

The Effects of Pet Therapy Using Ornamental Fish on Regression Behavior of Hospitalized Pre-Schoolers

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ABSTRACT

Introduction

Regression behavior is a problem which frequently occurs in pre-schooler while undergoing hospitalization. Continuous regression may cause negative impacts lead to prolong the length of stay. Pet therapy using ornamental fish is one of non-pharmacologic therapy for reducing level of regression by creating a comfort, tranquility, and relax environment in the midst of stressors of hospitalization.

Methods

The study applied a quasy experimental approach and used pre post-test control group design involving 20 respondents, divided into control and experimental group. The sampling technique used a non-probability purposive sampling method for recruiting the respondents. Pet therapy intervention referred to experimental group. Data were collected using a regression questionnaire.

Results

Data analysis by paired t-test and independent t-test found a significant value in post-test experimental group ($p = 0.000$). Data showed a significant value for the indicators of eating disorders, increased of dependency, and temper tantrum ($p = 0,000$). Yet the indicator of toilet training also showed a significant value with $p = 0.004$.

Conclusion

Pet therapy using ornamental fish may bring effect on decreasing the regression behavior caused by hospitalization among pre-schooler. It is strongly recommended to take further research investigating other regression indicator. Health professionals are suggested to provide this pet therapy using ornamental fish in order to reduce the regression behavior due to hospitalization.

Keywords

Pet Therapy; Ornamental Fish, Regression Behavior, Hospitalization, Preschooler

BACKGROUND

Hospitalization can be a cause of a state of crisis in children. This occurs because of the changes in health status condition, routine, and new environment while undergoing hospitalization.¹ Based on the National Economic Survey at 2001, the prevalence of pre-schooler (3-5 years) in Indonesia is 20.72% of Indonesia total population and approximately 35 out of 100 children experience hospitalization.² Based on data of preliminary study had been conducted in dr. Soepraoen Hospital Malang between period of May 2016 to September 2016, the number of children undergoing hospitalization was 553 children while the number of children aged 1-4 years is 200 children and the average preschool children undergoing hospitalization is 40 children per month.

During hospitalization, children may face new environments, unknown medical care providers, changes in daily routines and lifestyle as well as medical procedures causing pain.³ Additionally, the physical environment of hospitals such as hospitalization, medical devices, white uniforms of hospital personnel, and the social environment amongst paediatric patients or between children and health workers may lead to feelings of anxiety, tension, fear and discomfort for children. This may lead to various reactions that appear in children regarding to regression characterized by eating disorders (i.e. loss of appetite), toilet training disorders (i.e. bed-wetting), increased dependence on parents (i.e. asked being picked up, thumb sucking) and temper tantrum (i.e. blaming and angry to the parents for bringing them to the hospital).⁴

In a previous study by Pradita Dwi Wijayanti (2009) at Rumah Sakit Anak dan Bunda Harapan Kita, Jakarta with sample of 50 pre-schoolers, aged 3-5 years while undergoing hospitalization, this study obtained results 40% experiencing mild regression, 48% moderate regression, and 12% severe regression. Regression behaviours emerged were 10% children experienced toilet training disorder, 74% children experienced eating disorder, 22% children experienced increased dependence, and 58% children experienced temper tantrum.⁵

Prolonged and unavoidable regression behaviour may bring an unfavourable impact on the cooperation between children and parents on the hospitalization care, thus increasing length of stay. Continuing regression until the children being discharged from the hospital and untreated properly can inhibit the growth and development of children. Therefore, hospitalized children requires therapy that can provide comfort, tranquillity and relaxation. One of the therapies for lowering the regression is pet therapy. We chose pet therapy because they might enhance comfort, decrease loneliness and boredom, provide relaxation, and help lower stress levels.⁶

Based on these descriptions, due to the high prevalence as well as the regression behaviour emerged in hospitalized pre-schooler, the researchers interested to examine the effect of pet therapy on regression of hospitalized pre-schooler in dr. Soepraoen Hospital Malang, Indonesia. Researchers chose selected ornamental fish for pet therapy as it is useful in providing comfort, tranquillity, and reduce anxiety due to hospitalization stressor so it is expected to decrease the child's regression. For pet therapy, we used ornamental fish as it is considered safe, reducing the risk of allergies to feathers and efficient considering to be conducted in places with limited space and facilities.

This study aimed to identify the effects (sleep disorder, eating disorders, toilet training disorders, increased dependence, and temper tantrum) of pet therapy using ornamental fish in two groups, one provided with pet therapy and the other not provided with pet therapy.

METHODS

Design

We used quasi experimental with pre-post-test control group design.

Setting and Sample

For sampling, we used non-probability sampling method - purposive / judgmental sampling. Samples were taken at random where the first week was taken as a control group and the second week as an experimental group.

For experimental group, we measured the effect of pet therapy using ornamental fish on regression behaviour in hospitalized pre-schooler in which sleep disorder, eating disorders, toilet training disorders, increased dependence, and temper tantrum.

For control group, children received standard services provided by the hospital where the standard services were in the form of mentoring and involvement of parents / significant others of children during the hospitalization, providing facilities e.g. watching television and room decoration by sticking pictures in order to induce interest.

The inclusion criteria were as follows (1) Children with no previous hospitalization experience, (2) children undergoing hospitalization on day two, (3) children diagnosed with acute disease (in this study, the diagnosis chosen were bronchitis, Dengue Haemorrhagic Fever / DHF, and Urinary Tract Infection / UTI), (4) parents / significant others and children willing to participate in research and signed informed consent, (5) conscious, (6) following pet therapy using ornamental fish from day one to day three, (7) not afraid of ornamental fish, (8) parents / significant others could read and write.

The exclusion criteria were as follows (1) children with special needs or mental retardation, (2) children in observation, (3) suffering from chronic illness, (4) children with a medical diagnosis of indigestion.

The participants included in this study were 34 hospitalized children in paediatric unit, dr. Soepraoen Hospital Malang, Indonesia.

Measurements

In this study, a modified Post Hospitalization Behaviour Questionnaire (PHBQ) by Karling (2006) and Children Behaviour Checklist (CBCL) by Earls (2002) were used as measurement tools.^{7,8} The questionnaire for this tool contained 25 questions with four regression parameters, i.e., eating disorders, toilet training disorders, increased dependence as well as temper tantrum. We also tested the validity of the tool and confirmed from experts that this modified tool was acceptable for this study. The results of 25 items of question had value of α 0.633 - 0.942. r_{table} with 10 respondents showed 0.632 where $\alpha > r_{table}$ so that all items declared valid. For the

reliability, this questionnaire had been tested with Cronbach's alpha and yielded the value $\alpha > r_{table}$ ($0.968 > 0.6$) so it was declared reliable.

Ethics Consideration

This ethics approval was obtained from the Ethics Committee of Medical Faculty, Universitas Brawijaya, Malang, Indonesia.

Statistical Analysis

Data were analysed with the SPSS 21.0 program (SPSS Inc., Chicago, IL). The general characteristics of the participants were evaluated and presented as frequencies and percentages. Meanwhile, the effect of pet therapy using ornamental fish on sleep disorders in children was analysed by paired t test and unpaired t test.

RESULTS

Table 1. Characteristics of Respondents by Age

Groups	Age		
	3 year	4 year	5 year
Control	4	7	6
Experimental	5	6	6

Table 1 showed that the most respondents were pre-schoolers aged 5 years ($n = 12$), each 6 children for control and experimental groups whereas the least respondents were pre-schoolers aged 3 years ($n = 9$), 5 children for control and 4 children for experimental groups.

Table 2. Characteristics of Respondents by Gender

Groups	Gender	
	Male	Female
Control	10	7
Experimental	9	8

Table 2 showed that the most respondents were male ($n = 19$) in which 10 male for control and 9 male for experimental group compared to female patients ($n = 7$) in which 7 female for control and 8 female for experimental groups.

The paired t test in control group showed a significant value as 0.293 where $p > \alpha$ (0.05) thus can be concluded that H_0 was accepted which means there was no significant difference in the control group in pre and post test results.

For analysis result, we used paired t test and we obtained $p = 0.000$ ($p < 0.05$) thus there was significant difference in experimental group which seen in pre and post test result. This indicated pet therapy using ornamental fish showed effect on regression behaviour in experimental group.

The analysis result between two groups with unpaired t test showed p value = 0.000 which means both groups showed significant differences (Table 5 & 6).

DISCUSSION

Pre-post analysis of difference on regression in control groups

Table 3. Data Analysis on Control Groups

Control Groups	Mean	SD	Min-Max	p value
Pre test	56.70	11.411	48-75	0.293
Post Test	58.00	9.568	47-75	

Table 4. Data Analysis of Sleep Disorders in Experimental Group

Experimental Group	Mean	SD	Min-Max	p Value
Pre Test	68.30	14.621	46-87	0.000
Post Test	43.40	9.866	31-66	

Based on paired t test, the pre and post-test mean values in control group were 56.70 and 58.00 (Table 3). It was analysed that there was no significant difference in control group, p value 0.293 ($p > 0.05$), therefore it might be concluded that there was no significant difference related to the regression behaviour of respondents in control group both pre and post-tests.

In control group, the regression behaviour in pre-schooler showed no significant differences even there was an increase in 30% of respondents. This might be due to 30% of children whose health status was still unstable or likely worsening on day three. This caused the child to receive additional medical interventions that had not been received on day one or two. It could be one of the additional stressors for the child. Because of the increase in stressors, children tended to show a maladaptive behaviour as a coping mechanism. The most widely shown was the increased dependence and eating disorders (Table 6).

Meanwhile in control group as previously stated that the child received standard services provided by the hospital in order to inducing interest had not been able to reduce child's regression behaviour, $p = 0.293$ ($p < 0.05$) (Table 3). This may be affected by several factors i.e. gender, preparation, disease status and age. Female children tended to be more adaptable to stressors than males.⁵ At preschool age, the child's emotions tended to be volatile and more explosive in males. Low quality preparation also can affect regression behaviour regarding to giving understanding to the child about things that would be experienced during hospitalization. The cognitive development of pre-schooler has not grown as well as school-aged children. Pre-schooler can be given instruction, explanation and simple understanding but not as good as the cognitive development of school age in children.⁹ In addition, the status of

the disease also affected child's regression behaviour. This was related to the length of stay of hospitalized children.^{5,9}

As long as the child was admitted to the hospital, the regression behaviour will appear as a preliminary response as it is included in the defence and coping mechanism of the child while undergoing an unpleasant experience such as hospitalization. The longer hospitalized will induce the stress thought from invasive procedure, separation with parents, new and foreign environment so that the child will continue to show the negative impact of hospitalization, one of them is regression. In addition, there is no other companion therapy that can distract children's anxiety in these stressful conditions. These factors may be the cause of regression scores showed no significantly change in control group.

The evidence that there is not yet other companion therapy that can distract children's anxiety from hospitalization was already shown in many studies. Edward & Beck's (2002) studied the effect of pet therapy using ornamental ornamental fish to increase appetite for Alzheimer's patients and found no significant change in control group.¹⁰ DeSchrivers & Riddick (2015) also studied on the effect of pet therapy using ornamental ornamental fish on stress levels and found no significant decrease in stress, depression and frustration in control group.¹¹ Michelle's study (2013) on the effect of pet therapy on stress levels using rabbits also showed no significant reduction in stress levels in control group.¹² Lastly in the study of Johnson et al (2008) on the effect of pet therapy on the mood of cancer patients also mentioned that there was no significant influence in control group.⁶

Analysis of pre and post differences on regression in experimental group

Table 5. Different Analysis between Pre and Post Test Scores on Control and Experimental Group

Group	Mean	SD	P Value
Control	1.30	3.683	0.000
Experimental	25.00	11.215	

Based on paired t test results in table 4, it can be analysed that there was a significant difference in the experimental group after being given animal therapy using aquarium ornamental fish with p value 0.000 ($p < 0.05$), which proved significant change after pet therapy.

The difference of regression score in hospitalized pre-schooler was caused by the therapeutic effect of pet therapy using ornamental ornamental fish in an aquarium. This kind of therapy may give positive effect to the child's emotional condition as well as provide a comfortable environment for the child. This was proved by the decline in the temper tantrum indicator score as much as 11.1 as well as the decline in the dependence of children as much as 9.1 during the period of hospitalization (table 6).

These results supported research conducted by Edwards & Beck (2002) regarding to pet therapy using ornamental fish.¹⁰ Giving ornamental ornamental fish in the aquarium with beautiful scenery inside may cause happiness, relaxation, and increase appetite. Their study found a positive change in endorphins hormone that had good impact and might reduce stress levels through their interaction with ornamental fish from the colour, type, and movement that

can reduce anxiety, increase comfort, so that adaptive coping response to stressor may begin to arise, and regression at hospitalized children would decline.^{6,13}

Analysis of pet therapy effect on regression behavior (control and experimental groups).

Table 6. Different analysis of Indicator Score on Control and Experimental Groups.

Groups	Indicator	Pre Test	Post Test	Deviation
Control	Increased dependence	22.8	25	-2.2
	Eating Disorder	32.3	33.3	-1
	Toilet training Disorder	24.4	24.2	0.2
	Tempertantrum	18.4	17.2	0.7
Experimental	Increased dependence	27.4	18.3	9.1
	Eating Disorder	37	22.3	14.7
	Toilet training Disorder	24.2	17.6	6.8
	Tempertantrum	25.8	14.7	11.1

It is already stated in independent test that p value = 0.000 (Table 5), meaning pet therapy interventions may provide significant decrease regression behaviour of hospitalized pre-schoolers (3-5 years old).

The outcomes differences between control and experimental groups were due to the difference in the interventions application in both groups. In the experimental group of hospitalized pre-schoolers were given interventions using pet therapy (ornamental fish put in the aquarium), while the control group received a standard hospital intervention without being given pet therapy.

According to Cole (2009), pet therapy can reduce stress, anxiety, and fear in children caused by the impact of hospitalization. Pet therapy may induce safe, comfortable and calm environment in children thus decrease the regression caused by the changes environmental into new, unfamiliar, and unpleasant experiences during hospitalization. It also may stimulates the production of endorphin hormones that can trigger hypothalamus to increase appetite, decrease stress, so children will feel relaxed thus the emotional attitude regarding to regression shown will gradually decrease.¹³

The study conducted by Edward & Beck (2002) about pet therapy using ornamental fish for Alzheimer's patients also explained that by giving patients with pet therapy using ornamental fish in the aquarium could significantly increase appetite in the experimental group. Treatment method given was patients interacted with ornamental fish in which saw the ornamental fish movement, colour, and types; counted the ornamental fish number as well as fed the ornamental fish. This study showed significantly decreasing eating disorder indicator in experimental group.¹⁰

Johnson et al (2008) also supported pet therapy as they found the effect of pet therapy on cancer patients' moods. They found that interaction with pets could provide positive changes in neurochemicals such as cortisol and dopamine that can induce serotonin, prolactin and oxytocin

secretions in which they play a role in mood enhancement. The changes that commonly occurred were decreased cortisol and serotonin yet increased prolactin, oxytocin and dopamine thus it can improve the mood of children. It also induced decreasing in epinephrine levels that cause stress. Thus children can feel happy, did not feel threatened and felt comfortable despite being in a strange and stressful environment.⁶ This also was proved by significantly decreasing the dependency of children.

Pet therapy was success reducing stress-level and frustration yet enhanced feelings of comfort, relaxation and calm. They used ornamental fish and dog and the result shown that there was the decrease of regression of hospitalized pre-schooler.^{11,13}

CONCLUSIONS

Pet therapy using ornamental fish yielded positive effect on significantly reducing regression behaviour in hospitalized pre-schooler age 3-5 years old.

With this finding, we hope pet therapy using ornamental fish could be an alternative way on avoiding or reducing regression behaviour in hospitalized pre-schoolers. It is advisable for researchers to continue the application of pet therapy using other variables (i.e. decreased aggression, sleep disturbance, apathy, and mood disorders) in order to provide better outcome regarding to regression behaviour in hospitalized children.

Declarations

Authors' contributions

Each author had each responsibility that has been conducted well. All research activities were supervised by first author or corresponding author. The second and third author wrote this article with agreements from all authors.

Ethics approval and consent to participate

This work was approved by the Ethics Committee of Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia.

Consent for publication

All authors agree to publish this article

Availability of data and materials

This material and data will not be shared because we worried about being scooped and concern about privacy.

Competing interests

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