



RESEARCH ARTICLE

A STUDY OF PSYCHOLOGICAL MORBIDITY, FAMILY BURDEN AND GLOBAL FUNCTIONING  
IN CHILDREN WITH LEUKEMIA

<sup>1</sup>Sophia, M., <sup>\*2</sup>Anandakrishnakumar, S., <sup>2</sup>Viswanathan, G. A. and <sup>2</sup>Sabhesan, S.

<sup>1</sup>Consultant Psychiatrist., Madurai

<sup>2</sup>Department of Psychiatry, Madurai Medical College, Tamilnadu, India

ARTICLE INFO

Article History:

Received 22<sup>nd</sup> July, 2017  
Received in revised form  
10<sup>th</sup> August, 2017  
Accepted 27<sup>th</sup> September, 2017  
Published online 17<sup>th</sup> October, 2017

Key words:

Child,  
Leukemia,  
Mental disorders-  
Morbidity.

ABSTRACT

**Background:** Physical illnesses create a spiraling augmentation of psychological distress, both to the sufferer and to the caretaker. This is especially so, when the sufferer is a child. Prompt recognition and evaluation of psychiatric problems are essential, because psychiatric co-morbidity exacerbates the course of medical illness, causes significant distress to the patient, prolongs hospital-stay, and increases cost of care.

**Methodology:** The present study thus aims to understand the psychological consequences of Acute Lymphoblastic Leukemia on the children, their family burden, Functional capacity, illness related variables and their associations with psychopathology.

**Results:** Children with ALL are more prone for Psychological disturbances than major Psychiatric disorders. Depressive Conduct disorder is the most common among children with ALL in our study. Longer the duration of illness significantly increases psychopathology but treatment period do not show association with psychopathology. The presence of psychiatric disturbances significantly reduces global functioning in the Children with ALL. Presence of Psychopathology significantly interferes with Family interactions, Family dynamics, Financial Burden and Subjective distress.

**Conclusion:** Development of chronic illness in Children results in major impact on their physical growth, emotional maturity, social relationships, Family dynamics and academic achievements. These children should be given not only utmost medical care but their emotional suffering should also be addressed. They should be encouraged to express verbally and should be spent with adequate attention to their psychological needs and concerns. Their parents should be adequately educated about the illness and its outcome so that they may be effectively fulfilling adequate parental role.

Copyright©2017, Sophia et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Sophia, M., Anandakrishnakumar, S., Viswanathan, G. A. and Sabhesan, S. 2017. "A study of psychological morbidity, family burden and global functioning in children with Leukemia", *International Journal of Current Research*, 9, (10), 58670-58674.

INTRODUCTION

Owing to their developmental immaturity, children's conceptions of their bodies vary widely and are obviously influenced by experiences with illness. It is from their parent's reactions to illness or the treatment process, that the children understand how dangerous the illness could be and how they should optimally respond. Hence, intervention procedures should be tailored to their level of understanding and they should be encouraged to explain in their own words about their illness. Acute leukemia, especially Acute Lymphoblastic Leukemia (henceforth referred as ALL), is the most common form of malignancy in childhood with a peak incidence between 2 and 6 years of age. ALL is more common in boys than in girls. The exact cause remains unknown, but a variety of possible factors have been proposed which includes genetic factors, environmental factors, viruses and immune deficiency states.

\*Corresponding author: Anandakrishnakumar Somasundaram  
Department of Psychiatry, Madurai Medical College, Tamilnadu, India.

In the past 30 years, there has been dramatic improvement in the management of ALL, and more number of children are in complete remission more than 5 years after the diagnosis. The most stressful periods in the management include the time of diagnosis, remission during the long term survival and death. Psychological distress in response to serious Paediatric illness has been a focus of many disease specific and non categorical studies over the years. Chronic illness differs from acute physical conditions in several important respects. A chronic illness is usually treatable but not curable. The onset of symptoms, the rigors of treatment and frequent absence from school make huge demands on the emotional and interpersonal resources of the children and their families. Lavigne (1992) reviewed 87 studies of children's adjustment to physical disorders like epilepsy, congenital heart disease, pediatric cancers, in a meta analysis. Results indicate children with such disorders show increased risk for overall adjustment problems, internalizing and externalizing symptoms and the self-concept of children with physical disorders across all studies appears significantly lower than that of healthy children. In a study of 5736 childhood cancer survivors studied young adults, reported more symptoms of depression than their sibling controls (Zebrack et al., 2010). Psychiatric morbidity was

present in 80% of the children in the study of Konijnenberg (Konijnenberg *et al.*, 2006). In a study by Rao (2007) of HIV infection in children has a number of psychiatric illnesses including: depression, anxiety, disruptive disorders and hyperactive disorders have been observed. Thus, the studies on children with various physical illnesses indicate that, a significant number of them suffer from depression, anxiety disorders, disruptive and hyperactivity disorders commonly.

### Psychopathology among children with all

Paediatric cancer presents a number of challenges to patients and their families. Clinically significant psychological distress has been reported in the children with cancer and their parents (Magni *et al.*, 1983; Magni *et al.*, 1986). Pediatric ALL is now considered a chronic rather than an inevitably fatal disease, but it may still place these children at increased risk for development of psychological adjustment problems (Lavigne and Faier-Routman, 1992; Pless and Nolan, 1991). The life threatening nature of ALL, painful procedures and lengthy intensive treatment place considerable stress on the child and family, interfere with normal developmental tasks and add to the risk of developing adjustment problems (Michael and Copeland 1987; Kupst and Schulman, 1988). Despite the numerous stressors some studies (Worchel *et al.*, 1988; Gizynski and Shapiro, 1990) have shown that children with cancer report fewer symptoms of depression than healthy school children or children with asthma. Phipps and Srivastava (Phipps and Srivastava, 1997) have explained that the children with cancer use an avoidant coping style to deal with their emotional response to cancer. Sharan (Sharan *et al.*, 1999) interviewed 30 consecutive children aged 6-12 years using symptom checklist, children depression rating scale and the state trait anxiety inventory and found that 90 % of them had emotional disorders, which were mild to moderate intensity and was perceived to be treatable easily. The coping and adaptation of 39 children, 6-12 years of age was studied using the Children's Apperception Test and was found that disease awareness was present in 96%, 61% evidenced emotional distress (Sharan *et al.*, 1995). Thus these studies on the psychopathology of children with leukemia indicate an increased incidence of behavioral problems, emotional distress and adjustment problems.

### Individual and Family coping

Research has shown that individuals use multiple coping strategies in any given situation (Lazarus, 1999). Preferred coping styles often tied to personality variables; sometimes they can be viewed as traits as well as processes (Heim *et al.*, 1997). Coping strategies commonly used by children and their parents include problem-solving, a positive outlook, and good communication (Brown *et al.*, 1992). In a study by Goldbeck (1998), coping styles used were problem focused coping strategies in combination with optimistic basic attitude. Campbell (Campbell *et al.*, 1999) examined associations among several domains of executive function and found that executive function impairment may be associated with difficulties in coping and emotion regulation. A study by Earle (Earle and Eiser, 2007), on children's behavior following diagnosis of ALL showed that children in the 0-4 year age group adjusted well, owing to their limited understanding of their illness, 5-9 years age group were adjusting less well – experiencing social problems and worries about appearance. Older children 10- 14 years adjusted least well.

### Quality of Life

A number of studies have found that long term survivors tended to function well in school, work and in marriage (Holmes and Holmes, 1975; Fergusson, 1976; Li and Stone, 1976; Obetz *et al.*, 1980). Investigators at Dana Farber cancer center found that 53% of long term survivors were well adjusted. This also meant that 47% had at least mild symptoms of emotional distress (O'malley *et al.*, 1979; Mauer, 1981). Six years follow up study by Kupst (1988) on long term coping with pediatric leukemia, found that families of children in long term remission continued to do well and even improved over time. Investigations showed that despite significant life-events, they were able to regain a certain degree of quality of life because of the efficient use of coping mechanisms. But, such studies in the native setting are sparse and do not address many of the variables prominent in the local ethnic setting and sets the directions for further explorations.

## MATERIALS AND METHODS

### Aim

The present study aims to assess the psychopathology among the children with ALL, their Family burden, global functioning and to infer their possible predictors.

### Objectives

- To assess the frequency of psychopathology and psychiatric disorders among the children with ALL.
- To understand the family burden, global functioning and their associations with psychopathology.

### Hypothesis

The following hypothesis were formulated:

- Children with ALL are more prone for psychiatric disorders.
- Depressive disorders are most common among children with ALL
- Longer the duration of illness and treatment period will be associated with greater psychopathology
- The presence of psychiatric disturbances reduces global functioning
- Psychopathology significantly interferes with Family interactions and Family dynamics.

### Setting

The study was conducted in the Department of Paediatrics, Govt. Rajaji Hospital, Madurai, which is a tertiary care facility with the approval of the Institutional Ethics Committee. The study was conducted during a period of six months from December 2007 to May 2008. The study was a cross sectional evaluation of the psychological functioning of the children. As evidence in the review, there are very few studies on the psychological aspects of ALL in India and none in South Tamil Nadu. Moreover, detailed considerations of emotional consequences on the children are marked by their absence. Hence, the present study has been formulated on an explorative design. The study-population included 30 children with a diagnosis of Acute lymphoblastic Leukemia. The diagnosis was established on the basis of clinical and laboratory

investigations by the Pediatric Consultant. The subjects were recruited randomly based on the following selection criteria.

### Inclusion criteria

- Children with a diagnosis of Acute Lymphatic Leukemia, during their hospital stay for chemotherapy.
- Children between 5 and 12 years of age.
- Children of Parents who consent to participate.

### Exclusion criteria

- Children with previous history of psychological morbidity such as mental retardation.
- Children with history of other medical illnesses.
- Family history of any other significant physical or psychological morbidity. 4. Very sick children.

### Tools employed:

1. A Semi structured Performa
2. Paediatric symptom checklist (Jellinek *et al.*, 1999)
3. Children Depression Rating Scale (Poznanski *et al.*, 1985)
4. Children Global Assessment of Functioning Scale (Shaffer *et al.*, 1983)
5. Draw a Person test (Koppitz, 1968)
6. ICD 10 (World Health Organization, 1992)
7. Family burden interview schedule (Pai and Kapur, 1981)

### Statistical analysis

Analysis of the data was done using the measures of central tendency and dispersion such as the Mean, Standard Deviation, and Range. The associations between the variables were analyzed using Pearson's correlation

## RESULTS

Table 1 shows, the socio demographic details and disease related variables of the children. It was observed that two fifths of the children each were between 5-7yrs of age and 7-10yrs of age. Male children represented three fourths, eighty per cent of the children were from rural background and majority was from nuclear families.

**Table 1. Sociodemographic and illness variables of the children**

Sl. No	Variable	Number of Children (N=30) n	Percentage
1	Age	5-7 years	13
		7-10 years	14
		>10years	3
2	Sex	Boys	23
		Girls	7
3	Domicile	Rural	24
		Urban	6
4	Family type	Nuclear	25
		Joint	5
5	Duration of Illness	<4 years	27
		>4 years	3
6	Side effect on treatment	Absent	11
		Present	19

The duration of illness was less than 4 years in 90% and 63.34% had side effects such as alopecia and weight loss. It was observed that only 13.33% of the children scored above

the cut off in PSC and none in CDRS, though only two fifths of the children functioned normally.

**Table 2. Measures of mean, standard deviation, range and cut off scores of the variables of children**

Sl. No	Variable	Mean	SD	RANGE (Max-Min)	Number of Children (N=30) N	Percentage
1	PSC	14.63	8.98	0-30	4	13.33
2	CDRS	22.06	5.43	17-37	0	0
3	CGAS	65.10	7.99	40-75	13	43.33
4	DAP	7.63	2.06	2-13	-	-

### CUT OFF SCORES

PSC-Pediatric symptom check list - 28; CDRS-Children depression rating scale - 40; CGAS-Child global assessment of functioning scale - 70; DAP- Draw a person test. (Qualitative data, explained later)

**ICD 10 Diagnosis:** Oppositional defiant disorder (F91.3) was diagnosed in 4 of the children and two of them met criteria for depressive conduct disorder (F92.0)

**Table 3. Emotional indicators in dap**

Sl.No	Indicators	No. Observed N=30
1	Poor integration of parts	10
2	Tiny figures	10
3	Transparencies	8
4	Slanting figures	6
5	Shading	6
6	Omission of neck	4
7	Omission of parts	4
8	Asymmetry of parts	3
9	Monster	2
10	Genitals	1

Sum of indicators exceeds N as there were more than one indicators in each figure. Qualitative analysis of Draw a Person test showed indicators of emotional disturbances among children with chronic illness. But, operationally defined quantitation of the scores did not correlate with any of the measures of psychopathology. Poor integration of parts, shading, tiny figures, transparency, absence of parts of body, and monster figures were the commonly observed emotional indicators among these children.

**Table 4. Correlations between measures of psychological morbidity among children and disease variables**

	PSC	CDRS	CGAS	DAP
Duration of illness	0.37*	0.23	-0.08	-0.03
Side effect	0.08	0.20	-0.07	0.07
Treatment phase	0.21	0.09	-0.25	0.38*

Values refer to Pearson's  $\gamma$ ; Df = 28;  $p < 0.05^*$ ;  $p < 0.01^{**}$ ; PSC-Pediatric symptom check list; CDRS-Children depression rating scale; CGAS-Child global assessment of functioning scale; DAP- Draw a person test.

**Table 5. Correlations between measures of psychological morbidity among children**

	PSC	CDRS	CGAS	DAP
PSC	-	0.11	-0.66**	0.21
CDRS	0.11	-	-0.26	0.12
CGAS	-0.66**	-0.26	-	0.07
DAP	0.21	0.12	0.07	-

Values refer to Pearson's  $r$ ; Df = 28;  $p < 0.05^*$ ;  $p < 0.01^{**}$ ; PSC-Pediatric symptom check list; CDRS-Children depression rating scale; CGAS-Child global assessment of functioning scale; DAP- Draw a person test.

Correlations between the children's psychopathology and their disease variables indicated that, the duration of the illness

correlated positively with PSC. It was also observed that the treatment phase correlated positively with the children's psychopathology indicated by the Draw a person test. The correlations between the measures of the psychopathology among the children revealed that the scores on PSC correlated negatively with the scores on CGAS indicating that the children's functioning was significantly affected by the presence of psychopathology.

**Table 6. Correlations between measures of psychological morbidity among children and family burden**

	PSC	CDRS	CGAS	DAP
FB	0.47**	0.24	-0.42*	-0.06
FR	0.77**	0.21	-0.47**	0.25
FL	0.77**	0.43*	-0.56**	0.10
FI	0.81**	-0.01	-0.37*	0.20
PHY H	0.70**	-0.17	-0.25	0.18
PS H	0.72**	-0.12	-0.34	0.18
SB	0.69**	0.44*	-0.56**	0.09

Values refer to Pearson's  $r$ ;  $Df = 28$ ;  $p < 0.05^*$ ;  $p < 0.01^{**}$ ; PSC- Pediatric symptom check list; CDRS-Children depression rating scale; CGAS-Child global assessment of functioning scale; DAP- Draw a person test FB- Financial burden FR- Family routine; FL- Family leisure; FI- Family interaction PH- Physical health; PS H- Psychological health SB- Subjective burden

Correlations between the measures of children's psychopathology and Family burden indicate that, the scores on PSC correlated positively with all the seven domains of Family burden scale. The scores on CDRS correlated positively with scores on family leisure and the subjective burden. Negative correlations were observed between the scores on CGAS and the financial burden, family routine, family leisure, family interactions and the subjective burden.

## DISCUSSION

Chronic illnesses of the adults are experienced by their families distressing but chronic illnesses in children are felt as disorganizing. Near-total dependency of the children, their vulnerability to stress and immaturity of their conceptualization of the illness and its consequences differentiate their problems from those of the adults. Leukemia is a chronic illness. Course of illness, repeated chemotherapies with hospital-dependency, disturbances to the children's schooling and a questionable prognosis make them and their parents prone to continued stress for a long period (Kazak *et al.*, 1995). Since there were no previous studies in the native population simultaneously focusing on the children and the parents, the present study was planned on an explorative design. Thirty children were chosen on specific inclusion and exclusion criteria to identify a representative and homogenous population. All the children had been suffering from ALL for more than two years. Most belonged to the 5-10 yrs age group, were predominantly from rural domicile and all the families belonged to low economic status. The tools used in the study were sought to understand and quantify both the distress and the extent of well being experienced by the children. Thus, PSC, CDRS and ICD-10 were used to measure the extent of psychopathology in children and Draw a Person test was used as a projective test to learn their body image disturbances and other psychological disturbances. CGAS was used to learn about the extent of well-being of the children. Clinically, the children exhibited many behavioral problems. Due to constant exposure to hospitals and treatment, the children were initially withdrawn. Later, they were hyperactive, rebellious and

abusive, particularly of their mothers, both verbally and physically (Rajajee *et al.*, 2007). Oppositional defiant disorder (F91.3) in four children and depressive conduct disorder (F92.0) in two children could be identified in our study fulfilling ICD-10 criteria. Draw a Person test can be used as a measure of intelligence, to know their body-image concept and as a projective test (World Health Organization, 1992). Most children drew figures indicating age-related immaturity and scored poor IQs. None of the children had history of delayed developmental milestones or other indicators of mental retardation. The poor scores indicated how the illness and its consequences interfere with cognitive unfolding in these children. An operational method of quantification was attempted and the degree of disorganization increased during the phase of induction or relapse. Psychopathological changes in the children were marked by significant disturbances in their level of functioning. Measures of distress in children indicated that four children scored above the cut-off in PSC, none of the children above the cut-off mark in CDRS and 13 children were above the cut-off scores in CGAS. Thus, it was evident that though many children evinced significant extent of disturbances, they were able to contain their impairment through family support. Scores in PSC showed a significant inverse correlation to the CGAS and significant positive correlation to the duration of the illness. Though DAP was a qualitative study, an attempted quantification correlated significantly with the treatment phase. The study indicates that psychological distress is very high among the children with leukemia. Distress of the children is the essential and determining cause of parental distress, poor quality of life and family burden. On the other hand parental psychopathology affects their care giving abilities thereby affecting the children's well being. Resilience of the parents in the face of distress would guide the mental health professional in positively managing the difficult Liaison-Psychiatry problem.

## Conclusion

Based on the findings the following conclusions are made. Children with ALL are more prone for Psychological disturbances than major Psychiatric disorders. Depressive Conduct disorder is the most common among children with ALL in our study. Longer the duration of illness significantly increases psychopathology but treatment period do not show association with psychopathology. The presence of psychiatric disturbances significantly reduces global functioning in the Children with ALL. Presence of Psychopathology significantly interferes with Family interactions, Family dynamics, Financial Burden and Subjective distress. Pediatricians who take care of chronically ill children are the professionals who first come into contact with these parents and it will be worthwhile if they spend some time in identifying those parents in distress and arranging for appropriate referrals so that the children they are treating are given better and less stressful family atmosphere. Hence psychiatrists and allied mental health professionals have a major role in alleviating the suffering of these parents. This can ultimately improve the compliance and hence life of these children.

## REFERENCES

- Brown, R.T., Kaslow, N.J., Hazzard, A.P., Madan-Swain, A., Sexson, S.B., Sharan, P., Mehta, M., Chaudhry, V.P. 1999. Psychiatric morbidity in children suffering from acute

- lymphoblastic leukemia. *Pediatric hematology and oncology*, 1;16(1):49-54.
- Brown, R.T., Kaslow, N.J., Hazzard, A.P., Madan-Swain, A., Sexson, S.B., Lambert, R., Baldwin, K. 1992. Psychiatric and family functioning in children with leukemia and their parents. *Journal of the American Academy of Child & Adolescent Psychiatry*, 1;31(3):495-502.
- Campbell, L.K., Scaduto, M., Van Slyke, D., Niarhos, F., Whitlock, J.A., Compas, B.E. 2009. Executive function, coping, and behavior in survivors of childhood acute lymphocytic leukemia. *Journal of pediatric psychology*, 1;34(3):317-27.
- Earle, E.A., Eiser, C. 2007. Children's behaviour following diagnosis of acute lymphoblastic leukaemia: a qualitative longitudinal study. *Clinical Child Psychology and Psychiatry*, 12(2):281-93.
- Fergusson, J.H. 1976. Late psychologic effects of a serious illness in childhood. *The Nursing clinics of North America*, 11(1):83-93
- Gizynski, M., Shapiro, V.B. 1990. Depression and childhood illness. *Child and Adolescent Social Work Journal*, Jun 1;7(3):179-97.
- Goldbeck, L. 1998. Familial coping with cancer in childhood and adolescence. Possibilities for standardized assessment with a self-assessment method: results of an empirical pilot study. *Praxis der Kinderpsychologie und Kinderpsychiatrie*, 47(8):552-73..
- Heim, E., Valach, L., Schaffner, L. 1997. Coping and psychosocial adaptation: longitudinal effects over time and stages in breast cancer. *Psychosomatic Medicine*, 1; 59(4):408-18.
- Holmes, H.A., Holmes, F.F. 1975. After ten years, what are the handicaps and life styles of children treated for cancer? An examination of the present status of 124 such survivors. *Clinical Pediatrics*, 1;14(9):819-23
- Jellinek, M.S., Murphy, J.M., Little, M., Pagano, M.E., Comer, D.M., Kelleher, K.J. 1999. Use of the Pediatric Symptom Checklist to screen for psychosocial problems in pediatric primary care: a national feasibility study. *Archives of Pediatrics & Adolescent Medicine*, 1;153(3):254-60.
- Kazak, A.E., Boyer, B.A., Brophy, P., Johnson, K., Scher, C.D., Covelman, K., Scott, S. 1995. Parental perceptions of procedure-related distress and family adaptation in childhood leukemia. *Children's Health Care*, 1;24(3):143-58.
- Konijnenberg, A.Y., de Graeff-Meeder, E.R., van der Hoeven, J., Kimpfen, J.L., Buitelaar, J.K., Uiterwaal, C.S. 2006. Psychiatric morbidity in children with medically unexplained chronic pain: Diagnosis from the pediatrician's perspective. *Pediatrics*, 1;117(3):889-97.
- Koppitz, E.M. 1968. Psychological evaluation of children's human figure drawings. Grune & Stratton.
- Kupst, M.J., Schulman, J.L. 1988. Long-term coping with pediatric leukemia: A six-year follow-up study. *Journal of pediatric psychology*, 1;13(1):7-22.
- Lavigne, J.V., Faier-Routman, J. 1992. Psychological adjustment to pediatric physical disorders: A meta-analytic review. *Journal of pediatric psychology*, Apr 1;17(2):133-57.
- Lazarus, R.S. 1999. Hope: An emotion and a vital coping resource against despair. *Social Research*, 1:653-78.
- Li, F.P., Stone, R. 1976. Survivors of cancer in childhood. *Annals of internal medicine*, 1;84(5):551-3.
- Magni, G., Carli, M., De Leo, D., Tshilolo, M., Zanesco, L. 1986. Longitudinal evaluations of psychological distress in parents of children with malignancies. *Acta Paediatrica*, 1;75(2):283-8.
- Magni, G., Messina, C., Leo, D., Mosconi, A., Carli, M. 1983. Psychological distress in parents of children with acute lymphatic leukemia. *Acta Psychiatrica Scandinavica*, Oct 1;68(4):297-300.
- Mauer, A.M. 1981. The Damocles Syndrome: Psychosocial consequences of surviving childhood cancer. *JAMA*, Sep 11; 246(11):1258-.
- Michael, B.E., Copeland, D.R. 1987. Psychosocial Issues in Childhood Cancer: An Ecological Framework for Research. *Journal of Pediatric Hematology/Oncology*, 9(1): 73-83.
- Obetz, S.W., Swenson, W.M., McCarthy, C.A., Gilchrist, G.S., Burgert, E.O. 1980. Children who survive malignant disease: emotional adaptation of the children and their families. *The child with cancer*. Thomas, Springfield, 94-210.
- O'malley, J.E., Koocher, G., Foster, D., Slavin, L. 1979. Psychiatric sequelae of surviving childhood cancer. *American Journal of Orthopsychiatry*, 49(4):608.
- Pai, S., Kapur, R.L. 1981. The burden on the family of a psychiatric patient: development of an interview schedule. *The British Journal of Psychiatry*, 1;138(4):332-5.
- Phipps, S., Srivastava, D.K. 1997. Repressive adaptation in children with cancer. *Health Psychology*, Nov; 16(6):521
- Pless, I.B., Nolan, T. 1991. Revision, replication and neglect—research on maladjustment in chronic illness. *Journal of Child Psychology and Psychiatry*, Jan 1;32(2):347-65.
- Poznanski, E.O., Freeman, L.N., Mokros, H.B. 1985. Children's depression rating-scale-revised (SEPTEMBER 1984). *Psychopharmacology Bulletin*, 1;21(4):979-89.
- Rajajee, S., Ezhilarasi, S., Indumathi, D. 2007. Psychosocial problems in families of children with cancer. *Indian Journal of Pediatrics*, 1;74(9):837-9.
- Rao, R., Sagar, R., Kabra, S.K., Lodha, R. 2007. Psychiatric morbidity in HIV-infected children. *AIDS care*, Jul 1; 19(6):828-33.
- Shaffer, D., Gould, M.S., Brasic, J., Ambrosini, P., Fisher, P., Bird, H., Aluwahlia, S. 1983. A children's global assessment scale (CGAS). *Archives of General psychiatry*, 1;40(11):1228-31.
- Sharan, P., Mehta, M., Choudhry, V.P. 1995. Coping and adaptation in parents of children suffering from acute lymphoblastic leukemia. *The Indian Journal of Pediatrics*, 1; 62(6):737-41.
- Worchel, F.F., Nolan, B.F., Willson, V.L., Purser, J.S., Copeland, D.R., Pfefferbaum, B. 1988. Assessment of depression in children with cancer. *Journal of Pediatric Psychology*, 1;13(1):101-12.
- World Health Organization, 1992. The ICD-10 classification of mental and behavioural disorders: clinical descriptions and diagnostic guidelines. Geneva: World Health Organization.
- Zebrack, B.J., Zeltzer, L.K., Whitton, J., Mertens, A.C., Odom, L., Berkow, R., Robison, L.L. 2002. Psychological outcomes in long-term survivors of childhood leukemia, Hodgkin's disease, and non-Hodgkin's lymphoma: a report from the Childhood Cancer Survivor Study. *Pediatrics*, Jul 1;110(1):42-52.