

Quality of Life in Pediatric Cancer Patients

ABSTRACT

Background: In recent years the survival rates for children diagnosed with cancer has increased as result of successful treatment. Evaluation of health related quality of life during the process of treatments is important for recognition of acute dysfunction related to therapy and disease. **Aim** of the study is to identify the health-related quality of life in pediatric cancer patients and to detect the potential predictors of a total quality of life and its domains. **Material and Methods:** It is a cross-sectional study done on convenient sample of pediatric cancer patients. Their diagnosis was confirmed at pediatric hematology clinic and day care unit at King Abdulaziz University Hospital, Jeddah, Saudi Arabia.

Results: a total number of 51 children participated in this study, their age ranging from 8-15 years with mean 10.15 ± 2.52 . Hematological malignancies represented 70.5% of the sample, with the highest percentage for acute lymphocytic leukemia (45%). The mean value of the total quality of life is 73.48, which is referred to as a good quality of life. The best scores of subscales were cognitive problems (92.54), communication (82.67), and nausea (76.86), otherwise poorer score was detected. Although the value of total quality of life was relatively good however visiting the hospital more than 3 times per month, male gender, duration of therapy and duration of diagnosis more associated with more pain and hurt, great worry and treatment anxiety. **Conclusion:** Higher frequency of hospital visits, male gender, longer duration of diagnosis, longer duration of therapy, and increased intensity of therapy were all associated with more pain and hurt, great worry, nausea, and treatment anxiety which reflect a poor quality of life among the study group.

Key Words: Health-related quality of life; QOL; cancer; children.

1. INTRODUCTION

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33 In recent years the survival rates for children diagnosed with cancer has increased as result of
34 successful treatment. However, many studies reported that these treatments take part in the formation of
35 physical and psychosocial weakness for cancer survivors [1]. Despite the improved survival statistics,
36 cancer remains a potentially life-threatening condition, and as such poses a major challenge to both child
37 and family. During the course of treatment, most children experience unpleasant physical side-effects.
38 Behavioural and emotional problems have also been identified. In the longer term, there is a considerable
39 risk of late effects . These include reduced linear growth, compromised endocrine and sensory functions,
40 and damage to cardiac and reproductive systems [2].

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42 Globally, the incidence of cancer in children differs from 48 to 70 per million children less than
43 15 years of age [3]. The incidence of childhood cancer in some developed countries, such as in United
44 State, Ireland, Switzerland, and in Australia has reported with rates of 15.3, 13, 13.5, and 16 per 100,000
45 children, respectively, however in Asia the data are generally lower [4-12].

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47 In Saudi Arabia (SA) cancer in children, in the period between 1999 and 2008, reported about 8% of
48 total cancer cases. The greatest prevalent cancers were leukemia (34.1%), after that lymphoma (15.2%),
49 brain (12.4%), and kidney cancers (5.3%). The total incidence of childhood cancers increased from 8.8
50 per 100,000 in 1999 to 9.8 per 100,000 in 2008. Cancer incidence in SA increased through out the
51 years because of improvement of health care facilities, their diagnostic capacities, the
52 development of cancer registration practices a (13).

53

54 A study was done in Egypt 2013, they stated that the total QOL in children with cancer
55 relatively low with mean value of 62.29. Moreover, they reported female sex and younger age,
56 increased treatment intensity, long duration of hospital admission, and high frequency of hospital visits,
57 were associated with a poorer total QOL [1]. Multi-institutional cross-sectional study (Canada, 2009)
58 included children with cancer receiving any type of active treatment. The primary caregiver provided
59 information on child physical, emotional and social QoL. They reported that children with acute
60 lymphoblastic leukemia had better physical health while intensive chemotherapy treatment, and having a
61 sibling with a chronic condition were associated with poor physical QoL. Better emotional health was
62 associated with good prognosis, less intensive chemotherapy treatment and greater household savings,
63 whereas female children and those with a sibling with a chronic condition had poor social QoL [14].
64 Another study conducted in Canada 2017, Participant experiences reflected concepts of positive
65 and negative duality, including: maintaining physical functioning but longing for the ability to

66 participate in activities; experiencing a new level of intimacy with family and friends amidst
67 isolation; and developing positivity amidst anger, sadness and lingering worry [15].

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69 Most of the literature trying to predict QoL in children with cancer has focused on late effects of
70 cancer. Yet, QoL during active treatment also is important to children and their families. Studies of
71 children receiving active treatment primarily have consisted of small studies that did not identify those at
72 high risk of poor outcomes [16]. This study designed to identify the health-related quality of life in
73 childhood cancer patients and to detect the relationship between disease, treatment, and sociodemographic
74 factors with the total quality of life and its subscales. Additionally, to detect the potential predictors of a
75 total quality of life and its subscales. We did not find any similar study in Jeddah through search engines.

77 2. MATERIAL AND METHODS

78 2.1 Study Design, Sampling and sitting

79 This study is a cross-sectional study and conducted on a convenient sample of pediatric
80 cancer patients (We enrolled all cancer patients who came to the hospital from April to November
81 ,2018). Their diagnosis was confirmed at pediatric hematology clinic and day care unit at King Abdulaziz
82 University Hospital (KAUH), Jeddah, Saudi Arabia. Our inclusion criteria of the study including children
83 8-15 years of age, diagnosed with cancer for more than one month, and receiving cancer treatments
84 during the time of data collection. Data collected by interviewing questionnaire.

85 2.2 Study tool

86 Data collection tool is the Pediatric Quality of Life Cancer Module (PedsQL™ 3.0) [17], in
87 addition to sociodemographic information as age, gender, nationality, educational status of children,
88 family size, and educational status of mother and father . We used the Arabic version after taking consent
89 from the authors, the study tool is valid and reliable [17-19], Cronbach coefficient alpha = 87.6%. It is
90 intended to measure health related QOL domains specifically for pediatric cancer. It includes 8 fields
91 with the entire of 27 items for the whole module; pain and hurt include 2 items, procedural anxiety,
92 treatment anxiety, worry, perceived physical appearance, and communication, each one of them includes
93 3 items, whereas nausea and cognitive problems include 5 items for each [1].

94
95 Each item of the instrument is consisting of a 5-point Likert scale (0 = never a problem; 1 = almost
96 never a problem; 2 = sometimes a problem; 3 = often a problem; 4 = almost always a problem. Then we
97 transformed the scale to an equivalent score from 0 to 100, where 0 denoted the poorest quality of life and
98 100 denoted the greatest quality of life. The whole QOL is the mean of the scores for all fields, while

99 QOL for each field is the mean of scores of its items. Moreover, we divided the score of whole QOL and
100 fields into two grades, good scale which reflect the good quality of life (> 70) and poor scale (< 70)
101 which reflect the poor quality of life.

102 Procedures associated with treatments: *a) intensity of therapy*, which divided into three levels, low
103 intensity had a score 1, represented the patients had surgery only and/or six months chemotherapy with a
104 satisfactory prognosis, medium intensity had a score 2, represented the patients with chemotherapy
105 longer than 6 months with an intermediate prognosis, in addition to high intensity of treatment that
106 referred to treatment according to high risk protocols, bone marrow transplantation, and/or diseases with
107 less satisfactory prediction, it took score 3 [20,21]. *b) Rate of hospital visits*: classified into less than or
108 equal to 3 and > 3 visits per month. *c) Treatment duration*: low duration represented less than 6 months,
109 medium duration from 6 months to 1 year, and high duration denoted to more than 1 year. *d) Treatment*
110 *phase*: it divided into two sets, one who is on-treatment (continue getting anticancer treatment) and the
111 other who on the follow-up (cases completed their treatment and planned for interval follow up) [22].
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113 2.3 Data Entry and Analysis

114 The data collected were analyzed using SPSS, version 16. Numerical data denoted by frequency while
115 quantitative data existed as mean, and standard deviation (SD). We used independent sample t-test and
116 analysis of variance (ANOVA) to detect the differences in total and mean subscale scores of the
117 PedsQL3.0 cancer module between the studied variables. Binary logistic regression analysis test used to
118 find out the predictors of total QOL and all subscale. P value < 0.05 was considered significant.
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120 3. RESULTS

121 3.1 Characters of the study group:

122 A total number of 51 children participated in this study, 62.7% male and 37.3% female, their age
123 ranging from 8-15 years with mean 10.52; median 8 years and 5.45 as mean family size. About 94.1% of
124 them are non-Saudi (other nationalities as Syrian, Egyptian, Indian, Pakistanis, Sudanese; but they are
125 living in Saudi Arabia) and 5.9% are Saudi. 58.8% of children stopped learning and going to school,
126 while 41.2% are continuous. Hematological malignancies represented 70.5% of the sample, with the
127 highest percentage for acute lymphocytic leukemia (ALL) (45%). A high proportion of children (60.8%)
128 were visiting the hospital more than 3 times per month. Regarding the type of treatment, most of them
129 (88.2%) on chemotherapy treatment. Low intensity of therapy (54.9%) was more frequent than medium
130 and high intensity (35.3% and 9.8%, respectively). (table 1). In addition, 72.5% of the participants had
131 treatment duration less than one year at the time of data collection with a compliance rate of 98% of the

132 sample. About 84.3% and 90.2% of the mothers and fathers, respectively, had education at different
133 levels.

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135 **3.2 PedsQL 3.0 subscales**

136 Table 2, show mean scores of total health QOL and its subscales among the study group. The
137 value of total health related QOL is 73.48 The best scores of subscales (greater than 70) were detected in
138 three out of eight subscales which are cognitive scale (92.54), communication (82.67and nausea (76.86).
139 while the lowest scores were found in procedural anxiety (60.78) followed by worry (61.76), pain & hurt
140 (65.45) treatment anxiety (66.01) and perceived physical appearance (69.77).

141 ***3.3 Association between study group characteristics and PedsQL 3.0 subscales:***

142 The influence of variables on total health related QOL and subscale were demonstrated in table 3.
143 We observed that worry subscale was statistically great among patients visiting the hospitals more than 3
144 times per month than children visiting less than 3 times ($P=0.03$) and those with duration of diagnosis
145 equal to one year or more in comparison to children with diagnosis duration less than one year ($P= 0.01$).
146 However, pain and hurts statistically increased among male children than female ($P=0.04$). While
147 treatment anxiety was statistically increased among children with duration of therapy equal to 1 year or
148 more ($P=0.03$).

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151 ***3.4 Predictors of health-related quality of life in the study group:***

152 The binary logistic regression model represented in table 4 and showing predictors of health
153 related QOL in each subscale. The most common predictors for pain and hurt subscale were gender, age
154 at the time of diagnosis and duration of diagnosis. Males were more likely to have pain and hurt than
155 female (AOR= 8.77), children diagnosed with the disease at age less than 7 years are more likely to have
156 pain &hurt than those who diagnosed with cancer at an age equal to 7 years or more (AOR=4.74), and
157 children with duration of diagnosis more than one year are more likely to feel pain and hurt than those
158 with duration of diagnosis less than one year (AOR= 8.87), the differences were statistically significant.
159 Children with a medium score of treatment intensity are likely to have more nausea than those with the

160 low and high score (AOR=3.28). Moreover, males likely to worry four times more than female
161 (AOR=4.53).

162 4. DISCUSSION

163 Our study reported that the score of total QOL in childhood cancer was 73.48 and seemed to be
164 relatively good score for quality of life may be due to half of the study group had low intensity of therapy
165 (represented the patients had surgery only and/or six months chemotherapy with a satisfactory
166 prognosis), this means good prognosis and short period of chemotherapy. This result agrees with some
167 studies done in different countries as United State (US), it was 73.6, 72.2 for the Indonesian, 71.02 for the
168 Chinese mandarin child- hood cancer patients and 72.75 for Lebanon [23-27]. Moreover, our score is
169 better than the results of the Pakistani study [28] which demonstrated a much lower total QOL score of
170 42.07 and 62.29 in the Egyptian study [1].

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172 In this study, although the mean value of total health related QOL was relatively good and
173 similar to the score of some developed countries, however we observed low mean value in pain and hurt;
174 procedural anxiety, treatment anxiety; worry and perceived physical appearance subscales. We did not
175 find any statistically significant effect when the total QOL compared with the social and medical
176 characteristic of study group, maybe due to small sample size. However, in some subscales, we found
177 males experienced significantly more pain and hurt than females and this is compatible with regression
178 model in our results which reported that the most common predictors for pain and hurt subscale were
179 gender, as males feel pain seven times more than females. This result opposite to that reported from
180 Lebanon, Egypt and US, [26, 1, 17], the reason may be due to the differences in study type or
181 methodology or age of the participants. In addition to the gender we found also age at the time of
182 diagnosis and duration of diagnosis (more than one year) were other predictors for pain & hurt and this
183 like other study [14].

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185 Additionally, we reported children with a duration of therapy more than one year suffer more
186 treatment anxiety, may be due to high frequency of visiting the hospital and long duration of treatment or
187 may have experience more pain during the procedures, this is in agreement with the results of Canadian
188 and Lebanon studies [27,26].

189 Furthermore, great worry increased in children visiting the hospital more than three times per
190 month and those with duration of therapy more than one year. such findings indicated more frequent
191 exposure to hospital atmosphere and subsequently more therapy administration could be a leading reason.
192 This results consistence with other results [14,1].

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We observed that Children with a medium score of treatment intensity are likely to have more nausea than those with a low score, the explanation may be the medium intensity of treatment represents the cases treated with chemotherapy longer than six months according to the treatment protocol so they have more nausea than a lower score treatment which represents the surgery only and/or six months chemotherapy and this in agreement with results of some studies [1,14,29].

200 **5.CONCLUSION AND RECOMMENDATION:**

201 In this study although the total health related QOL was relatively good however higher frequency
202 of visiting the hospital, male gender and long duration of therapy and increased treatment intensity are
203 associated with a poorer QOL in the subscales among childhood cancer patients. So, an early and
204 continuous evaluation of these factors and predictors can supply the essential for interventions to enhance
205 response to treatment and detection of children at risk of poor QOL during and after treatment. We
206 recommend another studies in the same context and containing large number of children.

207 **LIMITATION**

208 This study includes some limitation like dependence on mothers' evaluations of their child's QOL.
209 Although most of study group were older but there was a difficulty to asking them directly as they tended
210 to be too ill to respond. In addition, we depend more on the mothers than fathers as because she tends to
211 be more contact and care with the child during the period of disease and treatment. They more responsible
212 for everything as medication, treatment and more likely to stay in the hospital with the child. This may
213 influence parent's perception of child's QOL. Others have noted that the multiple different perspectives
214 of QOL including the parent perspective are all important and contribute to our understanding of child
215 health [30]. Although our sample was convenient, but we recruited all children visited the hospital during
216 that period.

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219 **LIST OF ABBREVIATION**

220 ALL: Acute Lymphocytic Leukemia
221 ANOVA: Analysis of Variance
222 AOR: Adjusted Odds Ratio
223 KAUH: King Abdulaziz University Hospital
224 PedsQL 3.0: Pediatric Quality of Life Inventory™ 3.0 Cancer Module

225 QOL: quality of life
 226 SD: Standard Deviation
 227 SPSS: Statistical Package for the Social Sciences
 228 US: United State

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 230 **COMPETING INTERESTS**

231 The authors declared that they have no competing interests.
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234 **CONSENT**

235 Informed and written consent was taken from all parents of the children in the study with the guide lines
 236 of ethical committee.

237 **ETHICAL APPROVAL**

238 Ethical approval was obtained from the Institutional Review Board/Ethics Committee at Faculty of
 239 Medicine, King Abduaziz University.

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241 **Table 1: Demographic and medical characteristics of the study group.**

Variable	Frequency (n=51) n (%)
Age /year	
Mean ± SD	10.15 ± 2.52
Rang	8-15
Median	8
Gender:	
Male	32 (62.7)
Female	19 (37.3)
Nationality:	
Saudi	3 (5.9)
Non-Saudi	48 (94.1)
Educational Status:	
Continuous:	21 (41.2)
Stopped	30 (58.8)

Type of malignancy:	
Hematological:	36 (70.5)
ALL (Acute Lymphoblastic Leukemia)	23 (45.0)
AML = Acute Myeloid Leukemia	5 (9.8)
chronic myeloid leukemia	1 (2.0)
HD = Hodgkin Lymphoma	4 (7.8)
NHD= non-Hodgkin lymphoma	3 (5.9)
Solid:	15 (29.5)
Brain tumor	6 (11.7)
Nephroblastoma	1 (2.0)
Skin cancer	1 (2.0)
Ewing's sarcoma	5 (9.8)
Adenocarcinoma	1 (2.0)
Malignant neoplasm of parotid gland	1 (2.0)
Hospital visits:	
Three times or less/ month	20 (39.2)
More than three times /month	31 (60.8)
Type of treatment:	
Chemotherapy	45 (88.2)
Radiotherapy	2 (3.9)
Surgical	4 (7.8)
Intensity of therapy:	
Low	28 (54.9)
Medium	18 (35.3)
High	5 (9.8)
Treatment phase:	
On-treatment	31 (60.8)
Follow up	20 (39.2)

242 ALL (Acute Lymphoblastic Leukemia), AML = Acute Myeloid Leukemia
 243 chronic myeloid leukemia , HD = Hodgkin Lymphoma, NHD= non-Hodgkin lymphoma

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245 **Table 2: Mean scores of total health QOL and its subscales among study group.**

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Scale / subscale	No of items	Mean	Std. Deviation	Median
Total Quality of life		73.48	15.78	77.60
Pain & hurt	2	65.45	25.58	70.50
Nausea	5	76.86	24.69	90.00
Procedural Anxiety	2	60.78	34.85	66.66
Treatment Anxiety	3	66.01	33.41	75.00
Worry	3	61.76	30.51	66.66
Cognitive Problem	5	92.54	14.36	100.00
Perceived Physical	3	69.77	27.02	75.00

appearance				
Communication	3	82.67	28.52	100.00

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259 **Table 3: Association between study variables with total QOL and its subscales.**

	Total QOL	Pain & Hurts	Nausea	Procedural Anxiety	Treatment Anxiety
Age at diagnosis:					
<7 years (n=18)	72.30±15.18	84.02±29.01	80.83±18.96	57.87±34.82	62.03±32.36
≥ 7 years (n=33)	74.12±16.30	73.86± 29.70	74.69±27.35	62.37±35.30	61.61±29.96
t test	-0.38	1.18	0.94	-0.46	-0.48
P value	0.69	0.24	0.35	0.66	0.63
Gender:					
Male (n=32)	75.26±15.50	71.87±33.89	77.65±21.92	63.28±34.96	70.57±32.16
Female (n=19)	70.49±16.22	86.84±17.41	75.52±29.38	56.57±35.19	58.33±34.91
t test	1.04	2.07	0.29	0.66	1.27
P value	0.30	0.04*	0.76	0.51	0.20

Family size: ≤ 5 children (n=28) > 5 children (n= 23) t test P value	73.63±15.87 73.30±16.03 0.07 0.94	81.25±26.24 72.82±33.21 1.01 0.31	76.07±27.05 77.82±22.04 -0.25 0.80	63.09±33.44 57.97±37.05 0.51 0.60	63.69±35.73 68.84±30.89 -0.54 0.58
Hospital visits: ≤ 3 times/ month (n=20) >3 times / month (n=31) t-test P value	71.19±16.07 74.95±15.68 -0.82 0.41	80.00±29.63 75.80±29.91 0.49 0.62	77.75±24.35 76.29±25.29 0.20 0.83	56.25±34.50 63.70±35.32 -0.74 0.46	60.00±31.36 69.89±34.60 -1.03 0.30
Type of treatment: Chemotherapy (n=45) Radiotherapy (n=2) Surgical (n=4) F test P value	72.83±15.84 81.19±2.87 76.92±20.13 0.36 0.69	76.38±29.70 56.25±44.19 1.00±0.00 1.75 0.18	75.44±25.10 77.50±31.81 92.50±15.00 0.87 0.42	58.70±34.81 70.83±41.24 79.16±36.32 0.71 0.49	65.37±33.84 75.00±35.35 68.75±36.24 0.09 0.91
Duration of diagnosis: < 6 months (n=24) 6 months-1year (n=7) >1 year (n=20) F test P value	70.39±17.24 85.00±8.19 73.16±14.61 2.46 0.09	72.39±32.96 85.71±24.39 80.62±27.04 0.73 0.48	73.75±24.41 77.85±27.21 80.25±24.99 0.37 0.68	65.27±31.81 63.09±40.78 54.58±37.11 0.52 0.59	64.23±33.28 90.47±12.19 59.58±35.79 2.40 0.10
Therapy duration: < 6 months (n=32) 6 months-1 year (n=5) >1 year (n=14) F test P value	72.35±16.59 81.56±6.98 73.18±16.07 0.73 0.48	73.82±33.05 82.50±24.36 83.92±22.16 0.63 0.53	75.62±22.99 89.00±11.40 75.35±31.34 0.66 0.52	63.02±33.12 53.33±39.79 58.33±39.08 0.20 0.81	67.70±32.70 91.66±11.78 52.97±35.44 2.76 0.03*
Intensity of treatment: Low (n=28) Medium (n=18) High (n=5) F test P value	72.12±17.53 73.61±14.46 80.66±8.49 0.61 0.54	76.78±30.37 79.16±30.01 75.00±29.31 0.05 0.94	76.42±23.48 74.16±27.87 89.00±19.49 0.70 0.49	62.20±34.43 57.87±35.29 63.33±42.73 0.09 0.90	68.45±31.12 58.33±38.87 80.00±20.91 0.98 0.38
Treatment phase: On-treatment (n=30) Follow-up (n=21) t-test P value	73.69±16.72 73.16±14.61 0.11 0.90	75.40±31.37 80.62±27.04 0.61 0.54	74.67±24.66 80.25±24.99 0.78 0.43	64.78±33.31 54.58±37.11 1.02 0.31	70.16±31.6 59.58±35.79 1.10 0.27

260 ≤ = less than or equal to

> = More than

* = significant (p< 0.05)

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Continue table 3: Association between study variables with total QOL and its subscales.

Variables	Worry	Cognitive Problem	Perceived Physical appearance	Communication
Age at diagnosis: < 7 years (18) ≥ 7 years (33) t test	62.03±32.36 61.61±29.96 0.04	91.38±14.93 93.18±14.24 -0.42	64.35±27.23 72.72±26.86 -1.05	75.00±31.95 86.86±26.02 -1.43

P value	0.69	0.67	0.29	0.15
Gender:				
Male (n=32)	66.92±30.26	95.00±8.13	73.17±25.37	83.59±29.59
Female (n=19)	53.07±29.68	88.42±20.75	64.03±29.40	81.14±27.33
t test	1.59	1.60	1.17	0.29
P value	0.11	0.11	0.24	0.77
Family size:				
≤ 5 children (n=28)	57.14±35.33	93.92±12.71	72.32±26.35	81.54±28.45
> 5 children (n= 23)	67.39±22.87	90.86±16.28	66.66±28.09	84.05±29.18
t test	1.19	0.75	0.74	-0.31
P value	0.23	0.45	0.46	0.75
Hospital visits:				
≤ 3 times/ month (n=20)	69.08±28.07	94.75±6.97	71.66±27.49	78.75±29.67
>3 times / month (n=31)	50.41±31.35	91.12±17.54	68.54±27.10	85.21±27.94
t-test	2.16	0.87	0.39	-0.78
P value	0.03*	0.38	0.69	0.43
Type of therapy:				
Chemotherapy (n=45)	62.40±29.38	91.77±15.11	69.62±25.57	82.96±27.74
Radiotherapy (n=2)	87.50±17.67	95.00±0.00	87.50±5.89	1.00±0.00
Surgical (n=4)	41.66±41.94	1.00±0.00	62.50±47.87	70.83±43.30
F test	1.62	0.62	0.56	0.70
P value	0.20	0.54	0.57	0.49
Duration of diagnosis:				
<6 months (n=24)	59.37±29.92	90.62±14.01	62.50±29.38	75.00±34.75
6 months-1 year (n=7)	91.66±10.75	98.57±3.77	75.00±26.78	97.61±6.29
>1 year (n=20)	54.16±30.52	92.75±16.81	76.66±22.87	86.66±22.19
F test	4.64	0.82	1.69	2.11
P value	0.01*	0.44	0.19	0.13
Therapy duration:				
<6 months (n=32)	62.50±29.78	92.65±12.76	65.62±27.98	77.86±32.35
6 months-1 year (n=5)	66.66±38.64	96.00±5.47	76.66±27.25	96.66±7.45
>1 year (n=14)	58.33±31.35	91.07±19.72	76.78±24.49	88.69±21.08
F test	0.15	0.21	1.01	1.39
P value	0.85	0.80	0.37	0.25
Intensity of treatment:				
Low (n=28)	60.11±30.62	92.50±13.50	65.77±28.26	74.70±33.44
Medium (n=18)	63.42±32.35	91.11±17.45	73.61±28.04	91.20±19.06
High (n=5)	65.00±28.50	98.00±2.73	78.33±11.18	96.66±7.45
F test	0.09	0.44	0.73	2.66
P value	0.91	0.64	0.48	0.08
Treatment phase:				
On-treatment (n=30)	66.66±29.96	92.41±12.83	65.32±28.87	80.10±32.03
Follow-up (n=21)	54.16±30.52	92.75±16.81	76.66±22.87	86.66±22.19
t-test	1.44	-0.07	-1.48	-0.79
P value	0.15	0.93	0.14	0.42

265 ≤ = less than or equal to

> = More than

* = significant (p< 0.05)

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Table 4: Binomial logistic regression showing predictors of health-related quality of life in study group.

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	<u>Pain & Hurts</u>			<u>Nausea</u>			<u>Procedural Anxiety</u>			<u>Treatment Anxiety</u>		
	B	OR	P	B	OR	P	B	OR	P	B	OR	P
Gender: Male	2.06	7.85	.04*	.05	1.05	.94	-.47	.62	.49	-.97	.37	.16
Age at diagnosis time: <7 years	2.55	4.74	.04*	-1.02	.35	.14	.80	2.23	.21	.54	1.73	.39
Mother education: Educated	-1.20	.32	.28	-1.15	.315	.25	.64	1.90	.45	.67	1.96	.43
Hospital visits: > 3 time/m	.48	1.63	.54	.01	1.01	.98	.73	2.08	.24	.92	2.52	.14
Duration of diagnosis: > 1 year	2.18	8.87	.04*	.04	1.05	.95	-.78	.45	.33	.43	1.54	.59
Therapy duration: > 1 year	-.25	.77	.87	-1.97	2.72	.99	.72	2.06	.59	.64	1.91	.63
Intensity of treatment: Low	.06	1.06	.97	.61	1.84	.69	-.34	.71	.80	.34	1.40	.79
Medium	-1.37	.25	.38	1.04	3.28	.03*	-.75	.47	.51	-.47	.62	.68

272 B= β coefficient OR = odds ratio P= p value

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