

Psychosocial impacts on Thai children in intensive care hospitalization: a preliminary report

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Background Children hospitalized in a pediatric intensive care unit (PICU) are seriously ill and subjected to invasive procedures in order to overcome critical illness. There has been limited information about the impact of PICU hospitalization on children in Thailand.

Objective To compare emotional and behavioral problems between children hospitalized in a PICU and those in a general pediatric ward.

Methods A case-control study was conducted for children aged 6-15 years old, who had been hospitalized in the PICU at Chiang Mai University Hospital. The children admitted to the pediatric ward were enrolled as a comparison group. Demographic characteristics of the patients and their families, and semi-structured interviews for clinical features of emotional problems and post-traumatic symptoms were obtained. The Child Behavior Checklist was completed by the parents and used to assess emotional and behavioral problems in both groups of children.

Results The study population included 40 children with the mean age of 10.8 ± 3.0 years. Twenty of them had been hospitalized in the PICU and 20 were from the pediatric ward. The demographic characteristics of the children and their families were similar between the 2 groups. Internalizing, externalizing, and total problem scores were higher in the PICU group than those of the comparison group, but with no statistical significance. The social problem subset score of children in the PICU group was significantly greater than that of the control group.

Conclusion Children who had experienced PICU hospitalization may be at increased risk of emotional and behavioral problems. Further studies are needed to provide appropriate intervention. **Chiang Mai Medical Journal 2012;51(2):51-57.**

Keywords: children, intensive care, psychosocial impact

Hospitalization in an intensive care unit (ICU) is extremely stressful and this experience has a significant psychological impact on children and their families [1]. Children admitted to the pediatric intensive care unit (PICU) are seriously ill.

They require close monitoring and are subjected to invasive procedures to overcome the critical period of their illness. Parents are overwhelmed with stress caused by their children's situation [2]. Study findings showed that mothers of children in

the PICU were stressed from experiencing total intensive care and the use of monitors [3]. Also, the environment of a PICU is different from that in a general pediatric ward, and this can cause long- and short-term emotional and behavioral problems in children and their families. It was found that the quality of life for children previously admitted to the PICU was lower than that of healthy children at 3 and 9 months follow-up [4,5].

New technology and advances made in medical care have enabled children in the ICU to survive until discharged from the ward. Previous studies of psychological impact on these children cover various areas such as negative memories of experiences in the ICU, impairment of cognition and concentration, symptoms of post-traumatic stress disorder (PTSD), short- and long-term stress, and psychological and behavioral problems [1]. There were studies of children aged 4-17 years, who reported recollections of the PICU that ranged from 24 hours to 4 months after discharge [6-8]. These children also developed negative behavior such as post-traumatic stress (PTS) symptoms and intrusive thoughts [8-11]. Increased prevalence of posttraumatic stress disorder (10-28%) and depressive disorder (7-13%) in children surviving the PICU were reported [12]. However, the findings of those studies, which include comparison groups, are inconclusive [13, 14]. The study by Rennick et al, [13] revealed no difference of psychological impact between children admitted to the PICU and those in a general ward, although there could be temporary impact. However, in the study by Rees et al, [14] parents of PICU children were more likely to report PTSD symptoms than those of ward-admitted children. The study by Muranjan et al found that children hospitalized in the PICU had intrusive thoughts that were resolved within one month [11].

There were factors affecting psychosocial problems in children previously admitted to the PICU such as infant age, severity of disease, invasive procedures, duration of admission, endotracheal intubation, and central nervous system (CNS) suppressant medication,

as well as parental anxiety and stress. It was found that younger children, whose illness was more severe and needed additional invasive procedures, had more psychological distress at 6-months follow-up [9, 13]. Rees et al, found that the fear of death perceived by either the child or parent was associated with later distress in the child [14]. In young children, the risk factor that predisposed to poor outcomes followed unanticipated hospitalization [15].

The results from studies have not been concluded fully, as they are conflicting in the literature, and besides, consideration of the methodology is difficult in this field. Children in the PICU are critically ill, and therefore, it usually is not possible to talk to them. As parents worry about their sick child, it also is a difficult time for them to participate in a study. Thus, most studies had a variety of settings, with no comparison groups. These studies have many limitations, including particular settings, severity of illnesses, and differing ages. Patients who lose consciousness or receive medication for CNS suppression are difficult to evaluate regarding their psychological function. Infants and young children are unable to express their own feelings or emotions. Furthermore, it is quite difficult to determine the timing of these studies, due to stressful situations during a stay in the ICU. Long-term effects may be difficult to evaluate as well. There was limited information on the psychosocial impact of the PICU on children in Thailand. The objective of this study was to compare the short-term emotional and behavioral problems between children admitted to the ICU and those in a general pediatric ward.

Methods

A case-control study enrolled 40 children aged 6-15 years of age. They comprised 20 cases that had survived PICU hospitalization and 20 in the General Pediatric Ward of Chiang Mai University Hospital. The two groups were matched by age, socioeconomic status, and time of hospitalization. The children who survived the PICU until discharge to the General Pediatric Ward were enrolled consecutively. They had caregivers who could provide information and understand the Thai language. A study of short-term psycho-

Table 1. Demographic characteristics of children admitted to the PICU and pediatric ward

	PICU group (N=20)	Comparison group (N=20)	<i>p</i> value
Age (yr)	10.7 ± 3.4	10.8 ± 2.6	0.95
Gender: male	9	10	0.75
Primary caregiver: mother	19	19	1.00
Paternal age (yr)	40.1 ± 7.6	38.4 ± 6.0	0.44
Maternal age (yr)	37.5 ± 6.6	34.9 ± 7.6	0.26
Education, Fa (yr)	11.1 ± 5.6	9.0 ± 5.9	0.25
Education, Mo (yr)	10.2 ± 5.2	8.0 ± 5.7	0.21
Marital status: married	17	16	1.00
Underlying disease	17	18	1.00
Admission, unplanned	12	8	0.21

social problems was intended in order to give appropriate intervention and assurance that the patient's condition was stable. Therefore, the caregivers approached the patients approximately 24-72 hours after discharge from the PICU. The controls consisted of children with acute illness, who had never been admitted to the PICU. They were of similar age to the PICU group and put together with them in the General Pediatric Ward at about the same time. Children admitted for less than 24 hours in the PICU or those with neurological diseases in either group were excluded from the study. Informed consent and assent was obtained appropriately from parents of the children in both groups.

Parents/caregivers of all the children completed the Child Behavior Checklist (CBCL) when their child was in the General Pediatric Ward. The CBCL is a questionnaire that assesses both internalizing (anxiety and depression) and externalizing (aggressiveness and acting-out) behavior [16, 17]. The total number of problems comprises both internalizing and externalizing scores, which are derived from 8 subsets. Semi-structured interviews for clinical features of emotional problems and post-traumatic symptoms, as defined by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV-TR) criteria, [18] as well as information on demographic characteristics, were obtained also from the parents. The study was approved by the Ethics Committee of the Faculty of Medicine, Chiang Mai University. Since there is little information about psychological impacts on children in Thailand, this study can act as a preliminary report of children who had been admitted to the PICU.

Data analysis

Data were analyzed by the SPSS program. Mean (standard deviation) and percentage were used to describe the variables, as appropriate. The student t-test was used for

continuous variables and the Chi square or Fisher's exact test for categorical variables. A *p* value of less than 0.05 was considered statistically significant.

Results

Forty children participated in this study, of which 20 had been admitted to the PICU, and 20 were admitted to the General Pediatric Ward, as a comparison group. The mean age of the children in the PICU group was 10.7 years and 45% were male, while that of the general ward group was 10.8 years and 50% were male. Demographic characteristics included paternal and maternal age; and the children's underlying diseases were similar between the two groups (Table 1).

From the 20 children in the PICU group, 8 were in post-operative condition. Six of the remaining 12 had been admitted previously to the General Pediatric Ward. Three of them had septic shock, 2 had diabetic ketoacidosis, and 1 had portal hypertension with esophageal varices bleeding. The other 6 were new patients admitted to the PICU. The mean duration of PICU admission was 5.3 ± 3.7 days (range 2-13). Invasive procedures included endotracheal intubation, intercostals drainage, central venous catheter insertion, and continuous ambulatory peritoneal dialysis (Table 2).

Table 2. Details of patients with pediatric ICU admission (N=20)

Category	N
Conditions for ICU admission	
Critical illness	12
Post-operative	8
Invasive procedures	
Endotracheal tube	12
Thoracentesis	2
Central venous catheter	2
Continuous ambulatory peritoneal dialysis	1

Table 3. Emotional and behavioral problems of children admitted to the PICU and pediatric ward

Type of problem	PICU group (N=20)	Comparison group (N=20)	<i>p</i> value
Internalizing problems	4.1 ± 5.0	2.4 ± 4.0	0.23
Externalizing problems	4.3 ± 5.3	1.9 ± 3.7	0.11
Other problems			
Social	2.1 ± 2.0	0.9 ± 1.2	0.04
Thought	1.1 ± 1.4	0.3 ± 1.1	0.07
Attention	1.4 ± 2.0	1.1 ± 2.2	0.66
Total problems	14.7 ± 12.5	7.9 ± 12.4	0.09

No patients in either group had symptoms of DSM-IV for depressive and anxiety disorders, as found by the semi-structured interview screening for symptoms of DSM-IV-TR criteria for depressive, anxiety and post-traumatic stress disorders. According to the CBCL, internalizing and externalizing behavior, and total problem scores were higher in the PICU group, but not statistically significant when compared to those of the comparison group (Table 3). However, no cases met the clinical range of emotional and behavioral problems in either group. The social problem subset score of children in the PICU group was significantly greater than that of the control group ($p=0.04$).

Discussion

Findings from this preliminary report showed that children previously admitted to the PICU had higher scores for internalizing and externalizing

problems, as well as total problems scores, than those in the comparison group. Only the social problem subset score was significantly greater for children in the PICU group than that of the controls. The difference in scores between the two groups did not reach statistical significance, possibly because of the small sample size caused by a limited study period. Children previously admitted to the PICU had experienced critical illness or post-operative surgery requiring intensive care, which was more psychologically traumatizing than for those who were sick in the general ward.

The demographic characteristics of children previously admitted to the PICU were similar to those in the comparison group. The most frequent primary caregivers in the hospital were mothers in both groups. Children from both groups also had similar underlying chronic diseases such as type 1 diabetes, congenital heart diseases, leuke-

mia, etc. The difference was severity of the illnesses requiring intensive care.

The findings in this study may be consistent with the studies by Rees et al, [14] Davydow et al, [12] and the systematic review by Rennick et al, [19] that revealed the impacts from PICU hospitalization on children. School-age children had some recollection of their PICU stay according to the study by Board and Colville et al, [7, 8]. They may express negative behavior including PTS symptoms, anxiety and depression, which can be persistent or resolved quickly. The study by Ward-Begnoche suggested that children hospitalized in the PICU should be monitored for PTSD after their stay [20]. However, no differences of psychological distress between children hospitalized in a PICU and ward at 6 weeks and 6 months post-discharge were found in the study by Rennick et al, [13]. This may be because the psychological impact was temporary or due to the study groups overlapping in illness severity, invasive procedures, and length of stay, as well as heavy sedation in the PICU group, as explained in their study.

There were some limitations in this study. Firstly, the sample size was small; therefore, the difference between the two groups did not reach statistical significance. Most of the pediatric patients admitted to the PICU during the study period were infants and young children, who had a mean age of 3.75 years, and they did not meet the inclusion criteria of the study. Also, many of them had parents who could not give information about their child. Secondly, this study provided information for only short-term recovery. Longer follow-up would give more information. Thirdly, since the study was conducted during a 72-hour period after PICU discharge, the information was obtained from caregivers only. The patients were not well enough to complete the questionnaire themselves.

Since there is limited information in Thailand, findings from this study can be regarded as a preliminary report for understanding the psychological aspects of children who had been hospitalized in a PICU. Also, it can be helpful in a clinical

setting for the early detection of emotional and behavioral problems in these children. Psychological care for children from a PICU has lagged behind when caring about physical problems. It is essential to focus on developing and evaluating appropriate interventions to improve psychological outcome. It may be necessary to study the long-term effect of being admitted into the PICU. In conclusion, children who had experienced PICU hospitalization may be at increased risk of emotional and behavioral problems as well as impaired social function. Further studies with a larger population and more longitudinal assessment would help in addressing behavioral problems and identifying associated factors to provide appropriate intervention.

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References

1. **Colville G.** The psychologic impact on children of admission to intensive care. *Pediatr Clin North Am* 2008;55:605-16.
2. **Board R, Ryan-Wenger N.** State of the science on parental stress and family functioning in pediatric intensive care units. *Am J Crit Care* 2000;9:106-22.
3. **Board R, Ryan-Wenger N.** Stressors and stress symptoms of mothers with children in the PICU. *J Pediatr Nurs* 2003;18:195-202.
4. **Knoester H, Bronner MB, Bos AP, Grootenhuis MA.** Quality of life in children three and nine months after discharge from a paediatric intensive care unit: a prospective cohort study. *Health Qual Life Outcomes* 2008;6:21.
5. **Bronner MB, Knoester H, Bos AP, Last BF, Grootenhuis MA.** Posttraumatic stress disorder (PTSD) in children after paediatric intensive care treatment compared to children who survived a major fire disaster. *Child Adolesc Psychiatry Ment Health* 2008;2:9.
6. **Playfor S, Thomas D, Choonara I.** Recollection of children following intensive care. *Arch Dis Child* 2000;83:445-8.
7. **Board R.** School-age children's perceptions of their PICU hospitalization. *Pediatr Nurs* 2005;31:166-75.

8. **Colville G, Kerry S, Pierce C.** Children's factual and delusional memories of intensive care. *Am J Respir Crit Care Med* 2008;177:976-82.
9. **Rennick JE, Morin I, Kim D, Johnston CC, Dougherty G, Platt R.** Identifying children at high risk for psychological sequelae after pediatric intensive care unit hospitalization. *Pediatr Crit Care Med* 2004;5:358-63.
10. **Jones C, Griffiths RD, Humphris G, Skirrow PM.** Memory, delusions, and the development of acute post-traumatic stress disorder-related symptoms after intensive care. *Crit Care Med* 2001;29:573-80.
11. **Muranjan MN, Birajdar SB, Shah HR, Sundaraman P, Tullu MS.** Psychological consequences in pediatric intensive care unit survivors: the neglected outcome. *Indian Pediatr* 2008;45:99-103.
12. **Davydow DS, Richardson LP, Zatzick DF, Katon WJ.** Psychiatric morbidity in pediatric critical illness survivors: a comprehensive review of the literature. *Arch Pediatr Adolesc Med* 2010;164:377-85.
13. **Rennick JE, Johnston CC, Dougherty G, Platt R, Ritchie JA.** Children's psychological responses after critical illness and exposure to invasive technology. *J Dev Behav Pediatr* 2002;23:133-44.
14. **Rees G, Gledhill J, Garralda ME, Nadel S.** Psychiatric outcome following paediatric intensive care unit (PICU) admission: a cohort study. *Intensive Care Med* 2004;30:1607-14.
15. **Small L, Melnyk BM.** Early predictors of post-hospital adjustment problems in critically ill young children. *Res Nurs Health* 2006;29:622-35.
16. **Achenbach TM, Rescorla LA.** Manual for the ASEBA school-age form & profiles. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families; 2001.
17. **Achenbach TM, Ruffle TM.** The Child Behavior Checklist and related forms for assessing behavioral/emotional problems and competencies. *Pediatr Rev* 2000;21:265-71.
18. **American Psychiatric Association.** Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision. Washington, DC: American Psychiatric Association; 2000.
19. **Rennick JE, Rashotte J.** Psychological outcomes in children following pediatric intensive care unit hospitalization: a systematic review of the research. *J Child Health Care* 2009;13:128-49.
20. **Ward-Begnoche W.** Posttraumatic stress symptoms in the pediatric intensive care unit. *J Spec Pediatr Nurs* 2007;12:84-92.

ผลกระทบทางอารมณ์จิตใจต่อเด็กที่รับการรักษาในหอผู้ป่วยหนัก: รายงานเบื้องต้น

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บทนำ เด็กที่อยู่โรงพยาบาลในหอผู้ป่วยหนักเป็นเด็กที่เจ็บป่วยรุนแรงและเสี่ยงต่อการทำหัตถการฉุกเฉินเพื่อให้ผ่านพ้นความเจ็บป่วยวิกฤติ ยังมีข้อมูลจำกัดในด้านผลกระทบของการอยู่ในหอผู้ป่วยหนักต่อเด็ก

วัตถุประสงค์ เพื่อศึกษาปัญหาอารมณ์และพฤติกรรมของเด็กที่เคยอยู่ในหอผู้ป่วยหนักเปรียบเทียบกับเด็กที่อยู่ในหอผู้ป่วยกุมารเวชกรรมทั่วไป

วิธีการศึกษา เป็นการศึกษาแบบ Case-control ในเด็กอายุ 6-15 ปีที่เคยอยู่ในหอผู้ป่วยหนักของโรงพยาบาลมหาราชนครเชียงใหม่และเด็กที่อยู่ในหอผู้ป่วยกุมารเวชกรรมทั่วไปซึ่งเป็นกลุ่มควบคุม ได้ทำการรวบรวมข้อมูลพื้นฐานของตัวเด็กและครอบครัว รายละเอียดเกี่ยวกับโรคและการรักษา การสัมภาษณ์อาการทางคลินิกของปัญหาอารมณ์และอาการ post-traumatic stress รวมถึงผู้ปกครองตอบแบบประเมินพฤติกรรมเพื่อประเมินปัญหาอารมณ์และพฤติกรรมในเด็กทั้งสองกลุ่ม

ผลการศึกษา เด็กที่ทำการศึกษาทั้งหมด 40 คน อายุเฉลี่ย 10.8 ± 3.0 ปี เป็นเด็กที่เคยอยู่ในหอผู้ป่วยหนัก 20 คนและกลุ่มควบคุมอีก 20 คน ข้อมูลพื้นฐานของตัวเด็กและครอบครัวของทั้ง 2 กลุ่มไม่แตกต่างกัน พบว่าคะแนนด้านอารมณ์ซึมเศร้าและวิตกกังวล (internalizing behaviors) และด้านพฤติกรรมก้าวร้าว (externalizing behaviors) และคะแนนปัญหาพฤติกรรมรวมในกลุ่มเด็กที่เคยอยู่ในหอผู้ป่วยหนักสูงกว่าคะแนนของกลุ่มควบคุมแต่ไม่มีความแตกต่างอย่างมีนัยสำคัญ ส่วนคะแนนย่อยปัญหาด้านสังคมในกลุ่มเด็กที่เคยอยู่ในหอผู้ป่วยหนักสูงกว่ากลุ่มควบคุมอย่างมีนัยสำคัญ

สรุป เด็กที่มีประสบการณ์เคยอยู่ในหอผู้ป่วยหนักมาก่อนอาจมีความเสี่ยงต่อปัญหาอารมณ์และพฤติกรรมมากขึ้น การศึกษาเพื่อให้ได้ข้อมูลเพิ่มเติมจะช่วยให้เด็กกลุ่มนี้ได้รับการดูแลที่เหมาะสม **เชียงใหม่เวชสาร 2555;51(2):51-57.**

คำสำคัญ: เด็ก หอผู้ป่วยวิกฤติ ปัญหาอารมณ์จิตใจ