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RESEARCH ARTICLE

EFFECT OF THERAPEUTIC PLAY ON THE ANXIETY LEVEL AS A PREPARATION TECHNIQUE OF CHILDREN UNDERGOING INVASIVE NURSING PROCEDURES

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ABSTRACT

Hospitalization and invasive procedures impose a significant anxiety in the young children. Children's anxiety of the invasive procedures represented in behavioral and physiological changes , which are upsetting them and their parents. In addition, it makes it more difficult to complete the needed procedure. One of the suggested methods to prepare children for invasive nursing procedures is to familiarize children with invasive procedures through therapeutic play. This study aimed to determine the effect of therapeutic play on the anxiety level as a preparation technique of children undergoing invasive nursing procedures. The study sample comprised 100 children of age 2-7 years, undergoing invasive nursing procedures. First admitted to Pediatric Department, Hematology/Oncology Unit at Tanta University Hospitals was included in the study. They were randomized into two equal groups: study group received therapeutic play before the invasive procedure and control group received routine hospital care. Two tools were used to collect the necessary data: the questionnaire sheet and the observation check list sheet. The main results yielded by the study proved that, significantly lower in anxiety level and physiological reactions to invasive nursing procedures in children underwent therapeutic play.

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INTRODUCTION

Play is a significant component of childhood. It is one of the most powerful vehicles which children have for trying out and mastering new skills, concepts and experiences. Play is defined as the work of children. It consists of those activities performed for self-amusement that have behavioral, social, and psychomotor rewards these rewards usually come from within individual child. It is enjoyable and spontaneous (Aliene, 2006; Martin, 2006). Play is therapeutic at any age as it provides means for tension release and helps in decrease stress. The hospital care and treatment by invasive procedures can produce significant psychological effects on them. Especially for children aged between (Martin, 2006; Lansdown, 1996; Child life and hospitals; Broadhurst, 2003; Jane, 2006; Erin, 2006), hospitalization is considered as a new and difficult experience for them. Therefore, there are several strategies that can be used to help the children adapt to the hospital environment. These strategies include child life programs, therapeutic recreation, rooming in and therapeutic play (Lansdown, 1996; www.google.com).

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Therapeutic play is a guided play that promotes the psycho-physiologic well –being of the child. Also, it is a play technique that may be used to help the child have a better understanding of what will happen to him or/ her in a specific situation. For instance, the child who will have an I.V started before surgery might be given the materials and encouraged to start an I .V. on a stuffed animal or doll. This type of play can be used pre-operatively or prior to other frightening procedures such as veinpuncture, radiotherapy and nasogastric feeding. Broadhurst 2003 suggested that preparation for hospitalization not only facilitates the reduction of anxiety, but moreover it improves the response to treatment, provides an emotional out let and presents an opportunity to deal with fears, concerns and stressors of health experiences. Therapeutic play also provides means for the child to learn about health care and express anxieties (Jane, 2006; Erin, 2006). Therapeutic play has two types; play therapy and medical play. The nurse should understand the difference between play therapy and therapeutic play. On one hand, Play therapy is a technique of psychoanalysis that psychiatrists or psychiatric nurse clinicians use to uncover a disturbed child's underlying thoughts, feelings and emotions to help understand them well.

On other hand, medical play is a method of preparing and informing hospitalized children about impeding medical or hospital events (Ethel, 2006; Duke, 2006). Medical play is very important for hospitalized children as it helps to minimize the negative emotional impact of invasive medical procedures specially by using designed dolls, puppets and / or medical equipment such as using of syringes, masks, stethoscopes,….etc. Through such play children become more familiar with their hospital routines and invasive procedures that may range from drawing blood to I .V placements. In addition, it allows children of all ages to have hands-on, experience with the medical items they see in hospitals and make the child become more comfortable with medical equipment and help him /or her to practice what will happen at the hospital (Jane, 2006; Duke, 2006; Carol, 2004). According to Piaget's theory of development, children aged between 2-7 are in the pre-operational stage of development, they aren't able to think logically. So during their hospitalization, they need concrete visual and auditory images as in medical play with dolls to help them understand hospital routines and painful invasive procedures. During this stage of cognitive development, the children; especially, younger ones, typically fear being separated from their parents during hospitalization. This fear may be heightened when the child finds himself facing possibly painful procedures. Children may view the need for medical examinations and invasive procedures as a kind of punishment. Pre-logical thinking is typically for children between 2-7 years. Therefore, they think they get sick because of naughty actions or bad thoughts. Their limited ideas about illness demonstrate their cognitive immaturity which easily leads to misconceptions, unnecessary fears and anxieties (Jude children's research hospital, 2007; Purcell, 1995). Invasive procedures can be defined as a procedure that invades or enters the body usually by cutting, puncturing skin or by inserting instruments into the body. However, invasive procedures; particularly, procedures that involve needles can cause anxiety and pain in pediatric settings. The children's responses to painful invasive procedures include behavioral, physiological, emotional, cognitive and interpersonal responses. Children's behavioral distress responses to painful invasive procedures may include verbal e.g. crying, yelling, refusal to cooperate and flailing and or physical e.g. pushing, withdrawal and kicking. The physiological responses usually reflect sympathetic activation. It includes elevated heart rate respiratory rate, blood pressure and skin temperature (Adele, 1992; Mary, 2001). Preparing children for invasive procedures is an important element of the nurse work; this preparation includes physical and psychological preparation. Firstly, the physical preparation depends on the age of the child and the procedure itself while psychological preparation helps in decreasing the children anxiety and promotes their cooperation. So the nurse must prepare the child with honest, age-appropriate explanations and carry out procedures in the least stressful manner to the child. In general, young children respond better to play materials in their preparation therefore; many institutions have developed preadmission teaching programs and various procedures by offering hands-on experience with hospital equipment through medical play (Marilyn, 2005). Nurse's role regarding preparing children for medical or nursing procedures through the use of therapeutic play, is vital. She supplies materials as using hospital –related props such as syringes, masks, and dolls with intravenous lines. These items are used to convey information and give children opportunities for hands –on learning.

Also, the nurse lets the children be in charge of their play, starting and stopping as they wish and supervises the child during medical play. This helps the pediatric nurse to be aware of any misconception that the child may have, allow enough time without interruptions and help children talk about their feelings and actions. During the play session, concrete simple explanations can be offered and misconceptions can be corrected (Duke children's hospital and health center, 2006; Kelvin, 1994).

Aim of the Study: The study aimed to determine the effect of therapeutic play on the anxiety level as a preparation technique of children undergoing invasive nursing procedures.

MATERIALS AND METHOD

Materials

Design:

A quasi experimental research design was used in the present study.

Setting:

The study was conducted in the Pediatric Department, Hematology/ Oncology Unit of Tanta University Hospitals.

Subjects: A convenient sample of 100 children, age range between 2-7 years, both sexes were included. First admitted to Pediatric Department, Hematology/ Oncology Unit and undergoing invasive nursing procedures as insertion of cannula, taking blood sample and intravenous injections.

Tools: Two tools were used to collect the necessary data.

Tool one: Questionnaire sheet, this tool consists of two parts:

Part I: Included the demographic data about the children and their mothers, it including: age, sex, birth order, address, level of education and occupation of mothers.

Part II: Vital signs sheet it was developed by the researcher and consists of measuring temperature, pulse and respiration of children of both groups before and immediately after invasive nursing procedure.

Tool two: Observation check list sheet which was developed by the researcher and consists of three parts:

Part one which constructed to determine the types of intravenous procedures.

Part two consist of behavioral observational sheet: that was used to assess the psychological reaction of children during invasive nursing procedures and consisted of three parts: vocalization, facial expressions and body movement behaviors (McGrath, 1985).

Part three observational check lists for assessment the level of children's anxiety through observation of behaviors indicating levels of anxiety as

Mild anxiety: behaviors that don't delay or interfere with the performance of the procedure such as crying, whining, restlessness…….etc.

Moderate anxiety: behaviors that don't disrupt performance of the procedures can be delayed as yelling, tensing of muscles, facial contortion……etc.

Severe anxiety: behaviors result in the procedure being delayed or performed by using physical restraint as getting up from seat, leaving the room…….etc.

Pilot study: Before embarking on the actual study, a pilot study was carried out on ten children to verify the applicability and feasibility of the developed tool.

Methods

- Hospital administrative permission was obtained before conducting this study through official letters then faculty of nursing clarifying the purpose of the study.
- Data for this study was conducted in three months period from February 2007 to May 2007 and by means of children who met the predetermined collection criteria.
- Both pediatricians and nurses working in the Unit were informed about the role of the researcher to gain their cooperation and secure proper communication.
- Patients and their mothers consent was obtained to participate in this study.
- Good relationship and explanation of the study purpose and tools were made to obtain the children's cooperation before approaching them. Next, these children classified into two groups and each group was made of fifty children.
- The first fifty children were assigned as the study group and the second fifty children were assigned as a control group.
- The researcher was available all days of week during morning shift.
- Every child and his or her mother or caregiver was interviewed personally, using the questioned sheet for the demographic data.
- Each child in the study group was prepared in a quit and relaxed area.
- The researcher explained the invasive procedure to the children and their mothers or caregiver.
- For the study group the children were prepared by the researcher before the invasive nursing procedures by therapeutic play using the medical type, while the control group was received only the routine hospital care.
- The researcher was used medical type of therapeutic play. By using of doll, real medical equipments as syringe, cannula, cotton and tourniquet and teach the children how to use syringe and help them to try to handle the equipments and injected the doll.
- The time spent with each child in the study group was 15 minutes.
- The vital signs of every child in both groups were measured before and immediately after invasive procedure that includes temperature, pulse and respiration.
- The children were observed during invasive procedures to determine the type of intravenous procedures, psychological reaction of them to the procedure for both groups by using behavior observation sheet.
- Each child in both groups was encountered for behaviors indicating levels of anxiety before and after the invasive nursing procedures.

A comparison was drawn to identify the effect of therapeutic play on the anxiety level as a preparation technique of children undergoing invasive nursing procedures.

Statistical analysis: The collected data was organized, tabulated and statistically analyzed using SPSS software (Petrie, 2005).

RESULTS

Table (1) shows the socio-demographic characteristics of the studied children for both study and control groups undergoing invasive nursing procedures. Children age ranged from 2-6 years. The studied children had a mean age of 3.99±1.34 years and 3.94±1.45 years for both study and control groups respectively, and the majority of them were boys (78%, 80% respectively). The same table shows that the highest percentage of children's birth order undergoing invasive nursing procedures were represented in the first child birth order in both study and control groups (42% , 60% respectively). In addition, table (1) shows that more than three quarter (78%) of study group and half (50%) of control group were diagnosed as favism while, the rest (50%) were diagnosed as pallor for investigation. The difference was statistically significant between two groups where $X^2 = 8.507$, P= 0.004.

Table (2) demonstrates the comparison between (T.P.R) body temperature, pulse and respiration among study and control groups undergoing invasive nursing procedures before and after the therapeutic play. The mean value of body temperature before the invasive nursing procedure in the study and control groups were 36.79±0.48 ^{o}C and 36.74 ± 0.34 ^{o}C then it changed to become 37.33±0.48 ^{o}C and 37.47 ± 0.114 ^{o}C after the invasive nursing procedure respectively. It is apparent that the mean value of body temperature had a statistically significant difference before and after invasive nursing procedures in the study and control groups where t=10.843, 14.905, P= 0.001 respectively. As regards pulse. The mean value of pulse before the invasive nursing procedure in the study and control groups were 103.92±13.08 and113.64±14.88 beat/minute then it changed to become 129.40 ±10.93 and 137.60 ±14.26 beat/minute after the invasive nursing procedure respectively. The difference was statistically significant between pulse before and after the invasive nursing procedure in the study and control groups where t = 14.553, 13.709, P= 0.001, 0.001. Also a statistically significant difference was found on values of pulse between two groups where t=3.226, P=0.002. The mean value of respiration before the invasive nursing procedure in the study and control groups were 22.0±2.94 cycle/minute and 23.72±3.82 cycle/minute then it changed to become 32.0±4.02 cycle/minute and 34.72±5.79 cycle/minute after the invasive nursing procedure respectively . The difference was statistically significant between respiration before and after the invasive nursing procedure in the study and control groups where (t = 22.225, 15.503, P= 0.001, 0.001). Also a statistically significant difference was found on values of respiration between two groups where t=2.730, P=0.008. Figure (1) presents, comparison of psychological reactions during the invasive nursing procedure before and after therapeutic play among study and control groups. It was observed that ninety percent of children in both groups depended on weeping as vocal of psychological reactions during invasive procedure.

While the majority (94%) of children in study group was had groaning compared to 88% in control group. Regard facial expressions it was found that 26%, 4% of the children of both groups respectively had used biting of lower lip as psychological reactions during invasive procedure. The difference was statistically significant between the two groups where X^2 = 9.490, P= 0.002. Regarding the body movements 22%, 42% of two groups respectively had performing protective movements as withdrawal of hand during invasive nursing procedure. Purposeless movements were performed by 22%, 43% of two groups respectively. The difference was statistically significant between the two groups where X^2 = 4.596, P= 0.032. Table (3) represents comparison between types of intravenous procedure among study and control groups during invasive nursing procedures. More than two third (68%, 70%) of children in study and control groups respectively had blood sampling as type of intravenous procedures, while about 32%, 26% in both groups respectively had insertion of canula and 4% of children in control group had intravenous injection. Regard the number of trials of insertion of needle, it was clear that the highest percent 76%, 66% of children in study and control groups respectively had one trial of insertion of needle, while about fifth (20%) of study group and about one quarter (24%) of control group had more than one trials of insertion of needle. Table (3) also reveals that about 34% of children in study group had one minute to complete the procedure compared to 44% of children in control group taken about two minutes.

Figure (2) represents effect of therapeutic play on levels of anxiety before and after the invasive procedure between study and control groups. It was observed that majority (68%) of children in study group suffered from moderate anxiety before the invasive nursing procedure and one fifth (20%) had severe anxiety and only 12% had mild anxiety. Compared to more than three quarter (78%) of children of control group had sever anxiety and the rest (22%) of them were had moderate anxiety. The difference was statistically significant between the anxiety level before the invasive nursing procedure in study group and control group where X^2 =33.653, P= 0.001. Regarding level of anxiety after the invasive nursing procedure, about more than half (54%) of children had mild anxiety ,44% had moderate anxiety and only 2% had severe anxiety in study group compared to 14% had mild anxiety, 28% had moderate anxiety and more than half (58%) suffered from severe anxiety in control group. The difference was statistically significant between the anxiety level after the invasive nursing procedure in study group and control group where X^2 =39.676, P= 0.001. A significantly difference was found between two groups Z=5.303, P=0.001 for study group and Z= 3.713, P=0.001.

Table (4) demonstrates the relation between level of anxiety before and after the invasive procedure and age of study and control groups. The table show that more than two third (68.7%) of children who aged 2-4 years were had moderate anxiety and about one third (31.3%) of them had severe anxiety before the invasive nursing procedure in the study group, compared to 92.9% of children at the same age group had severe anxiety and 7.1% had moderate anxiety in the control group. As regard to children aged 5-7 years in the study group more than two third had moderate anxiety and 33.3% had mild anxiety, while in control group more than half (59.1%) had severe anxiety and about 40.9% had moderate anxiety. In relation to level of anxiety before the invasive nursing procedure and age of children in study and control groups , it was found that there were statistical significant difference between level of anxiety and two age group of children (2-4 years, 5-7 years) in both study and control groups respectively where P= 0.008,0.006. Regarding level of anxiety after the invasive nursing procedure 56.3% of children aged 2-4 years had moderate anxiety, while 40.6% had mild anxiety and only 3.1 % had severe anxiety in the study group compared to 58.7% of children at the same age group in control had severe anxiety and 14.3% of them had moderate anxiety. But children 5-7 years, three quarter (77.8%) had mild anxiety and 22.2% had moderate anxiety in the study group, while about to half 45.5% had moderate moderate anxiety,31.8% had mild anxiety and about one quarter 22.7% had severe anxiety in control group. It was found that there were statistical significant differences between levels of anxiety and two age group of children(2-4 years, 5-7 years) in both study and control groups (P= 0.018,0.001) respectively. Table (5) represents the relation between level of anxiety before and after the invasive procedure and sex of study and control groups. It was observed that the highest percentage of males in the study group who represented 71.8% had moderate anxiety before the invasive nursing procedure compared to 54.5% of female who had moderate anxiety too, while in control group the highest percentage 72.5% of males had severe anxiety and 100% of females had severe anxiety too. Concerning the level of anxiety after the invasive nursing procedure, it was observed that the more than half (51.3%) of males in study group had mild anxiety and 48.7% had moderate anxiety and zero % had severe anxiety. In females 63.6% had mild anxiety and 27.3% had moderate anxiety and about 9.1% had severe anxiety. Compared to males in control group it was found that more than half (55%) had severe anxiety, 27.5% had moderate anxiety and 17.5% had mild anxiety, while the majority (70 %) of children had severe anxiety and about thirty percent had moderate anxiety and zero% of females had mild anxiety.

Table (6) shows the relation between level of anxiety before and after the invasive procedure and birth order of study and control groups. Two third (61.9%) and 72.4% of both first child and others (second, third, fourth, fifth, sixth child) respectively had moderate anxiety before the invasive nursing procedure in the study group compared to about one quarter (23.8%) of the first child had mild anxiety and 24.1% of others had severe anxiety, while in control group the majority (83.3%) of children had severe anxiety were the first child and about 70% of others had severe anxiety too before the invasive procedure. Regarding the level of anxiety after the invasive nursing procedure, it was observed that the majority (81%) of the first child of children had mild anxiety, 19% had moderate anxiety and zero % had severe anxiety where as about two third (62%) of children whose had moderate anxiety, 34.55 had moderate anxiety and only only 3.4% had severe anxiety were others (Second, third, fourth, fifth, sixth child) while in control group 60% of children had severe anxiety were first child and 36.7% had moderate anxiety but in others (Second, third, fourth. fifth. sixth child) about more than half (55%) had severe anxiety and thirty percent had mild anxiety. It was found that there were statistical significant differences between levels of anxiety in the first child and others (second, third, fourth. fifth. sixth child) after the invasive nursing procedure in the study group were P= 0.002.

Table 1. Socio-Demographic Characteristics of the Studied Children for Both Study and Control Groups Undergoing Invasive Nursing Procedures

Variables	Study group (n=50)		Control group (n=50)		X^2	p
	n	%	n	%		
Age in years						
2-	13	26.0	14	28.0		
3-	10	20.0	9	18.0		
4-	11	22.0	9	18.0	0.512	0.972
5-	8	16.0	10	20.0		
6-	8	16.0	8	16.0		
Mean ±S.D.	3.99±1.34		3.94±1.45			
Sex:						
Boys	39	78.0	40	80.0	0.060	0.806
Girls	11	22.0	10	20.0		
Residence:						
Urban	17	34.0	28	56.0	4.889	0.027*
Rural	33	66.0	22	44.0		
Birth order:						
1st child	21	42.0	30	60.0		
2nd child	8	16.0	8	16.0	4.043#	0.132
3rd child	18	36.0	7	14.0		
4-6th child	3	6.0	5	10.0		
Educational level:						
Nursery home	27	54.0	23	46.0		
Primary	10	20.0	8	16.0	1.667	0.434
Others	13	26.0	19	38.0		
Diagnosis:						
Favism	39	78.0	25	50.0	8.507	0.004*
Pallor	11	22.0	25	50.0		
Hospital accommodation:						
Mother	48	96.0	43	86.0	FE	0.159
Grandparents	2	4.0	7	14.0		

*Significant at P < 0.05 FE = Fisher exact test

Table (2): Comparison Between T.P.R Among Study and Control Groups Undergoing Invasive Nursing Procedures Before and After the Therapeutic Play.

Vital signs	Study group (n=50)		Control group (n=50)		t	p
	Before	After	Before	After		
Temperature:						
Range	36-37.7	36.4-38.5	36.2-38	36.5-38.3		
Mean	36.79	37.33	36.74	37.47	1.536	0.128
S.D.	0.48	0.48	0.34	0.411		
t	10.843		14.905			
p	0.001*		0.001*			
Pulse :						
Range	80-128	90-148	88-144	100-160		
Mean	103.92	129.40	113.64	137.60	3.226	0.002*
S.D.	13.08	10.93	14.88	14.26		
t	14.553		13.709			
p	0.001*		0.001*			
Respiration:						
Range	20-30	24-38	19-30	22-46		
Mean	22.00	32.00	23.74	34.72	1.157	0.008*
S.D.	2.94	4.02	3.82	5.79		
t	22.225		15.503			
p	0.001*		0.001*			

*Significant at P <0.05

Table 3. Comparison Between Types of Intravenous Procedure among Study and Control Groups During Invasive Nursing Procedures

Variables	Study group (n=50)		Control group (n=50)		X^2	p
	n	%	n	%		
Type:						
Inserting canula	16	32.0	13	26.0		
Blood sampling	34	68.0	35	70.0	0.437#	0.508
Intravenous injection	0	0.0	2	4.0		
No. of trials						
1	38	76.0	33	66.0		
2	10	20.0	12	24.0	1.214#	0.271
3	2	4.0	5	10.0		
Site of insertion:						
Dorsal hand veins	33	66.0	35	70.0	0.184	0.668
Brachial veins	17	34.0	15	30.0		
Time of procedure in minutes:						
1	17	34.0	12	24.0		
2	14	28.0	22	44.0	2.942	0.401
3	9	18.0	7	14.0		
4+	10	20.0	9	18.0		

*Significant at P<0.05

Table 4. Relation Between Levels of Anxiety Before and After the Invasive Procedure and Age of Study and Control Groups

Level of anxiety	Study group (n=50)				Control group (n=50)			
	2-4 years		5-7 years		2-4 years		5-7 years	
	n	%	n	%	n	%	n	%
Before invasive nursing procedure:								
Mild	0	0.0	6	33.3	0	0.0	0	0.0
Moderate	22	68.7	12	66.7	2	7.1	9	40.9
Severe	10	31.3	0	0.0	26	92.9	13	59.1
p	0.008*				0.006*			
After invasive nursing procedure:								
Mild	13	40.6	14	77.8	0	0.0	7	31.8
Moderate	18	56.3	4	22.2	4	14.3	10	45.5
Severe	1	3.1	0	0.0	24	85.7	5	22.7
p	0.018*				0.001*			

*Significant at P<0.05

Table 5. Relation Between Levels of Anxiety Before and After the Invasive Procedure and Sex of Study and Control Groups

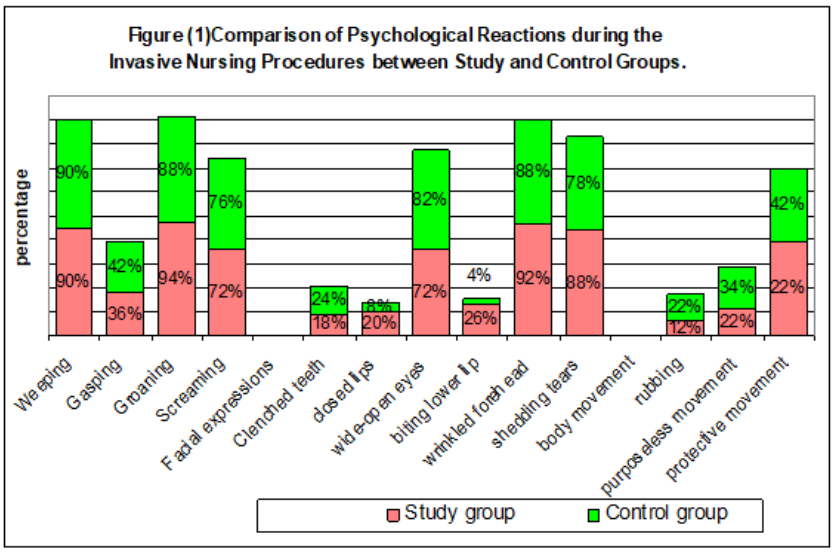
Level of anxiety	Study group (n=50)				Control group (n=50)			
	Boys		Girls		Boys		Girls	
	n	%	n	%	n	%	n	%
Before invasive nursing procedure:								
Mild	3	7.7	3	27.3	0	0.0	0	0.0
Moderate	28	71.8	6	54.5	11	27.5	0	0.0
Severe	8	20.5	2	18.2	29	72.5	10	100.0
p	0.996				0.092			
After invasive nursing procedure:								
Mild	20	51.3	7	63.6	7	17.5	0	0.0
Moderate	19	48.7	3	27.3	11	27.5	3	30.0
Severe	0	0.0	1	9.1	22	55.0	7	70.0
p	0.515				0.488			

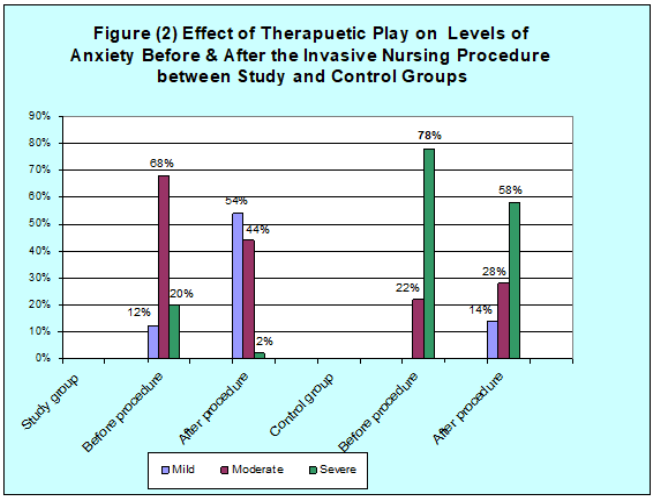
*Significant at P< 0.05

Table 6. Relation Between Levels of Anxiety Before and After the Invasive Procedure and Birth Order of Study and Control Groups

Level of anxiety	Study group (n=50)				Control group (n=50)			
	First child		Others		First child		Others	
	n	%	n	%	n	%	n	%
Before invasive nursing procedure:								
Mild	5	23.8	1	3.4	0	0.0	0	0.0
Moderate	13	61.9	21	72.4	5	16.7	6	30.0
Severe	3	14.3	7	24.1	25	83.3	14	70.0
p	0.488				0.311			
After invasive nursing procedure:								
Mild	17	81.0	10	34.5	1	3.3	6	30.0
Moderate	4	19.0	18	62.1	11	36.7	3	15.0
Severe	0	0.0	1	3.4	18	60.0	11	55.0
p	0.002*				0.776			

*Significant at P< 0.05





DISCUSSION

The present study revealed that the age of the studied children ranged from 2-6 years with the mean age 3.9 years. This finding is in agreement with Authers 1974[19] who stated that the highest incidence of favism in children were in age 2-6 years. Also the findings of this research showed that the majority of the studied children were boys. This finding is in agreement with Authers, 2006 [20] who found that 93.3% of the studied children whose have favism were boys and only 6.7% were girls. Also this finding was in agreement with Duran 2006 who stated that 80% of the studied children were boys and 20% were girls this is as result from that favism usually affect boys two or three times more frequent than in girls as stated by Duran 2006. As regard to diagnosis, the present study revealed that the majority of the studied children were diagnosed as favism whereas; pallor for investigation represented the least diagnosis. It well known that favism usually occurs during the spring season, as a result of ingestion of fresh or frozen beans, but fresh beans by far the commonest offender. This time which the current study done during it. This finding is congruent with the study of Duran 2006 (Duran, 2006). Furthermore, the result of the current study revealed that heart rate and respiratory rate was increased with anxiety in both study and control groups. This may be attributed to autonomic nervous system responses to anxiety, particularly sympathetic nervous system activation and increase activity of the hypothalamus and pituitary gland. This result is comparable to Harmesh, 2000 and Gessle, 2004 they observed that heart rate was significantly increased after painful procedures.

The present study showed that, positive statistical significant decreasing in values of heart rate and respiratory rate after applying therapeutic play (medical play) on children of the study group. This is can be attributed to effect of this type of therapeutic play on the cause of anxiety in those children whose may be anxious due to dealing with stranger environment and equipments which they may faced during their hospitalization. Also there is lack of information about nursing procedures which they may faced in it. So by the therapeutic play this cause can be resolved so the body can return to normal (relaxation response) through activation of the parasympathetic nervous system and the decrease activity in the hypothalamus and pituitary gland [24] which play a role in decreasing anxiety responses (lowering heart rate, respiratory rate) as mentioned by Charney, 2004 and Jech, 2001 These findings are in agreement with Lina, 1998, who illustrated that the experimental group had significantly lower mean values than the control group for both systolic blood pressure and pulse rate. Thus, the children involved with therapeutic play showed less physiological stress in response to the injection. However, there were no statistical differences in temperature value between the study and control groups. The results of this study demonstrated that, there was statistically significant difference between two groups regarding the psychological reactions during the invasive nursing procedures. These reactions particularly biting of lower lips and using of protective body movements as withdrawal of hand during procedures. Similar findings were demonstrated by Ho-Cheung, 2007. Ho-Cheung mentioned that both children and their parents in the experimental group who's received therapeutic play intervention before the surgery exhibited fewer instances of negative emotional behaviors in pre- and post-operative periods.

The most frequent invasive procedures that hospitalized children encounter include venipuncture for laboratory blood sampling and intravenous (I.V) cannulation, and intramuscular injections. At the same time the current study revealed that the taking of blood sampling and insertion of cannula consist the majority of intravenous procedures that done in hematological department. Amount of anxiety caused by these procedures varies across studies, and reports range from mild to severe as stated by Eland, 1982. The present study showed that, a highest percentage of the studied group were had moderate level of anxiety before the invasive nursing procedure and more than half of them had mild level of anxiety after the invasive nursing procedures. While in control group the majority of children had severe anxiety before and after the invasive nursing procedures. It seems that, the study group who received therapeutic play (medical type) reported significant lowered level of anxiety before and after the invasive procedure.

These findings is in agreement with Violeta, 2007 who found that the experimental group who received therapeutic play reported significantly lower state anxiety scores in pre- post-operative periods than control group who received routine information. In addition the result were in agreement also with Authers, 2008 who concluded that anxiety levels in the informed group were statistically higher than in the mask group who playing with an anesthesia mask before anesthesia in mask group. The present study revealed that there were statistical significant difference between level of anxiety and two age group 2-4 years and 5-7 years. As younger children have higher level of anxiety than older ones. This finding is in agreement with Tiedeman and Clatworthy, 1990 who founded that younger children were more anxious than older one. Piaget's theory of cognitive development may help explain the increase in anxiety in younger as children aged between 2-7 years in the pre-operational stage of development aren't able to think logically and focus on magical thinking and are less able to distinguish reality from fantasy. Tiedeman and Clatworthy found that children aged between 5-7 years were more anxious throughout hospitalization compared by those who were aged between 8-11 years .This finding also in agreement with Wendy et al, 2001[33] who stated that the younger children displaying more distress and reporting more pain than older one. This finding is in agreement with Tiedeman and Clatworthy, 1990 [32] who founded that younger children were

more anxious than older one. Piaget's theory of cognitive development may help explain the increase in anxiety in younger as children aged between 2-7 years in the preoperational stage of development aren't able to think logically and focus on magical thinking and are less able to distinguish reality from fantasy. Tiedeman and Clatworthy found that children aged between 5-7 years were more anxious throughout hospitalization compared by those who were aged between 8-11 years .This finding also in agreement with Wendy et al, 2001 who stated that the younger children displaying more distress and reporting more pain than older one. In comparing sex and anxiety levels, the findings of this research showed that no difference was found between boys and girls and anxiety level. Similar results were presented by Edwinson, 1988 [34] , Margolis 1998 [35] and Schwartz, 1983 [36] . Also, these findings were in agreement Wendy, 2001 who found no significant gender differences observed in behavioral distress of children undergoing intravenous procedures. This result were incongruent with Tiedeman and Clatworthy 1990 who found that boys were more anxious than girls at admission and continuing through post hospitalization. Regarding to birth order and level of anxiety before and after the invasive nursing procedures. The results of the study were not in agreement with Essawy, 1987 and Awaritefe, 1988 who found that the first born children were rated as significantly more sensitive in their behaviors. As no significant difference between two groups in the levels of anxiety in the first child or others (2nd, 3rd, 4th, 5th child).

Conclusion

The study concluded that the anxiety level of children in study group, were improved after applying of therapeutic play. The result also revealed that, therapeutic play help in decreasing level of anxiety in children in pre-operational stage (2-7 years), and increase their cooperation during invasive nursing procedures. Also children in this study manifested less anxiety and less physiological stress when they were prepared by medical play.

Recommendations:

The followings are the recommendations pertained to the study

- Playing room must be founded in every pediatric department and should be provided with Toys, stuffed animals, dolls, medical equipments which needed to perform therapeutic play.
- The nurse must allow children to approach a frightening situation in playing room.
- The nurse should be identifying any misinterpretation the child may have and correct them about the invasive nursing procedures during play.
- Training programs in therapeutic play for nurses and medical stuff to provide the hematology department with a sufficient number of professional persons to facilitate performing of therapeutic play.

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