

# Affordance-based Approach with Loose Play Items for Children's Restoration in Nigerian Paediatric Settings

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**Abstract:** Studies on children's hospital play in both indoor and outdoor settings have indicated relative degrees of psychological support for children's health restoration process. This Paediatric-centered action research with children in ambulatory and non-ambulatory care employs an affordance-based approach with loose play items, termed features-user affordance, to enhance hospitalized children's restoration. The objective of this study is to ascertain the value of Paediatric play using loose items in a Nigerian hospital context. The benefits are measured in terms of children's behaviours such as movement and interaction with their peers and caregivers, as a result of the treatment they have received in the ward as a play setting. Twelve children, aged 3-7 years, from the Paediatric ward of Abubakar Tafawa Balewa University Teaching Hospital in Bauchi, were selected to receive treatment in a ward cubicle designed with loose play items. Their behavioural responses were elicited by the researcher using video recording of their actions and behaviours. This was followed by structured interviews with caregivers comprising six physicians and nine nurses. The data was analysed using descriptive content analysis. It was found that play using loose items increased movement, engaged and sustained social interaction and verbal conversations. Responses from caregivers indicated changes in children's behaviour in terms of child management and cooperation. The study suggests that loose play items as intervention measures provide a complementary approach for supporting hospitalized children's functioning in Paediatric ward settings.

**Keywords:** Children's Play, Ward Cubicle, Healing Process, Loose Play Items

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## 1. Introduction

Hospitalized children seem more introverted and quiet than their non-hospitalized peers, with signs of regressive behaviour, unhappiness and sadness [1, 2]. Aside from being ill, children face the challenges of separation from familiar settings like their homes [3]. The fear of medical procedures and uncertain treatment also contribute to such regressive behaviour [4, 5]. Furthermore, hospitalization is associated with negative feelings which in combination with protocols that often result in stress, thus, reduce children's functioning such that they feel helpless and are often restless, with excessive crying and gloomy moods [6]. Such conditions are common in Nigerian Paediatric hospital wards. In addition to the ward conditions, the design features and the healthcare management focus only on the pathogenic approach to medical treatment [7]. Less emphasis is given to children's

psychological and emotional responses or to relieving their stress [8]. Thus, children's psychosocial and emotional wellbeing are given less consideration [9, 10]. The psychological effect of stress can negatively influence patients' healing abilities and restoration process [11]. Stress is appraised as a relationship between a person and his setting that is perceived to be more demanding such that the demand may exceed the bearing capacity of the person [12].

This study uses the concept of affordance with loose play items to enhance children's restoration in Nigerian hospital ward settings. Affordance, a concept from perceptual psychology, is being adapted and applied to the field of architectural design and practice. The affordance of a setting, as stated by Gibson, is what the environment affords the occupants either for good or ill [13]. Affordance in relation to the architectural field is more tailored towards building designs affording shelter to occupants from outdoor conditions, affording aesthetic benefits to passer-by and occupants, affording storage facilities and so forth [14].

Building components such as windows afford lighting and illumination, as viewed from both inside and outside positions. Likewise, floors afford to carry the live load of occupants and the dead load of furniture and other finishing materials [11]. Affordances are fundamental to the architectural design of buildings and their functioning, and basically to enable us to understand the ties between the building's envelope and occupants' behaviour in relation to the forms and functions [14]. Previous studies have applied the concept of affordance to architectural design and practice, for example, to ascertain architectural space through the techniques of affordance mapping and building elements such as door handles and their affordance to end users [15-17, 13]. Similarly, Kim states that task performance in particular settings is influenced by how the user perceives the affordance of the related environment [18]. For example, a building lobby might affect the feelings of the different end users. The aforementioned studies focus on technical aspect of architectural design affordance that relate to adult settings, while this study focuses on practical perceptual aspects and utilizes the concept of affordance using features of loose play items in relation to children. The approach influences the architectural design process by affording the building occupants items that are familiar, such as play items for children. Children's needs and demands that are compatible, functional and useable within the building space are termed 'features-user affordance'.

While on the ward receiving treatment in line with medical norms and protocols, the children are allowed to interact and play with loose items introduced into the ward settings. The loose play items mean moveable materials that children can use in their play, they can be bought materials, recycled or naturally found such as sand, stones, and pebbles, anything can be loose play items provided it can provide children that desire to interact, play and develop their functioning. This creates a complementary rapport between the play features and the children, which reflects the formulation of an affordance of an environment to the animal situated in it [19]. Therefore, the features in the hospital ward setting can be viewed as part of the architectural design, that is, the loose play items, and the 'typical animals' as the children that interact with these features. As such, the children have the opportunity for situated freedom and actions that will afford them more functional and progressive behaviours [20]. Certainly, when playing with loose items in a setting like a hospital ward, children can sustain their interest and attention to reduce their fear and stress [21]. An affordance indicates a potential for behaviour due to the features of the loose play items, such as size, shape, weight, colour or the child's regained strength, age or gender, which are not in themselves affordances [13]. This further allows the children to explore and adapt to their immediate unfamiliar environment, such as hospital wards [22, 16]. It also encourages them to control and contain their emotions in relation to different medical procedures [23]. Play is a supporting tool in reducing children's frustration, anger, tension and anxiety. It also enhances their communication with medical personnel, caregivers and peers. Thus, play assists hospitalized children

in coping with routine hospital norms and protocols [24, 25]. In general, the features of loose play items have shown to afford children adequate quality play and creative skills [26] with the extensive variety needed to initiate sustainable play behaviour, thus enhancing children's functioning [27].

Studies on hospitalized children in Paediatric nursing suggest that play should be part of children's healthcare delivery [28]. They further conclude that play should be an integral part of children's healthcare management, as it can enhance their physical, social and cognitive functioning [24]. Therefore, it is important to create a hospital setting that can support and allow children to play and socialize. This study uses loose play items in the children's ward to support the healing process of early and middle childhood patients. The loose items are from the category of 'loose parts' coined by Nicholson, as play materials with physical properties, features and attributes that can be moved, carried, combined, reshaped, lined up, and taken apart and put back together in several ways [25]. This enhances children's activities and their developmental needs [29]. This was affirmed by Ihn, as routine play materials can be combined to afford children plenty of play affordance, such as water and sand in a sandbox [30]. The objective of this study is to determine the effect of using loose items in supporting the functioning and restoration process of hospitalized children. Restoration, as described by previous studies, which implies the person's resumption of normal functioning, involving the expansion of consciousness leading to the understanding of one's present conditions [31]. Similarly, in disciplines like Paediatric psychology, environmental psychology and Paediatric nursing, restoration involves the gradual shift in patients' physical, cognitive and social functioning [32]. For example, before restoration, children obviously demonstrate signs of regressive behaviour, such as crying, clinging to their parents, and being quiet in their beds. As such, the research aims to reveal whether the loose play items can be a mechanism for enhancing children's physical, social and cognitive functioning, being guided by the following questions:

1. How can loose play items influence children's behaviour in the ward as a play setting?
2. What behaviour would children demonstrate after interacting with the loose play items?

In order to find answers to these questions, the research concentrated on children's behaviour and explored their relations with the features of the loose play items. In sum, studies on children's play behaviour in a hospital setting gave the general view that the provision of a variety of play items with many play features influences the intensity of activities and the duration of play engagement. The ward setting should be created as a play setting that will support children's physical, social and cognitive functioning.

## 2. Methods and Materials

### 2.1. Procedure

Data were elicited through video recording of children's activities in a setting with loose play items, and interviews were

conducted with caregivers on identifying the shift in their children's functioning. Codes and categories were assigned to describe the activities of the children, including physical activities, social interaction and cognitive responses. The observation took place with twelve children in a ward cubicle at Abubakar Tafawa Balewa University teaching Hospital Bauchi. The children were between the ages of 3 and 7 years old and had been admitted to recover from illnesses such as malaria, typhoid and fever. Patients who were not fully conscious and those suffering from chronic diseases were not allowed to participate. The caregivers involved in the study were contacted by the head matron of the ward for their consent to participate. As for the children, approval was obtained from the hospital ethical and research committee and from the parents who consented to allow their children to participate.

In preparing the setting, the two cubicles for the experiment are of the same size having (5.8 m x 4.8 m) as all other cubicles in the ward. Each cubicle had six beds, with a cabinet and chair for each bed, which is the common arrangement in most public hospital wards, but for the purpose of this study, the number of beds in the experimental cubicle was reduced to three. This was to create the space needed for movement, play and the play items. In addition, the following items and changes were affected in the controlled cubicle for the study: initially there was no floor cover on the sand screed finishing, so the whole floor area was carpeted with leather carpet as part of the procedure. Figure 1 shows the play items that were introduced to turn the cubicle into a play setting.



**Figure 1.** Loose play items placed in a children's ward setting for children to play.



**Figure 2.** Loose play items placed in a sandbox for children to play.

To make the setting more hygienic and to make it easier for cleaning and to allow the children to play without dirtying their clothes, the ethical committee allowed the use of synthetic grass carpet on 50% of the floor area in the ward cubicle to make the floor space more habitable. The conventional hospital bedding was replaced with more colourful sets featuring cartoon patterns. Furthermore, conventional learning signs were put on the walls and the floor of the study cubicles. Finally, loose items such as a sandbox and water containers with other manipulative play items sourced locally such as stones of different sizes and shapes, shells, and wooden logs and building blocks, were placed into the study cubicle. Then a staff member was assigned to monitor and take care of the play items, including washing solid items, changing the play water and cleaning the study site.

## 2.2. Observation

Observing and eliciting children's responses on their behaviour and play activities were conducted for fourteen days from 8 o'clock in the morning to 12 o'clock midnight. A digital video recorder stored information at intervals of 15 minutes both on work days and at the weekend. Observation and data recording were conducted by a research assistant who starts the hidden digital camera clock in the morning. The children were not aware that their activities and behaviour were being recorded; this was to avoid situations where they would change their behaviour. When the observation commenced at the beginning of the day, the researcher sat in the ward, pretending to be working with nurses, recording the children's behaviours for four hours and noting the pattern of their play and activities with the loose play items and observing the children's interaction, functioning and level of engagement with the play items. At the end of each observation, the working notes identifying activities were compiled for analysis and triangulated with the responses from the video recordings.

## 3. Analysis of Data

Data from the video recordings and caregivers' responses were analyzed using content analysis. These were to note the child's level of engagement of with the loose play items and their ability to engage with peers and siblings over the period of the research. The children's behaviour was categorized according to similar functioning physiognomies as affordances, this is because the appraisal of restoration refers to ways children perceived the features and attributes which they exploit and shape into different play items. It is their interaction with the features of the physical setting that structures their conception and perception of shaping potential affordances in their setting. Children play in setting with features that afforded them potential affordances explains children setting preferences which fulfils their needs and influences their behaviours such as physical, social and cognitive (Table 1) shows thirty affordances from the different categories of play items introduced as loose play

items in the ward.

**Table 1.** Content analysis of the results and findings on children's actions and behaviour in the ward.

Play items introduced	Result	Affordances	Inferences	Emerging Themes	Categories
Sandbox with sand, water and miniature play items	Jumping, Crawling, Dumping, Digging, Hipping, Mixing, Moulding, Supporting weaker ones, Sieving, Being noisy, and Rolling on the sandy surface. Play period (3-4) hours every day to child's discharge	Jump-able-to, climb-able-to, mix-able-to, pour-able-to, sieve-able-to, mould-able-to, walk-able-to, feel-able-to, dump-able-to, concentrate-able-to (n=9)	Regaining movement skills, increasing movement skills, regaining control, increase in coordination, active in play.	Provides children and peers with space for empowerment and choices	More Physical functioning
Wooden and plastic building block	Coupling, Passing play items, Playing with another patient, Playing with siblings, Sharing play items, Hiding play items, Taking turns, quarrelling over play items. Play period (4-5) hours every day to child's discharge	Lift-able-to, fix-able-to, loose-able-to, move-able-to, build-able-to, push-able-to, roll-able-to (n=7)	Interacting with peers, communicating, conversing, group participation, acquaintanceship	Provide space for positive outcomes of medicine and play interactions	More social functioning
Stones and shells of different colours with writing and learning materials.	Grasping play items, moving play items around, Passing play items, Moving from one play end to another to write or draw, quarrelling over play items. Play period (2-3) hours every day to child's discharge	Grasp-able-to, throw-able-to, play game-able-to, sort-able-to, count-able-to, hide-able-to, focus-able-to, attention-able-to sharp-able-to, drum-able-to, break-able-to, erase-able-to, stroke-able-to, and yield-able-to. (n=14)	Being cheerful, being more relaxed, calm, being less worried, feeling less pain, being cooperative, sleeping well	Provide space for children to develop the capacity to revive	More cognitive functioning

## 4. Findings

Change through affordance and adaption

The setting for hospitalization is challenging to children, as they are being confronted with setting that does not match their needs and demands alongside medical norms and medical protocols in addition to their illness. Nevertheless, a well-adapted restorative setting with loose play item as well as social interaction with peers gave the children a comfortable feeling to express their inner self. This involves jumping even when there is provision for them to step in or out of the sandbox. Their jumping in and out of the sandbox further afforded the hospitalized children affordances depicting increased physical activities such as moving, sitting, crawling, and playing; meaning an unfamiliar but comfortable environment. They liked the sandbox play and appreciated the mixing of sand and water which further afforded the children physical activities such as dumping sand, digging sand, pouring sand, and so forth. This suggests that the hospitalized children were enjoying the freedom to engage and interact with peers and siblings. The relationship between the play elements and the children allows for affordance to exist. For example, affording a sand walk in a sandbox is a kind of interaction, while the experiencing of a scrunching tactile sensation by the child is another kind of interaction. The two interactions are related because the sandbox first affords walking and subsequently the scrunching tactile sensation. This means that the activities increase their movement; the finding suggests that the ward with loose play items features affordances kept the children out of their hospital beds which signify restoration.

Furthermore, the wooden and plastic building blocks, stones of different colours with writing and scribbling

materials were found to be excellent for enhancing hospitalized children physical, social and cognitive functioning. Playing with the wooden and plastic blocks provided the children with an excellent opportunity for physical, social and creative development. The wooden and plastic building blocks afforded the children activities that indicated positive behaviour. The features of the blocks comprised their texture and shapes, such as square, cylindrical, triangular, rectangular, and circular. Additionally, they had a smooth surface, and could be rolled or stacked. The routine aspect of coupling, dismantling and rearrangement of the wood and plastic blocks afforded the children seven affordances that included fix-able-to, lift-able-to, loose-able-to and move-able-to. As a result, they afforded children to experience fixing, loosening, lifting and moving. Such play activities allow children to come together and interact [33].

The coloured stones with writing and learning materials provided children with spontaneous play, enhancing all aspects of child development. The stones had properties such as smooth surface and oval shape with attributes like nice to hold, nice to rub, good to throw. They provided the children with affordances such as grasp-able-to, throw-able-to, bury-able-to, and play-game-able-to. This type of physical functioning implies that the children are involving in more physical relationships with their peers and siblings. It also suggests that the children are improving their physical functioning and relationships day by day as they interact with each other and with the loose play items [34]. The drawing and writing materials, such as paper, pencils, coloured pencils, crayons, and markers, afforded the children two activities, namely drawing and writing. The properties and attributes of the writing and drawing paper, such as surface texture, smoothness and patterns, motivated the children to

strike lines and write. The structure, consisting of the paper size or area, shape, thickness and weight, allowed the children to place it in any position they wanted. Its physical appearance, such as colour, glossy and reflective, also motivated the children to engage in play. This afforded the children four affordances, such as write-able-to, draw-able-to, fold-able-to, rolled-able-to, cut-able-to, glue-able-to, and beauty.

This meant that the children were experiencing interactions with peers and siblings, which motivated their creative activities, meaning an increase in their social functioning. Thus, this play behaviour improves their motoric development and physical activities [35]. The features and attributes of these play items permitted the children to move and play in ways of their own choosing. On the other hand, the building blocks supported the previous findings that the children's physical, social and cognitive functioning was motivated by the functional properties of the loose play items. From the perspective of restoration, experiencing their preferred play items influences children's emotional status: thus, the play setting provide satisfaction and reduction of stress which further signify restoration [36].

## 5. Discussion

The results suggest that the children viewed the ward as a play setting that afforded them play with loose play items. According to study in preventive medicine on stress reduction in children's hospital room by Eyre *et al.*, unsupportive physical settings that lacks play properties and attributes deprived children of opportunities for movement (sitting quite in bed) [18]. On the other hand, studies on children play in hospital in paediatrics and child health by Jun-Tai stated that play to hospitalized children provided relief and encouragement in frightening and unfamiliar setting [22]. It allows a child to master skills and improve on his imagination even during illness and hospitalization. As the hospital ward consists of loose play properties and attributes, it motivates children and excited them to engage in an activity and play [37]. Therefore, the loose play items afforded the hospitalized children's various activities that enabled peer engagement in situated freedom and action. The actions are the children play involving motorized movement, lifting, pushing and throwing play items together with their peers [38]. This was demonstrated in their behaviours when playing with the loose items placed in the ward. The children perceived and recognized the familiarity of the play items provided and the various forms of play they afforded them. They perceived the positive affordances of the play setting and blended them with the provisions that matched their needs and demands. In this research, the ward irrespective of the medical protocols and hospital routines afforded the children play. The engagement in continued play in this study is an indication that the more play behaviour as a result of unstructured play time of 2-4 hours and the provision of items with plenty plays features. Contrast to the ward cubicle as a setting without play affordances, the children perceived

the ward cubicle as play settings that afforded those ample positive affordances with a few negative ones such as issues that relates to hospital design, norms and medications. It confirms that children social play and interaction with items that has endless manipulative features were vital components in hospitalized children restoration, from being restless to being becoming active in play, from bored to interacting with peers, communicating, conversing and participating in group play and from being sad to being cheerful, calm and relaxed. In addition, the result supported the notion that loose play items in the ward space afforded more play coordination such as sieving, mixing, moulding, in addition to active play such as jumping and climbing, over other play provisions such as toys, teddy and dolls in a play room. Relative to other intervention strategies employed to implore restoring to hospitalized children, such as hospital clowns, the loose play item in a space afforded continuous and uninterrupted fascination such as sand play, stimulation such scrunching sensation and play pleasure for restoration [5].

## 6. Conclusion

This research suggests that a children hospital ward with loose play items is suitable for child's hospitalization towards restoration. That is, the design and arrangement of children hospital ward setting should be created as a ward that will give children a place of their own: a setting with evidence for actions, freedom and exploration, which reflects children's ideas, ideals, attitudes and their culture. The children's behaviour after experiencing the hospital ward as a play setting showed their willingness to play more and interact with the selected loose play terms. This was because the children no longer viewed the ward as a place for their medical treatment, but rather as a play setting for interaction and socialization. Future research can also test the model of the children's everyday functioning in a setting considering all the four aspects of the setting characteristic in determining the level of child functioning and stress reduction.

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