

# Effects of Programmed Information on Coping Behavior and Emotions of Mothers of Young Children Undergoing IV Procedures

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**Purpose.** To determine the effects of provision of information on mother's problem focused coping ability during their child's intravenous procedure.

**Methods.** Data were collected from 56 mothers whose children have admitted to pediatric ward in the hospital. The participants included 27 intervention group mothers and 29 control group mothers. For the information intervention, "Programmed Information for Parental Coping before Intravenous Procedure (PIPC-IP)", video program was made based on self-regulation theory for the experimental group mothers. Mother's coping ability was measured by parental supportive behavior, parental beliefs and Profile of Mood State (POMS).

**Results.** Mothers who received PIPC-IP showed significantly higher levels of supportive behavior ( $t = 3.55, p = .005$ ) and Parental Beliefs ( $t = 2.95, p = .005$ ), but no significant difference in negative mood on POMS ( $t = .15, p = .87$ ) compared to mothers in the control group.

**Conclusions.** These results demonstrate that PIPC-IP is an effective intervention to increase the supportive behaviors and beliefs of mothers' problem focused coping ability but not the negative mood.

**Key Words :** PIPC-IP, self-regulation theory, problem focused coping ability.

## INTRODUCTION

Young children find invasive procedures, such as injections, blood draws, and spinal punctures that are conducted in the hospital repeatedly and urgently, to be extremely painful and almost intolerable. As these children are not able to clearly communicate their fear or pain, they often offer extreme resistance to such procedures, and that results in parental stress as well. In a Korean study (Oh, Cho &, Koo, 1996) the parents expressed negative emotional responses to their children undergoing intravenous procedures saying things like "my heart is broken," "I want to cry," or "I would prefer to go

through the procedure myself in the place of my child". This report showed the vulnerable emotions parents are exposed when they are not psychologically prepared. Thus, it is necessary that the parental role be strengthened to help them cope with the stress of their child's fear and pain during invasive procedures.

In recent studies (Salmon and Pereira, 2002; Blount et al., 1997), researchers found that children's coping ability significantly increased when parents exhibited supportive behaviors during intravenous procedures. Under stress young children have difficulty in expression of pain and are dependent on their parents for comfort. To promote this role in parents when their child is under stress it is necessary for the parents to use problem solv-

ing coping strategies, e.g. seeking information. Parents using this type of coping tend to be more actively involved in their children's care than parents who use emotion-focused coping strategies, e.g. avoidance and distancing. (LaMontagne et. al., 1992). The ability to use problem solving coping strategies can be enhanced by providing information to the parents in advance. The mechanism of this function has been well proven by the self-regulation theory (Johnson, Fieler & Jones et al., 1997; Leventhal & Johnson, 1983).

Use of information based on self-regulation theory enhances the parental role especially as it relates to problem solving coping ability for their young children who are under stress of hospitalization or pain in the pediatric unit (Melnyk, 1994). In the study by Melnyk (1994) information was provided to parents of young children who are about to have an IV procedure and the problem focused coping ability of the parents in experimental group was higher than for parents in the control group and also the information was effective in enhancing their mood and beliefs.

In this study information based on self-regulation theory was developed and was labeled, "programmed information for parental coping before intravenous procedure (PIPC-IP)", and the following hypotheses were proposed and tested: 1) Mothers in the experimental group will demonstrate more supportive behavior for their young children during the intravenous procedure than mothers in the control group, 2) Mothers in the experimental group will express less negative emotion immediately after the intravenous procedure than mothers in the control group; and 3) Mothers in the experimental group will show more parental belief in their role after receiving the information than mothers in the control group.

## BACKGROUND

Child behavior is extremely resistant to immobility and pain. Parental emotion during intravenous administration or blood work for their young children easily elapses into negative emotions when they attend the procedure but are not prepared psychologically (Watt-Watson, Everden & Lawson, 1990). Children's irritability requires consistent parental supportive behavior to protect the child from the stress of painful procedures such as venous punctures. As a demonstration of supportive parental role in the regulation of negative emotions, previous reports (Melnyk, 1994; 1995) show a

good effect with the provision of information based on self-regulation theory. Self-regulation theory proposes the ability to regulate negative emotions and increase functional coping to solve the problem at hand. The theory is rooted in stress theory (Lazarus and Folkman, 1984) where information transfer is described as being carried out based on information processing (Rumelhart, 1984), and in control theory (Carver and Scheier, 1982).

There are two types of function in coping activities (Lazarus and Folkman, 1984), the regulation of emotional responses and solving of problems. To evaluate parental coping during invasive procedures involving their children, it is necessary to measure emotional responses, such as parental negative mood or anxieties, and problem solving ability, such as supportive behaviors or participation in child care. Thus if there is an intervention for parental coping, the parents will show regulation of negative emotions and functional coping behaviors.

The provision of information based on self-regulation theory must be objective oriented, reasonably accurate to real life, and concrete. It must inform the individual of the major stressful factors of the upcoming event. Through the provision of this information based on self-regulation theory and through understanding and integration of the major stressful factors of the upcoming event, the cognitive schema is induced to predict the real context and decide the best way to act (Johnson et al., 1997). After receiving information, the cognitive schema forms the parental beliefs in that individual (Melnyk, 1995). These beliefs, in turn, help the individual to channel his or her energy toward realistic problem solving rather than toward negative emotional responses.

The information needs to include information about the major stressors of the event (Johnson et al., 1997). The major stressors to the parents of hospitalized children are behavioral changes in the child and parental role uncertainties, both of which result in parental anxieties and frustrations (Kasper & Nyamathi, 1988; Melnyk, 1994; Won, Seung & Elder, 2005)). Role uncertainty resulting from the child's resistant behavior and environmental constraints during the venous puncture result in a discrepancy between the role in the current situation and the usual parental role. For parents to maintain their parental beliefs in their role, in spite of the child's resistant behavior and the environmental constraints, parents need accurate information to minimize the discrepancy.

Thus, the information in PIPC-IP was developed based on self-regulation theory and hypothesized to increase parental functional coping abilities during intravenous administration for the child.

## METHODS

### *Research design and sample*

A pretest-posttest experimental design was used in this study, which was done to increase the problem focused coping ability of mothers during the intravenous procedures on their children in a pediatric unit. Fifty-six mothers participated in this study and they were selected from a population of mothers at the U University Hospital, which is located in the industrial U City, Korea. Participants were randomly selected in order of admission in 3-month periods and control group was selected first. They agreed to participate with the study and submitted written consent. Twenty-nine mothers were allocated to the control group and twenty-seven mothers to the experimental group. Most of the children had been admitted to the pediatric unit with a diagnosis of acute respiratory disease or gastro-intestinal problems, but not with any immediate life threatening illnesses. They were undergoing a venous puncture immediately after admission. The selection criteria were mothers who have child's age was less than three years and whose child had not undergone a previous venous puncture.

### *Procedures*

Mothers who were in the experimental group completed a self-report mood test and the parental beliefs test before the PIPC-IP was provided. Right after the PIPC-IP was provided they repeated the parental beliefs test. The PIPC-IP intervention was given by showing the videotape for 7 minutes in a small quiet room in the pediatric ward. A research assistant helped mothers to administer the self-report questionnaires on mood test and beliefs test, and to watch the videotape. The child was placed in the treatment room for venous puncture and two trained nurses observed parental support behaviors during the venous puncture. The inter rater reliability of the nurses was 82% and they were double blinded to avoid bias. Within an hour of the completion of the venous puncture the mothers did another self-report mood test.

Mothers in the control group had similar procedures

but received only routine information as the intervention. They completed the self-report mood test and parental beliefs test before the routine information was provided and then repeated the parental beliefs test again after provision of routine information. All of the rest of the procedures were identical with the experimental group. The routine information included the purpose of the venous puncture and encouragement of maternal supportive behavior to their child during the venous puncture.

### *The programmed information on IV procedure*

The programmed information was a 7-minute audiovisual program made for this study by the author. It involved two kinds of theoretical concepts; orientation to the IV procedure including physical environment and main stress factors to the parents during the procedure. The main stress factors to the mothers covered in the PIPC-IP were children's resistant responses and parental supportive roles during the IV procedure. The video was made in the real setting to decrease the discrepancy in parental expectation and to increase their predictability of the child's venous puncture. Permission to tape picture for the videotape was obtained from all the mothers, nurses and doctors who were shown in the video.

The role of the mothers and responses of the children were varied even though the role of the doctor and nurse were consistent. The pictures in the film were accumulated until there were adequate varieties of responses by both children and mothers. It took about three months to obtain the various types of responses. Basically there were two criteria for children's responses, cooperation or resistance on the part of the child. In the responses of mothers, most were supportive responses but uncooperative attitudes were also demonstrated. Resistant responses by the children included loud crying, kicking out, change in color of face, and pushing the nurses with resistant gestures away from the venous puncture procedure. Cooperative responses were gestures following the nurse's guidance. The parental cooperative reactions were supportive behaviors such as petting, kissing, hugging, eye contacting, and explaining the procedure. Uncooperative reactions included irritation, anger directed at the child or the nurse, and negative emotion such as crying and shouting. A voice describing the pictures was added after the film was edited and it emphasized concrete objective information to gain a cognitive schema which would enhance understanding

of the pictures towards an objective concrete perspective rather than a negative emotional perspective.

For content validity, two senior pediatric nurses and two pediatric nursing professors were invited to discuss the criteria description before production of the tape. They also reviewed the edited video and agreed with the content.

## MEASURES

### *Measurement of parental support*

Parental support was measured using the Index of Parental Support developed by Melnyk (1994) to measure degrees of parental support during invasive procedures in children. Written permission was obtained from the author to use the index in this study. Research assistants who were blind to the assignment groups scored the mothers supporting behaviors to her child during the procedure for both the experimental and control group. The inter rater reliability was established as  $r = .86$ . The Cronbach's alpha was  $.81$ . The original instrument contains 16 dichotomous (yes/no) items describing possible parental behaviors, including "explaining the procedure," "giving positive reinforcement," "having eye contact," and "smiling at child". They were translated into Korean and then back to English in order to ensure accuracy with the original English expression. Dichotomous items were changed to a 5-point scale. Two clinical pediatric nurses and two faculty members from the college of nursing established the validity of the translated instrument. The Cronbach's alpha was  $.92$  for the total scale.

### *Measurement of parental beliefs*

Parental beliefs were measured using the Parental Beliefs Scale developed by Melnyk (1994) to measure the degree of parental beliefs after provision of information on their hospitalized child and written permission

was obtained from the author to use it in this study. Melnyk's (1994) 20 item parental belief scale was used to measure mother's beliefs of child behavioral information and parental role information. The Cronbach's alpha was  $.86$  for the original study. An example of items was, "I know what kind of behavioral change is to be expected in my child while he or she is undergoing the venous puncture procedure." The scale was translated into Korean and then translated back into English to compare. Two pediatric nurses and two faculty members from the college of nursing established the content validity. The Cronbach's alpha was  $.90$  for the scale as a whole.

### *Measurement of negative mood*

The Profile of Mood State (POMS) was developed by McNair et al. (1971) and translated into Korean by Lee (1991) The Cronbach's alpha was  $.92$  at the time of translation and content validity has been established by several nursing faculty and clinicians. Lee's Korean version was used in this study after written permission was obtained. The instrument consists of 65 items, each of which is scored on a 5-point scale. The criteria score for each item consists of six emotional states including tension-anxiety, depression-dejection, anger-hostility, vigor-activity, fatigue-inertia, confusion-bewilderment. Higher scores indicate a greater level of negative emotion. The Cronbach's alpha was  $.80$  for the scale as a whole.

## RESULTS

As shown in Table 1, the general characteristics of both study groups were homogenous. The mean age in the experimental group was 29.8 years with a range from 24 - 38 years and the mean ages in the control group was 30.2 years with a range from 23 - 41 years. The median education level for the mothers was high school graduation. The mean age of the children in the

**Table 1.** Characteristics of Mothers and Children in Experimental and Control Groups

|        |              |                    | Experimental (N = 27) | Control (N = 29) | t or $\chi^2$ | p   |
|--------|--------------|--------------------|-----------------------|------------------|---------------|-----|
| mother | Age          | M(SD)              | 29.8 (3.47)           | 29.8 (4.00)      | .03           | .98 |
|        |              | Range              | 24 - 38               | 23 - 41          |               |     |
|        | Education    | Junior/High school | 17                    | 21               | .57           | .45 |
|        |              | College            | 10                    | 8                |               |     |
| Child  | Gender       | Boy                | 15                    | 21               | 1.73          | .19 |
|        |              | Girl               | 12                    | 8                |               |     |
|        | Age (months) | Average            | 16.6                  | 14.9             | .72           | .48 |
|        |              | Range              | 6 - 32                | 3 - 41           |               |     |

experimental group was 16.6 months with a range from 6 - 32 months and in the control group, 14.9 months with a range from 3 - 41 months. There were no statistical differences between the experimental and control groups for the variables of age and education.

Table 2 shows the effects of the PIPC-IP intervention on the level of mothers' support during the intravenous procedure. Significant differences were found between the two groups. Mothers in the experimental group had significantly higher levels of supportive behavior during the procedure than mothers in the control group ( $t = 3.55, p = .005$ ). Hypotheses 1, 'Mothers in the experimental group will demonstrate more supportive behavior for their young children during the intravenous procedure than mothers in the control group' was accepted ( $t = 3.55, p = .005$ ).

Table 3 lists the scores of both groups on the POMS. Scores before the treatment indicated no significant difference in mothers' mood between the two groups ( $t = .15, p = .87$ ). For the effect of the treatment on the POMS, there was also no significant difference between the two groups ( $t = -.20, p = .83$ ). PIPC-IP did not affect mothers' mood right after the IV procedure. However in two groups, there are some differences of POMS between before and after IV procedure of each

group. In experimental group, mothers showed more significant decrease in their negative mood ( $t = 2.30, p = .03$ ) than control group ( $t = 1.51, p = .14$ ) after IV procedure. However there is no significant change between two groups after IV procedure.

Hypotheses 2, 'Mothers in the experimental group will express less negative emotion immediately after the intravenous procedure than mothers in a control group' was rejected ( $t = -.20, p = .83$ ).

As shown in Table 4, scores for the Parental Belief Scale for the control and the experimental groups did not show a significant difference at the beginning of the study ( $t = -.53, p = .60$ ). After receiving the PIPC-IP, mothers in the experimental group scored significantly higher on the Parental Belief Scale than did mothers in the control group ( $t = 2.95, p = .005$ ). PIPC-IP increased mothers' beliefs immediately after the intervention. Also in two groups there are some different increases in Parental Beliefs Scale between before and after IV procedure of each group. Both groups have significant increase in the scale but experimental group showed more significant change ( $t = -4.94, p = .0005$ ) than control group ( $t = -3.02, p = .005$ ).

Hypotheses 3, 'Mothers in the experimental group will show higher beliefs in the mothers' role after receiving the PIPC-IP information compared to mothers in the control group was accepted ( $t = 2.95, p = .005$ ).

**Table 2.** Scores for Parental Supportive Behavior

| Experimental (n=27) | Control (n=29) |      |      |
|---------------------|----------------|------|------|
| Mean (SD)           | Mean (SD)      | t    | p    |
| 36.48 (8.41)        | 27.48 (10.36)  | 3.55 | .005 |

**Table 3.** Mean for Profile of Mood State (POMS)

|                          | Experimental (n = 27) | Control (n = 29) | t    | P   |
|--------------------------|-----------------------|------------------|------|-----|
|                          | Mean (SD)             | Mean (SD)        |      |     |
| Before intervention      | 188.52 (31.21)        | 187.38 (23.55)   | .15  | .87 |
| After Invasive procedure | 175.81 (36.07)        | 177.68 (30.87)   | -.20 | .83 |
| t                        | 2.30                  | 1.51             |      |     |
| p                        | .03                   | .14              |      |     |

**Table 4.** Scores for Parental Beliefs Scale

|                     | Experimental (n = 27) | Control (n = 29)            | t    | P    |
|---------------------|-----------------------|-----------------------------|------|------|
|                     | Mean (SD)             | Mean (SD)                   |      |      |
| Before intervention | 61.15 (13.58)         | 62.97 (11.95)               | -.53 | .60  |
| After Intervention  | 74.15 (7.74)          | 67.03 (10.46)               | 2.95 | .005 |
|                     |                       | (After routine information) |      |      |
| t                   | -4.94                 | -3.02                       |      |      |
| p                   | .0005                 | .005                        |      |      |

## DISCUSSION

In this study the informational intervention, PIPC-IP,

based on the self-regulation theory (Leventhal and Johnson, 1983) was used with the experimental group to test its effects on coping behaviors. The mothers in the study were significantly distressed because of their children's admission to hospital and they need to provide supportive behavior to their children during an intravenous procedure right after admission. The children struggled to escape from the painful venous puncture. To achieve a good parental role for their struggling child mothers needed to exhibit problem focused coping behavior by regulating their own stressful emotions with belief in their parental role in order to support their child during this distressful procedure.

The results of this study demonstrate that the provision of PIPC-IP based on the self-regulation theory (Johnson, 1997) significantly increases mothers' supportive behavior ( $t = 3.55, p = .005$ ) and mothers' beliefs ( $t = 2.95, p = .005$ ), but their negative mood ( $t = .15, p = .87$ ) did not show any significant improvement. The most important purpose of the provision of PIPC-IP is to elicit parental supportive behavior as problem focused coping ability during the stressful intravenous procedure. The results show that mothers in the experimental group did not resort to negative emotional coping responses as much as the control group even though their negative emotion was not significantly different from the control group. For parental coping behaviors, Melnyk (1994) also demonstrated that parents who received information based on self-regulation theory had a significant increase in their caring activities as they use problem focused coping behavior. A study in which similar information was provided to mothers of children with autism showed similar results to this study. Won (2005) reported that the mothers of five children with autism were given 3 steps of information in series for 3 months. The two steps were information for parents of children with autism so as to increase the parental role of imitating and waiting for their autistic child and observation of their autistic child's social reciprocity with verbal language in 6 weeks. The 3rd information based on self-regulation theory by a video film given at 7th weeks was an edited video film of mothers and child's behaviors after 1st and 2nd steps of the intervention which described factors which are stressful for mothers related to their autistic child's behavior and their parental roles. The results showed that compared to the measurement before the intervention, four of the five children had 2-10 times higher social reciprocity and verbal language after the 3

week study period.

Johnson (1997) assumed that information provision based on self-regulation theory would give a schema of the event, and thus induce problem focused coping behavior. The schema was measured by parental beliefs in this study and Melnyk's (1994) and parental beliefs were significantly higher in mothers in the experimental group as Johnson's assumed. The experimental group of the study showed very significant effects ( $t = -4.94, p = .0005$ ) of PIPC-IP, and in spite of the effects of the control group ( $t = -3.02, p = .005$ ) by the routine information, the differences of the effects between two groups are significantly different ( $t = 2.95, p = .005$ ).

Negative mood in this study did not show any significant improvement between two groups ( $t = -.20, p = .83$ ). Somehow in experimental group there is significant decrease ( $t = 2.30, p = .03$ ) of the negative mood comparing control group ( $t = 1.51, p = .14$ ) right after IV procedure. This significant decrease of experimental group indicates that PIPC-IP influenced some significant effects to the mothers but is not statistically significant between two groups.

When Johnson (1996) provided verbal and hand out information based on self-regulation theory to adult pessimistic cancer patients before radiotherapy, she found that their negative mood significantly improved with their self-care activities compared to a control group. Also for parental emotions, Melnyk (1994) measured parental anxieties after provision of information based on self-regulation theory for parents of children who had a sudden admission to hospital. The results show that parental anxiety was significantly decreased.

Comparing the information in this study with Melnyk's (1994) and Johnson's (1997) studies, there are some differences between information. In the first two studies, the delivery of information was by 15-minute tape recordings or verbal information with handouts with objective descriptions. In the video film for this study a few extremely resistive behavioral and emotional expressions of the children and angry attitudes by the mother were shown as the real situation. This emotional information possibly influenced mothers and they seemed not regulate their negative mood. Because information based on self-regulation theory needs to be objective. However the PIPC-IP strengthened the beliefs in their parental role of those mothers in the experimental group and increased their supportive behavior in spite of their negative mood.

## CONCLUSION

This study was a pre-post experimental research to increase mothers' coping behavior during intravenous procedure for their children in a pediatric unit. Fifty-six mothers participated in this study. They were selected from a population of mothers at the U University Hospital, which was located in the industrial U City, Korea. Twenty-nine mothers were allocated to the control group and twenty-seven mothers to the experimental group. Their children were admitted to the pediatric unit without any immediate life threatening illness. They were undergoing a venous puncture right after admission. Programmed information called "Programmed Information for Parental Coping before Invasive Procedure (PIPC-IP)" was developed for this study by the author as a video film based on self-regulation theory. Two nursing professionals and two pediatric nurses participated in validity testing of the PIPC-IP. PIPC-IP was provided to twenty-seven mothers before their young child had the intravenous procedure. This study had 3 hypotheses and the results of the study showed that hypotheses 1 and hypotheses 3 could be accepted but not hypotheses 2. Hypotheses 1, "Mothers in the experimental group will demonstrate more supportive behavior for their young children during the intravenous procedure compared to mothers in the control group" was accepted ( $t = 3.55, p = .005$ ). Hypotheses 2, "mothers in the experimental group will express less negative emotion immediately after the intravenous procedure than mothers in the control group" was rejected ( $t = .15, p = .87$ ). Hypotheses 3, "Mothers in the experimental group will show stronger parental belief in their role after receiving the information compared to mothers in a control group" was accepted ( $t = -3.02, p = .005$ ).

Similar study of information intervention needs to be done to expand and apply the theory to other stressful clinical situations for children such as bone marrow biopsies or spinal fluid tests. Repetition with a larger sample size is also necessary.

### Acknowledgements

The author gratefully acknowledges the support of the pediatric nursing staff of the Ulsan University Hospital. They cooperated in the videotaping of the invasive procedures, provided the facilities for conducting the inter-

vention, and performed data collection. I would also like to acknowledge the contributions of professor's Kasil Oh from Yonsei University in Korea who advised this study and Margaret Storey who helped with the English for this manuscript.

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