

PSYCHOSOCIAL SCREENING USING PEDIATRIC SYMPTOM CHECKLIST IN PATIENTS WITH ACUTE LYMPHOBLASTIC LEUKEMIA

WILMA N. DE LEON, MARIA EVA I. JOPSON, MARILOU ABIERA

ABSTRACT

BACKGROUND: Leukemia is the most common malignant neoplasm in childhood, with Acute Lymphoblastic Leukemia (ALL) comprising 71% of cases. Patients undergo intensive course of treatment and complications, making them at risk for psychosocial difficulties. The Pediatric Symptom Checklist (PSC) is a validated psychosocial screening tool for the identification of emotional, cognitive, and behavioral problems in children. It uses subscales to identify impairments in attention, internalizing, and externalizing behaviors.

OBJECTIVE: To screen the psychosocial status of pediatric patients with ALL using the PSC. It aimed to correlate a positive PSC score with factors such age, gender, and on-going chemotherapy.

METHODS: The study design is cross-sectional. Participants were asked to answer the PSC which is a 35-item questionnaire. Total scores were calculated and interpreted based on set cut-off scores.

RESULTS: A total of 87 patients with ALL were included in the study. The PSC was able to identify 16 patients (18%) with psychosocial problems. The patients had concerns related to the internalizing subscale, followed by attention and externalizing subscales. There was no association between age, sex, duration of diagnosis, and on-going chemotherapy with the presence of psychosocial issues in patients with ALL.

CONCLUSIONS: In this study, the prevalence of psychosocial issues in patients with ALL is 16%. Screening patients using the PSC can help in the early detection of psychosocial issues among children with ALL.

RECOMMENDATIONS: A separate study which focuses on both patients and families' psychosocial status is recommended to get an overall picture of the effect of cancer and its treatment. Screening in several points during the course chemotherapy can also be done in future studies.

KEYWORDS: Acute Lymphoblastic Leukemia; Psychosocial screening; Pediatric Symptom Checklist

INTRODUCTION

Mental health includes emotional, psychological, and social well-being that is important in every stage of life, from childhood, adolescence, and through adulthood.¹ Worldwide, 10-20% of children and adolescents experience mental disorders with half of the cases begins by the age of 14.²

Children with chronic conditions have a greater risk of having poor mental health and developing a psychological comorbidity compared to those children without chronic conditions.³ This highlights the increasing need for investigation into the effects of these conditions on life-long mental health and wellbeing.⁴ Addressing mental health during clinic visits is important for all pediatric patients especially those with chronic conditions.³

Leukemia is the most common malignant neoplasm in childhood accounting for approximately 31% of all malignancies that occur in children younger than 15 years of age. Acute Lymphoblastic Leukemia (ALL) comprised 71% of these cases,⁵ and in Metro Manila, ALL comprised 65% of all leukemias among children ages 0-14 years old.⁶ Despite the improved survival rates, cancer still remains to be a life-threatening condition with major impact not only on the lives of the child but also the entire family.⁷ Upon diagnosis of leukemia, pediatric patients and their families goes through an often lengthy, stressful, and intensive course of treatment as well as complications, making them at increased risk for new or exacerbated psychosocial difficulties.⁸

The American Academy of Pediatrics (AAP) Task Force on Mental Health provides guidance and tools to aid screening and identification of mental health issues in primary care practice. There are different screening tools to detect common psychosocial problems. The Pediatric Symptom Checklist (PSC), developed by Jellinek and Murphy (1986), is a validated psychosocial screening tool that aids in the identification of emotional, cognitive, and behavioral problems in children.^{10,11,12,13} Factor analysis of the PSC has led to the validation of three subscales for use in the identification of attention, internalizing and externalizing problems.³¹

At present, there are only two studies that screen patients with chronic illness for psychological dysfunction using the PSC. One of these studies revealed that PSC had adequate sensitivity and specificity when applied to pediatric neurology patients compared to a lengthier Child Behavior Checklist (CBCL) in identifying patients with psychological issues.¹⁵ Stoppelbein used PSC in patients with insulin-dependent diabetes mellitus and sickle cell disease. This supports the empirical use of the PSC in screening patients for psychosocial dysfunction in a tertiary care pediatric setting. No similar studies, however, has been done locally or abroad on ALL patients. This study utilized the PSC to patients with ALL in a tertiary care setting in order to identify possible psychosocial and mental health issues among this population.

Significance of the Study

The use of PSC, although not diagnostic, can be a useful tool for pediatricians in the early detection of psychosocial and behavioral problems in patients with chronic illnesses such as ALL. If left unaddressed, such problems may worsen the child's medical condition as well as the disease management in general, further compromising their quality of life. Early detection will lead to an early referral to a specialist for further psychiatric or psychological assessment. Initiation of early intervention for such psychosocial problems can improve not only the patients' mental health status but also their families. It can also reduce financial burden caused by medical complications brought about and exacerbated by these problems. The use of subscales can assist pediatricians on which domains or subscales to focus on to identify what psychosocial disorders affect patients with ALL. This will be of benefit to psychologists and psychiatrists to guide them in their assessment and interventions.

OBJECTIVES OF THE STUDY

General Objective

This study aimed to screen the psychosocial status of pediatric patients with Acute Lymphoblastic Leukemia using Pediatric Symptom Checklist.

Specific Objectives

Specifically, the study aimed to:

1. Determine the prevalence of psychosocial issues among patients with ALL using PSC.

2. Identify in what subscales the subjects scored highest.
3. Identify whether factors such age, gender, and an on-going chemotherapy, are associated with positive PSC.

MATERIALS AND METHODS

The research design of this study is cross-sectional. The study included primary caregivers of patients with ALL. Convenience samplings was used in choosing eligible subjects and were screened based on the following inclusion criteria:

- Caring for patients diagnosed with ALL of:
 - Any subtype and stage
 - Ages 3 to 17 years
 - May or may not be undergoing chemotherapy at the time of the study
 - Being seen at the outpatient department (pay or service) or admitted in the ward
- May be a parent or non-parent
- Should be with the patient most days of the week (at least 5 days a week) both at home or in the hospital
- Responsible for taking care of the patient's basic needs, physical health, and emotional well-being for at least 6 months

Caregivers of patients diagnosed with psychiatric disorders and neurodevelopmental delay were excluded in the study.

The research protocol was submitted for review and approval of the Institutional Review – Ethics Committee (IR-EC) and commenced only upon final approval from the board. Primary caregivers of admitted and outpatients diagnosed with ALL seen at the Cancer and Hematology Center of a tertiary government hospital were recruited and screened for eligibility based on the set inclusion criteria. A written consent was then secured from all the participants who agreed to be part of the study.

The PSC was administered in a private cubicle in the outpatient department of the Cancer and Hematology department to provide privacy to the participants while answering the questionnaires. The participants were asked to answer the PSC. This is a validated screening tool widely used in research and clinical settings to help identify children with psychosocial issues. It has been translated and validated in multiple languages and all forms are available online for free. The Filipino version was downloaded from the website: http://www.massgeneral.org/psychiatry/services/psc_home.aspx and was used in this study. It took only 5 to 10 minutes to complete the questionnaire. The PSC – Filipino version which consists of 35 items that are rated as “*Hindi* (Never)”, “*Paminsan-minsan* (Sometime)” or “*Madalas* (Often)” were scored 0, 1, and 2, respectively. The total score was calculated by adding together the score for each 35 individual items, with a total score ranging from 0 to 70. If one to three items are left blank, a score of 0 is given. If four or more items are left black, the questionnaire was considered invalid.

The total score indicates whether a child has impairment in psychosocial functioning. For children and adolescents ages 6 through 17, a cutoff score of 28 or higher indicates psychological impairment. For children ages 3 to 5 and those who are not attending school, score on elementary school related items 5, 6, 17, and 18 were ignored and the total score was based on the remaining 31 items. The cutoff score for this group was 24 or higher. The result for each subscale was interpreted as follows:

- A score of greater or equal to 7 in the attention subscales signified impairment in attention.
- A score of greater or equal to 5 in the internalizing subscale signified impairment with anxiety or depression.
- A score of greater than or equal to 7 in the externalizing subscale signified impairments with conduct.

A positive score on the PSC suggests the need for further evaluation by a qualified health or mental health professional. Patient characteristics were summarized using frequencies and proportion. PSC and subscale scores were determined for each patient and summarized using mean and standard deviation. The rates of positive screening in the PSC and each subscale were also computed. Simple and multiple logistic regression analysis were done to determine which patient characteristic was associated with positive screening in the PSC. The significance level was set at 95% and all analyses were done using STATA14.

The study was started only upon approval by the IR-EC. The entirety of the study was explained to the parent/ guardian participants. These include the significance of the study, the procedure, the benefits, and the confidentiality. Participating in the study was voluntary and the parents/ guardians were enrolled in the study only when they consented. Answering of the questionnaires was at the convenience of the parents/ guardians, and of the patients to make sure that the study did not interfere with the patients' treatment or consultation. All private patients who participated in the study were included upon the approval of their attending physicians. The participants were given the option to withdraw from the study at any given point in time. Upon withdrawal, his/her input was not counted as valid and participation was completely terminated. Whatever information that has been gathered during the period of participation was kept confidential.

Participation in the study was completely free of charge and no monetary compensation was given for participation. Whatever information gathered from the participants was used solely for the purpose of the study and for advancement in health education and counseling.

The primary investigator, research assistant, and encoder were the only ones who had access to the gathered data. All documents including the questionnaires answered by the subjects was kept in a secured box labeled as confidential and was stored in the office of the Cancer and Hematology Center. All documents will be

shredded and disposed two months after the completion of the final paper.

All patients who scored positive for mental health issues were identified including drop outs. The results of the screening test were discussed to the participants and their doctors. The importance of further evaluation for psychiatric disorders and the need for a psychiatric consult were explained. We coordinated with the Child Neuroscience Center to facilitate referral of patients who screened positive with PSC for further assessment and management.

RESULTS

Eighty-seven (87) patients with ALL were included in the study. The patients age ranged from 3-17 years with a mean age ($\pm$ standard deviation) 7.43 ± 3.56 years. There are more males (65.5%) than females (34.5%). The mean duration of diagnosis ($\pm$ standard deviation) was 21.98 ± 19.31 months. Sixty-eight or 78.2% of the children are not attending school.

Table 1 shows the chemotherapy status of the children. Majority or 90.8% of the patients included in the study are receiving chemotherapy. Of the 79 patients with on-going chemotherapy, 31% are on induction phase, 17.3% on consolidation phase, and 42.5 % are on maintenance phase.

Table 1. CHEMOTHERAPY STATUS OF ALL PATIENTS IN THE STUDY

Status	Frequency	Percentage (%)
With Chemotherapy	79	90.8
Induction Phase	27	31.0
Consolidation Phase	15	17.3
Maintenance Phase	37	42.5
Without Chemotherapy	8	9.2
TOTAL	87	100

Nineteen or 22% of the parent/ guardian participants of the study have the perception that their child has some form of psychosocial problem. Of these, 16 or 18% of the patients perceived to have a psychosocial problem, truly screened positive with the PSC (Figure 1). All the patients who screened positive with PSC were also perceived by their parents/ guardians to have a psychosocial problem.

A patient with a positive score was interpreted as having psychosocial issues. The highest score recorded was 39, obtained from one patient. Seven or 43.8% are females and nine or 56.3% are males. Of the 16 patients with psychosocial issues, 15 are on chemotherapy.

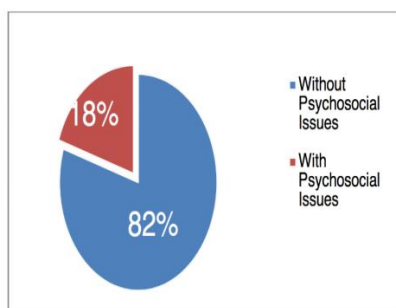


Figure 1. Proportion of ALL Patients With and Without Psychosocial Issues by PSC

A total of 16 (18%) patients with ALL scored positive with PSC. Positive score was interpreted as having psychosocial issues. Of these 16 patients who scored positive, only eight patients had positive subscale scores. Internalizing subscale screens for depression and anxiety while externalizing subscale screens for conduct disorder, oppositional defiant disorder, and rage disorder among others. Attention subscale, on the other hand, requires evaluation for Attention Deficit/Hyperactivity Disorder (ADHD).¹⁴

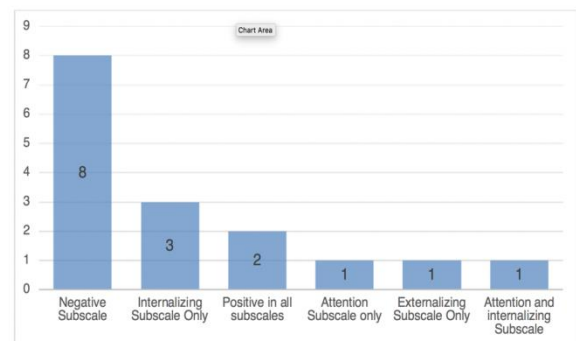


Figure 2. Distribution of ALL Patients with Psychosocial Issues Based on Subscales

Two patients scored positive in all three subscales, one patient scored positive for both attention and externalizing subscales, one patient scored positive for both attention and internalizing subscales, three patients scored positive to internalizing subscales only, and one patient scored positive to attention subscale only (Figure 2). The remaining 8 patients did not score positive in any of the three subscales. Internalizing subscale has the greatest number of patients who scored positive followed by attention subscale, and externalizing subscale.

Table 2 shows the mean and median PSC subscale scores of the patients in the study. The internalizing impairment subscale is the highest mean score followed

by attention impairment. The externalizing impairment subscale is the lowest at 1.53. The six patients identified to have internalizing impairments were diagnosed to have ALL and ranged from 6 to 33 months from time of diagnosis.

Table 2. The PSC Subscale Scores Among ALL Patients

Subscale	Mean Score	Median Score
Internalizing Impairment	2.72 ± 2.41	2.00
Attention Impairment	2.46 ± 2.06	2.00
Externalizing Impairment	1.53 ± 1.63	1.00

Using logistic regression, a p-value <0.05 is considered to have to have a significant association between patient's characteristics and the presence of psychosocial issues. Based on the analysis of data, there was no association between age, sex, duration of diagnosis, and on-going chemotherapy with a positive PSC score as seen in Table 3.

Table 3. Association of Age, Gender, and Chemotherapy status with Presence of Psychosocial Issues.

Factors	Psychosocial Issues		Odds Ratio	CI	P value
	Present	Absent			
Mean Age (years)	8.13	7.27	1.063	0.915 – 1.235	0.423
Sex					
Female	7.0 (43.8)	23.0 (32.4)	1.781	0.567 – 5.596	0.323
Male	9.0 (56.3)	48.0 (67.6)			
Mean Duration of Diagnosis	18.25	22.82	0.987	0.956 – 1.018	0.394
Chemotherapy status					
With chemotherapy	15.0 (93.8)	64.0 (67.6)	0.499	0.053 – 4.707	0.543
Without chemotherapy	1.0 (6.3)	7.0 (32.4)			

DISCUSSION

One of the major tasks of childhood involves achieving healthy development and functioning in physical, cognitive, emotional, and psychosocial domains. Studies have shown that childhood chronic illness, including childhood malignancies like leukemia, can impair psychosocial functioning and development.⁴⁵ There have been inconsistent findings with regard to psychosocial impairments in patients with cancer in general. One study showed that most patients with leukemia suffered from significant psychiatric morbidity – with older age, female gender, and parental psychopathology as risk factors.²⁷ Another study showed that children in remission from ALL have on average significantly more problems regarding mental health and psychosocial adjustment as compared with health controls.⁴⁶ These two studies however are in contrast with another study by Nazari et al wherein behavioural problems among the ALL cases are significantly less frequent than the healthy peers.⁴⁷ In the present study, no comparison was done between patients with ALL and healthy peers. However, this is the first study that measured the prevalence of psychosocial issues among patients with ALL in a tertiary government hospital in the Philippines. A prevalence of 16% among the participants showed that screening might play a role in identifying psychosocial issues in patients with ALL. Using a simple validated screening tool like the PSC can help clinicians in identifying patients who are at risk.

Studies on the externalizing impairments among children with cancer have also been inconsistent. Some studies concluded that significant numbers of children have behavioral problems in the childhood cancer population as compared with healthy controls and that they have higher risks for displaying behavioral difficulties.⁵⁰ These findings were not consistent with one study done by Michalowski et al, wherein they compared the emotional and behavioral symptoms in three groups: a) children with acute leukemia; b) children with blood dyscrasia; and c) children evaluated or treated in a pediatric outpatient service. In this cross-sectional study, children with leukemia did not differ from the two other groups regarding symptoms of externalization.⁵¹

There are few studies that correlate attention problems with cancer. One of these studies, reported on longitudinal change in neurocognitive function and predictors of neurocognitive outcomes 2 years after completing therapy for ALL. The results showed that survivors of childhood ALL remain at elevated risk for attention problems that impact real-world functioning.⁵² Of those who screened positive using PSC, 5 patients had impairment in either externalizing or attention subscales. All these patients who screened positive for PSC will require further evaluation and management by a child psychologists or psychiatrist. With the use of PSC subscales, certain psychosocial impairments were identified, and these can assist in the evaluation of these patients. However, a bigger study using PSC in conjunction with other validated

psychosocial tools may produce a more sensitive and accurate assessment.

We also noted the association of positive PSC with age, sex, duration of diagnosis, and on-going chemotherapy in this study. The nature of the onset and course of the illness, the potential fatality of the illness and the degree of incapacitation are important factors in understanding the impact of chronic illness in general. In patients with ALL, chemotherapy has a significant impact on the psychological status of both patients and their parents with high prevalence of low self-esteem in children and high degree of stress in their parents.⁵³ However, there was no association between on-going chemotherapy and the presence of psychosocial issues in patients with ALL. The same holds true with age, sex, and duration of diagnosis. The innate nature of Filipinos of being optimistic and resilient might be factors that aid both patients and their families in battling cancer.

CONCLUSION AND RECOMMENDATIONS

This study used the Pediatric Symptom Checklist to screen patients with Acute Lymphoblastic Leukemia in a tertiary government hospital in the Philippines. The PSC was able to identify 16% of patients with ALL to have psychosocial issues. The internalizing subscale has the highest mean score, followed by attention subscale, and externalizing subscale with the lowest mean score. There is no relationship between age, sex, duration of diagnosis, and on-going chemotherapy with the presence of psychosocial issues in patients with ALL.

Screening patients may be necessary for early detection of psychosocial issues among children with ALL.

We recommend using PSC as a screening tool in a broader population of patients with cancer – including those with other types of leukemia and tumors. Testing in several points during treatment or chemotherapy can also be done so as to better establish the role of chemotherapy in the psychosocial aspect of health of patients with cancer. Future studies which focus not only on the patients psychosocial status but as well as the parents and family psychosocial status may be necessary to get an overall picture of the effect of cancer and it's treatment in the smallest unit of the community.

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