



# The Role of Socio-economic Factors in Abandonment of Cancer Treatment among Paediatric Patients in Jos Nigeria

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## Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

## Article Information

DOI: 10.9734/BJMMR/2016/22283

### Editor(s):

(1) Divya Kesanakurti, Department of Cancer Biology and Pharmacology, University of Illinois College of Medicine, USA.

(2) Chan Shen, Department of Biostatistics, MD Anderson Cancer Center, University of Texas, USA.

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Complete Peer review History: <http://sciencedomain.org/review-history/12946>

Original Research Article

Received 27<sup>th</sup> September 2015

Accepted 30<sup>th</sup> October 2015

Published 11<sup>th</sup> January 2016

## ABSTRACT

The outcome of pediatric cancer therapy in the developed country is good however in Developing countries like Nigeria pediatric cancer treatment is characterized by late presentation, presences of co-morbidities and outright refusal of investigation and initiation or continuation of treatment. This might be because of socio economic reasons. This study set out to determine the proportion of cancer patients who abandoned their therapy and identify the socioeconomic factors associated with AT among children diagnosed with malignancy.

**Methods:** Hospital records of 41 children admitted for childhood malignancy at the Jos University Teaching Hospital over a period of 2 years were retrieved and data was obtained from them regarding their biodata, diagnosis, treatment procedure and outcome. Data was computed using EPI info version 7.0 statistical software.

Abandonment of Treatment was compared with socio-economic variables using the chi square test or fisher exact score at 95% confidence interval. A p value of < 0.05 was considered statistically significant.

**Results:** The prevalence of abandoning of treatment was 63.4%. The odds of AT was 4.5 times

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higher in children who were less than 10 years of age compared to older children. Children from smaller families (4 children or less) had a 3.4 odds of abandoning treatment than large families. The odds of abandoning treatment was 16 times (CI= 1.2-200.5) higher if a mother was the caregivers while the child was on hospital admission compared to others. AT was significantly higher in children who travel for  $\geq 2$  hours before arrival at the hospital (travelled for more than 2 hrs from their homes for therapy in JUTH). Socio economic status, parental education, gender, marital status of parent and birth order did not have any statistical association with AT.

**Conclusion:** The high rate of AT in pediatric cancer patient in Jos university Teaching Hospital is associated with socioeconomic factors. Further studies with a larger sample size will give more insight into this problem and pave way for possible solutions.

*Keywords: Pediatric cancer; pediatric malignancy; abandoning; treatment.*

## 1. INTRODUCTION

There has been a remarkable improvement in the outcome of childhood malignancy, in the last few decades, especially in developed countries where the cure rate of 80% have been reported [1,2].

This contrasts with the poor survival of pediatric malignancy patients reported in most developing countries that account for over 80% of the 114,000 yearly new cases reported globally and accounts for over 90% of world's pediatric cancer mortality [3'4]. In these resource poor countries, the outcome of Pediatrics cancer treatment is characterized by late presentation, presences of co-morbidities and outright refusal of investigation and initiation or continuation of treatment [5,6].

The failure to start or complete curative cancer therapy has being termed, Abandonment of treatment (AT) which the International Society of Pediatric Oncology (SIOP) defines as failure either to begin (conventionally termed refusal) or to continue the planned course (abandonment) for duration of 4 weeks or more [7,8,9].

AT is frequently observed amongst children with malignancy seeking therapeutic care / cure especially in the developing world. It is major cause of treatment failure [9]. For example in western Kenya and Zimbabwe about 50% of children with malignancy abandoned their treatment [10,11]. This is similar to what is obtained in some Asian countries and the findings might be comparable to that of Nigeria [12,13].

In spite of the remarkable improvement in skills, diagnosis and therapeutic cancer services: for instance cytotoxic drugs and radio - therapy are more readily available, accessible and affordable

than a decade ago. This should have translated to an improvement in outcomes of cancer therapy. Despite this, quite a significant proportion of patient abandoned their treatment. The reasons for this abandonment of pediatric cancer treatment may-be social and economic factors. Therefore it is important to view the care of pediatric cancer patient from the socio-economic context of the child and his / her family, especially in developing countries like Nigeria where health is individually purchased [4,5]

It is therefore the aim of this paper review to determine the proportion of children with malignancy who abandoned their treatment and also determine the socioeconomic factors associated with AT.

## 2. METHODS

This study was done at the Jos University Teaching Hospital [JUTH] Plateau State, Nigeria. All children less than 18 years, diagnosed with childhood cancer between January 2010 to December 2012 were enrolled into the study. Data on all oncology patient admitted into the ward were obtained from the various registers / patients records. The following information was then obtained from these records: bio data, parental education, occupation, and marital status, along with birth order of index patient, clinical and pathologic diagnosis, duration before diagnosis and commencement of chemo-therapy and outcome of these patients.

### 2.1 Outcome Measures

The primary outcome measure was abandonment of therapy; this was defined as all patients who left against medical advice (refusal of treatment), all patients who were lost to follow up and all patients who defaulted their treatment for more than 4 weeks before returning.

## 2.2 Data Management

The data generated was analyzed using epi info version 7.0. The outcome (abandoning of Treatment) was compared with socio-demographic variables using the chi square test or fisher exact score at 95% confidence interval.

## 3. RESULTS

There were 19(46.3%) females and 22(53.7%) males, with a mean age of  $8.4 \pm 4.4$  years. Of the 41 patients, 48.8% (20) were ages 5 -10 years while 19.5% (8) were under five. Adolescent aged (11-18 years) constitute 31.7%. Using the Odusanya's social stratification it was found that 65.8% (27) were of social class V, 6 (14.6%) social class IV, 5 (12.2%) Social class III, 2 (4.8%) were social class II with only one child from social class I. Of the 41 children reviewed 36 children lived with their married parents, while 5 children stayed with a single parents. The number of children per household ranged between 1-11 with 41.5% (17) children having greater than 4 siblings. The modal, median and mean birth orders of children were 1, 3 and  $3.5 \pm 2.6$  respectively Table 1.

### 3.1 Abandoning and Refusal of Treatment

During the period under review, 63.4% (26) of children with malignancy seen at the Jos University Teaching hospital had abandoned their treatment. Death was recorded in 22% (9) of children, only 14.6% (6) of subjects had either completed or were undergoing treatment.

The Odds of abandoning treatment was 4.5 times higher in children who were less than 10 years of age compared to older children who were equal or greater than 10 years. The AT rates were not statistically different between male and females and between first born and none - first born (Table 2).

The marital status of the caregivers was not statistically associated with abandoning of treatment ( $p > 0.05$ ). However, families with 4 children or less had a 3.4 odds of abandoning treatment than family who had more than 4 children ( $p < 0.05$ ). Parental literacy and occupation was not associated with abandoning of treatment ( $p > 0.05$ ) Table 2.

The data of the child's caregivers while on hospital admission was available for only 20 of

41 patients. Mothers cared for 60% of these children while the remaining 40% were under the care of either their brother, sisters, grandparent uncles or step parents. The odds of abandoning treatment was 16 times ( $CI = 1.2-200.5$ ) higher if a mother is the caregivers compared to others.

No statistical difference was found between patients who got alternative treatment in form of herbs before presentation and those who received orthodox care either from patent medicine store, primary health care or secondary health care Table 2.

## 4. DISCUSSION

In this study the prevalence of AT in paediatric cancer patients seen at the Jos University Teaching Hospital was 63.4%. This finding is similar to the AT prevalence of 50-63% observed in developing countries [7,10,11]. Similar rates on refusal of treatment and treatment default were reported by Offiong and Meremikwu in North central and South Eastern Nigeria respectively [14,15,16]. This may suggest a similarity in the social, cultural, economic and political determinants of AT (refusal of treatment and default) across most of these developing countries [8].

This study and a previous study by Metzger et al in Honduras established an association between AT an age of the child [17]. In both studies younger children are likely to have their treatment abandoned compared to older children. Other studies by Bonilla et al. [12] and by Sitaresmi et al. [13] in El-savador and Indonesian leukemic children respectively did not show this correlation. In the context of this study it is difficult to explain this observation. However, the concept of illness leading to death, and the irreversibility of dead is well understood by children aged 10 years and above [18]. These groups of children have capacity to influence their caregiver's compliance to prescribed treatment.

The gender of the child did not show any impact on AT in this current study. Similar observation were reported by Bonilla et al. [12] Sitaresmi et al. [13] in Indonesia and El-Salvador respectively. This may reflect the gender equity in health seeking behavior of parents with cancer children. This is further supported by an almost equal proportion of male and female paediatric cancer patients presenting for treatment in previous and current review in JUTH [14].

**Table 1. Socio-demographic variables of cancer children by abandonment of treatment (N=41)**

	<b>Total N=41</b>	<b>Abandoning treatment N=26</b>	<b>Died/Follow up N=15</b>
<b>Age group</b>			
<10	23 (56.1)	18 (69.2)	5 (33.3)
≥10	18 (43.9)	8 (30.8)	10 (66.7)
<b>Gender</b>			
Male	22 (53.7)	15 (57.7)	7 (46.7)
Females	19 (46.3)	11 (42.3)	8 (53.3)
<b>Paternal education</b>			
None	21 (51.4)	14 (53.8)	7 (46.7)
Primary	10 (24.4)	7 (26.9)	3 (20.0)
Secondary	7 (17.1)	4 (14.4)	3 (20.0)
Tertiary	3 (7.3)	1 (3.8)	2 (13.3)
<b>Maternal education</b>			
None	20 (48.8)	11 (42.3)	9 (60.0)
Primary	11 (26.8)	8 (30.8)	3 (20.0)
Secondary	7 (17.1)	5 (19.2)	2 (13.3)
Tertiary	3 (7.3)	2 (7.3)	1 (6.7)
<b>Social class</b>			
I	1 (2.4)	0 (0.0)	1 (6.7)
II	2 (4.9)	2 (7.7)	0 (0.0)
III	5 (12.2)	3 (11.5)	2 (13.3)
IV	6 (14.6)	5 (19.2)	1 (6.7)
V	27 (65.9)	16 (61.5)	11 (73.3)
<b>Siblings</b>			
≤4	24 (58.5)	18 (69.2)	6 (40.0)
>4	17 (41.5)	8 (30.8)	9 (60.0)
<b>Birth order</b>			
First born	10 (24.4)	7 (26.9)	3 (20.0)
Non first born	31 (75.6)	19 (73.1)	12 (80.0)
<b>Father's employment</b>			
Farmers	24 (58.5)	17 (65.4)	7 (46.7)
Army	1 (2.4)	1 (0.0)	0 (0.0)
Trades	4 (9.8)	2 (7.7)	2 (13.3)
Civil servants	5 (12.2)	3 (11.5)	2 (13.3)
Mechanics	1 (2.4)	1 (3.8)	0 (0.0)
Carpenter	3 (7.3)	1 (3.8)	1 (6.7)
None	2 (4.9)	1 (3.8)	2 (13.3)
Lecturer	1 (2.4)	0 (0.0)	1 (6.7)
<b>Hours to hospital</b>			
<30 min	12 (29.3)	9 (34.6)	3 (20.0)
30-60 mins	12 (29.3)	10 (38.5)	2 (13.3)
1-2 hrs	6 (19.5)	3 (11.5)	3 (20.0)
2-3 hrs	3 (14.6)	2 (7.7)	1 (6.7)
>3 hrs	8 (19.5)	2 (7.7)	6 (40.0)
<b>Marital status</b>			
Married	36 (87.8)	24 (92.3)	12 (80.0)
Separated	1 (2.4)	0 (0.0)	1 (6.7)
Widow	4 (9.8)	2 (7.7)	2 (13.3)
<b>Hospital visited</b>			
0-1	28 (68.3)	20 (76.9)	8 (53.3)
2-3	11 (26.8)	6 (23.1)	5 (33.4)
4-6	2 (4.9)	0 (0.0)	2 (13.3)

**Table 2. Association of socio-demographic variables of cancer children by abandonment of treatment (N=41)**

	<b>Total (n=41)</b>	<b>Abandoning treatment (26)</b>	<b>Died/FU (n=15)</b>	<b>OR(CI)</b>	<b>p value</b>
<b>Age group</b>				4.5 (1.2-17.5)	0.02
<10	23	18	5		
≥10	18	8	10		
<b>Gender</b>				1.6 (0.4-5.6)	0.26
Male	22	15	7		
Females	19	11	8		
<b>Paternal education</b>				0.8 (0.2-2.7)	0.45
Illiterate	21	14	7		
Literate	20	12	8		
<b>Maternal education</b>				2.0 (0.6-7.5)	0.15
Illiterate	20	11	9		
Literate	21	15	6		
<b>Social class</b>				1.0 (0.2-4.7)	0.95
Lower	33	21	12		
Upper	8	5	3		
<b>Siblings</b>				3.4 (1.01-12.7)	0.04
≤4	24	18	6		
>4	17	8	9		
<b>Birth order</b>				1.5 (0.3-6.8)	0.62
First born	10	7	3		
Non-firstborn	31	19	12		
<b>Father's employment</b>				1.3 (0.2-7.8)	0.71
Self	34	22	12		
Non self	7	4	3		
<b>Hours to hospital</b>				0.2 (0.1- 0.9)	0.03
>2 hr	30	22	8		
≤2 hr	11	4	7		
<b>Marital status of parents</b>				1.9 (0.3-11)	0.46
Married	35	23	12		
Not married	6	3	3		

*Lower (class IV, V)*

This study did not show any relationship between AT and parental socio-economic status as documented by Kulkarni et al. [19]. The Olusanya's socio-economic classification (SEC) used in this review has been widely used by other researchers in Nigeria and is based on paternal occupation and maternal education [20]. It was observed that about 80% of the patients belong to the lower socio-economic class and only about 20% were in the Middle and upper class. This skewed distribution across SEC may be responsible for the lack of difference

observed. It therefore not surprising that the educational level of mother and paternal employment were inconsequential on AT. It maybe that correct knowledge on pediatric cancer rather than parental education determines AT. This was however not considered in this study.

In this current study a travel time greater than two hours to the health facility was association with AT. This observation is similar the findings Metzger et al. [17] and contrast to the study by

Bonilla et al. [12,16]. Transportation allowance, accommodation and free treatment were provided for all patients in El-Salvador this was however, not the case in this study where some patient travelled over as much as 6 hours. Longer travel distance increase expenditure and loss of income because caregivers especially the self employed are absent from their business.

The higher the number of sibling the more likely the patient will stay and complete his/her treatment. Since cancer is a chronic disease, the availability of a caregiver in the hospital other than the mother might be perquisites for compliances as this study showed that children cared by others than their mothers demonstrated high adherence.

## 5. CONCLUSION

The high rate of AT in pediatric cancer patient in Jos university Teaching Hospital is associated with socioeconomic factors. Further prospective studies with a larger sample size will give more insight into this problem and pave way for possible solutions.

## CONSENT

Patient consent was not applicable in this study because it was retrospective review of case record and no personal identifying data was given on any patient.

## ETHICAL APPROVAL

All authors hereby declare that this study was examined and approved by the appropriate ethics committee.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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