Burden of Caregivers Care for Children with Thalassemia at Babylon Child and Maternity Teaching Hospital / Babylon Governorate / Iraq

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Abstract: Objectives: to assess the psychological burden of caregivers of thalassemia children, the social burden of caregivers of thalassemia children, and to find out the association between psychological and social variables with the demographic characters of caregivers like age, level of education, occupation, and residential area.

Methodology: Descriptive design study, purposive sample of (100) caregivers who attending the Babylon Pediatric and Maternity Teaching Hospital. Questionnaire was used to collect the data for the period from 26th March to 27th May 2013, data were analyzed by using descriptive statistical (percentage, frequency and mean score) and inferential (chi-square).

Result: the study presents that (55%) of caregivers are mothers and (34%) are relatives, (82%) of caregivers are feeling fear of future, while (66%) of them have no pleasure in life. Also the results show that (82%) are hoping to treat their children in private hospitals.

Conclusion: The majority of caregivers are hoping to treat their children in private hospitals and this makes them feel guilty toward their children.

Recommendation: Further studies with larger sample size or multicentre studies with longer period of follow up.

Keywords: Burdens, caregivers, children with thalassemia

I. Introduction

Thalassemia at present is considered as one of the most challenging hematological disorder with no permanent cure (¹). It refers to a group of genetic disorders, characterized by insufficient production of hemoglobin (²). Thalassemia is a disorder characterized by defective production of hemoglobin and excessive destruction of red blood cells. This defect causes an abnormal development of red blood cells and ultimately anemia, which is the main characteristic symptom of the thalassemia (³).

Children with thalassemia need regular blood transfusions in order to live. The usual treatment consists of periodic blood transfusions that can cause iron overload within tissues; the resulting iron overload also requires chelating therapy (²).

Although optimal medical managements have reduced the difficulties faced by thalassemia, the psychosocial problems faced by the family are now of primary importance. The clinical burden caused by thalassemia is overwhelming to whole family and this may include psychological as well as social burden (⁴). They have to cope up with the psychosocial aspects along with their regular visits to the thalassemia centers for blood tests and blood transfusion with iron chelation therapy and their determination to fulfill the treatment steps. This creates a lot of burden on the families due to many causes like being chronic, treatment modalities, morbidities and the expectation of early death adding to complications which may result. All the later, may lead and arouse the psychosocial burden upon parents due to their inability to cope with painful situation and leads to worsen the relationship among family members (³). Present study was designed to study the psychosocial and social burdens among parents having children with Thalassemia.

II. Objectives of the study

1. To assess the psychological burden of caregivers of thalassemia children
2. To assess the social burden of caregivers of thalassemia children
3. To find out association between psychological and social burdens with the demographic characteristics of caregivers like age, level of education, occupation, residential area and

DOI: 10.9790/1959-04658287 www.iosrjournals.org
III. Methodology:

1. Design of the study: descriptive study.
2. Setting of the study: The study was carried out at Pediatric and Maternity Teaching Babylon Hospital, Thalassemia Center for the period from 26th March to 27th May 2013.
3. The sample of study: The purpose non-probability sample selected from Thalassemia Centre at Pediatric and Maternity Babylon Hospital. The sample consisted of (100) caregivers having children with thalassemia. The criteria of the sample selection: caregivers who have children whom diagnosed with thalassemia major. The questionnaire was used as a mean of data collection. The data collection was carried out at Pediatric and Maternity Babylon Hospital for the period from 26th March to 27th May 2013. Questionnaire was designed to assess the psychological and social burdens of caregivers. It comprised of (10) items for psychological burdens and (8) items for social burdens. The items were rated according to 3 points type rating scale as (always, sometimes and never) and levels of scale were scored as (3 for always, 2 for sometimes and 1 for never).
4. Ethical consideration: Data collection is carried out by researcher who kept the confidentiality and anonymity of the data. The form for data collection was applied without mentioning the name of caregiver, their address, or any other information and adding to that a verbal agreement was obtained from participants in the study.
5. Statistical Analysis: Data were analyzed through the measurement of descriptive tools (frequencies, percentage) and inferential (chi-Square), the test used to determine the significant relation of caregiver’s psychological and social burden and the relation - Demographic characteristics at p value< 0.05

IV. Results:

Table 1. Demographic characteristics of caregivers

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caregivers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mothers</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>Fathers</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Parents</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Age of caregivers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>25-31</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>32-38</td>
<td>68</td>
<td>68</td>
</tr>
<tr>
<td>39-45</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>More than 45 years</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Level of caregivers education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Read and write</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Primary school</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Secondary school</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Institute and college</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>caregivers occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Unemployed</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Residual area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban area</td>
<td>73</td>
<td>73</td>
</tr>
<tr>
<td>Rural area</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Table (1) shows that (55%) of caregivers were mothers and (34%) were relatives. Also the table indicated that (68%) of caregivers age is between (32-38) years while (23%) of them their age ranging between (25-31) years. The table also stated that (38%) of caregivers' level of education were primary and (30%) of caregivers were read and write, regarding to the occupation of caregivers (70%) of them were employee and (30%) were unemployed, also table (1) stated that (73%) of caregivers from urban area.
Table 2. Assessment of psychological burden of caregivers of children with thalassemia

<table>
<thead>
<tr>
<th>Psychological burden</th>
<th>Always</th>
<th>Sometimes</th>
<th>Never</th>
<th>M.s Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am frustrated since diagnosis of the disease</td>
<td>53</td>
<td>27</td>
<td>20</td>
<td>2.33</td>
</tr>
<tr>
<td>2. I feel sad</td>
<td>33</td>
<td>43</td>
<td>24</td>
<td>2.09</td>
</tr>
<tr>
<td>3. I feel guilty</td>
<td>53</td>
<td>44</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>4. I want to cry</td>
<td>42</td>
<td>45</td>
<td>13</td>
<td>2.29</td>
</tr>
<tr>
<td>5. I lost appetite for food</td>
<td>51</td>
<td>44</td>
<td>9</td>
<td>2.46</td>
</tr>
<tr>
<td>6. I need pleasure in life</td>
<td>66</td>
<td>28</td>
<td>6</td>
<td>2.6</td>
</tr>
<tr>
<td>7. I feel shivering in hands</td>
<td>34</td>
<td>36</td>
<td>30</td>
<td>2.04</td>
</tr>
<tr>
<td>8. I feel dryness in my mouth</td>
<td>42</td>
<td>38</td>
<td>20</td>
<td>2.32</td>
</tr>
<tr>
<td>9. I feel the fear of the future</td>
<td>82</td>
<td>16</td>
<td>2</td>
<td>2.8</td>
</tr>
<tr>
<td>10. I feel despair of life</td>
<td>73</td>
<td>23</td>
<td>4</td>
<td>2.69</td>
</tr>
</tbody>
</table>

*ML: medium level* HL: high level* LL: low level

Table (2) stated that (82%) of caregivers were feeling scared from the future while (66%) of them lost pleasure in life, and (53%) of them were feeling guilty, also (53%) of caregivers frustrated since diagnosis of the disease and (42%) of caregivers were having the feeling to cry. Also the table indicated that (73%) of them feel despair of life.

Table 3. Assessment of social burden of caregivers of children with thalassemia

<table>
<thead>
<tr>
<th>Social burden</th>
<th>Always</th>
<th>Sometimes</th>
<th>Never</th>
<th>Mean score</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I spend most of my time with my child</td>
<td>54</td>
<td>42</td>
<td>4</td>
<td>2.5</td>
<td>ML</td>
</tr>
<tr>
<td>2. My relationships with others have been affected</td>
<td>56</td>
<td>32</td>
<td>12</td>
<td>2.44</td>
<td>ML</td>
</tr>
<tr>
<td>3. I am ashamed because of my son’s illness</td>
<td>31</td>
<td>49</td>
<td>30</td>
<td>2.21</td>
<td>ML</td>
</tr>
<tr>
<td>4. I feel that I am rejected by society because of my son</td>
<td>29</td>
<td>51</td>
<td>20</td>
<td>2.09</td>
<td>ML</td>
</tr>
<tr>
<td>5. Care of my child is Lord satisfy</td>
<td>56</td>
<td>14</td>
<td>30</td>
<td>2.26</td>
<td>ML</td>
</tr>
<tr>
<td>6. Ignoring my other children</td>
<td>15</td>
<td>53</td>
<td>32</td>
<td>1.83</td>
<td>LL</td>
</tr>
<tr>
<td>7. Care at the hospital is not enough</td>
<td>10</td>
<td>37</td>
<td>53</td>
<td>1.87</td>
<td>LL</td>
</tr>
<tr>
<td>8. I hope that my son can be treated in private hospital</td>
<td>82</td>
<td>37</td>
<td>53</td>
<td>2.79</td>
<td>HL</td>
</tr>
</tbody>
</table>

ML: medium level* HL: high level* LL: low level

Table (3) stated that (82%) of the sample were not satisfied with services in hospital and hoping that to treat their children in the private hospital and (56%) of them stated that, their relationships have been affected due to the child sickness and (56%) of caregivers were handling the care of their children to the Lord, also (54%) of them spend most of their time with sick child and ignore the rest.

Table 4. Association between ages of mothers with psychology burden

<table>
<thead>
<tr>
<th>Item</th>
<th>Always</th>
<th>Sometimes</th>
<th>Never</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24 years</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>25-34 years</td>
<td>12</td>
<td>3</td>
<td>8</td>
<td>23</td>
</tr>
<tr>
<td>35-44 years</td>
<td>44</td>
<td>13</td>
<td>11</td>
<td>68</td>
</tr>
<tr>
<td>45-54 years</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>More than 54 years</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>64</td>
<td>17</td>
<td>19</td>
<td>100</td>
</tr>
</tbody>
</table>

Chi-square 7.378, df. 6 P.0.28729933 Significant

This table shows that there is significant relation between the ages of caregivers with psychological burden at p≤ 0.5

DOI: 10.9790/1959-04658287 www.iosrjournals.org 84 | Page
Table 5. Association between ages of caregivers with social burden

<table>
<thead>
<tr>
<th>Item</th>
<th>Always</th>
<th>Some time</th>
<th>Never</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24 years</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>25-31 years</td>
<td>15</td>
<td>15</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>32-38 years</td>
<td>38</td>
<td>38</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>39-45 years</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>More than 45 years</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>59</td>
<td>21</td>
<td>19</td>
</tr>
</tbody>
</table>

Chi-square = 5.615, df = 6, P = 0.46766779

This table shows that there is significant relation between the ages of caregivers with social burden at p ≤ 0.5

Table 6. Association between levels of education caregivers with psychology burden

<table>
<thead>
<tr>
<th>Item</th>
<th>Always</th>
<th>Some time</th>
<th>Never</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Illiterate</td>
<td>9</td>
<td>9</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Read &amp; write</td>
<td>21</td>
<td>21</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Primary school</td>
<td>30</td>
<td>30</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Secondary school</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Institute &amp; college</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>67</td>
<td>67</td>
<td>19</td>
<td>19</td>
</tr>
</tbody>
</table>

Chi-square = 20.753, df = 8, P = 0.00078333

This table shows that there is significant relation between levels of education with psychology burden at p ≤ 0.5

Table 7. Association between levels of education caregivers with social burden

<table>
<thead>
<tr>
<th>Item</th>
<th>Always</th>
<th>Not agree</th>
<th>Strong not agree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Illiterate</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Read &amp; write</td>
<td>18</td>
<td>18</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Primary school</td>
<td>33</td>
<td>33</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Secondary school</td>
<td>10</td>
<td>10</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Institute &amp; college</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>70</td>
<td>17</td>
<td>17</td>
</tr>
</tbody>
</table>

Chi-square = 19.005, df = 8, P = 0.0.1566388

This table shows that there is significant relation between levels of education with social burden at p ≤ 0.5

Table 8. Association between caregivers care with psychology burden

<table>
<thead>
<tr>
<th>Item</th>
<th>Always</th>
<th>Sometimes</th>
<th>Never</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caregivers care</td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Fathers</td>
<td>38</td>
<td>38</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Mothers</td>
<td>17</td>
<td>17</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Grandmothers</td>
<td>10</td>
<td>10</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>65</td>
<td>24</td>
<td>24</td>
</tr>
</tbody>
</table>

Chi-square = 11.149, df = 4, P = 0.02493952

This table shows that there is significant relation between caregivers care with psychology burden at p ≤ 0.5
<table>
<thead>
<tr>
<th>Item</th>
<th>Always</th>
<th>Sometime</th>
<th>Never</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caregivers care</td>
<td>f 52</td>
<td>f 2</td>
<td>f 45</td>
<td>f 52</td>
</tr>
<tr>
<td>Fathers</td>
<td>45</td>
<td>5</td>
<td>2</td>
<td>52</td>
</tr>
<tr>
<td>Mothers</td>
<td>10</td>
<td>8</td>
<td>4</td>
<td>22</td>
</tr>
<tr>
<td>Grandmothers</td>
<td>22</td>
<td>3</td>
<td>1</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>77</td>
<td>16</td>
<td>7</td>
<td>100</td>
</tr>
</tbody>
</table>

Chi-square = 16.041 df = 4 P.Value = 0.00296464

This table shows that there is significance relation between care givers with social burden at p ≤ 0.5

<table>
<thead>
<tr>
<th>Item</th>
<th>Always</th>
<th>Sometime</th>
<th>Never</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>occupation</td>
<td>f 30</td>
<td>f 8</td>
<td>f 12</td>
<td>f 22</td>
</tr>
<tr>
<td>Employer</td>
<td>70</td>
<td>16</td>
<td>23</td>
<td>54</td>
</tr>
<tr>
<td>Employer</td>
<td>100</td>
<td>24</td>
<td>35</td>
<td>76</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>24</td>
<td>24</td>
<td>100</td>
</tr>
</tbody>
</table>

Chi-square = 1.048 df = 2 P.Value = 0.59214722

This table shows that there is significance relation between occupations of care givers with psychology burden at p ≤ 0.5

<table>
<thead>
<tr>
<th>Item</th>
<th>Always</th>
<th>Sometime</th>
<th>Never</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>occupation</td>
<td>f 30</td>
<td>f 1</td>
<td>f 7</td>
<td>f 22</td>
</tr>
<tr>
<td>Employer</td>
<td>70</td>
<td>3</td>
<td>13</td>
<td>54</td>
</tr>
<tr>
<td>Employer</td>
<td>100</td>
<td>4</td>
<td>20</td>
<td>76</td>
</tr>
<tr>
<td>Total</td>
<td>76</td>
<td>20</td>
<td>4</td>
<td>100</td>
</tr>
</tbody>
</table>

Chi-square = 0.326 df = 2 P.Value = 0.89959119

This table shows that there is significance relation between occupations of care givers with social burden at p ≤ 0.5

<table>
<thead>
<tr>
<th>Item</th>
<th>Always</th>
<th>Some time</th>
<th>Never</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residual area</td>
<td>f 55</td>
<td>f 30</td>
<td>f 9</td>
<td>f 100</td>
</tr>
<tr>
<td>Urban area</td>
<td>43</td>
<td>23</td>
<td>7</td>
<td>73</td>
</tr>
<tr>
<td>Rural area</td>
<td>18</td>
<td>7</td>
<td>2</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>55</td>
<td>30</td>
<td>9</td>
<td>100</td>
</tr>
</tbody>
</table>

Chi-square = 0.504 df = 2 p.Value = 0.777244

This table shows that there is significance relation between residential areas of care givers with psychology burden at p ≤ 0.5

<table>
<thead>
<tr>
<th>Item</th>
<th>Always</th>
<th>Some time</th>
<th>Never</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residual area</td>
<td>f 76</td>
<td>f 12</td>
<td>f 12</td>
<td>f 100</td>
</tr>
<tr>
<td>Urban area</td>
<td>55</td>
<td>4</td>
<td>2</td>
<td>27</td>
</tr>
<tr>
<td>Rural area</td>
<td>21</td>
<td>4</td>
<td>2</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>76</td>
<td>12</td>
<td>12</td>
<td>100</td>
</tr>
</tbody>
</table>

Chi-square = 0.91 df = 2 p.Value = 0.063444797

This table shows that there is significance relation between residential areas of care givers with social burden at p ≤ 0.5

DOI: 10.9790/1959-04658287 www.iosrjournals.org
V. Discussion

The result of this study indicated that (55%) of caregivers were mothers and (34%) were relatives. This may be explained by the women still outnumber men when it comes to family caregivers, men are less likely to have background in performing care (5). Majority of the respondents were found females in studies done by (6 &7). Also the result stated that (68%) of caregivers ages are between (32-38) years, while (23%) of them are at age ranging between (25-31) years. This is the age of motherhood which agreed upon by many studies (8 &9) who mentioned that highest percentage of the caregiver age between 30-39 years. The result also stated that (38%) of caregivers’ level of education was primary and (30%) was read and write. Also, in regard to the occupation of caregivers (70%) of them were unemployed and (30%) were employers. And lastly (73%) of caregivers from urban areas.

According to psychological burden the result stated that (82%) of caregivers were feel fear of future while (66%) of them were loss pleasure in life , and (53%) of them were feel guilty ,also( 53%) of caregivers frustrate since the diagnosis of disease is confirmed and( 42%) of caregivers were feel to cry(Table 2).There results are supported by (1,2) who reported that psychological problems were very high (74%) strikingly high percentage (44%) of families had perceived severe burden due to illness of their children. and (68 %) reported that the family being more stressed, embarrassed and afraid of their child’s future. Probably related to the fear for future complications (5). Similar results were reported in studies held by (4,6), who studied 45 caregivers, having children with thalassemia, with the aim of assessing the psychological burden .The results indicated that (57%) of the caregivers had psychological problems, with depressive disorders in (50%).According to social burden the results showed that ( 82%) of the sample have a hope to treat their children in the private hospitals and( 56%) of them their social relation affected because of the care of their children. (54%) of the sample spend most of their time with their sick children as sported by (10) who mentioned that mothers of children with thalassemia reported having physical problems and feelings of meaninglessn ness and dissatisfied with their life. Most of the sick adolescents (50%) reported that thalassemia had affected their social life. Going out and share in social life were decrease. (11). The adolescents worried about their disease and its complications. On being questioned about their worries (12), they responded that they were mainly concerned about the future of their health (56%) and education (34%). Patients belonging to the lower socio-economic status had additional worries related to the financial ramifications of their therapy.

VI. Recommendation

1- Further studies with larger sample size or multicentre studies with longer period of follow-up.
2- Psychological disturbances of families having children with thalassemia is a major issue which indicate that approaches need to be more family-centered than patient centered.
3. Caregivers should be encouraged to attend specific meetings, programs, workshops and seminars which set by Ministry of Health in concerning thalassemia and needs of children with this issue to be acquainted with the most recent, advances and skills in the field .

References

[4] Luigi Mazzone, Laura Battaglia, Francesca Andreozzi, Maria Antonietta Romeo, and Domenico Mazzone, (2009), Emotional impact in thalassaemia major children following cognitive-behavioural family therapy and quality of life of care giving mothers,Clinical Practice Epidemiology Mental Health , v.5; 2009.

DOI: 10.9790/1959-04658287 www.iosrjournals.org 87 | Page