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EFFECTIVENESS OF DEEP BREATHING RELAXATION ON ANXIETY DUE TO HOSPITALIZATION IN PRESCHOOL AGE CHILDREN

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ABSTRACT

Background: Hospitalization in preschool children causes them to lose control over their environment, resulting in psychological and physical distress, characterized by panic, phobia, obsessive, compulsive, and generalized anxiety disorders. **Objective**: This study aims to analyze the effectiveness of Deep Breathing Relaxation. on hospitalization anxiety. **Method:** This study is a quantitative study with a *quasi-experimental design of two groups pre* and *posttest.* The sample of this study was preschool children who underwent hospitalization as many as 32 children. This study used the *Preschool Anxiety Scale* (PAS) instrument which is of international standard with proven validity (r=0.68) and reliability (0.87). The bivariate data analysis used the *Wilcoxon test* for the intervention group, the *Paired T Test* for the control group, and *Man Whitney* test for comparison of intervention group with control, and *N-Gain test* to see the effectiveness of the intervention. **Result:** The results of the study showed that hospitalization anxiety in children before Deep Breathing Relaxation averaged 65.75 with the lowest score of 32 and the highest 79 (SD: 13.394). After the intervention, the children's anxiety score decreased, namely an average score of 53.69, the lowest score of 27 and the highest 66 (SD: 12.877). There was a significant difference between the intervention group and the control group with *a p value of* 0.038 (<0.05), but the N-Gain results showed that the intervention was in the ineffective category (N-Gain: 20.46%).

Key words : deep breathing relaxation, hospitalization anxiety, preschool children,

Background

Childhood is an important period for optimal growth and development (Dian, 2013) . During their growth, children may face illnesses that cause them to be hospitalized (Hidayati et al., 2021) . Hospitalization is a condition where a child must be hospitalized for various reasons such as disease examination, medical treatment operations, acute conditions, trauma, or chronic diseases that require surgical intervention (Saputro et al., 2017 ; Bintang et al., 2022) .

Hospitalization can provide an unpleasant, but painful and stressful experience that can have an impact on psychological and physical distress (Hadi et al., 2019) . This can be characterized by children panicking, phobic, obsessive, compulsive, generalized anxiety disorder (Saputro et al., 2017) , anxious, afraid, angry to less controlled (James et al., 2012) . Hospitalization in preschool children makes them lose control of their environment (Apriliyanto et al., 2021) . Children feel the loss of an environment that they feel is safe, loving, and fun (Bintang et al., 2022) .

The morbidity rate of children in Indonesia reaches more than 45% of the total number of children in Indonesia. This has resulted in an increase in hospitalization of children. In 2018, there was an increase in the number of hospitalizations of children by 13% compared to 2017 (Ministry of Health, 2018). A hospital environment that is unfamiliar to children will be one of the causes of stress in children which can have an impact on the treatment process (Nilifda et al., 2016) . Anxiety can result in a decrease in the effectiveness of the therapy given. Children will rebel and try to seek protection for themselves (Syakura et al., 2022) . This reaction will be an obstacle to the child's healing process. This problem shows that there is instability in the behavioral system so that nursing intervention is needed (Ghanbari, 2018) . Johnson explains that human behavior is a system that will be influenced by its subsystems, namely the environment and health problems. Another subsystem that will also influence human behavior is the purpose of the intervention carried out by nurses in order to restore patient stability (Alligood, 2017) .

Anxiety problems experienced by children during hospitalization can be handled with nursing actions, one of which is deep breathing relaxation. Based on research, it shows that diaphragmatic breathing "deep breathing relaxation" and progressive muscle relaxation can be used by children aged 4 years, while guided imagery exercises can be used by school-age children to manage stress related to procedures (DeMaso & Snell, 2013 ; Agbayani et al., 2020) .

This deep breathing relaxation is a nursing implementation method where nurses teach patients to breathe slowly (holding inspiration to the maximum) and how to exhale slowly, (Nursalam, 2017). Deep breathing is also known as diaphragmatic breathing, is a technique based on the integration of mind and body that produces relaxation. Relaxation techniques give individuals self-control when there is discomfort or pain, physical and emotional stress on pain, (Potter & Perry, 2010) . This technique is also useful for relaxing tense muscles, thus helping the body relax and providing a calming effect on the entire body, (Wulandari & Wahyuningsih, 2021) . The selection of this technique is a fairly effective strategy because this method is cost-effective, non-invasive, and has low risk of harm and can be delivered by service providers either directly, via video, or via audio recording, (Agbayani et al., 2020) . This exercise is a repetitive exercise that does not require additional materials after the child has learned and practiced the skills enough, (Huth et al., 2004; Agbayani et al., 2020) .

Given the importance of overcoming hospitalization anxiety in children, nurses need to provide interventions that are considered capable of overcoming anxiety in order to help achieve effective nursing care. Based on the previous description, this study aims to analyze the effectiveness of Deep Breathing Relaxation on hospitalization anxiety.

Method

This study uses a quantitative approach with a *Quasy Experiment Two Group Pre* and *Post Test design* . This study used a sample size of 16 children for the intervention group and 16 children for the control group (a total of 32 respondents) aged 4-6 years treated in the Baji Minasa treatment

room, Labuang Baji Hospital. The anxiety assessment was carried out before and after the intervention using the *Preschool Anxiety Scale* (PAS) questionnaire with a total item score of 0-112, (Buchanan & Hegarty, 2020). Each subscale of this PAS questionnaire has been tested for validity and has a significant correlation of 0.68 with the results of each SPAS subscale of general anxiety (r=0.60), social anxiety (r=0.57), separation anxiety (r=0.50), obsessive compulsive disorder/OCD (r=0.42), and fear of physical injury (r=0.43). Meanwhile, the PAS-Parent Reliability value is in the good range of 0.87, with Cronbach's ÿ for each subscale: general anxiety (0.63), social phobia (0.67), fear of physical injury (0.75), and separation anxiety (0.63) obsessive-compulsive disorder (0.567) , (Spence et al., 2001 ; Maharjan et al., 2022) .

Deep breathing relaxation therapy done in groups intervention by researchers directly. Deep breathing relaxation therapy is carried out in three sessions. Researchers teach children and families how to do deep breathing relaxation. The first session is carried out for 15-30 minutes. In the intervention group, education was previously given about children's anxiety and an explanation of coping mechanisms in dealing with anxiety such as telling stories and interacting with others. Furthermore, researchers teach deep breathing relaxation exercises to children accompanied by families with a frequency of three deep breathing exercises. After the first session ends, researchers will provide SOP for deep breathing relaxation therapy to families as a guideline to be repeated on children. The second session is carried out the next day as well as the first session.

Data analysis was performed using SPSS. First, a normality test was performed by looking at the *Skewness Ratio*. In the intervention group, the *Wilcoxon* test was used and in the control group, the *Paired T-Test* was used. The effectiveness test used the *N - Gain* test. This study has been assessed by the Fitkes Ethics Committee of Jenderal Acmad Yani University, Cimahi with the number 01/KEPK/FITKes-Unjani/III/2024.

Results

Respondent Characteristics

Table 1
Frequency Distribution of Characteristics of Children Undergoing Hospitalization at the Labuang Baji Regional Hospital in Makassar City

Characteristics of Children	Intervention		Control	
	n	%	n	%
Gender				
Man	10	65.5	8	50
Woman	6	37.5	8	50
Amount	**16**	**100**	**16**	**100**
Child Age				
≥ 4 Years (48-59 Months)	9	56.5	9	56.5
≥5 Years (60-71 Months)	5	31.3	4	25.2
≥6 Years (72-83 Months)	2	12.6	3	18.8
Amount	**16**	**100**	**16**	**100**
Treatment Duration				
Short (≤ 3 days)	14	87.5	13	81.3
Not Short (> 3 days)	2	12.5	3	18.8
Amount	**16**	**100**	**16**	**100**

Table 1 shows that based on gender in the intervention group, most were male, namely 10 children (65.5%), while in the control group the number of genders was the same between male and female. Based on the age of the child, it shows that in the intervention group and the control group, most were ≥4 years old (48-59 months), namely 9 children each (56.5%). Furthermore, based on the

length of care, most children in the intervention group had a short length of care, namely 14 children (87.5%), while the control group also had a short length of care, namely 13 children (81.3%).

Table 2
Distribution of Differences in Children's Anxiety Before and After Implementation Deep Breathing Relaxation Exercise in the Intervention Group

Intervention Group	N	Mean	Median	Min	Max	Standard Deviation
Before doing deep breathing relaxation exercises	16	65.75	70.50	32	79	13,394
After doing deep breathing relaxation exercises	16	53.69	58.00	27	66	12,877

Table 2 shows that the anxiety score of children in the intervention group before deep breathing relaxation exercises was an average of 65.75. The lowest score was 32 and the highest was 79 with a standard deviation value of 13.394. Meanwhile, after being given deep breathing relaxation exercises average score 53.69. The lowest value is 27 and the highest is 66 with a standard deviation value of 12.877.

Table 3
Differences in Children's Anxiety Before and After in the Control Group

Control Group	N	Mean	Median	Min	Max	Standard Deviation
Before	16	68.50	71.50	42	86	12,915
After	16	64.19	69.00	43	78	12,007

Table 3 shows that the anxiety scores of children in the control group before being given education average of 68.50. The lowest score is 42 and the highest is 86 with a standard deviation value of 12.915. While after being given education the average score is 64.19. The lowest value is 43 and the highest is 78 with a standard deviation value of 12.007.

Table 4
Deep Breathing Relaxation Application on Hospitalization Anxiety In Preschool Children at Labuang Baji Regional Hospital Makassar City

Child Anxiety	N	Mean	Min-Max	P- *value** <0.05
Before intervention	16	65.75	32-79	0.001
After Intervention	16	53.69	27-66	

* *Wilcoxon test*

Table 4 shows that the average anxiety score of children before the intervention was 65.75 and after the intervention there was a decrease in the score to 53.69. The decrease in the score illustrates that there was a decrease in anxiety in children who were hospitalized. The results of the Wilcoxon test obtained a value of 0.001 <0.05, which means that deep breathing relaxation exercises effectively reduce Hospitalization anxiety in preschool children at Labuang Baji Regional Hospital, Makassar City.

Table 5
Implementation of Education on Hospitalization Anxiety in Preschool Children at the Labuang Baji Regional Hospital in Makassar City

Child Anxiety	N	Mean	SD	IK 95%	p- *value** <0.05
Before education	16	68.50	12,915	2,340	0.001
After education	16	64.19	12,007	-6,285	

* *Paired T Test*

Table 5 shows that the average anxiety score of children before education was 68.50 and after education there was a decrease in the score to 64.19. The decrease in the score illustrates that there was a decrease in anxiety in children who underwent hospitalization. The results of the *Paired T Test* obtained a value of 0.001 <0.05, which means that education was also able to reduce the anxiety of children who underwent hospitalization at the Labuang Baji Hospital in Makassar City.

Table 6
Comparison of Children's Anxiety between Intervention Groups with Control Group

Group	N	Mean	SD	p-value <0.05*
Intervention	16	53.69	12,877	0.038
Control	16	64.19	12,077	

* *Man Whitney* Test

Table 6 shows that the average level of anxiety in children after deep breathing relaxation exercises was carried out of 53.69, while anxiety in children who were only given education was 64.19. The results of the *Man Whitney test* obtained a p value of 0.038, meaning that there was a significant difference between the intervention group and the control group.

Table 7
Effectiveness of Children's Anxiety between Intervention Group and Control Group

Group	N	N-Gain (%)
Intervention	16	20.46
Control	16	9.18

Table 7 shows that the results of the N-Gain test in the intervention group were 20.46%, while in the control group the N-Gain value was 9.18. These results indicate that the application of deep breathing relaxation exercises is good. and education falls into the category of not yet effective.

Discussion

1. Respondent characteristics

Based on the results of the study, it was found that the characteristics of children based on gender in the intervention group were mostly male. Tendency At the age of 2-5 years, anxiety is more common in boys than in girls. This result is in line with the research obtained by Sitorus et al., (2020) , which showed that the majority (68.4%) of boys who underwent hospitalization experienced moderate anxiety. However, other studies showed different results by Atawatun et al. (2021) , which found that more girls (67.4%) experienced anxiety than boys.

Characteristics based on age show that the intervention group and the control group are mostly ≥4 years old. At the preschool age stage, children will experience operational

development. which is identical to the desire to explore something that is not yet understood, so that preschool children's anxiety is related to everything that is foreign to them. The characteristics of preschool age are egocentric, namely children tend to see and understand things from their own perspective and interests, especially in needing attention (Khairi, 2018) .

Based on the length of treatment, most children in the intervention group had a short treatment period of ≤3 days. This shows that children who have just undergone treatment in the early days will experience anxiety. This could be due to the new environment for them. Other things make children feel stressed during hospitalization because children have to adapt to a new environment, experience pain during treatment and experience separation from their peers and other family members , (Atawatun et al., 2021) .

2. **Children's Anxiety Before Deep Breathing Relaxation Exercises**

The research results obtained showed anxiety scores for children in the intervention group before deep breathing relaxation exercises were carried out. average of 65.75 (32-79). A child when treated in hospital, will face a foreign environment, unfamiliar staff (doctors and nurses) and disruption to their lifestyle. They sometimes have to undergo unpleasant procedures and cause pain when injected, given infusions, and so on (Rafidani et al., 2020) . Anxiety in children, that children feel uncomfortable, restless, fussy, feelings of fear, which sometimes the problem is not known for sure, (Yusuf et al., 2015) .

Many factors can cause variations in anxiety in children undergoing hospitalization. As previously explained, anxiety can be felt by all genders, but anxiety tends to be higher in boys. The dependent nature that is quite possessed by boys makes them expect the full presence of their parents to accompany them when they have to be treated, (Beelmann & Lösel, 2021) . In addition, preschool-aged children are more likely to experience hospitalization stress because of their age, their cognitive abilities are still limited in understanding hospitalization.

3. **Children's Anxiety After Deep Breathing Relaxation Exercises**

The research results showed that after being given deep breathing relaxation exercises the average anxiety score in children was 53.69 (27-66), while in the control group it was found that after being given education the average score was 64.19 (43-78). The decrease in scores in each group is a form of the effect of each action given. The lower the score, the anxiety felt begins to decrease.

The results of this study are in line with previous studies which showed that the average (mean) level of anxiety of respondents before being given therapy was 56.23 and the mean after being given Jenga playing therapy was 38.53, (Tamara et al., 2023) . Relaxation exercises can be effective in increasing the state of relaxation both at the psychological and physiological levels, (Toussaint et al., 2021) . In addition, deep breathing can increase sustained attention and reduce negative influences and decrease cortisol levels, (Ma et al., 2017) .

At preschool age, children learn to control and express emotions. At this stage, children need experience in regulating emotions, such as controlling and directing emotional expressions and maintaining behavior when strong emotions arise, (Aryani & Zaly, 2021) . Children who experience anxiety are a natural reaction by showing changes in behavior, changes in emotions, and natural fears, (Mulyanti & Kusmana, 2020) . In order to maintain children's emotions, a diversion in the form of intervention is needed. A study shows that 95% believe that after being intervened with Mozart classical music therapy, the average change in emotions and peer relationships in children with emotional disorders is 7.74 - 10.38, (Padila et al., 2020) .

4. **Effectiveness of Implementing Deep Breathing Relaxation Exercises on Anxiety in Preschool Children**

Based on the research results, the average level of anxiety in children after deep breathing relaxation exercises was obtained. of 53.69, while anxiety in children who were only given

education was 64.19. The results of the *Man Whitney test* obtained a p value of 0.038, meaning that there was a significant difference between the intervention group and the control group.

This study is in line with the study of Etemadifar et al., (2018) that there was a statistically significant difference in the average stress score (p = 0.003) immediately after the family empowerment intervention program. Other studies also showed that there was a significant decrease in dental anxiety scores from a score of 1 (before the anesthesia procedure) to a score of 2 (after the anesthesia procedure), where diaphragmatic breathing exercises were shown to be significantly effective in reducing dental anxiety during local anesthesia, (Bargale et al., 2021) .

In contrast to the control group, although there was a decrease in anxiety scores, the value remained high above 50% of the total score. So there was an average difference of 10.5. This means that deep breathing relaxation exercises reduce anxiety in children faster than just providing education.

Relaxation exercises can improve vagal function, increase the production of pain-relieving neurotransmitters such as serotonin, and reduce stress hormone levels, (Bargale et al., 2021) . The breathing process will directly affect the autonomic nervous system, such as heart rate which is influenced by the sympathetic and parasympathetic nervous systems (Russo et al., 2017 ; Magnon et al., 2021) . The autonomic nervous system will affect cognitive information processing, where sympathetic activity is related to stress responses that will trigger hypervigilance and anxiety. Conversely, parasympathetic activity is related to a safe state. This means that the low inhalation/exhalation process will specifically increase vagal activity and not sympatho-vagal balance, thus providing relaxation that increases social interaction efficiently, (Porges, 2007, in Magnon et al., 2021) . The presence of neuro-visceral activity and psycho-physiological coherence models suggests that higher heart rate variability is associated with better cognitive performance, (Mantantzis et al., 2018) .

During deep breathing relaxation, the lungs stretch, causing cardiopulmonary stretching that stimulates an increase in the baroreceptor reflex that can inhibit the sympathetic nerves. This event stimulates arterial vasodilation and improves circulation so that blood flow that carries oxygen to body tissues will increase, (Mulki et al., 2020)

Deep breathing relaxation exercises useful in dealing with anxiety problems in children due to hospitalization. This therapeutic intervention is carried out by providing examples of exercises to children. This technique allows children to observe someone and then model their behavior , (Azizah et al., 2016) . This therapeutic concept is considered very suitable for reducing anxiety in preschool children due to hospitalization, because repetitive exercises do not require additional materials after the child has learned and practiced the skills sufficiently, (Agbayani et al., 2020) .

From observations during the study, when the child felt anxious, the family taught deep breathing exercises or something like blowing. Parents/families practice 2-3 times in one frequency. During the exercise, when the child succeeds, the family tries to give a reward by praising the child or hugging him. The praise given by parents when the child is cooperative with the nurse is very useful as support for providing care for sick children, providing appropriate health facilities, and the overall efforts of parents to create a good atmosphere for the child, (Atawatun et al., 2021) .

Furthermore, the results of the *N-Gain test* in the intervention group were 20.46%, while in the control group the *N-Gain value* was 9.18. Although there was a difference of 11.25 between the groups, these results indicate that both the application of deep breathing relaxation and education falls into the category of not yet effective.

The ineffectiveness of these results can be influenced by several factors. Among them are the length of treatment and the condition of the Hospital environment. In this study, the average length of treatment for children was in the short category (≤ 3 days), so the anxiety felt was still quite high.

This result is proven by previous research that there is a relationship between the length of hospitalization, p-value = 0.045 with anxiety in children undergoing hospitalization, (Patantan et

al., 2022) . The anxiety of children who are hospitalized will be very visible on the first to second day or even until the third day, and usually entering the fourth or fifth day the anxiety felt by the child will begin to decrease, (Potter and Perry, 2017). However, the results of other studies reveal something different, where it was found that the longer the child was hospitalized, the more anxious the child was because he felt uncomfortable, the new environment and fear when the nurse entered the room, (Sari & Widianingrum, 2024) .

Conclusion

Based on the results of the study, it can be concluded that based on gender, the majority of the intervention group were male 65.5%, while in the control group the number of genders was the same between male and female. Based on the age of the children in the intervention group and the control group, most were ≥4 years old (48-59 months), which was 56.5% each. Based on the length of treatment, most children had a short length of treatment, in the intervention group 87.5%, while in the control group 81.3%. As for hospitalization anxiety before deep breathing relaxation exercises were carried out an average of 65.75 with the lowest score being 32 and the highest being 79 (SD 13.394), while hospitalization anxiety after deep breathing relaxation exercises The average score was 53.69 with the lowest score of 27 and the highest score of 66 (SD 12.877). The final results showed the anxiety score in the deep breathing relaxation exercise group. lower than the control group. However, the N-gain test showed that both the intervention and control groups were in the ineffective category.

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