

A comparative study of psychological problems of children suffering from cancer, epilepsy and asthma

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Abstract: This study examines the psychological problems of chronically ill Malaysian children. The sample consisted of 63 parents of children suffering from cancer, epilepsy and asthma. The Child behavior checklist (CBCL; Achenbach, 1991) for ages 4-18 with its subscales of internalizing, externalizing, thought, attention and social problems was used to assess the behavioral problems of the children as perceived by their parents. The data were collected from the pediatric outpatients and wards of Kuala Lumpur General Hospital. The data were analyzed for differences between children suffering from cancer, epilepsy and asthma on the CBCL and its subscales using one-way analyses of variance. A priori comparisons were computed between one illness and a combination of other two illnesses to substantiate the findings of ANOVAs. The findings supported our hypothesis that children suffering from cancer, epilepsy and asthma differed in the degree of their psychological problems. The results demonstrated that children suffering from cancer had more internalizing problems as compared to the children suffering from epilepsy and asthma. The results also indicated the presence of more thought, attention and social problems in the case of epileptic children compared to cancer and asthmatic children. Contrary to our hypothesis, the cancer children showed more externalizing problems than the asthmatic children.

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Keywords: Health psychology, Applied psychology, Clinical psychology, Developmental psychology, Personality.

Abstrak: Kajian ini meneliti masalah-masalah psikologi terhadap penyakit kronik dalam kalangan kanak-kanak di Malaysia. Sampel kajian terdiri daripada 63 orang ibubapa kepada kanak-kanak yang mengalami penyakit kanser, epilepsi dan asthma. Senarai semak perlakuan kanak-kanak (CBCL; Achenbach, 1991) bagi mereka yang berumur antara 4-18 tahun telah digunakan untuk mengukur sub-skala dalaman, luaran, berfikir, perhatian yang diberikan dan masalah sosial bagi masalah-masalah perlakuan kanak-kanak pada tanggapan ibubapa mereka masing-masing. Data telah dikumpul daripada pesakit luar kanak-kanak dan di wad-wad Hospital Kuala Lumpur. Data telah dianalisis untuk mendapatkan perbezaan antara kanak-kanak yang mengalami penyakit kanser, epilepsi dan asthma untuk CBCL dan subskala-subskalanya dengan menggunakan analisis varians satu hala (ONEWAY ANOVA). Perbandingan a priori telah digunakan untuk melihat perbezaan antara satu penyakit dengan penyakit-penyakit gabungan yang lain bagi mendapatkan hasil kajian dengan menggunakan ANOVA. Hasil kajian menyokong hipotesis bahawa kanak-kanak yang mengalami penyakit kanser, epilepsi dan asthma didapati berbeza dari segi aras masalah-masalah psikologikal. Keputusan menunjukkan bahawa kanak-kanak yang mengalami penyakit kanser mempunyai lebih banyak masalah dalaman perbanding dengan kanak-kanak yang mengalami penyakit epilepsi dan asthma. Keputusan juga menunjukkan bahawa terdapat perbezaan antara kanak-kanak yang mengalami epilepsi perbanding dengan mereka yang mengalami penyakit kanser dan asthma. Ini adalah kerana kanak-kanak yang mengalami epilepsi merupakan mereka banyak berfikir, mendapat tumpuan dan yang bermasalah sosial. Bertentangan dengan hipotesis kami, kanak-kanak yang mengalami kanser menunjukkan lebih banyak masalah-masalah luaran perbanding dengan kanak-kanak yang mengalami penyakit asthma.

Kata Kunci: Psikologi kesihatan, Psikologi gunaan, Psikologi klinikal, Psikologi perkembangan, Personaliti.

Introduction

Childhood chronic illness is a medical condition or disability that affects a child for an extended period, often for life (Barlow & Ellard, 2006; Garrison & Mc Quiston, 1989), incapacitates or significantly impairs the child, and interferes with his/ her daily functioning. Although childhood chronic illnesses are relatively rare, their estimated prevalence in children under the age of 18 years is 10% - 30% (Newacheck, 1994). In the U.S., 15% - 18% of children have a chronic health condition, with

asthma as the leading illness among children (Heflinger & Saunders, 2005; Judson, 2004) and about 20% of chronically ill children have psychological problems (Osofky & Fitzgerald, 2000).

Childhood cancers are comparatively rare, affecting one in every 600 children before the age of 15 years (Lioffi, 1999). In the UK, each year, there are around 1300 new childhood cancer patients (Cancer Research UK, 2016), and the most common cancer in Canadian children and teenagers is leukemia (National Cancer Institute of Canada, 2003).

Epilepsy is the most common neurological disorder in childhood, with a prevalence rate of about 0.5% (Cowan, 2002). The peak age of onset in Asian children is reported to be from 11 to 20 years (Tran, Odermatt, Le, Hue, Druet-Cabanac, Barenne, Strobel, & Prueux, 2006). Epilepsy affects approximately 0.6% of the Canadian population with prevalence rates of 0.3% between the ages of 0-11 and 0.6% between the ages of 12-14 (Statistics Canada, 2007).

Asthma is the other most common chronic illness in children worldwide (GINA, Global Initiative for Asthma, 2002); in the U.S., asthma affects an estimated 5% - 10% of children under 18 years of age (Heflinger & Saunders, 2005), and in Canada it is one of the most prevalent chronic conditions in children and youth (Statistics Canada, 2007).

In the case of developing countries, surveys about the incidence and prevalence of chronic illness among children in the majority of these countries are rare. Where Malaysia is concerned, starting in 1997, approximately one child below 12 years was diagnosed for cancer per week in one state of East Malaysia (Sarawak Tribune, 2002) and the National Cancer Registry recorded 42,985 new cancer cases in 2003 (Chye & Yahaya, 2004). The number of children suffering from asthma also increased from 10% to 13% between 1995 and 2002 (Othman, 2003). While no prevalence data are available for childhood epilepsy in Malaysia, estimates show that 0.5% of all children suffer from epilepsy (Malaysian Pediatric Association, 2003; Manonmani & Tan, 1999).

The National Health and Morbidity Surveys of 1996 and 2006 have reported a 13% (9.7% - 17%) overall adjusted prevalence of psychiatric morbidity in Malaysian children and adolescents; a significant proportion of these children also suffer from physical illnesses like asthma, cancer,

physical disability, speech disability, and hearing impairment (Amal, Paramesarvathy, Tee, Gurpreet, & Karuthan, 2011; Toh, Ding, Peng, Maniam, Lim, Abdullah, Sararaks & Hamid, 1999).

Epidemiological surveys indicate that chronically ill children are at a greater risk of maladjustment, mental health and psychological problems than children without such conditions (Caplan, Siddarch, Gurbani, Hanson, Sankar & Shields, 2005; Glazebrook, Hollis, Heussler, Goodman & Coates, 2003; Judson, 2004). Studies also indicate that children with chronic illness and physical disability are thrice more at risk for psychiatric disorders, social maladjustment and impairment in self-care, communication and learning as compared to healthy children (Earle & Eiser, 2007; Witt, Riley & Coiro, 2003).

Studies on the psychological implications of chronic illness on children have found evidence of emotional disturbances such as anxiety and depression (Jusiene & Kuchinskias, 2004; LeBovidge, Lavigne, Donenberg, & Miller, 2003; Sitaresmi, Mostert, Gundy, Sutaryo & Veerman, 2008), difficulties in peer group relationships (Berge & Patterson, 2004; Collins, Gill, Chittleborough, Martin, Taylor, Winefield, 2008), and a stronger belief in external control (Garrison & Mc Quiston, 1989). Yeh & Wang (2004) found that children with cancer exhibited significantly low competence scores on the Child Behavior Checklist and high scores on all of the emotional and behavioral problems, but low delinquent and aggressive behaviors and externalizing scores.

Research on the effects of chronic illnesses on the psychological functioning of children show that those suffering from cancer experience a highly disrupted school life and lower cognitive functioning (Lenton, Stallard, Lewis & Mastroyannopoulou, 2001) and those who survive cancer show a higher incidence of depression, anxiety, drug abuse, attention deficit, learning difficulties and antisocial behavior (Schultz, Ness, Whitton, Recklitis, Zebrack, Robison, Zeltzer & Mertens, 2007).

Epilepsy has also been found to have negative impact upon the psychological adjustment of children, particularly their anger control, inattention, and over-activity (Carr, 1999; Davies, Heyman, & Goodman, 2003; Mitchell, 2016). Estimates show that up to 70% of children with epilepsy have a learning disorder and show cognitive impairment on intelligence, attainment, and memory tests (Cull & Goldstein, 1997; Kim & Ko, 2016; van Rijckevorsel, 2006).

A three and half year follow-up study by Oostrom, van Teeseling, Smeets-Schouten, Peters, & Jennekens-Schinkel (2005) of children suffering from epilepsy showed that throughout the follow-up, this group of children performed poorer than healthy classmates on measures of learning, memory span of words, attention and behavior. Two meta-analyses on children with epilepsy have revealed their high risk for both internalizing and externalizing problems (Pinquart & Shen, 2011; Rodenburg, Stams, Meijer, Aldenkamp & Dekovic, 2005b).

Examination of psychological disturbances among children with complex partial seizures indicate that 33% of them had affective and anxiety disorders and 20% had suicidal ideation, but none had attempted suicide (Caplan et al., 2005).

Asthma is a chronic illness that causes severe and unpredictable difficulties in children because it is intermittent, variable, and reversible in nature. First, asthma attacks vary in frequency from child to child and from time to time. Second, asthma attacks vary in severity, from mild sensations of tightness in the chest or slight wheeze to “status asthmaticus”. While the former is associated with slight discomfort, the latter is an acute exacerbation of asthma that does not respond to standard treatments of bronchodilators and can lead to death. Third, asthma is reversible as children only experience breathing difficulty during asthmatic attack while at other times their breathing is normal. Research indicates that 35% of children with asthma have emotional disturbances and depression as compared to the controls (Ortega, Huertas, Canino, Ramirez, & Rubio-Stepec, 2002; Walker, 2012).

In Malaysia, mental health care available to children suffering from chronic illnesses can be described as precarious. There are four reasons for this neglect. First, the severity of chronic illnesses draws the attention of the parents and the physicians only to the physical conditions of the child and the treatment of the illness. Second, some ages old cultural stigmas, folklores and stereotypes associated with certain illness, especially, epilepsy may prevent parents from seeking treatment for the sick child (Baki, 1993; Bunnell, 2016; Lim, Li, Casanova-Gutierrez, & Tan, 2012; Othman, 1993; The Malaysian Medical Gazette, 2013). Third, due to the meager resources allocated to the mental health sector and its low priority accorded by the government, a viable mental health system is not available in the public sector hospitals and it is virtually

non-existent in the private hospitals. Fourth, the financial burden of the treatment and the time spent in the care of the chronically ill children leave little room for the parents to attend to the mental health needs of their children. Some studies in the West paint an equally dismal picture of the availability of mental health services for children suffering from chronic illnesses, indicating that only a quarter to one third of chronically ill children receive specialist help from child mental health services (Caplan et al., 2005; Glazebrook et al., 2003).

Furthermore, another major reason for the neglect of mental health of children suffering from chronic illnesses seems to be a lack of research and data on the psychological problems of children suffering from such illnesses (Suls, Davidson, & Kaplan, 2010).

Objectives of study

The objective of our study, to investigate the current mental health state of children suffering from chronic illnesses, is an attempt to address this lack of research. We selected three medical categories of oncology, neurology and respiratory problems because they differ on the extent and the type of psychological problems and some disease-related dimensions such as the age of onset, the duration and the severity of illness (Johnson & Rodrigue, 1997; Kelly & Hewson, 2000; Shah & Othman, 2013; Spirito, Stark, & Tyc, 1994).

A number of studies discussed earlier show that children suffering from chronic illnesses not only show increased psychological and cognitive thought problems (Glazebrook et al., 2003; Judson, 2004; Witt et al., 2003) but they also differ in term of these problems, depending on the type of illness. For example, children suffering from cancer were found to have more emotional and behavioral problems (Davies et al., 2003; Mitchell, 2016; Yeh & Wang, 2004); those suffering from epilepsy showed more problems of inattention, cognitive impairment on intelligence and memory tests and learning disorders (Carr, 1999; Cull & Goldstein, 1997; Kim & Ko, 2016; van Rijckevorsel, 2006); and those affected by asthma suffered from emotional disturbances, depression, and anxiety and phobic disorders (Annesi-Maesano, Zhou, Baiz, Banerjee, André Charpin, Caillaud, de Blay, Raheison, Lavaud, 2013; Collins et al., 2008).

Majority of the research in the West suggest that children suffering from chronic illnesses experience more psychological problems as compared to healthy children (Jusiene & Kuchinskas, 2004; LeBovidge et al., 2003 & Osofky & Fitzgerald, 2000) and the manifestation of various psychological problems by the sick children depend on the type of chronic illness (Caplan et al., 2005; Glazebrook et al., 2003; Judson, 2004; Witt et al., 2003).

Investigating the psychological problems of Malaysian children suffering from chronic illnesses poses some formidable challenges. Valid indigenous or culturally- adapted instruments to measure the psychological problems of Malaysian children are lacking. As culture and psychopathology are interlinked, a psychological disorder can be understood within the context of that specific culture. This is known as 'cultural relativism' (Matsumoto & Juang, 2013). In addition, the cultural norms and values determine, to a significant extent, the definition of normality and abnormality (Marsella & Yamada, 2007). We assume that Malaysian children suffering from chronic illnesses may show mostly identical psychological problems as those observed elsewhere. In addition, it is also believed that the collectivist nature of Malaysian culture that cherishes deep parent-child relationship may impact disease specific problems to some extent (Okazaki, Okazaki & Sue, 2009; Weisz, Weiss, Suwanlert & Chaiyasit, 2006).

The main hypothesis of the study was that children suffering from cancer, epilepsy, and asthma will differ in the severity of their psychological problems. To investigate the dominant psychological problems associated with specific chronic illnesses, our first hypothesis states that the children suffering from cancer will show more emotional and behavioral problems as indicated by previous studies (Yeh & Wang, 2004). The second hypothesis of the study postulated that children suffering from cancer will show more internalizing problems as compared to epileptic and asthmatic children (Carey, Crocker, Coleman, Roy Ellias, & Feldman, 2009). Our third hypothesis suggests that children suffering from asthma will show more externalizing problems as compared to those suffering from cancer and epilepsy.

The family dynamics in Malaysian culture is characterized by a close and supportive parent-child relationship (Bunnell, 2016). As asthma is intermittent and varies from mild to severe attack, parents exercise less

behavioral control and give undue attention to these children (Jaggi, 2005). This parental behavior may pamper the children and they may show more relational, social and aggressive behaviors. The results of previous studies are mixed, showing both externalizing and internalizing problems for children with asthma (Annesi-Maesano et al, 2013; Berge & Patterson, 2004; Hysing, Elgen, Gillberg & Lundervold, 2009). Next, as a number of Western studies have shown cognitive, attention, learning and social problems for children with epilepsy (Carey et al., 2009; Carr, 1999; Cull & Goldstein, 1997; Oostrom et al., 2005), we propose differential hypotheses for these problems. Hence, the fourth hypothesis of our study states that children suffering from epilepsy will show more thought problems as compared to the children suffering from cancer and asthma (Kim & Ko, 2016; Shah & Othman, 2013). The fifth hypothesis postulates that children with epilepsy will experience more inattention problems compared to children with cancer and asthma (Oostrom et al., 2005; van Rijkevorsel, 2006). Finally, the sixth hypothesis of our study proposes that children suffering from epilepsy will show more social problems as compared to the children suffering from cancer and asthma (Davies et al., 2003; Mitchell, 2016; Pinquart & Shen, 2011).

Method

Participants

The study is based on an incidental sample of 63 parents, including 51 mothers and 12 fathers, of chronically ill children. The age range of the parents was from 20 to 51 years. A majority of the parents were housewives; others were working in the government or private sectors. The parents were recruited from the outdoor pediatric clinics and wards of the Kuala Lumpur General Hospital after they agreed to participate in the study.

The children comprised 39 males and 24 females in the age range of 4–17 years. There were 22 children suffering from cancer, 21 from epilepsy and 20 from asthma. Five cancer, epilepsy and 15 asthma patients were struck by the illnesses during the first four years of their life. Nine cancer, 6 epilepsy and 3 asthma cases occurred between the fifth and eighth year of the children's lives. There were 8 children with cancer, 11 with epilepsy and 2 with asthma whose illnesses started after the ninth year of their lives. This shows that asthma onset in Malaysia as compared to cancer and epilepsy is in the early years of a child's life.

An overview of the demographic characteristics of the respondents and the children are presented in Table 1.

Table 1: Demographic characteristics of the parents and their chronically ill children

Variable	Frequency (n)	Percentage (%)
1. Parents' Characteristics		
Parenthood		
Mother	51	81.0
Father	12	19.0
Age (in years)		
20-30	4	6.3
31-40	28	44.4
41-50	21	33.3
50 and above	10	15.9
Occupation		
Housewife	37	58.7
Government servant	20	31.7
Private sector	5	7.9
Others	1	1.6
2. Children's Characteristics		
Sex		
Male	39	61.9
Female	24	38.1
Age (in years)		
4-7	24	38.1
7-11	18	28.6
11-17	21	33.3
Type of visit		
Outpatient	34	54.0
Hospitalized	29	46.0

Measures

Two measures, a demographic questionnaire and Child Behavior Checklist for the age range of 4–18 (CBCL, Achenbach, 1991) were used in the study.

Child Behavior Checklist

Psychological problems among children were assessed with the Child Behavior Checklist for ages 4–18 (CBCL/4–18; Achenbach, 1991). The checklist has 118 items and is used to obtain information about children's competencies and problems from their parents or surrogate parents. Responses are scored using a 3-point scale from "0" through "2" (0 = "not true of the child"; 1 = "sometimes true of the child"; and 2 = "very true or often true of the child") during the previous six months of the study. CBCL were age normed and were derived for the ages 6-11 and 12-18. There were also different profiles of CBCL for boys and girls.

The profile of CBCL displays eight syndromes that have been derived from the statistical analyses of problems on a sample of 4,455 children referred to mental health services. The syndromes in CBCL include withdrawn, somatic complaints, anxious/ depressed, social problems, thought problems, attention problems, delinquent behaviors, and aggressive behaviors. The eight syndromes are categorized into two major groups of disorders named as internalizing and externalizing problems. The externalizing problems involve children's conflicts with others and social mores and comprise aggressive and delinquent behavior syndromes. The internalizing problems involve disorders of emotion and subjective inner distress in the children and comprise anxiety and depression, withdrawn, and somatic complaints (Achenbach, 1991).

The internal consistency of subscales of the CBCL ranges from 0.54 to 0.96 (Achenbach, 1991). Content validity of the CBCL is demonstrated by the ability of nearly all of its items to discriminate significantly between demographically matched referred and non-referred children. Construct validity is supported by numerous correlates of CBCL scales, including significant associations with analogous scales on the Conners (1996) Parents Questionnaire, and the Quay-Peterson (1983) Revised Behavior Problem Checklist. Criterion-related validity is supported by the ability of the CBCL's quantitative scale scores to discriminate

between referred and non-referred children after demographic effects were partialled out. Clinical cut-off scores on the scale were also shown to discriminate significantly between demographically matched referred and non-referred children (Achenbach, 1991).

We used the available CBCL's norms and the cutoff scores for our sample as the validation of CBCL norms for the Malaysian sample was beyond the scope of our study. We believed that the use of CBCL (Achenbach, 1991) will capture the same dimensions and its factor structure would be valid for our sample based on the extensive review of factorial structure of CBCL and its eight dimensions in 30 countries representing Asia, the Middle East, East, West, South and North Europe, Australia, the Caribbean region, and North America (Ivanova, Achenbach, Rescorla, Dumenci, Almqvist, Bilenberg, Bird, & Broberg, et al., 2007a; Ivanova, Dobrea, Dopfner, Erol, Fombonne, Fonseca, Frigerio, & Grietens, et al., 2007b) and a follow up review of parents' ratings of their children in 23 countries (Ivanova, Achenbach, Rescorla, Harder, Ang, Bilenberg, Bjarnadottir, & Capron et al., 2010).

Demographic Questionnaire

A demographic questionnaire was constructed to collect personal and clinical background data of children and the respondents. Information obtained included children's age, gender, diagnosis of disease, age at the onset of illness, duration of illness and current treatment. Information about the respondents consisted of their gender, age, occupation, and relationship with the child.

Procedure

The study was approved by the review committee of the 'Kulliyah of Islamic Revealed Knowledge and Social Sciences of International Islamic University of Malaysia'. The data were collected at the Pediatric Department of the Kuala Lumpur General Hospital after permission had been obtained from the director of the hospital. The director in turn sought the help of the Head of the Pediatric Department and the nursing staff to assist the researcher.

The Kuala Lumpur General Hospital has five pediatric wards and three outpatient pediatric clinics for children suffering from cancer,

epilepsy, and asthma. The researcher approached the parents whose children were either suffering from cancer, epilepsy or asthma during their visits to the pediatric outpatient clinic or whose children were in the pediatric wards. The researcher explained to the parents the purpose of the study first, which was to know about the psychological and other problems of chronically ill children. Then their consent to participate in the study was obtained and they were assured of the confidentiality of information provided by them. The respondents were administered the CBCL and then the demographic questionnaire. If both parents were present, the mother was asked to complete the questionnaire.

Most of the parents preferred to be interviewed rather than complete the questionnaires on their own. The researcher administered the questionnaires individually. Each interview took between 25 to 40 minutes. After the interview, the researcher thanked the participants and debriefed them about the purpose of the study.

Results

In analyzing the data obtained, internal consistency reliability (coefficient alpha) of the Child Behavior Checklist (CBCL) was determined. Descriptive and inferential statistics were computed for the total scores on CBCL, internalizing and externalizing problems and thought, attention and social problem scores of the chronically ill children which had been obtained from the parents.

One-way between subject analyses of variance (ANOVAs) were computed to examine differences between children suffering from cancer, epilepsy, and asthma on the score of CBCL, internalizing and externalizing problems and thought, attention and social problems. Effect sizes i.e., eta squared (η^2) for the results of all ANOVAs were computed using the formula suggested by Gravetter & Wallnau (2014).

A coefficient alpha of 0.94 indicated a high reliability of CBCL for our sample.

Table 2: Means, standard deviations, and F- values for the parents' scores of children suffering from cancer, epilepsy, and asthma on internalizing, externalizing, thought, attention, and social problems of CBCL.

Problems	Cancer		Epilepsy		Asthma		F	p
	M	SD	M	SD	M	SD		
CBCL	71.1	19.3	68.0	20.7	25.1	15.7	38.4	0.0001***
Internalizing	^a 29.0	10.6	^b 24.2	10.2	^b 7.4	6.5	30.1	0.001**
Externalizing	^a 16.5	6.7	^b 13.4	6.8	^b 5.9	5.1	15.5	0.001**
Thought	^a 2.5	2.4	^b 4.2	2.7	^a 0.4	0.6	16.1	0.001**
Attention	^a 8.8	4.2	^b 10.9	3.7	^a 3.3	2.2	24.9	0.001**
Social	^a 4.9	3.3	^b 6.6	3.0	^a 2.7	2.0	9.0	0.001**

The results of one-way between subject analysis of variance for the three illness groups on the CBCL scores in Table 2 show a significant difference between children suffering from cancer, epilepsy and asthma in terms of their psychological problems, $F(2,60) = 38.4$, $p < .0001$. The mean score of children suffering from cancer was highest ($mean = 71.1$; $S.D. = 19.3$), followed by children suffering from epilepsy ($mean = 68.0$; $S.D. = 20.7$) and asthma ($mean = 25.1$; $S.D. = 15.7$). The effect size (η^2) was 0.56. This shows that children suffering from cancer experience more psychological problems as compared to those with epilepsy and asthma. This finding supports our first hypothesis that children suffering from cancer, epilepsy and asthma will differ in their psychological problems.

The result of the ANOVA among cancer, epilepsy and asthma groups for the internalizing problems as shown in Table 2 indicates a significant difference, $F(2, 60) = 30.1$, $p < .001$. The effect size (η^2) was 0.50. The mean internalizing problem score of children suffering from cancer was the highest ($mean = 29.0$; $S.D. = 10.6$), followed by those suffering from epilepsy ($mean = 24.2$; $S.D. = 10.2$) and asthma ($mean = 7.4$; $S.D. = 6.5$). This result confirms our second hypothesis that children suffering from cancer will show more internalizing problems as compared to children suffering from epilepsy and asthma.

The result of the ANOVA among the children with cancer, epilepsy and asthma for the externalizing problems also show a significant difference, $F(2, 60) = 15.5$, $p < .001$. The effect size (η^2) for externalizing problems was 0.34. The children suffering from cancer also had the highest mean externalizing problem scores ($mean = 16.5$; $S.D. = 6.7$) as compared to those with epilepsy ($mean = 13.4$; $S.D. = 6.8$) and asthma ($mean = 5.9$; $S.D. = 5.1$). This result is contrary to our third hypothesis

which stated that children suffering from asthma will exhibit more externalizing problems as compared to those suffering from cancer and epilepsy.

The results of one way between subject analysis of variance (Table 2) further show significant differences among the three chronic illness groups for thought problems, $F(2, 60) = 16.1, p < .001$. The effect size (η^2) for this result was 0.32. The mean scores of the three illness groups indicate that children suffering from epilepsy scored highest on thought problems ($mean = 4.2; S.D. = 2.7$), followed by the children suffering from cancer ($mean = 2.5; S.D. = 2.4$) and asthma ($mean = 0.4; S.D. = 0.6$). This result supports our fourth hypothesis that children suffering from epilepsy will experience more thought problems as compared to children suffering from cancer and asthma. The results of one way between subject analysis of variance as shown in Table 2 again indicate a significant difference among three chronic illness groups for attention problems, $F(2, 60) = 24.9, p < .001$. The effect size (η^2) for attention problems was 0.45. The mean attention score of children suffering from epilepsy was highest ($mean = 10.9; S.D. = 3.7$), followed by the children suffering from cancer ($mean = 8.8; S.D. = 4.2$) and asthma ($mean = 3.3; S.D. = 2.2$). This outcome is in line with our fifth hypothesis, which postulated that children with epilepsy will exhibit more attention problems than the children with cancer and asthma.

The results of one way between subject analysis of variance (Table 2) also show significant differences among cancer, epilepsy and asthma illness groups for social problems, $F(2, 60) = 9.0, p < .001$. The effect size (η^2) for social problems was 0.23. The mean scores indicate that children suffering from epilepsy had the highest mean ($mean = 6.6; S.D. = 3.0$), followed by those with cancer ($mean = 4.9; S.D. = 3.3$) and asthma ($mean = 2.7; S.D. = 2.0$). This result supports our sixth hypothesis, which stated that children suffering from epilepsy will experience more social problems as compared to children suffering from cancer and asthma.

The effects sizes for ANOVAs pertaining to the hypotheses of our study were in the range of 23% - 56% indicating that a significant amount of variance of the independent variables (types of chronic illnesses) was accounted for by the dependent variable (psychological problems).

Discussion

This study examined the psychological problems of children suffering from chronic illnesses, namely, cancer, epilepsy, and asthma. The results of the study indicate that children suffering from these illnesses differ in their psychological problems, thereby supporting our main hypothesis. The children suffering from cancer showed more overall problems as compared to children with epilepsy and asthma.

The results also confirmed our second hypothesis regarding more internalizing problems of children with cancer as compared to children with epilepsy and asthma. Internalizing problems in children suffering from cancer were manifest in their depressed mood, anxiety, withdrawal, and somatic complaints as compared to children suffering from epilepsy and asthma. The dominant problems of the children with cancer included sadness, feelings of loneliness, worthlessness, and complaints about physical illness. Previous research has also indicated that children undergoing cancer treatment procedure (i.e., bone marrow transplant) were stressed, exhibited poor adherence, and had low social competence, self-esteem, and emotional well-being (Hysing et al., 2009; Lenton et al., 2001; Sloper & White, 1996; Schultz et al., 2007).

The preponderance of somatic complaints, mood and emotional disturbances and their related symptoms seem to be characteristics of the life-threatening nature of cancer and the intense pain associated with it (Heflinger & Saunders, 2005; Sandstrom & Schanberg, 2004). Children suffering from cancer experience variable degree of pain during the treatment and also due to the nociceptive activity of the disease; i.e., it invades the bones, compresses the nerves, infiltrates blood vessels, and injures healthy tissues. Both acute and chronic pain is experienced as a result of tissue damage caused by blood-sampling procedures, lumbar punctures, bone marrow aspirations, intramuscular and intravenous injections, surgery, chemotherapy, and radiation therapy (Cancer Research UK, 2016; Sitaresmi et al., 2008). The quality of these pains varies in relation to the nature of tissue damage (Canadian Cancer Society, 2016; Cancer Net, 2016; Cancer Research UK, 2016), hence, the pain and discomfort associated with the treatment causes anxiety and depressed mood among children with cancer.

Chemotherapy and radiation therapy produce visible side effects such as hair and weight loss, and physical disfigurement of the children,

resulting in extreme fatigue and restlessness. These unexpected changes in their physical appearance affect children's self-esteem and self-consciousness negatively (Sloper & White, 1996; Jaffee et al., 2005). They feel physically exhausted, are less active, and often miss school. Limited social participation and school absenteeism add to their anxiety and withdrawal (Sitaresmi et al., 2008). They generally avoid group activities because of the fear of negative reactions from other children, which increases their isolation causing sadness and depressed mood (Collins et al., 2008). The majority of children undergoing repeated chemotherapy and radiation therapy suffer from physical sicknesses and, hence, develop anticipatory nausea, vomiting, and dizziness which become more generalized over time (Dadds, Bovbjerg, Redd, & Cutmore, 1997; Sitaresmi et al., 2008).

In our study, children suffering from cancer also showed heightened signs of anxiety as compared to children with epilepsy and asthma. The reasons for this excessive anxiety among cancer children could be attributed to Malaysian parents' behavior and their protective attitude based on traditional beliefs that concealing the reality of the illness from children would lessen their distress and anxiety (Hamidah, Rustam, Tamil, Zarina, Zulkifli, & Jamal, 2009; Jilek, Jilek, Kaaya, Mkombachepa & Hillary, 1997; Othman, 1993). On the contrary, research shows that withholding information on illness is not protective; rather it increases uncertainty and confusion about one's own condition, provokes one's anxiety, and increases one's depression (Eiser, 1990).

Children suffering from cancer also scored higher on externalizing problems, in contrast to our third hypothesis which postulated that children with asthma will exhibit more externalizing problems than children with cancer and epilepsy. The dominant externalizing problems included children's aggressive behaviors such as moodiness, stubbornness, arguing, throwing temper tantrums, screaming, demanding attention, bragging, and disobeying the parents (Recklitis et al., 2007; Yeh & Wang, 2004). It has been noted that the painful experiences of chemotherapy and emotional sufferings of the children might contribute toward the tantrums and hostile behaviors among cancer stricken children (Barlow & Ellard, 2006; Yeh & Wang, 2004).

The children suffering from epilepsy exhibited more thought and attention problems relative to children suffering from asthma and

cancer, supporting our hypotheses 4 through 6 that children suffering from epilepsy will show more thought, attention and social problems as compared to children suffering from cancer and asthma. Children with epilepsy showed more distorted perceptions and hallucinations such as hearing or seeing non-existent things, staring blankly, having strange ideas or carrying out strange behaviors, being confused and obsessed by certain thoughts, having tremors, feeling nervous, and showing impulsiveness as compared to children suffering from cancer and asthma (Kim, & Ko, 2016; Marsh & Rao, 2002; van Rijckevorsel, 2006). A number of studies have found that children with epilepsy frequently suffer from anxiety and affective disorders (Beyenburg, Mitchell, Schmidt, Elger, Reuber, 2005). Seizure is a symptom of underlying brain dysfunction. The exposition of such behavioral problems is most probably because of the recurrent and sudden electrical discharge in the brain during an epileptic attack (Beyenburg et al., 2005; Stump, 2008).

Some research findings have indicated that several factors characterizing epilepsy, such as neurological dysfunction and the use of medication in children with epilepsy leads to behavioral side effects in almost all anti-epileptic drugs (Besag, 2004, Carr, 1999; Kariuki, Abubakar, Holding, Mung'ala-Odera, Chengo, Kihara, Neville, & Newton, 2012).

Our results also indicate that children with epilepsy face greater social problems as compared to children suffering from cancer and asthma. These problems relate to children's immaturity and lack of social skills. Research indicates that children suffering from epilepsy behave too immaturely for their age, are teased and rejected by others, are too dependent on their parents and are unable to get along with their peers (Kariuki et al., 2012; Kerr, Nixon, & Angalakudit, 2011; Wheless & Sirven, 2013).

There are some age-old misconceptions about epilepsy in the Malaysian culture still prevalent and maintained through folklore which result in social stigmatization (Lim et al., 2012; Neni, Latif, Wong, & Lua, 2010; Zainy, Atteyah, Aldisi, Abdulkarim, Al-helo, Al-hilali, & Jan, 2013). The belief in the Malay society that epileptic seizures are contagious discriminates against an individual with epilepsy (Baki, 1993). Other ethnic groups in Malaysia, for example, Chinese and

Tamils have their own stigma words for epilepsy which are associated with insanity (Lim, et al., 2012).

Some other misconceptions about epilepsy in Malaysia are that it leads to mental illness and ultimately to ‘epileptic personality’ and mental deterioration (The Malaysia Medical Gazette, 2013). An epileptic attack is socially stigmatizing, especially, when it happens publicly, for example, at the school or among peers. Society’s negative attitude toward epilepsy, which seems to be a sad reality worldwide, leads the child to depend heavily on his/her parents and avoid social contact (Lim, Hills, Choo, Wong, Wu, & Tan, 2013; Masoudnia, 2009; Neni et al., 2010; Ramasundrum, Mohd Hussin, & Tan, 2000; Spatt, Bauer, Baumgartner, Feucht, Graf, Mamoli, & Trinkka, 2005; Zainy et al., 2013).

As epilepsy is considered a socially humiliating condition, many Malay parents initially conceal this illness from others and are reluctant to seek medical treatment (Neni, et al., 2010; Ramasundrum, et al., 2000). In the majority of cases, this behavior of the parents aggravates the suffering of the child because she/he misses the opportunity for early intervention and treatment (Hiatt, Pasick, Perez Stable & McPhee, 1996; Talamantes, Lawler & Espino, 1995; Wing, Crow & Thompson, 1995). Frequently, epilepsy begins in childhood and children’s understanding of events is conditioned by the parents’ explanations and behaviors. Parents may act as “stigma coaches”, training their children to feel ashamed and apprehensive about their epilepsy, fostering concealment by advice or example (Okazaki et al., 2009; Weisz et al., 2006). This is a form of overprotection that may be a key source of anger and resentment in epileptic children, and may be associated with the behavioral and personality problems in their future life (Rimm-Kaufman & Pianta, 2002; Rodenburg, Meijer, Dekovic & Aldenkamp, 2005a).

Many cultural beliefs about epilepsy indicate that culture is not only associated with the attributions about the causes of health and disease processes but also affects attitudes about health care and treatment (Matsumoto, 2000; Matsumoto & Juang, 2013).also In addition, cultures have their own criteria for the description of certain disorders (Siddiqi & Shah, 1997), the acceptance of their symptoms as normal or abnormal (Marsella & Yamada, 2007; Matsumoto, 2000), and specific attitudes

toward illnesses (Baki, 1993; Jilek, et al., 1997; Neni et al., 2010; Zainy et al., 2013).

The results of our study did not support our hypothesis that children suffering from asthma will show more externalizing problems as compared to the children with cancer and epilepsy. Children with asthma scored in the normal range on all the symptoms of externalizing problems. In contrast to the outcome of our study, the results of some other studies showed more behavior problems in children with asthma (Feitosa, Santos, Barreto do Carmo, Santos, Teles, Rodrigues & Barreto, 2011) and abnormal or borderline emotional symptoms (internalizing problems) or conduct problems (externalizing problems) were found in asthmatic children (Annesi-Maesano et al, 2013). A recent study by Cutuli, Herbers, Lafavor, Ahumada, Masten and Oberg (2014) of homeless children with asthma did not find any relationship between asthma and cognitive test performance or subsequent academic performance, or other behavior problems in school. On the other hand, some studies have found a high frequency of internalizing disorders among children with asthma while little indication of externalizing problems (Klennert, Mcquaid, McCormick, Adinoff & Bryant, 2000; Vila, Nollet-Clemencon, De Blic, Moren-Simeoni & Scheinmann, 2000). Still other studies indicate that children suffering from asthma were emotionally disturbed and depressed (Hysing et al., 2009; Klennert et al., 2000; Vila et al., 2000).

As compared to other chronic illnesses, the complexity of asthma as intermittent, variable, and reversible in nature may be the reasons for the inconsistencies in research findings. A number of research studies including meta-analyses and research reviews have come up with various explanations to better understand these inconsistencies. A meta-analysis of 569 studies on psychological problems of children suffering from chronic illnesses that used the Child Behavior Checklist found variations in the results of these studies by country, age, gender and the study design (Pinquart & Shen, 2011). Other researchers believe that the inconsistencies may be because of a lack of research on understanding involvement of behavioral problems in childhood asthma according to phenotypes (Annesi-Maesano, et al, 2013); the complex nature of the pathways through which the relationship between asthma and a child's mental health is established (Feitosa, et al., 2011); an interplay between the demographic characteristics and the social-psychological

wellbeing of the family of asthmatic children and the psychological problems among children (Barlow & Ellard, 2006; Cutuli, et al., 2014); and inconsistencies in the operational definitions of asthma (Sá-Sousa, Jacinto, Azevedo, Morais-Almeida, Robalo-Cordeiro, Bugalho-Almeida, Bousquet, & Fonseca, 2014).

Majority of the children in our study suffered from asthma when they were four years old or less as compared to the children suffering from cancer and epilepsy. The onset of asthma in earlier childhood, as compared to cancer and epilepsy, might have enabled the children to adjust and cope with the illness. In addition, the tropical hot and humid Malaysian climate might help children with asthma to cope with the illness in a better way as compared to their counterparts in colder Western climates. Supporting our view, statistics from a National Health and Morbidity Survey indicate that the majority of the childhood incidence of asthma in Malaysia, i.e., about 90.5%, was mild, 8.4% moderate and only 1% was severe in nature, whereas statistics from Western countries show that about 4% of the Australian children with asthma suffered from severe asthma and required regular medications (Bakri, Mohd Said, Mohan, Wang, & Hamid, 1999) and asthma was the third leading cause of hospitalization among children under the age of 15 in the U.S. (Judson, 2004).

Another plausible explanation might be that the children and their parents perceive asthma as a common, less threatening, and manageable illness among the chronic illnesses (Okazaki et al., 2009; Weisz et al., 2006). Hence, children with asthma might feel less anxious and might be able to cope with it better. Further, a relatively positive attitude of the family toward this illness might be a supporting factor for children with asthma to adapt to their circumstances (Berge & Patterson, 2004).

Conclusion

Our study investigated the mental health problems of Malaysian children suffering from chronic illnesses. Our findings show similarities as well as differences between the mental health problems of Malaysian children suffering from chronic illness and their counterparts in the West. These findings indicate that children suffering from cancer showed more internalizing and externalizing problems; children with epilepsy displayed more thought, attention, and social problems; whereas children with asthma scored lowest on these problems. Our

results are in line with some previous research regarding the emotional, cognitive and psychological problems faced by chronically ill children (Berge & Patterson, 2004; Caplan et al., 2005; Hysing et al., 2009; Jusiene & Kuchinskas, 2004; LeBovidge et al. 2003; Oostrom et al., 2005; Rodenburg et al., 2005a; Rodenburg et al., 2005b; Yeh & Wang, 2004) except in the case of asthma children who scored low on the internalizing as well as externalizing problems. This inconsistency in the outcome of our study and other studies, as discussed earlier, could be due to the complex nature of asthma and an interplay of social-cultural factors where this chronic illness is concerned.

The outcome of our study also highlights the importance of culture and its impact on the lives of the individuals (Matsumoto & Juang, 2013). Although, we did not include any cultural variable in our study design, we believe that the collectivist Malaysian culture plays some role in mitigating the adverse effects of chronic illnesses on children. The close parent-child bonds and the caring attitude of the parents and the family seem to help children continue their everyday life activities, especially, in the case of children suffering from asthma (Jaggi, 2005).

As mentioned earlier, the folklores and stigmas associated with a specific illness (e.g., epilepsy in Malaysia) may exacerbate the emotional and psychological problems of a child and negatively affect her/his psychosocial development (Bakri, Said, Mohan, Wong, & Hamid, 1999; Hiatt et al., 1996; Jilek et al., 1997; Matsumoto, 2000; Talamantes et al., 1995; Wing et al., 1995). In fact, the attitudes of parents, the family and the society toward a specific illness vis-à-vis its acceptance/rejection plays a vital role in the treatment and management of the illness (Matsumoto & Juang, 2013; Neni et al., 2010; Ramasundrum et al., 2000; Zainy et al., 2013). In addition, a lack of infrastructure for the prevention and the treatment of psychological problems or the very denial of their existence may impede the chances of assessment, identification, early intervention and treatment of mental health problems of the children suffering from chronic illness (Bakri et al., 1999).

Childhood is a vital stage in human development. Chronically ill children, in particular, demand additional care and attention to ensure their well-being. Thus there is need for more research on the incidence and prevalence of childhood chronic illnesses in the developing

countries and their psychosocial impact on the children, their parents, siblings and families.

Limitations of the study

It would be difficult to generalize our findings because of the small sample size and the limited focus of the study. Our study employed a small sample because of the infrequency of children suffering from the selected chronic illnesses and also due to time constraints.

We did not validate the CBCL on our sample because of the limited scope of our study. We assumed that the factor structure, the dimensions of externalizing/internalizing behaviors and other specific dimension would be similar in our sample as was found across 30 countries (Ivanova et al., 2007a; 2007b) and a later review of CBCL in 23 countries (Ivanova et al., 2010). As a consequence, we might have missed the opportunity to identifying culture specific behaviors (Achenbach et al., 2008) and culture specific aspects of psychopathology (Gone & Kirmayer, 2010).

We collected data on the children through their parents, majority of who were the mothers. The parents, especially, the mother might be more sensitive to the children's problems and discomfort. Furthermore, we did not collect certain medical details regarding the children's illnesses, such as the severity of the three illnesses at the time of the study. We have also not differentiated amongst the severity/frequency of children's problems on the basis of their socio-economic class, ethnic belongingness and family circumstances.

However, we believe that the outcome of this study could provide some useful directions for future research which could employ a bigger sample and incorporate some specific disease- related dimensions such as age at the onset of the illness, duration of illness and the quality of medical care as covariates in the study.

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