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Original article

Family functioning and associated factors in families of children and adolescents with chronic illness at King Chulalongkorn Memorial Hospital

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Background: Chronic illnesses have a serious effect on the physical and mental health of the children and their families. Previous studies showed that families of children with chronic illnesses have a lower family functioning score. Their parents suffer more stress than those of healthy children. Diabetes and obesity are mainstay chronic illnesses with high prevalence and is a threat to the healthcare system of Thailand.

Objective: To study family functions and its associated factors in families of children or adolescents with chronic illnesses.

Methods: This is a cross-sectional descriptive study performed on parents of children and adolescences with Type I and II diabetes and obesity with aged 20 - 60 years and with 6 months of care or more that had been receiving services at diabetes and obesity clinic of King Chulalongkorn Memorial Hospital between February 1 to September 31, 2018. The questionnaire consisted of 3 part: 1) Personal information and factors that are associated with patient care; 2) Chulalongkorn Family Inventory (CFI); and 3) Thai hospital anxiety and depression scale (Thai HADS). Descriptive analysis including frequencies, percentage, mean, standard deviation of family function was analyzed using an independent *t* - test, one-way ANOVA and Pearson correlation.

Results: There were 108 parents of children and adolescences with Type I or II diabetes or obesity; 79.6% of them are mothers. The duration of patient care ranges from 6 months to 5 years. CFI is at a mean of 1.8 ± 0.4 which is a slightly good score. There was no depression or anxiety found in 75.9% of these parents. The duration of patient care had a significant association with the roles ($P = 0.017$), affective responsiveness ($P = 0.036$). Depression also had a positive association with problem solving ($r = 0.359$), communication ($r = 0.295$), affective involvement ($r = 0.212$), role ($r = 0.297$), general family function ($r = 0.310$) and overall family functions ($r = 0.331$). Anxiety has a positive association with problem solving ($r = 0.372$), communication ($r = 0.377$), affective responsiveness ($r = 0.288$), affective involvement ($r = 0.264$), role ($r = 0.295$), general family function ($r = 0.392$) and overall family function ($r = 0.410$).

Conclusion: Family functioning in families of children and adolescents with chronic illnesses is generally slightly good. Associated factors are the duration of patient care and types of chronic illnesses, both of which are associated with family functioning. Emotional factors including depression and anxiety also have a correlation with family functioning. Awareness of the parent's family functioning and emotional conditions is important.

Keywords: Family functioning, chronic illness.

Over the past century, diseases that have problems for children have changed from infectious diseases to chronic diseases. [1] Disease in this group affects many children. It has continued effect until being an adult [2] which affecting the lives of children both physically and mentally. It was found that this group of children had decreased quality of life in terms of physical, emotional, psychosocial, social and school attendance when compared with healthy children.[3] In addition, there are the impacts on family. It was found that parents of chronically ill children will have more tensions in raising a child more than healthy children. The tension is related to the responsibility of patient care and related to the poor adaptation of parents. [4]

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The good family function is that family members can adjust to tension effectively in the context of psychosocial, cultural, environmental, social and economic life through the circuit [5], which serves families of children with chronic disease compared to healthy subjects. It was found that the scores of chronic patients decreased significantly in emotional attachment, control of communication behavior in family roles as depending on the chronic disease that the family has to face as well.[6] In addition, the role of good family in terms of commitment, problem solving and responsibility is related to depression of mothers and adolescents. In families with positive emotions, from the study, it was found that proper family function is a preventive factor for depression from mothers to teenagers in the family.[7]

Diabetes is a chronic disease that is more common throughout the world. The study found that the risk increased in patients lower age[8], which is found in diabetic patients lower age as well.[9] As for pediatric patients, there are several factors related to the partnership treatment and control blood sugar levels especially the family [10] because the family has a duty to take care of patients closely both in behavior adjustment and discipline in treatment.[11] Causing tension in the family will affect family relationships and family functions as well.[12, 13] In addition, obesity is a major health problem in Thailand like many other countries around the world. [14] Obesity is a disease that affects the mind, emotions and societies such as lack of self-confidence, stress and depression [15] which families may be affected and has contributed to children Obesity can occur, such as eating behavior, improper parenting.[14]

Therefore, it can be seen that chronic diseases in children and adolescents affecting children both physically and mentally including the impact on the family system. It may cause impaired family function and return to the efficiency of patient care. In the long-term may cause parents to be anxiety and depression. Diabetes and obesity are common diseases and are major health problems of the Thai public health system. This research is, therefore, designed to study family functions and related factors of this family of patients in order to apply in the care of patients and families in a holistic way.

Materials and methods

This is a cross-sectional descriptive study. The samples consisted of 108 parents of children and adolescents with diabetes mellitus type 1, type 2 and obesity, aged 20 - 60 years old, recruited from Diabetes and Obesity Clinic, King Chulalongkorn Memorial Hospital between 1 February to 31 September 2018. The participants received explanations of the study objectives and participated in the study with voluntarily by signing the inform consent to participate in the study. Sampling selection using purposive sampling method. Inclusion criteria are father or mother to take care of patients continuously for more than 6 months. Exclusion criteria are career or the person who get paid by taking care of patient, Father and mother are not able to understand and communicate in Thai. Calculate the sample size from the Infinite Population Mean Formula equal to 98 cases and to prevent errors in data collection. Therefore increasing the sample size by 10 percent. A total of sample sizes were 108 peoples. The study was approved by the Ethical Committees, the Institutional Review Board (IRB) of Faculty of Medicine, Chulalongkorn University (IRB No. 498/60).

All samples completed three questionnaires: 1) Demographic data form : Parent ‘s characteristic are gender, age, marital status, occupation, personal income, education, history of medical illness, history of psychiatric disorder, history of substance use, duration of patient care. Clinical characteristic of children are gender, underlying disease, age, blood pressure, body mass index (BMI), fasting blood sugar, HbA1c; 2) Chulalongkorn Family Inventory (CFI); 3) Thai hospital anxiety and depression scale (Thai HADS). Chulalongkorn Family Inventory (CFI) the questionnaire of the family functioning by Professor Umaporn Trangkasombat, developed from the Family Assessment Device (FAD) based on the McMaster model. The questionnaire consists of 36 items including 7 domains: 1) Problem solving; 2) Communication; 3) Roles; 4) Affective responsiveness; 5) Affective involvement; 6) Behavior control; 7) General function. Calculate mean score range from 1 - 4 1.00 - 1.49 is poor family functioning, 1.50 - 2.49 is slightly good family functioning, 2.50 - 3.49 is good family functioning and 3.50 - 4.00 is excellent family functioning. The internal consistency reliability of Chulalongkorn Family inventory (Cronbach’s alpha) was 0.88 Thai hospital anxiety and depression scale, Thai HADS is an assessment form that measures anxiety and depression in physical illness patients, translated from the English version of Zigmond and Snaith by Thananilai Kovit and the Thai HADS group

as a self-administered questionnaire. There are 14 questions, divided into 7 items for measuring anxiety symptoms and 7 items depressive symptoms. For anxiety symptoms, the score was calculated from odd number (1, 3, 5, 7, 9, 11, 13). For depression, the score was calculated from double number (2, 4, 6, 8, 10, 12, 14) combined. Patients who have a combined score of any of the above 11 symptoms may have a psychiatric disorder in that condition. The reliability of the instrument is good, with Cronbach's alpha coefficient = 0.86 for sub-scale anxiety and 0.83 for sub-scale depression.

The data were analyzed by using SPSS for Windows version 17.0. The demographic data were presented by frequency and percentage. The data were expressed as mean ± standard deviation (SD) or median, interquartile range (IQR) as indicated. Correlation between each subject's personal factor and family functioning were analyzed by independent *t* - test, One-way ANOVA. Association between Depression and Anxiety with family functioning were analyzed by Pearson Correlation. A $P < 0.05$ was considered statistically significant.

Results

As shown in Table 1, parents of children and adolescent patients with type I and II diabetes and obesity that attended King Chulalongkorn Memorial Hospital are 79.6% females and 20.4% males. Age range of most subjects were within 41 - 50 years and were account for 44.4%; 74.1% were married. The most common occupation is company employee (38.0%). Most had monthly income less than 25,000 THB (45.4%) with median at 10,000 (IQR = 21,250) THB. Education at the Bachelor's degree or higher account for 33.3%. The most common medical condition was diabetes (12.0%). Prevalence of anxiety was low at just 1.9%. Alcohol consumption and smoking within 1 month were at 3.7% and 1.9% respectively; 73.1% has been taking care of the patient for 6 months to 5 years. The median of time of caregiving is 3 (IQR = 4) years.

Table 2 shows that the patients were mostly female (52.8%); 64.8% has diabetes and 35.2% has obesity. Mean age is 11.8 ± 3.7 years. Their systolic and diastolic blood pressures are at 99.9 ± 38.8 mmHg and 62.7 ± 25.2) mmHg respectively. Mean BMI is 21.6 ± 10.2 kg/m^2. Mean blood glucose is at 157.5 ± 83.4) mg/dL and HbA1c is at 8.0 ± 1.8%.

Analysis of factors associated with family functioning of the study population are shown in Table 3. The mean score is 1.8 ± 0.4. Most of which are at the slightly-good level. Considering each of the 7 aspects, the aspect with the highest score is that of behavioral control of family member. Next below is the aspect of affective involvement and general family functional has the lowest score.

Table 4 shows analysis of depression and anxiety among subjects. Depression score are at mean of 4.2 ± 3.1, most of the subjects do not have depression (86.1%). Anxiety score are at mean of 5.6 ± 3.0, most of them also do not have anxiety (75.0%).

The correlation between each subject's personal factor and 7 aspects of family functioning is shown in Table 5. Gender, age, marital status, occupation, monthly income, and education are not statistically correlated with any aspects of family functioning. Whereas medical condition is significantly correlated with communication aspect of family functioning ($P = 0.047$). Those with medical condition has communication score, which is higher than those without medical condition score. Duration of patient care is significantly correlated with role ($P = 0.017$). Family member with 11 - 15 years of caregiving has higher score on role and those with 6 months – 5 years has lower score. Depression has positive correlation with problem solving skill ($r = 0.359$), communication ($r = 0.295$), affective involvement ($r = 0.212$), role ($r = 0.297$), general family functioning ($r = 0.310$) and overall family functioning ($r = 0.331$). Anxiety also has positive correlation with problem solving ($r = 0.372$), communication ($r = 0.377$), affective responsiveness ($r = 0.288$), affective involvement ($r = 0.264$), role ($r = 0.295$), general family function ($r = 0.392$) and overall family function ($r = 0.410$), shown in Table 6.

Table 7 shows analysis of correlation between the patient's personal factor and 7 aspects of family functioning. The result shows that sex, age, systolic and diastolic blood pressure, body mass index, blood glucose, and HbA1c of the patient are not statistically correlated with any aspect of family functioning. Medical conditions, on the other hand, has significant correlation in the aspect of affective responsiveness ($P = 0.036$). The patient with diabetes has affective responsiveness score higher than those of the patient with obesity. Also, there are statistically significant correlation between the patient's medical condition and role aspect ($P = 0.03$). Those with diabetes has a score on family role functioning at 1.9 ± 0.5, and those with obesity has a score at 1.7 ± 0.4.

Table 1. Participant's characteristics (n = 108).

Characteristics	n (%)	Characteristics	n (%)
Gender			
Female	86 (79.6)	Bachelor or higher than bachelor	36 (33.3)
Age		**History of medical illness**	
20 - 30 years	7 (6.5)	Diabetic mellitus	13 (12.0)
31 – 40 years	41 (38.0)	Allergy	12 (11.1)
41 – 50 years	48 (44.4)	Hypertension	9 (8.3)
51 – 60 years	12 (11.1)	Other	8 (7.4)
Marital status		Hyperlipidemia	6 (5.6)
Married	80 (74.1)	Respiratory tract disease	2 (1.9)
Single	14 (13.0)	GI tract disease	2 (1.9)
Divorce or Separate	10 (9.3)	Cardiovascular disease	1 (0.9)
Widow	4 (3.7)		
Occupation		**History of psychiatric disorder**	
Company employee	41 (38.0)	Anxiety disorder	2 (1.9)
Merchant	31 (28.7)	**History of substance use in 1 month**	
Unemployed	16 (14.8)	Alcohol drinking	4 (3.7)
Civil servant	11 (10.2)	Smoking	2 (1.9)
Other	7 (6.5)		
Agriculturist	2 (1.9)		
Personal income (n = 78)		**Duration of patient care**	
Median (IQR)	10,000 (21,250)	Median (IQR)	3 (4.0)
≤ 25,000	49 (45.4)	6 months – 5 years	79 (73.1)
25,001 – 50,000	22 (20.4)	6 - 10 years	24 (22.2)
≥ 50,001	7 (6.5)	11 - 15 years	5 (4.6)
Education			
Uneducated	1 (0.9)		
Lower than primary school	2 (1.9)		
Primary school	23 (21.3)		
Middle school	13 (12.0)		
High school	27 (25.0)		
Diploma	6 (5.6)		

Table 2. Clinical characteristics of children and adolescents (n = 108).

Characteristics	Mean ± SD
Gender	
Male / Female n (%)	51 (47.2) / 57 (52.8)
Underlying disease	
Diabetic mellitus type I, II n (%)	70 (64.8)
Obesity n (%)	38 (35.2)
Age (years) n (%)	11.8 ± 3.7
Systolic blood pressure (mmHg)	99.9 ± 38.8
Diastolic bold pressure (mmHg)	62.7 ± 25.2
Body mass index (kg/m^2)	21.6 ± 10.2
Fasting blood sugar (mg/dL)	157.5 ± 83.4
HbA1c (%)	8.0 ± 1.8

Table 3. Family functioning of study population (n = 108).

Chulalongkorn family inventory item	Level of family functioning					
	Excellent n (%)	Good n (%)	Slightly good n (%)	Poor n (%)	Mean (SD)	
Problem solving	1 (0.9)	6 (5.6)	48 (44.4)	53 (49.1)	1.6 (0.6)	Slightly good
Communication	0 (0.0)	8 (7.4)	75 (69.4)	25 (23.1)	1.8 (0.4)	Slightly good
Affective responsiveness	0 (0.0)	10 (9.3)	63 (58.3)	35 (32.4)	1.8 (0.5)	Slightly good
Affective involvement	1 (0.9)	14 (13.0)	69 (63.9)	24 (22.2)	1.9 (0.6)	Slightly good
Role	0 (0.0)	10 (9.3)	83 (76.9)	15 (13.9)	1.8 (0.5)	Slightly good
Behavior control	2 (1.9)	43 (39.8)	57 (52.8)	6 (5.6)	2.3 (0.6)	Slightly good
General family function	0 (0.0)	4 (3.7)	53 (49.1)	51 (47.2)	1.6 (0.4)	Slightly good
Overall	0 (0.0)	3 (2.8)	82 (75.9)	23 (21.3)	1.8 (0.4)	Slightly good

Table 4. Anxiety and depression of study population (n = 108).

Characteristics	Thai HADS score			Mean (SD)
	0 - 7 (Non-cases)	8 - 10 (Doubtful cases)	11 - 21 (Cases)	
Depression	93 (86.1)	10 (9.3)	5 (4.6)	4.2 (3.1)
Anxiety	81 (75.0)	20 (18.5)	7 (6.5)	5.6 (3.0)

Table 5. Association between with 7 aspects of family functioning (n = 108).

Factors	n	Mean	SD	*P* - value	Significantly pair wise comparison
Family functioning: Communication					
History of medical illness					
Yes	41	1.9	0.5	0.047*	
No	67	1.8	0.4		
Family functioning: Role					
Duration of patient care					
6 months – 5 years	79	1.7	0.4	0.017*	0.039* (6 - 10 years),
6 - 10 years	24	2.0	0.5		0.027* (11 - 15 years)
11 - 15 years	5	2.2	0.4		

*$P < 0.05$

Table 6. Association between depression and anxiety with 7 aspects of family functioning (n = 108).

Characteristics	Problem solving	Communication	Affective responsiveness	Affective involvement	Role	Behavior control	General Family function	Overall
Depression	$r = 0.359$* ($P < 0.001$)	$r = 0.295$* ($P = 0.002$)	$r = 0.115$ ($P = 0.110$)	$r = 0.212$* ($P = 0.028$)	$r = 0.297$* ($P = 0.002$)	$r = -0.053$ ($P = 0.583$)	$r = 0.310$* ($P = 0.001$)	$r = 0.331$* ($P < 0.001$)
Anxiety	$r = 0.372$* ($P < 0.001$)	$r = 0.377$* ($P < 0.001$)	$r = 0.288$* ($P = 0.003$)	$r = 0.264$* ($P = 0.006$)	$r = 0.295$* ($P = 0.002$)	$r = -0.042$ ($P = 0.664$)	$r = 0.392$* ($P < 0.001$)	$r = 0.410$* ($P < 0.001$)

*$P < 0.05$

Table 7. Association between the patient's personal factors and 7 aspects of family functioning (n = 108).

Factors	n	mean	SD	*P* - value
Family functioning:				
Affective responsiveness				
Medical conditions				
Diabetes type I, II	70	1.8	0.5	0.036*
Obesity	38	1.7	0.4	
Family functioning: Role				
Medical conditions				
Diabetes type I, II	70	1.9	0.5	0.030*
Obesity	38	1.7	0.4	

*$P < 0.05$

Discussion

The objective of this study is to examine the function of families of children and adolescent patients with chronic illnesses using Chulalongkorn Family Inventory (CFI). The demographic data shows that 76.0% of the subjects are mothers with married marital status. This result is consistent with the study of Piran P, *et al*. [16] on caregiving burden of children with chronic diseases which found that 89.6% of caregivers were also mothers with married marital status.

Family functional in families of children and adolescents with chronic illness is generally slightly good and general function of families with chronic illnesses is also found to be in a poor range which is in line with Herzer M, *et al*. [17] result of a study on family functional of families of young patients with 5 chronic illnesses compared to normal families which found that 7 aspects of family functional is 13.0 – 36.0% in an unhealthy range.

Depression and anxiety are not found in most of the subjects in this study, this result is consistent with the study of Brehaut JC, *et al*.[18] on the general health of caregivers of children with a chronic disease which found that 89.0% of subjects has a low level of depression and no clinical depression. This, however, is not in line with the study of Streisand R, *et al*.[19] on the parent's anxiety and depression on caring for children with Type I diabetes, which found a higher score of depression and anxiety. This discrepancy could result from a difference in duration of care in each study. The study at King Chulalongkorn Memorial Hospital covered 6 months of caregiving and could have provided an opportunity for emotional adaptation which reduced depression and anxiety.

Relationship aspects of family functioning are correlated with diseases of the patient especially those of affective responsiveness and family role. This is in concordance with a study by Cohen D, *et al*. [20] on children with diabetes and their families which found that there is a correlation between disease and cohesion in their families.

Caregiver's depression is correlated with general family functioning, including problem-solving, performing family role, and performance of the family as a whole. These findings are in line with the studies of both Ferro MA, *et al*. [21] on children with chronic disease, which found that physical chronic illness is correlated with maternal depression and family functioning, and the study of Moore SM, *et al*.[22] on children with Type I diabetes that found that the child's illness has effects on the parent's stress and their family functioning.

Limitations of the study only includes parents of patients with Type I and II diabetes and obesity that received medical care at King Chulalongkorn Memorial Hospital. Because of this, the results could not be applied to the general population moreover because the nature of a cross-sectional descriptive study, there was no longitudinal follow-up, whether forward or backward in time. From the results, it is found that depression and anxiety from parents are positively correlated with family function which possibly caused by population of depress and anxiety is low. Therefore, the relationship in family function could have errors.

Conclusion

Family functioning in families of children and adolescents with chronic illnesses is slightly good both in general and in some specific aspects. Factors that are associated with family functioning are the duration of patient care and types of chronic illnesses. Of which are also associated with family role functioning of each family member. Emotional factors including depression and anxiety also have correlations with multiple aspects

of family functioning. Hence, the awareness of the parent's family functioning and emotional conditions is important in psychological caring of these patients with chronic illnesses in conjunction with physical caring. The result of this study could be used in the planning of better care of these patients and their families.

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Conflict of interest

The authors, hereby, declare no conflict of interest.

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