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The Effected of Providing Concrete Objective Information on Fear of Preschoolers Receiving an Intravenous Fluid Infusion

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Abstract*— *Purpose: *Intravenous fluid infusion (IVI) is a standard method used to balance body fluid and electrolyte. The procedure affects mental health of preschoolers. They are fear needle insertion. This article aims to examine the effect of providing concrete objective information on fear of preschoolers receiving an intravenous fluid infusion.* ***Methods****: This study was quasi-experimental 2 group designs. It was designed to investigate the effects of providing concrete objective information to reduce the fear of preschool-age children (3-5 years old) receiving an intravenous fluid infusion.* ***Results:*** *The first part was the population characteristics. They did not make a significant difference between the characteristics at baseline of the sample. The second part was descriptive analyses of fear score between the controls and experimental on three occasions. Both groups showed a fear score increased on each occasion. The third part was hypothesizes testing. The fear means score in the experimental group of providing concrete objective information was significantly lower than that of the control group ($p<0.05$). It means that fear of preschoolers receives providing concrete objective information was lower than that receive concrete objective information.* ***Conclusion and Implications:*** *The findings of this study are in accordance, which explained managing threating for reducing emotional response as stress, anxiety, and fear by providing information and reduce threatening. Hence, the phenomenon of fear in this study could reduce by providing concrete objective information.*

Keywords*— Concrete objective information, Fear, Intravenous fluid infusion, Preschoolers.*

I. INTRODUCTION

Intravenous fluid infusion (IVI) is a standard method used to balance body fluid and electrolyte and to administer medications [1]. When getting ill, preschool clients always loss appetite and eat less than their body requirements. They usually have fluid and electrolyte imbalance. Intravenous fluid infusion is an essential therapeutic method used among preschool clients [2].

At the first experience of receiving an intravenous fluid infusion, preschool clients appraised it as a threat and fearful event [1, 3]. Perception of the threat comes from unknown (preschoolers clients do not know what IVI is and what will happen with them while they get IVI. Unknown leads preschoolers to imagine, but it does not congruent with realistic and imagine is fearful. Next, preschoolers feel a loss of control because they have to hold still in order for nurses to be able to insert a needle into their vein. They cannot do anything that they want to. They feel that the IVI procedure threat them [4]. Preschooler clients perceive that providing intravenous fluid infusion is fearful of the unknown, loss of control, and pain.

The preschooler's behavioral expression assesses fear in preschoolers during the initiation of IVI, consisting of body movement, facial expression, and verbal expression. Fear of the intravenous fluid injection among preschoolers mostly comes from their interpretation of the threat events and their decision to deal with the situation [5]. Appraisal and decision making will guide children's behaviors. Preschoolers pay more than attention to subjective events and emotional responses, whereas abandoning of the concrete situations and functional response. These lead the children to misunderstand the events and unable to plan and confront the situations appropriately [6], so children do not cooperate with the nurse. Most of the children express their refusing to intravenous set by taking the needle off or pulling the plaster out. Hence, fear may lead to unsuccessful in giving intravenous fluid or medications on time [7]. Children who refused intravenous fluid infusion might receive insufficient nutrients, and fluid resulted in worse symptoms [8]. The fearful experiences suffered by children continue to affect the adult. It may cause an increasing reaction to fear and avoidance of medical procedures in later life [9]. Reducing fear that preschoolers experience in this procedure is imperative.

For the conventional nursing care, before giving an intravenous infusion to children, nurses will inform parents and children about objectives, and the place to perform the IVI. The information was given by describing activities which preschoolers will see when they come to the treatment room. Preschoolers may be the limitation of speech understanding and may not clear understanding. All of the above showed standards care for fear reduction. Nurses manage unknown by telling a parent to stay in the treatment room and distraction the children to look at other objects. However, preschoolers are fear–before, during, and after insertion at moderate and severe levels [10]. There was the previous study showed that providing concrete objective information could reduce fear in school-age and adolescent with IV insertion [11].

Nursing care for fear reduction should consist of management cause of fear regarding Johnson's theory to self-regulation (1999), the characteristics of the information effect. The effect of concrete objective information on the cause of unknown and loss of control might present as preschoolers clients will perceive the IVI process, induce mental image.

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They know what will happen to them and what they will do at that time. They pay more than attention to objective events and functional responses. They regulate with functional response whereas abandon of the subject situations and emotional response. These lead the children to understand the events and able to plan and confront the situations appropriately. All the above showed providing concrete objective information might affect fear by manipulation of unknown and loss of control.

Therefore, the nursing intervention that deals with managing all causes of fear at all stages of intravenous fluid injection is needed. According to Lazarus and Folkman (1984), threatening reduction affects fear level. Concrete objective preparatory information could influence patients to appraise the health care event as less threatening, resulting in positive coping outcomes. Nursing intervention by providing concrete objective information plus cold alcohol compression should help children to control themselves. Preschooler clients will perceive the environment feature, temporal characteristics, physical sensations, and symptoms that occur, and cause of sensations, symptoms, and experience, process. All of the information induces mental image. They know what will happen. They pay more than attention to objective events and functional responses, whereas abandoning the subject situations and emotional response. When preschooler clients are confronting with IVI procedures, fear is reduced. It can conclude that nursing care for reducing fear ought to be nursing care, which can manage with all causes of fear (unknown, loss of control, and pain). Helping preschoolers, clients understand the situation, change their points of view to the contexts, build the right and appropriate imaginations concurrent to reality, and reduce negative imaginations. These processes will lead the preschoolers to be able to control their functional responses and be complied with nurses during all stages of intravenous fluid injection. At the same time, the emotional response is decreased. Fear is reduced.

Objective

This article aims to examine the effect of providing concrete objective information on fear of preschoolers receiving an intravenous fluid infusion.

II. METHODS

The research design in this study was quasi-experimental two-group designs [12]. It was designed to investigate the effects of providing concrete objective information in reducing the fear of preschool-age children (3-5 years old) receiving IVI. It was carried out in a clinical setting for some ingredients because it had manipulation, control, enrollment of the subjects to each control and treatment group by gender, and double-blindness (preschoolers client and research assistant who rate the score).

Participants of the study

The participants were all the eligible hospitalized preschoolers (3-5 years) who received the first experience of IVI at the pediatric unit, Khon Kaen Hospital. Participants were included by purposive sampling. Each eligible preschoolers was assessing age group and divided to be three years old, four years old, and five years old. Then, they were the random assignment to each experimental or control group.

Sample size

The participants were recruited preschool children receiving IVI in IPD. Cohen (1992) detect sample size of ANOVA for four groups with large effect size of previous study (d =>.8; at power = .8, α = .05), was 18 participants per group. Consequently, researcher detects a necessary sample size per group was 18 participants (d =1.45; at power = 0.8, α = 0.05). Therefore, the total sample size needed for this study should be 80 participants.

Inclusion and exclusion criteria

The Inclusion criteria of preschoolers were presented as follows. There was a doctor order to provide intravenous fluid infusion for the first experience. They are not diagnosed with emergency diseases that require emergency care and mental retardation or delay development. They have no vision or hearing problems. They do not receive any topical anesthetic medication. Furthermore, they do not receive opioids or sedatives or analgesic drugs during the previous 4 hours.

The exclusion criteria of preschoolers were presented as follows. There was not interested in the information (participants cannot completely attend in cartoons till the end. There was not successful in receiving intravenous insertion on the first try. They develop a worse symptom during receiving IVI, such as dyspnea, seizure, urinates, and vomiting.

There were 80 participants included in this study. The seven participants were excluded because of two participants could not completely attention in cartoon until the end. The three participants were not successful in receiving intravenous insertion on the first try.

Research Instruments

The instrument for Data Collection: The researcher developed demographic questionnaires specific for preschool-age children 3 to 5 years old who received IVI and their mother or mothers. Some demographic data were collected from the patient's chart. The subject's and mother's demographic and clinical data included diagnoses, gender, age, the reason for IVI, number of a sibling, and history of admission/ hospitalization. The mother's or mothers' demographic and clinical data included gender, relationship to the child, academic background, the experience of a caring child receive IVI, religion, and occupation.

The researcher used tools for assessing fear in preschoolers receiving IV [11]. Two behaviors will be added because the stages of study are different. The scale was developed for measuring fear of 40 preschoolers receives Intravenous fluid infusion from the preschool client come in the treatment room to the swaddled cloth. The instrument comprises of three dimensions with 18 behavior items. The sum of the score was 0-54. A high score means more than fear, and a low score means less than fear. This study, the stage of observation, was started from the preschool client come in the treatment room to swaddled cloth on his/ her arm and strap tape. So some behaviors have to be added to the instrument. The two behaviors comprise of "take the hand to remove the equipment of Intravenous fluid" and "close one's eye." The instrument

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comprises of three dimensions with 20 behavior items. The dimensions comprise body movement, seven items, facial and posture expression five items, verbal and crying eight items, 20 items. Observers will record the occurrence of a given behavior over three specific occasions. 1st occasion; from the child taken into the treatment room to treatment bed, 2nd occasion; from starting swaddle the cloth until finish swaddling, 3rd occasion; from applying alcohol to the IV insertion area, IV insertion, strapping tape on the IV site, and swaddle cloth over the child's arm for supporting the needle. Sum of score consisted of 3 parts include: score of occasion 1 (Range = 0-20), score of occasion 2 (Range = 0-20), score of occasion 3 (Range = 0-20). The sum of the score was 0-60. A high score means more than fear, and a low score means less than fear.

Intervention Instruments: The concrete objective information comprise of 4 dimensions as, a) physical sensations and symptoms that occur, b) temporal characteristics, c) environment feature and d) cause of sensations, symptoms, and experience. The words that were used are simple, realistic, and no personal opinion [6].

Mother was the closest and the essential person who understand preschoolers' needs. According to the "Family-centered care," mothers could support the child's collaboration [13]. Pediatric nurses should encourage the mother's role to perceive the expectation of maternal behaviors, i.e., repeating nurse's keywords, encouraging children to cooperate with nurses, holding children during INTRAVENOUS FLUID INFUSION process. It helped children trust, feel secure, and attend to the information [14].

We are providing concrete objective information which manipulates the causes of unknown and loss of control through the process of INTRAVENOUS FLUID INFUSION. 1st occasion since client walk into the treatment room, swaddle cloth over the child's body, from the child taken into the treatment room to treatment bed, 2nd occasion; from starting swaddle the cloth until finish swaddling, and 3rd occasion was from applying alcohol to the IV insertion area, IV insertion, strapping tape on the IV site, and swaddle cloth over the child's arm for supporting the needle.

Data collection

Ten minutes before providing intravenous fluid infusion procedure, the demographic questionnaire was completed by the parents of children in each of the two groups. The parents are asked the number of experiences of receiving intravenous fluid infusion is taken in the past. The children are assessed fear score as the baseline. Parents of children in both groups are provided with conventional nursing care information. The video was recorded for behavior assessment during intravenous insertion. Data were collected from all children on the first try, without the second attempt on children. In all of the groups, parents accompanied their children during the procedure.

Data Analysis

Data are analyzed using the Statistical Package for the Social Sciences version (SPSS). Demographic data are presented as frequencies and percentages. The One-way ANOVA used for determining different of a total fear score between 3 experimental and control groups. The t-test used for determining different perceptions and pain between experimental and control groups. The results expressed with a 99% confidence interval, and p values <.01 are considered significant.

III. Results

The results of the comparison of fear in preschoolers receive intravenous fluid infusion between three experimental groups and the control group indicated. 1) The mean of the fear score in experimental group1 was lower than the control group at the statistical 0.01. It indicated that fear of preschoolers receiving concrete objective information was lower than conventional nursing care groups. 2) The mean of the fear score in experimental group 2 is lower than the control group at the statistical 0.01. It indicated that fear of preschoolers receiving cold alcohol compression was lower than conventional nursing care groups. 3) The mean of the fear score in experimental group3 was lower than the control group at the statistical 0.01. It indicated that fear of preschoolers receiving concrete objective information plus cold alcohol compression was lower than conventional nursing care groups.

IV. Discussion

This research is a Quasi-experimental research study with Post-test, only two groups design. Research objectives are to examine the effect of providing concrete objective information on fear of preschoolers receiving an intravenous fluid infusion. Preschoolers received intravenous fluid infusion in the first experience. The result of the study will be presented in 3 parts, as follows:

Part 1: Demographic characteristics; descriptive statistic was used to analyze demographic data of the subjects. (Table 1)

Table 1 revealed that most of the experimental group aged 36-47 months, group 1, group 2, and group 3 had 65 percent, 70 and 11, respectively. They had kindergarten education level 1 of three groups to 35, 55, and 35 percent, respectively. The majority of birth order was the first birth order of three groups had 65 percent, 80, and 70, respectively. The majority of diagnosis was pneumonia in three groups, 40, 35, and 10 percent, respectively. They had never been hospitalized for three groups, with 25, 25, and 15 percent, respectively. The majority of caregiver was the mother in three groups, 70, 80 and 80 percent, 20-29 years old with 45, 15 and 20 percent, respectively. The majority of caregivers' education level was the secondary school in three groups, 65, 55, and 55 percent, respectively. The majority of caregiver's occupation was housemaid in three groups, 30, 30, and 35 percent, respectively.

Overall, data from Table 1 did not show the significant difference between the characteristics at baseline of the sample.

Part 2: Fear score of the sample (Table 2)

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TABLE 1: Sample characteristics at baseline

Demographic characteristics	Experimental group1 n (%)	Experimental group2 n (%)	Experimental group3 n (%)	Control group n(%)	χ^2	*p*-value
Gender						
Male	10 (50)	10(50)	11(55)	10(50)	.15	.98
Female	10 (50)	10(50)	9(45)	10(50)		
Age group (year) (month)					1.99	.58
3 (36-47 mo)	13 (65)	14(70)	11(55)	12(60)		
4 (48-59 mo)	6 (30)	5(15)	6(30)	6(30)		
5 (60 -71 mo)	1 (10)	1(5)	3(15)	2(10)		
X (sd)	()	()	()	()		
Education level					1.32	.72
Child daycare center	6(30)	3(15)	4(20)	2(5)		
Kindergarten 1	7(35)	11(55)	7(35)	8(40)		
Kindergarten 2	6(30)	5(25)	5(25)	5(25)		
Kindergarten 3	1(5)	1(5)	4(20)	3(15)		
Birth order					.51	.92
1	13 (65)	16(80)	14(70)	15(75)		
2	6(30)	4(20)	6(30)	4(20)		
3	2(10)	-	-	1(5)		
Diagnosis					2.51	.98
Acute gastroenteritis	8 (40)	7(35)	4(10)	12(60)	10.40	.15
Pneumonia	10 (50)	12(60)	14(70)	3(15)		
Dengue fever	2(10)	1(5)	2(10)	5(25)		
Illness hospitalization history					.19	.97
Ever	6 (25)	5(25)	3(15)	5(25)		
Never	14 (75)	15(75)	17(85)	15(75)		
The age group of caregiver (Year)					10.40	.015
20-29	15 (45)	3(15)	4(20)	13(65)		
30-39	5 (25)	13(80)	11(55)	7(35)		
>39	2(10)	4(5)	5(25)	-		
Caregiver						
Father	2 (10)	3(15)	1(5)	3(15)	3.50	0.32
Mother	14 (70)	16(80)	16(80)	17(85)		
Grandmother	4(20)	2(10)	3(15)	-		
Caregiver' education level					.49	.92
Primary school	1 (5)	3(15)	1(5)	2(10)		
Secondary school	13(65)	11(55)	11(55)	12(60)		
≥ Graduate	4 (20)	2(10)	6(30)	2(10)		
other	2 (10)	4(20)	2(10)	4(20)		
Occupation					.31	.96
Agriculture	4 (15)	3(15)	4(20)	3(15)		
Maid	6 (30)	6(30)	7(35)	6(30)		
Contractors	4 (20)	5(25)	1(5)	4(20)		
Government officer	1(5)	1(5)	3(15)	1(5)		
Merchant	3 (15)	5(25)	2(10)	3(15)		
Other Employee	2 (10)	-	-	3(15)		

**P<.01

TABLE 2: Descriptive analyses of fear score between the control and experimental at 3 Occasions

Timepoint	Total score in 3 occasions	Occasion 1		Occasion 2		Occasion 3	
	Mean	Mean	SD	Mean	SD	Mean	SD
Experimental group	20.00	3.35	2.75	5.75	3.1	10.9	3.34
Control group	33.9	6.55	2.99	10.25	3.98	17.1	1.91

Occasion 1: from the child taken into the treatment room to the treatment bed.

Occasion 2: from starting swaddling the cloth until finish swaddling**.**

Occasion 3: from applying alcohol to the IV insertion area, IV insertion, strapping tape on the IV site, and swaddling cloth over the child's arm for supporting the needle.

Total score in from the child taken into the treatment room to the IV. Insertion area, IV insertion, strapping tape on the IV site, and swaddling cloth over the child's arm for supporting the needle.

Experimental group means receive concrete objective information.

Control group means receive regular nursing care.

Table 2 for the Experimental group; the total score of fear was 20+5.20. Occasion1, from the child taken into the treatment room to the treatment bed, the fear means the score was 3.35 +2.75. Occasion2, from starting swaddling the cloth until finish swaddling. The fear means the score was 5.75+ 3.10. Occasion3; from applying alcohol to the IV insertion area, IV insertion, strapping tape on the IV site, and swaddling cloth over the child's arm for supporting the needle, the fear mean score was 10.9+3.34.

Control group; the total score of fear was 33.9 $\pm$7.09. Occasion1, from the child taken into the treatment room to the treatment bed, the fear mean score was 6.55$\pm$ 2.99.

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Occasion2, from starting swaddling the cloth until finish swaddling. The fear means score 10.25±3.98. Occasion3; from applying alcohol to the IV insertion area, IV insertion, strapping tape on the IV site, and swaddling cloth over the child's arm for supporting the needle, the fear mean score was 17.1±1.91.

Both groups showed that fear score increased on each occasion from occasion 1- occasion 3.

Part 3: was hypothesizes testing (Table 3)

TABLE 3: Comparison for Individual group mean differences in fear mean score in receiving intravenous fluid infusion between the experimental and control group (Pairwise comparison)

Dependent Variable	Group to be compared	Mean difference		
		Experimental group_1 (20.00)	**Experimental group_2 (22.15)**	**Experimental group_3 (15.55)**
Fear				
	Experimental group_1 (20.00)	-	-	-
	Experimental group_2 (22.15)	2.15	-	-
	Experimental group_3 (15.55)	-4.45	-6.6***	-
	Control group (33.9)	13.9***	11.75***	18.35***

From table 3 shows a comparison between the experimental group and the control group, receive concrete objective information. Fear means the score was 20.00. In the control groups, Fear means the score was 33.9. The statistic showed that the Fear means score in the experimental group was significantly lower than that of the control group ($p<.001$). Hence, fear of preschoolers receives concrete objective information was lower than that receive conventional care.

V. Conclusion and Implications

The findings of this study have implications for scientific knowledge, nursing practice, nursing education, and national health policy. Also, recommendations for future research are presented.

Implications for scientific knowledge: Providing concrete objective information plus cold alcohol compression is the method which could reduce fear in preschoolers receiving the intravenous fluid infusion. This knowledge could use in various settings to reduce fear in preschoolers receive the invasive procedure.

Implications for nursing practice: The pediatric nurses should provide concrete objective information plus cold alcohol compression via cartoon animation and demonstrate IVI material for preschoolers receiving the intravenous fluid infusion. The content in cartoon animation, which comprises of four dimensions could lead preschoolers to understand a situation and cooperate with a procedure, because of fear reduction.

Implications for nursing education: The curriculum of pediatric nursing care should add the knowledge of the method to reduce fear in preschoolers receiving the intravenous fluid infusion. The time, cost-saving method as providing concrete objective information plus cold alcohol compression is the effective method which student nurse should use when they are studying in the curriculum of pediatric practicum.

Implications for national health policy: The nurse administrators can use the results of this study to create a policy for improving health care personnel and the quality of nursing care. The nurse administrators may create a training program to promote the uses of this program to the pediatric nurse. It is the practical, timely, and cost-saving method which nurse can use. It does not need more time for preparation.

Recommendations

The knowledge of the effectiveness of providing concrete objective information plus cold alcohol compression should be used to research other pediatric phenomena. It can be conduct in the various clinical procedure which functional response and emotional response.

The providing concrete objective information should be concerned with the instrument or media which appropriate to the appropriate developmental level of children. The research which provides various kinds of media should be tested.

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