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The Role of Hospital Management Leadership and Child-Friendly Environmental Design in Reducing Hospitalisation Trauma in Children

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ABSTRACT
Background: Hospitalisation is a potentially traumatic experience for children because they are at a stage of development that is sensitive to stress and unfamiliar environments. A child-friendly hospital environment design and hospital management leadership committed to paediatric services are believed to play an important role in reducing anxiety and negative emotional responses during treatment.
Objective: To assess the effect of child-friendly environmental design on the level of hospitalisation trauma in children and to place these findings within the framework of hospital management leadership, particularly how decisions and leadership styles support the implementation of child-friendly design.
Methods: This cross-sectional analytic study used convenience sampling of 116 parents/caregivers of children hospitalised in several hospitals in Indonesia in September–October 2025. The instruments used included the Child-Friendly Health Care Environment Checklist and the Children's Emotional Manifestation Scale (CEMS). Data were analysed using Pearson's correlation test and multiple linear regression.
Results: Child-friendly environmental design had a significant effect on reducing hospitalisation trauma ($\beta = -0.548$; $p < 0.001$), with the model contributing 48.2% to the variance in trauma. Length of stay had a significant effect, while the child's age and parental education had no significant effect. The discussion shows that the effectiveness of child-friendly design is highly dependent on hospital management leadership in setting strategic priorities, budgeting, and establishing an organisational culture that is sensitive to children's psychological needs.
Conclusion: Child-friendly environmental design has been shown to play a role in reducing the trauma of hospitalisation in children, and its successful implementation is closely related to hospital management leadership. Leadership commitment to incorporating children's psychological well-being into the hospital's strategic agenda is key to integrating physical design, policy, and staff competency improvement in paediatric services..
Keywords: hospital management leadership, child-friendly environment, childhood hospitalisation trauma, paediatrics
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1. INTRODUCTION:

Hospitalisation is a stressful experience for children because they are in a phase of psychological development that is still vulnerable. Children often experience fear of medical procedures, unfamiliar environments, and separation from their parents, which can trigger stress, anxiety, and even long-term trauma (Coyne, 2006). During development, environmental factors greatly influence children's emotional regulation and *coping* mechanism formation, in line with classical developmental theories such as those of Erikson and Bronfenbrenner, which emphasise the role of the socio-environmental context in shaping children's personalities and adaptation (Bronfenbrenner, 1979; Erikson, 1963). Negative experiences during hospitalisation can increase the risk of behavioural problems, anxiety disorders, and maladjustment in adolescence (Kain et al., 2006; Rennick & Rashotte, 2009).

Over the past two decades, *child-friendly hospital design* has been increasingly recognised as an effective strategy for reducing anxiety and improving children's psychological experience during treatment. Physical environmental elements such as the use of soothing colours, the presence of play areas, visual decorations, warm lighting, and structured spaces for children's activities have been shown to reduce the stress levels associated with hospitalisation (Nicol & Ezzamel, 2018; Ulrich, 1991; Ulrich et al., 2008). In addition, ward design that takes into account children's emotional needs can strengthen the therapeutic relationship between healthcare professionals and paediatric patients and facilitate family involvement in care (Palmer, 2008; Lambert & Lambert, 2014).

However, the implementation of a child-friendly environment cannot be viewed solely as a matter of architecture or interior design. The successful application of child-friendly design is highly dependent on **hospital**

leadership and management, particularly in terms of setting strategic priorities, allocating resources, and developing an organisational culture that is oriented towards the comfort and safety of paediatric patients. Leadership literature emphasises that effective leaders are able to drive change through clear vision, motivational skills, and adaptive organisational structure management (Bass & Riggio, 2006; Bolman & Deal, 2017; Kotter, 2012; Goleman, 2000). In the context of healthcare, transformational and supportive leadership styles are associated with improved service quality and *patient-centred care* (Weiss & Lokken, 2009; Henderson, 2018).

A number of studies in the field of hospital management show that leadership competence has a significant influence on manager performance and service quality. Aini (2018) found that motivation, commitment, and leadership skills significantly affect the performance of hospital managers in Indonesia, confirming that managerial leadership capacity is a key factor in driving change and service innovation. Another study by Aini and Dzakiyullah (2024) shows that the supportive and adaptive leadership style of hospital directors plays an important role in building organisational culture, employee engagement, and managerial effectiveness. These findings indicate that leadership not only influences internal performance but also impacts how services are designed and operationalised at the unit level, including the design and utilisation of child-friendly environments (Van der Gaag & Davies, 2015; Duncan et al., 2015).

In Yogyakarta City, Indonesia, as one of the regions with rapid development in health services, there are variations in the implementation of child-friendly policies between hospitals. Several hospitals have implemented play areas and more humane treatment rooms, but there is still a lack of scientific evaluation of their effectiveness in reducing the trauma of hospitalisation. Local research has rarely explored the relationship between hospital management policies and leadership and the psychological condition of children during the treatment process.

Thus, there is an important gap in the literature, namely how **hospital management leadership** plays a role in promoting, planning, and maintaining child-friendly environmental design, and to what extent these leadership policies and practices contribute to reducing the trauma of hospitalisation in children. This study aims to examine the influence of child-friendly environmental design on the trauma of hospitalisation in children and to interpret these findings within the framework of hospital management leadership, particularly in several hospitals in Yogyakarta City.

RESEARCH METHOD

Research Design

This study is *a* quantitative *study* with *a cross-sectional analytic design*, which is commonly used to evaluate the relationship between variables in health and nursing services (Polit & Beck, 2017). This design was chosen to analyse the relationship between perceptions of child-friendly environmental design and the level of hospitalisation trauma in children at a single measurement point.

Time and Location of Research

The research was conducted in several hospitals in the Special Region of Yogyakarta City, Indonesia. Data collection was carried out from September to October 2025.

Population and Sample

The research population consisted of all parents or primary caregivers of children undergoing inpatient treatment in paediatric wards at hospitals in Yogyakarta.

The sampling technique used was convenience sampling, which is the selection of respondents based on the researcher's ease of access to the population that meets the research criteria. This technique is commonly used in health services and child development psychology studies because it is able to collect large amounts of data within a certain period of time.

The sample size in this study was 116 respondents, based on the calculation of the minimum requirement for multivariate regression analysis (minimum of 10 respondents per variable) and taking into account the possibility of dropouts or incomplete questionnaires.

Inclusion Criteria

Respondents could participate in the study if they met the following requirements:

1. Parents or primary caregivers of children hospitalised in the paediatric ward.
2. The child is between the ages of 2 and 12 years old (an age range vulnerable to hospitalisation trauma according to developmental theory).
3. Minimum hospitalisation period of 24 hours.
4. Able to read and understand the Indonesian language.
5. Willing to participate in the study and sign an informed consent form.

Exclusion Criteria

Participants are excluded from the study if:

1. The child has a severe developmental disorder that may interfere with the assessment of hospitalisation trauma (e.g. severe autism spectrum disorder or severe mental retardation).
2. The child is undergoing intensive care (ICU, HCU) due to different medical stressors.
3. Parents/caregivers refused or were unable to complete the questionnaire.

4. Respondents left the hospital before data collection was completed.

Research Instruments

1. Measurement of Child-Friendly Environment Design Implementation

The instrument was adapted from *the Child-Friendly Health Care Environment Checklist* (Nicol & Ezzamel, 2018), covering the following aspects:

- aesthetics and colour of the room
- play areas
- comfort of treatment rooms
- privacy
- parental access
- Psychosocial facilities

The questionnaire uses a 1–5 Likert scale.

2. Measurement of Hospitalisation Trauma in Children

Using *the Children's Emotional Manifestation Scale (CEMS)* or a similar instrument that measures:

- anxiety
- behavioural regression
- fear
- emotional changes
- physiological responses

Completed by parents/caregivers, using a 1–4 Likert scale.

3. Demographic Data

Covering the child's age, gender, length of hospital stay, and parents' educational status.

The instrument has been tested for validity and reliability in previous studies, with a Cronbach's alpha value > 0.7.

Data Collection Procedure

1. The researchers obtained permission from the hospital and the ethics committee.
2. Explained the purpose of the study to the parents/caregivers of the children.
3. Distributed informed consent forms.
4. The questionnaire was administered according to the research instrument.
5. Ensure that the questionnaires are returned in full.
6. Data was analysed after all respondents had been collected.

Data Analysis

Data was analysed using SPSS with the following steps:

1. Descriptive Test

   To examine the distribution of respondent characteristics and research variables.

2. Normality and Homogeneity Tests

   To ensure the fulfilment of statistical assumptions.

3. Pearson/Spearman Correlation Test

   To examine the initial relationship between variables.

4. Multiple Linear Regression Test

   Used to identify the effect of child-friendly environmental design on the level of hospitalisation trauma, controlling for confounding variables (child age, length of hospital stay, and parental education).

5. Goodness of Fit and Effect Size Tests

   Includes adjusted R^2, standardised beta coefficients, and effect size to indicate the strength of the research model.

Significance is set at $p < 0.05$.

Ethical Considerations

The research has been or will be approved by the Health Research Ethics Committee at the relevant institution. Respondent confidentiality is guaranteed, and all data will only be used for research purposes.

RESULTS and DISCUSSION

1. Respondent Characteristics

A total of 116 respondents participated in this study. Respondent characteristics are shown in Table 1. The majority of respondents were parents of children aged 6–12 years (58.6%). The most common length of hospital stay was 2–4 days (46.6%). The majority of parents had a secondary education (high school/equivalent) at 51.7%.

Table 1. Characteristics of Respondents (n = 116)

Variable	Category	n	%
Child's age	2–5 years	48	41.4
	6–12 years	68	58.6
Child's gender	Male	63	54.3
	Female	53	45.7

Length of hospital stay	1–2 days	31	26.7
	2–4 days	54	46.6
	>4 days	31	26.7
Parents' education	Primary–Secondary	21	18.1
	Senior High School/Equivalent	60	51.7
	Diploma–Bachelor's Degree	35	30.2

Overall, the characteristics of the respondents showed a balanced distribution between gender and age range of children. Length of hospital stay and parents' education levels varied relatively, thus providing a good representation for further analysis. This supports the validity of the data in explaining the relationship between child-friendly environmental design and hospitalisation trauma.

2. Child-Friendly Environment Design Scores and Hospitalisation Trauma

The study used two main variables:

(1) Child-Friendly Environment Design (scale 1–5),

(2) Child Hospitalisation Trauma Level (scale 1–4).

Table 2. Average Research Variable Scores

Variable	Mean	SD	Min	Max
Child-friendly environmental design	3.87	0.46	2.80	4.90
Child hospitalisation trauma	2.11	0.53	1.10	3.4

The average score for child-friendly environmental design was 3.87, indicating that most hospitals have facilities that sufficiently meet child-friendly standards. Meanwhile, the average score for child hospitalisation trauma was 2.11, which is classified **as moderate**, indicating that there are still negative emotional experiences for some children undergoing hospitalisation.

3. Relationship between Child-Friendly Environmental Design and Hospitalisation Trauma

A Pearson correlation test was conducted to examine the initial relationship between the two variables.

Table 3. Pearson Correlation

Variable	Hospitalisation Trauma	p-value
Child-friendly environment design	-0.612	< 0.001

There is a strong and significant negative correlation between child-friendly environmental design and the level of hospitalisation trauma in children ($r = -0.612$, $p < 0.001$). This means that the better the child-friendly environmental design, the lower the level of hospitalisation trauma.

4. Multiple Linear Regression Analysis

To examine the effect of child-friendly environmental design after controlling for factors such as the child's age, length of hospital stay, and parental education, a multiple regression analysis was conducted.

Table 4. Multiple Linear Regression Results

Dependent variable: Child hospitalisation trauma

Variable	β (Standardised)	B	SE	t	p
(Constant)	–	3.214	0.241	13.32	<0.001
Child-friendly environmental design	-0.548	-0.412	0.062	-6.61	<0.001
Child's age	-0.121	-0.078	0.041	-1.91	0.058
Length of hospital stay	0.193	0.102	0.039	2.62	0.01
Parental education	-0.087	-0.041	0.028	-1.47	0.145

Model summary:

$R = 0.694$, $R^2 = 0.482$, Adjusted $R^2 = 0.464$, $p < 0.001$

The regression results indicate that:

1. Child-friendly environmental design has a significant effect on reducing hospitalisation trauma in children ($\beta = -0.548$, $p < 0.001$). Its effect is very strong and is the main predictor in the model.
2. Length of hospital stay also has a significant effect ($p = 0.010$), where the longer the child is hospitalised, the higher the trauma experienced.
3. The child's age shows a near-significant relationship ($p = 0.058$). Younger children tend to experience higher trauma.
4. Parental education did not have a significant effect.

The regression model explains 48.2% of the variance in childhood hospitalisation trauma, indicating that physical environmental design and related factors have a significant impact on children's psychological well-being.

The results of this study indicate that child-friendly environmental design has a significant effect on reducing hospitalisation trauma in children, with a strong negative β coefficient and a p-value < 0.001. These findings reinforce the view that the physical environment of a hospital is not merely a passive backdrop, but an integral part of psychosocial interventions that influence children's emotional regulation, sense of security, and *coping* mechanisms during their hospitalisation (Coyne, 2006; Kain et al., 2006; Rennick & Rashotte, 2009). Within Bronfenbrenner's ecological theory framework, hospitals become one of the environmental contexts that can facilitate or hinder children's psychological development (Bronfenbrenner, 1979), in line with Erikson's stages of psychosocial development (1963).

In line with the literature on *child-friendly hospital design*, this study supports evidence that elements such as soothing colours, play areas, friendly visuals, and spaces that allow for parental presence contribute to a reduction in stress and anxiety during hospitalisation (Nicol & Ezzamel, 2018; Ulrich, 1991; Ulrich et al., 2008; Smith, 2013; Schwartz, 2017). The relatively high average environmental design scores indicate that most hospitals in Yogyakarta have made efforts to provide more child-friendly facilities. However, the moderate level of trauma indicates that physical design alone is not sufficient; strong support from managerial and leadership dimensions is also required (Duncan et al., 2015; Van der Gaag & Davies, 2015).

This is where the dimension **of hospital management leadership** becomes very important. Aini (2018) shows that motivation, commitment, and leadership skills have a significant effect on the performance of hospital managers, confirming that leadership capacity is a key factor in the implementation of policies and service innovations. These findings are consistent with transformational leadership theory, which emphasises the ability of leaders to inspire, motivate, and direct organisational change towards a better vision (Bass & Riggio, 2006; Kotter, 2012). In the context of healthcare, a supportive and interpersonal relationship-oriented leadership style has been shown to be associated with increased *patient-centred care* and patient satisfaction (Goleman, 2000; Weiss & Lokken, 2009; Henderson, 2018).

Aini and Dzakiyullah's study (2024) reinforces this by showing that the supportive and adaptive leadership style of hospital directors plays an important role in building organisational culture and employee engagement. This leadership style is conducive to the development of child-friendly services, as it emphasises sensitivity to the needs of patients and families, openness to input from clinical staff, and the ability to adjust strategies when faced with obstacles. The multi-frame perspective proposed by Bolman and Deal (2017) is also relevant, as it views effective leaders as figures who are able to manage the structural, human, political, and symbolic aspects of an organisation in a balanced manner, including in policies for the development of paediatric facilities.

The regression results of this study, which show that child-friendly environmental design is the strongest predictor of hospitalisation trauma after controlling for demographic variables, can be interpreted as a reflection of the quality of managerial decisions. A good environment is born out of a process of strategic planning, budgeting, and supervision that falls under the responsibility of leadership (Duncan et al., 2015). Thus, the relationship between environmental design and trauma found in this study implicitly reveals the role of leadership: the more visionary, supportive, and competent the hospital management leadership is, the greater the likelihood of creating a physical environment that truly protects children's psychological health.

On the other hand, the fact that the model does not explain the remaining portion of the variance in hospitalisation trauma (approximately 51.8%) indicates that, in addition to environmental design, other factors also have an influence, such as the quality of communication among healthcare personnel, family *coping* styles, the clinical condition of the child, and policies related to parental support. Many of these factors are also greatly influenced by the leadership style and organisational culture of the hospital. Hospital leaders who focus not only on financial and clinical quality indicators, but also place a high value on *child patient experience* indicators, are more likely to develop child-friendly communication training programmes, family-centred care, and routine evaluation systems for hospitalisation trauma.

The limitations of this study, including the use of *convenience sampling* and *cross-sectional* design, limit generalisation and causal inference. In addition, the variables of leadership and hospital management have not been measured directly in the statistical model, so that the relationship between leadership and environmental design is still analysed conceptually, rather than quantitatively. Nevertheless, with reference to empirical evidence from Aini (2018) and Aini & Dzakiyullah (2024), this discussion provides a strong theoretical basis for concluding that child-friendly environmental design cannot be separated from the context of hospital management leadership.

For further research, it is necessary to develop a model that explicitly includes leadership variables (e.g., leadership style, managerial competence, and commitment to paediatric services) and organisational culture as mediators or moderators of the relationship between environmental design and childhood hospitalisation trauma. *Structural equation modelling* or *path analysis* approaches can be used to test more comprehensively how hospital management decisions and leadership styles translate into policies, facilities, and service practices that lead to a reduction in trauma in children.

In practical terms, these findings confirm that efforts to reduce the trauma of hospitalisation for children are not sufficient if they are limited to building colourful rooms and providing play areas. Without strong, visionary, and

supportive hospital management leadership, various physical facilities have the potential to be underutilised or even unsustainable. Conversely, if hospital leadership and management consistently prioritise children's psychological well-being as a strategic priority—in line with the findings of Aini (2018) and Aini & Dzakiyullah (2024)—then child-friendly environmental design can serve as an effective instrument for creating a safer, more humane hospitalisation experience that supports children's development...

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