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Original article

Anxiety and related factors among mothers of postoperative pediatric patients at King Chulalongkorn Memorial Hospital

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Background: According to previous studies, mothers caring for children with various diseases had anxiety. However, few studies were conducted on anxiety and related factors among mothers of postoperative pediatric patients in Thailand.

Objectives: To study the prevalence of anxiety and related factors among mothers of postoperative pediatric patients at King Chulalongkorn Memorial Hospital.

Methods: Data were collected from 105 mothers of pediatric patients receiving corrective surgery as in-patients and out-patients by using questionnaires including: 1) The mothers' demographic questionnaire; 2) The children's background questionnaire; 3) The STAI Form-Y1, Y2 anxiety measuring form; and, 4) The Parental Stress Scale: Pediatric Intensive Care Unit (PSS: PICU). Univariate analysis (*t* - test and Chi-square) was used to examine the factors related to anxiety and multivariate analysis was used to determine the predictors of anxiety among this group of mothers.

Results: Most mothers had moderate level of anxiety state (63.5%) and moderate level of anxiety trait (53.3%). Among them, 3.8 % had high anxiety state, whereas 6.7% had high anxiety trait. Four factors were found correlated with anxiety: having more than four family members, children undergone major surgery, having moderate-severe anxiety trait and having stress from children's behavioral and emotional response.

Conclusion: On average, the subjects had moderate level of anxiety. Associated factors to anxiety were number of family members, major surgery, moderate-severe anxiety trait, and stress from children's behavioral and emotional responses. These results suggested the medical staffs to help mothers decrease their anxiety level and to encourage them to support the treatment of their children.

Keywords: Anxiety, mothers, pediatric patients.

Childhood illnesses require some children undergoing corrective surgery in order to return to normality. The discomfort occurs during that period causing different forms of care plan provided by parents or caregivers. Moreover, the feelings of significant loss of childcare roles and duties, anxiety and stress are developed among parents or caregivers.

According to the study on post-traumatic stress disorder (PTSD) among mothers of pediatric patients with congenital abnormalities who had undergone corrective surgery by Nagataa SI, *et al.* ⁽¹⁾, 20.0% of the mothers participating in the study had symptoms of PTSD with effects on anxiety and children's conditions. The post-corrective surgery care for pediatric patients has significant effects on anxiety and stress among parents or caregivers. Due to the reasons above, the researchers are interested in studying anxiety among the mothers of this group.

The previous studies were conducted only among postoperative pediatric patients with diseases requiring major surgery. However, no study about anxiety levels in mothers who cared for pediatric patients

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receiving minor surgery was conducted. This study aimed to identify anxiety level among mother of pediatric patients receiving surgery and associated factors.

Materials and methods

A cross-sectional descriptive was used to recruit 105 mothers not under 18 years old, able to read and write in Thai, complete questionnaires independently, and giving consent for this study by signing the provided forms without randomization. Data were collected from mothers of postoperative pediatric patients receiving corrective surgery as in-patients and out-patients at the Department of Pediatric Surgery, King Chulalongkorn Memorial Hospital by using following questionnaires:

Part 1: The Demographic Data Questionnaire (for mothers) created by the researcher based on related studies, containing 20 items.

Part 2: The Background Questionnaire for Pediatric Patients created by the researcher from the literature review and related studies, containing 18 items.

Part 3: The anxiety assessment form divided into two parts as follows: The 20-item State-Trait Inventory Form Y-1 (STAI Form Y-1) developed and translated into Thai by Tapinda D. ⁽²⁾ with the reliability score of 0.9 using for assessing anxiety state among adults, and the 20-item State-Trait Inventory Form Y-2 (STAI Form Y-2) translated into Thai by Tapinda D. ⁽²⁾ to assess anxiety trait among adults. Each item can be rated as 1, 2, 3, 4 with the possible range of total score of 20 - 80 with the higher score represent higher severity of anxiety. Both anxiety trait and state and be categorized into 3 levels, namely; 1) low level (those who got total score between 20 - 39), 2) moderate level (those who got total score between 40 - 59), and 3) high level (those who got total score between 60 - 80).

Part 4: The 37-item Parental Stress Scale: Pediatric Intensive Care Unit (PSS: PICU) which could be divided into 7 domains of stress. created by Carter MC, *et al.* ⁽³⁾ and translated into Thai by Prasert A. ⁽⁴⁾ with the reliability score of 0.90 assessing seven areas including children's visible characteristics, images and sounds from instruments, care received by children, staffers' attitude and behavior, changes in parental roles, staffers' communication, and children's behavioral and emotional responses. Each item can be rated as 0 (in case of no even happened) and 1 - 5 (in case there was an event happened depend on

severity of stress the subject perceived). The average stress scores were calculated in each domain. The higher average scores indicated the higher level in stress.

Statistical analysis

Descriptive statistics were used to describe demographic characteristics of the sample about anxiety and related factors among mothers of postoperative pediatric patients at King Chulalongkorn Memorial Hospital. Data are expressed as mean \pm standard deviation (SD). Inferential statistics were used to determine factors related to anxiety among the participants assessing by using the stress questionnaires with *t* - test and Chi-square statistics, and multivariate analysis was used to determine predictors of anxiety among them. $P < 0.05$ was considered as significance.

Results

Mothers' demographic data

Demographic data are presented in Table 1. Overall, mean age was 35.2 years. Most of them were married and cohabiting (79.0%), lived in elementary families (49.5%), had two children (42.9%), were Buddhists (89.5%), attained at least Bachelor's Degree (46.7%), worked as employees in private companies (31.4%). In average, their monthly income was 23,476.2 baht, and family monthly income was 56,125.5 baht.

Most subjects had no chronic physical diseases (88.6%) or chronic psychiatric disorders (100.0%). Regarding caffeine, alcohol, and other substance consumption, most of them did not consume caffeine (72.4%), and alcohol (97.1%), cigarettes, marijuana or other narcotic substances (100.0%).

The primary caregivers for children were the mothers (72.4%) who spent on average 14.7 hours/day and 19.9 hours/day on holidays. Among them, 73.3% received insufficient information on postoperative care for children, but had high participation in children's treatments (63.8%). According to the need of these mothers, 96.2% needed support in the domain of knowledge on care methods for postoperative pediatric patient, 92.3% in the domain of treatment expense support, 84.4% need to leave from work to care for their children, 88.2% need help from their husband, 90.2% need help from other relatives, 100.0% need to be participated in children's treatment steps, 35.2% need more time

to rest, 83.8% need help in traveling to the hospital, 95.2% need help for seeking in-patient beds, and 95.2% need consoling or expressing sympathy from staffs.

The results from using the STAI-Form Y-1 shows that most of participants were in moderate anxiety (63.5%), and the results from STAI-Form Y2 shows the similarly trend of moderate anxiety trait among

most of them (53.3%). Concerning stress assessment by using (PSS: PICU), most subjects had no stress caused by staffs' attitudes and behavior (91.4%), staffs' communication (83.8%), changes to parental roles (81.1%), visible characteristics of the children (74.3%), images and sounds from instruments (72.4%), children's behavioral and emotional responses (71.4%) and care received by children (65.7%).

Table 1. Mothers' demographic data.

Mothers' factors (n = 105)	Mean ± SD or n (%)
Age (years)	35.2 ± 6.9
Married and cohabiting (n = 104)	83 (79.0)
Length of married life (years) (n = 98)	9.7 ± 6.2
Number of children (including the sick child): 2 children	45 (42.9)
Buddhist	94 (89.5)
Education attainment at a bachelor's degree or higher (n = 100)	49 (46.7)
Worked as employees in private companies (n = 102)	33 (31.4)
History of chronic physical illnesses	12 (11.4)
History of caffeine consumption	29 (27.6)
History of alcohol use	3 (2.9)
Monthly personal income (baht) (n = 84)	23,476.2 ± 18,358.5
Monthly family income (baht) (n = 94)	56,125.5 ± 58,454.3
1 – 4 Family members (n = 102)	61 (58.1)
Living as nuclear families (n = 104)	52 (49.5)
Primary caregiver is the mother	76 (72.4)
Number of hours spent caring for the child on work days (hours/day) (n = 85)	14.7 ± 7.5
Number of hours spent caring for the child on holidays (hours/day) (n = 88)	19.9 ± 6.6
Insufficient information on care for postoperative pediatric patients	77 (73.3)
High participation in children's treatments or procedures	67 (63.8)
Need for support of knowledge on care methods for postoperative pediatric patient	101 (96.2)
Need for support in the area of treatment costs (n = 104)	96 (92.3)
Need for support from the workplace to take leave to care for children (n = 96)	81 (84.4)
Need for support from husband (n = 102)	90 (88.2)
Need for support from other relatives (n = 102)	92 (90.2)
Need for support in participating in children's treatment steps (n = 103)	103 (100.0)
Need for support in the area of time to rest (n = 104)	37 (35.2)
Need for support in the area of traveling to the hospital	88 (83.8)
Need for support in the area of seeking in-patient beds (n = 104)	99 (95.2)
Need for support in the area of consoling or expressing sympathy	100 (95.2)
Anxiety state score (n = 104) *	43.3 ± 9.8
Anxiety trait score**	42.4 ± 9.6
Stress scores in the area of children's visible characteristics showed no stress***	78 (74.3)
Stress scores in the area of images and sounds from instruments showed no stress***	76 (72.4)
Stress scores in the area of care received by children showed no stress (n = 103) ***	69 (65.7)
Stress scores in the area of staffers' attitude and behavior showed no stress (n = 104) ***	96 (91.4)
Stress scores in the area of changes to parental roles showed no stress***	85 (81.1)
Stress scores in the area of staffers' communication showed no stress***	88 (83.8)
Stress scores in the area of children's behavioral and emotional responses showed no stress***	75 (71.4)

*Assessment from the State-Trait Inventory Form Y-1.

**Assessment from the State-Trait Inventory Form Y-2.

***Assessment from the Parental Stress Scale: Pediatric Intensive Care Unit (PSS: PICU).

Pediatric patients' data

The mean age of pediatric patients were 5.5 years. Most of them were males (76.2%), firstborn child (55.2%), with dysuria and hypospadias (37.5%), had no aches/pain (62.9%), missed school due to illness (38.1%), had the same level of postoperative self-efficacy (38.1%). The mean time from first diagnosis to the present day was 33.60 months, and patients continued to have symptoms (53.3%). The mothers were aware of the pediatric patients' surgery type (61.9%). The pediatric patients having undergone surgery were not admitted to an intensive care unit (ICU) (85.7%). They had in-patient status (57.1%), had partial disbursement benefits for treatment (47.6%), had no other chronic physical illnesses (74.3%), were diagnosed with inguinal and genitalia problems (50.5%), and received minor surgery (54.3%) Their mean treatment fee was 15,346.8 baht/time. (Table 2).

Factors related to anxiety among mothers of postoperative pediatric patients at King Chulalongkorn Memorial Hospital

The results assessed by the STAI Form Y-1, 34 participants were found having low anxiety (32.4%) and 70 participants were found having moderate/high

anxiety (67.3%). Twelve factors were found being related to anxiety: number of family members, living status, aches/pain, absence from school due to illness, admission to be treated in an ICU, in-patient status, time after corrective surgery, diagnosis from the Department of Pediatric Surgery, surgery performed by the Department of Pediatric Surgery, base trait anxiety level from the STAI-Form Y-2, stress from care received by children, and stress from children's behavioral and emotional responses. (Table 3).

Predictors of anxiety among mothers of postoperative pediatric patients at King Chulalongkorn Memorial Hospital

Factors related to anxiety were analyzed by using logistic regression analysis, the following four factors capable of predicting anxiety among mothers remained: 1) more than four family members (OR = 8.546, 95% CI = 1.931 - 37.817, $P = 0.005$); 2) major surgery (OR = 3.919, 95% CI = 1.077 - 14.262, $P = 0.038$); 3) moderate-severe base anxiety habits (OR = 4.229, 95% CI = 1.225 - 14.600, $P = 0.023$); and, 4) stress from children's behavioral and emotional responses (OR = 11.029, 95% CI = 1.833 - 66.359, $P = 0.009$) (Table 4).

Table 2. Pediatric patients' data.

Pediatric patients' data (n = 105)	Mean \pm SD or n (%)
Pediatric patients' age (years)	5.5 \pm 4.1
Male gender	80 (76.2)
First child (n = 103)	58 (55.2)
Presenting symptoms leading to pediatric surgery were dysuria and hypospadias (n = 102)	39 (37.5)
Time from symptoms (months) (n = 87)	36.4 \pm 47.8
Have pain	39 (37.1)
Missed school due to illness (n = 104)	40 (38.1)
Recovered self-efficacy after surgery (n = 104)	40 (38.1)
Time from diagnosis to present day (month) (n = 93)	33.6 \pm 43.4
Current remaining symptoms (n = 90)	56 (53.3)
Mother unknown of pediatric patients' surgery type	40 (38.1)
Number of operations received by children (times) (n = 103)	2.5 \pm 2.6
Admitted to intensive care unit (ICU) (n = 103)	14 (13.3)
In-patient status	60 (57.1)
Time after corrective surgery: 0 – 1 days (n = 100)	64 (61.0)
Partial disbursement treatment benefits (n = 101)	50 (47.6)
Mean treatment fee per time (baht/time) (n = 79)	5,346.8 \pm 26,797.4
History of other chronic physical diseases (n = 104)	26 (24.8)
Inguinal and genitalia problems	53 (50.5)
Received minor surgery from department of pediatric surgery	57 (54.3)

Table 3. Relationships between anxiety among mothers of postoperative pediatric patients at King Chulalongkorn Memorial Hospital and related factors.

Factors (n = 105)	Low anxiety (n = 34) Mean ± SD or n (%)	Medium/high anxiety (n = 70) Mean ± SD or n (%)	P - value
Number of family members	3.8 ± 0.7	5.0 ± 2.2	<0.001*
Living status			0.005*
Nuclear family	23 (69.7)	28 (40.0)	
Others	10 (30.3)	42 (60.0)	
Aches/pain			0.013*
No	27 (41.5)	38 (58.5)	
Yes	7 (17.9)	32 (82.1)	
Absence from school due to illness			0.011*
No	15 (44.1)	14 (20.3)	
Yes and children not of school age	19 (55.9)	55 (79.7)	
Admission for intensive care unit (ICU)			0.032**
No	33 (37.1)	56 (62.9)	
Yes	1 (7.1)	13 (92.9)	
Patient status			0.005*
In-patient	13 (21.7)	47 (78.3)	
Out-patient	21 (47.7)	23 (52.3)	
Time after corrective surgery (days)			0.001*
0 - 1	29 (85.3)	34 (52.3)	
≥ 2	5 (14.7)	31 (47.7)	
Diagnosis from the department of pediatric surgery			0.009**
GI and biliary tract	4 (14.3)	24 (85.7)	
Inguinal and genitalia problems	21 (39.6)	32 (60.4)	
Head and neck lesions	9 (56.3)	7 (43.8)	
Pediatric trauma	0 (0.0)	2 (100.0)	
Other	0 (0.0)	5 (100.0)	
Surgery performed by department of pediatric surgery			0.005*
Minor surgery	25 (44.6)	31 (55.4)	
Major surgery	9 (18.8)	39 (81.3)	
Anxiety trait (STAI-Form Y-2, a trait)*			0.000*
Low	24 (70.6)	18 (25.7)	
Moderate – high	10 (29.4)	52 (74.3)	
Stress scores in the area of care received by children**			0.017*
No stress	28 (41.2)	40 (58.8)	
Low stress – highest stress	6 (17.6)	28 (82.4)	
Stress scores in the area of children's behavioral and emotional responses**			0.002*
No stress	31 (41.9)	43 (58.1)	
Low stress – highest stress	3 (10.0)	27 (90.0)	

*Assessment from the State-Trait Inventory Form Y-2., $P < 0.05$

**Assessment from the Parental Stress Scale: Pediatric Intensive Care Unit (PSS: PICU)

Table 4. Predictors of anxiety among mothers of postoperative pediatric patients at King Chulalongkorn Memorial Hospital when analyzed with logistic regression analysis.

Factors	Adjusted OR	95% CI	P - value
More than 4 family members	8.546	1.931 - 37.817	0.005*
Major surgery	3.919	1.077 - 14.262	0.038*
Moderate-severe base anxiety	4.229	1.225 - 14.600	0.023*
Stress from children's behavioral and emotional responses	11.029	1.833 - 66.359	0.009*

* $P < 0.05$

Discussion

The prevalence of anxiety among 105 mothers of postoperative pediatric patients at King Chulalongkorn Memorial Hospital were found 63.5% of the subjects had moderate anxiety, concurring with the research of Kaewprem P. ⁽⁵⁾, the study conducted by Suwanwela S, *et al.* ⁽⁶⁾, and the research conducted by Kiepura E, *et al.* ⁽⁷⁾ studying about antenatal depression and anxiety among first-time Polish parents and found parents to have moderate anxiety. However, the current study was inconsistent with Scrimin S, *et al.* ⁽⁸⁾ studying about anxiety and depression among parents of pediatric patients in the first 24 hours after surgery which the results showed 26.0% of parents having high anxiety due to the time for collecting the data. The subjects of this study doing the assessment after the first 24 hours after the surgery may exhibit less anxiety as they might adapt to anxiety.

In line with study conducted by Lisanti AJ, *et al.* ⁽⁹⁾, having more than four family members including all adults and children was a factor related to anxiety among mothers of postoperative pediatric patients at King Chulalongkorn Memorial Hospital due to the fact that mothers had another child (in addition to the pediatric patient) to care possibly causing more anxiety than mothers with only child treated in the hospital.

In accordance with the study of Kvello M, *et al.* ⁽¹⁰⁾, major surgery was related to anxiety among mothers of postoperative pediatric patients at King Chulalongkorn Memorial Hospital. The subjects with children who received major surgery with high risk, possibility of admission to the intensive care unit, and extensive postoperative care details were found having high anxiety.

In agreement with the study conducted by Charana A, *et al.* ⁽¹¹⁾, moderate-severe base anxiety habits were related to anxiety among mothers of postoperative pediatric patients at King Chulalongkorn

Memorial Hospital. The subjects, with moderate-severe base trait anxiety, were found having significant suffering from uncontrollable events causing high anxiety during confrontation.

In concordance with the study of Manatae P. ⁽¹²⁾, stress from children's behavioral and emotional responses was related to anxiety among postoperative pediatric patients' mothers at King Chulalongkorn Memorial Hospital. The subjects were found being stressed by children's behavioral and emotional responses after surgery such as struggling, refusal, resistance, crying, expressions of pain, expressions of demands and sadness causing mothers to have correspondingly high anxiety.

However, this study may some possess limitations due to a small number of sample size and heterogeneity of operations which may not be able to considered as a representative of mothers of other type of patients.

Conclusion

Mothers of postoperative pediatric patients had moderate level of anxiety. Related factors to anxiety were number of family members, major surgery, moderate-severe anxiety trait, and stress from children's behavioral and emotional responses. The suggestion for medical personnel is to provide more guidelines including surgery information, preoperative and postoperative instructions, pain assessment, and pain medication administration after surgery to reduce anxiety among mothers and support them by improving the treatment and care efficiency throughout treatment for pediatric patients surgery.

Conflict of interest

The authors, hereby, declare no conflict of interest.

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