Lincoln, M. (2016a). Child outcomes of a pilot parent-delivered intervention for improving the social play skills of children with ADHD and their playmates. *Developmental neurorehabilitation*, 19(4), 238-245.
- Wilkes-Gillan, S., Bundy, A., Cordier, R., Lincoln, M., & Chen, Y.-W. (2016b). A randomised controlled trial of a play-based intervention to improve the social play skills of children with attention deficit hyperactivity disorder (ADHD). *PloS one*, 11(8), e0160558.
- World Federation of Occupational, T. (2006). Position statement on human rights. In: WFOT Londres.



**Table 1: Participant Demographics**

<b>Participant Demographic Information</b>	<b>Round 1</b>		<b>Round Two</b>	
	N	%	N	%
<b>Gender</b>				
Female	27	73.0%	26	74.2%
Male	8	21.6%	7	20.0%
Preferred not to say	2	5.4%	2	5.7%
<b>Age (years)</b>				
20-29 years	4	10.8%	4	11.4%
30-39 years	13	35.1%	12	34.2%
40-49 years	5	13.5%	5	14.3%
50-59 years	7	18.9%	7	20%
60-69 years	6	16.2%	5	14.3%
70-79 years	2	5.4%	2	5.7%
<b>Country of residence</b>				
Zimbabwe	9	24.3%	9	25.7%
Australia	8	21.6%	7	20%
South Africa	7	18.9%	7	20%
United States of America	6	16.2%	5	14.3%
Malawi	3	8.1%	3	8.6%
United Kingdom	2	5.4%	2	5.7%
Bermuda	1	2.6%	1	2.9%
Ireland	1	2.6%	1	2.9%
<b>Highest qualification</b>				
Bachelor (or equivalent) degree	13	35.2%	13	37.1%
Master's degree, please specify	10	27.0%	10	28.6%
PhD	14	31.8%	12	34.3%
<b>Professional role</b>				
Occupational therapist	21	38.1%	20	57.1%
Researcher/ academic	14	25.5%	13	37.1%
Educationalist (including teachers)	8	14.5%	8	22.8%
Speech and Language therapist	4	7.3%	4	11.4%
Psychologist	4	7.3%	4	11.4%
Medical Doctor (various specialty)	3	5.5%	3	8.6%
Physiotherapists	1	1.8%	1	2.9%
<b>Employment sector</b>				
University	15	29.4%	13	37.1%
Service Provider (i.e. hospitals)	13	25.5%	13	37.1%
Private practice/ Small business	9	17.6%	9	25.7%
Education sector	7	13.7%	7	20.0%
Currently a PhD student	7	13.7%	7	20.0%
<b>Experience (Years)</b>				
5 - 9 years	13	38.2%	13	37.1%
10 - 11 years	9	20.6%	8	22.9%
12 - 13 years	4	11.8%	4	11.4%
14 - 15 years	6	14.7%	6	17.1%
>15 years	5	14.7%	4	11.4%

**Table 2:** Play-based intervention principles

\*IQR – Inter Quartile Ranking

Aspects to be considered in play-based intervention program	Round 1			Round 2		
	Median	IQ R*	Percentage Agreement	Median	IQ R	Percentage Agreement
Advocacy for more play opportunities	1	0.25	96.2%			
Increase social interaction	2	1	84.8%			
Cultural sensitive practice about play	1	1.50	84.4%			
Awareness campaigns (information dissemination on play)	2	1	81.8%			
Building resilience	1	1	81.8%			
Caregiver involvement	2	1	81.3%			
Should target Physical play skills	1	1	79.4%			
Awareness campaigns (dispelling myths around HIV/Aids)	1	1	75.8%			
Peer involvement	2	2	72.7%			
Psychosocial education	2	2	71.9%			
Should target Social play skills	1	2	70.6%			
Provision of food	2	2	66.7%	1	1	88.2%
Compliance to medication	2	1	57.6%	1	1	88.2%
Video modelling	3	2	33.3%	1	1.25	76.5%

**Table 3:** Play-based intervention techniques to best address deficits on items based on elements of playfulness

Elements of playfulness	Items on Test of playfulness	Caregiver Education	Therapist Modelling	Peer Modelling	Video Modelling	Decentering	Giving play things	Safe Environment	Allow child to choose	Allow child to succeed	other
Internal Control	Extent of deciding what to do	73.5%	64.7%	82.4%	50.0%	55.9%	44.1%	67.6%	73.5%	38.2%	Giving rewards after participation
	Skill of modifying task requirements	64.7%	76.5%	79.4%	58.8%	47.1%	44.1%	70.6%	55.9%	44.2%	Invest time in developing relationships with the child and caregivers giving verbal cues or physical guidance, e.g. hand over hand technique
	Skill of interacting with objects	70.6%	79.4%	67.6%	55.9%	55.9%	41.2%	64.7%	50.0%	26.5%	Players should not be hungry or tired (from physical activity prior to this activity)
	Skill of negotiating needs	61.8%	76.5%	85.3%	58.8%	41.2%	29.4%	61.8%	29.4%	14.7%	
	Skill of playing with others	55.9%	82.4%	91.2%	58.8%	52.9%	35.3%	70.6%	35.3%	26.5%	
	Skill of sharing ideas and objects	67.6%	73.5%	85.3%	67.6%	41.2%	41.2%	64.7%	38.2%	23.5%	
Freedom to suspend reality	Extent of pretending	64.7%	70.6%	70.6%	47.1%	44.1%	50.0%	55.9%	47.1%	20.6%	Allow child to individually participate and solve given tasks
	Skill of pretending	70.6%	70.6%	79.4%	64.7%	38.2%	35.3%	47.1%	32.4%	26.5%	
	Extent of using people/objects unconventionally	61.8%	70.6%	61.8%	55.9%	47.1%	38.2%	50.0%	41.2%	14.7%	
	Skill of using people/objects unconventionally	58.8%	73.5%	67.6%	52.9%	44.1%	35.3%	47.1%	44.1%	14.7%	
Intrinsic Motivation	Intensity of persistence	50.0%	64.7%	64.7%	44.1%	32.4%	35.3%	58.8%	44.1%	35.3%	Coaching Grading activity from simple to more complex
Framing	Skill of giving cues	67.6%	79.4%	67.6%	55.9%	35.3%	29.4%	52.9%	29.4%	14.7%	
	Skill of responding to Cues	61.8%	73.5%	73.5%	55.9%	32.4%	14.7%	50.0%	20.6%	11.8%	
	Skill of being engaged	55.9%	64.7%	70.6%	61.8%	35.3%	38.2%	61.8%	47.1%	29.4%	

**Comments:** Therapist and peer modelling has been reported as the most common techniques used to address play deficits identified by Test of playfulness items.

**Table 4:** Topics to be included in the pre-intervention learning

Topic	Median	IQR	Percentage Agreement
Play in children – characteristics of play, play things and toys, benefits of play, positive outcomes, and long-term implications	1	1	97%
HIV/Aids – characteristics, misunderstandings and myths, common challenges in play	1	1	90.9%
Ways/approaches to promote play children with HIV/Aids	1	1	87.9%
Importance of building positive relationships between home, clinic and school in ways that foster collaborative partnerships	1	1	87.9%
Play programs and strategies to assist in individualising play programs to the needs of individual children with HIV/Aids	2	1.5	75.8%
Implementation of the play-based intervention – (i.e., how to incorporate into existing play routine, practicing intervention principles, troubleshooting potential challenges	1	1	81.8%