Psychological manifestations in adolescents with thalassemia
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Objective
Beta-thalassemia major and its complications have a significant psychological impact, causing emotional burden, hopelessness, and difficulty with social integration.

Patients and methods
This study was an observational analytical case–control study that included 30 adolescents with a diagnosis of thalassemia, ‘Cases’, and another group of 30 adolescents from the gastrointestinal outpatient clinic, ‘Controls’. All participants were subjected to a semistructured interview, the Patient Health Questionnaire, the Hospital Anxiety Depression Scale, the Middlesex Hospital Questionnaire, and the McGill Quality of Life Questionnaire.

Results
Thalassemic adolescents showed statistically significant higher depressive symptoms ($P < 0.001$) and higher anxiety symptoms ($P < 0.001$) compared with adolescents from the gastrointestinal outpatient clinic. There was a highly significant difference in the results of the Middlesex Hospital Questionnaire ($P < 0.001$). Thalassemic adolescents showed significantly higher levels of anxiety, phobia, obsession, somatization, depression, and hysteria. Thalassemic adolescents showed significantly lower levels in different aspects of quality of life, total, general, physical, and emotional, with regard to the McGill Quality of Life Questionnaire ($P < 0.001$).

Conclusion
Depressive and anxiety symptoms were more prevalent among adolescents with thalassemia. In addition, in the same group, there was a higher degree of free floating anxiety, phobic anxiety, obsessive symptoms, somatic symptoms, depressive symptoms, and hysteria. Quality of life was highly affected among adolescents with thalassemia.

Keywords:
adolescents, depression, thalassemia

Introduction
Thalassemia was first described by Cooley and Lee in 1952 in several Italian children as a severe anemia with spleen and liver enlargement, skin discoloration, and bony changes. Great strides in management and intervention have not been matched by progress in psychosocial rehabilitation [1].

Thalassemia is one of the most common genetic disorders worldwide [2].

Beta-thalassemia major is a disorder characterized by the defective production of hemoglobin and excessive destruction of red blood cells. Hemoglobin comprises four protein subunits, that is, two $\alpha$ and two $\beta$. Genetic mutations in the gene encoding for the $\beta$ subunits of the protein result in reduced or totally absent synthesis of the globin $\beta$-chains, leading to the formation of abnormal hemoglobin or even to the absence of $\beta$ hemoglobin. This defect causes an abnormal development of red blood cells and ultimately anemia, which is the characteristic symptom of thalassemia. The disease is prevalent among Mediterranean individuals, the highest frequency is found in the Greek islands, Italy (lower Po valley, Sicily, and Sardinia), and Asia, whereas the highest concentration of individuals carrying the genetic mutations underlying thalassemia is found in the Maldives [3].

Rapid physical changes are accompanied by significant psychological changes relating particularly to the way in which the adolescent perceives himself or herself, this can be a turbulent time. Parents and others, especially sports coaches and teachers, who work with adolescents must be very sensitive to both the physical and the psychological changes taking place during this period [4].

For an adolescent with an infirmity or chronic illness, and for his family, there exist specific problems in addition to those encountered by a healthy adolescent. The painful awareness of social, professional, and relational barriers is reactivated. The feeling of failure and helplessness, low selfesteem, and anger at being a victim represent a supplementary affective burden for the adolescent and his family [5].

Thalassemia is one of the inherited hemoglobinopathies responsible for a large number of chronic illnesses throughout the world. The clinical picture of thalassemia
presents a wide range of problems. The treatment involves periodic red blood cell transfusion, daily iron chelation, and sometimes splenectomy. It poses a very severe burden for patients with thalassemia and their families [6].

Beta-thalassemia is a chronic illness that poses excessive psychological burden to children and their families as clinical manifestations usually develop early in life and invasive procedures cause considerable suffering [7]. Especially in children, β-thalassemia major and its complications have a significant psychological impact, causing emotional burden, hopelessness, and difficulty with social integration [8].

Patients with thalassemia feel different from their peers and develop negative thoughts about their life, a sense of guilt, increased anxiety, and low self-esteem; their behavioral profile is similar to normal individuals, but many of them may develop severe psychosocial problems because of difficulties in complying with the painful chelation; male patients, in particular, show oppositional defiant disorder. Within the family, concerns for the future of a thalassemic child may contribute to worsening of relationships among members, and to increase marginalization and isolation [9].

In addition, quality of life (QoL), which is defined as an individual’s perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, and expectations, is often limited by the chronic illness [10].

Many neurotic symptomatologies have been found in children with thalassemia major in different surveys. Depressive moods and anxiety were diagnosed in children with thalassemia major [5].

Screening for anxiety and depression in patients with thalassemia is essential. Thus, appropriate treatment of these conditions may improve patients’ health-related QoL [11].

The impact of thalassemia major and intermedia and their associated complications of QoL are largely known [12].

Psychological support therefore seems to help reduce the emotional burden of children with β-thalassemia major and their families [13].

Psychosocial support aimed at reducing emotional distress, improving compliance to chelation therapy, and strengthening the coping strategies for better integration into daily life is therefore necessary. Aydinok et al. [13] found that the frequency of psychopathology is higher in patients with thalassemia compared with the normal population, this supports the need for lifelong psychological support to prevent mental health issues among patients with thalassemia and their parents.

The recognition and management of the psychological problems that accompany chronic physical illnesses including thalassemia would optimize treatment outcomes and QoL [14].

In Egypt, thalassemia is considered the most common genetically determined hemolytic disease. Its high prevalence causes a significant burden on health resources. A few studies of children with thalassemia have shown a heightened risk of developmental and behavioral problems. However, the results vary from mild behavioral problems to obvious psychiatric disorders.

The objectives of this study were as follows: (a) to study in depth the psychological effect of thalassemia; (b) to evaluate the presence of psychiatric symptoms (including depressive symptoms, anxiety, phobic anxiety, obsessive symptoms, somatic symptoms, and hysteria) among adolescents with thalassemia; and (c) to analyze QoL of adolescents with thalassemia.

**Patients and methods**

**Patients**

This is an observational analytical case–control study, which includes 30 adolescents with a diagnosis of thalassemia, ‘Cases’, (patients regularly undergoing transfusion every 3 weeks and receiving regular oral chelation treatment) and another group of 30 adolescents from a gastrointestinal outpatient pediatric clinic who complained of acute gastroenteritis, ‘Controls’. Patients in this study were selected from the outpatient pediatric clinic one day per week in the period from January to May 2010. Clearance from the research ethics committee was obtained and all enrolled children provided consent to participate in addition to legal guardian written consent.

**Inclusion criteria**

The inclusion criteria in this study were as follows:

1. Both sexes;
2. Age between 12 and 19 years;
3. Agreeing to participate in this study, by obtaining an informed consent from the legal guardian and the child’s consent to participate.

**Exclusion criteria**

The exclusion criteria in this study were as follows:

1. Legal guardian or child Refusal to participate in this study;
2. Current psychiatric disorder and other chronic medical conditions.

Hemoglobin fetal was determined in all participants included and cases were defined as being hemoglobin fetal positive, and controls were confirmed as being hemoglobin fetal negative.

**Methods**

Participants of this study were subjected to the following:

**Semistructured interview**

Patients and controls were interviewed using a psychiatric history-taking sheet designed at the Department of Psychiatry, Cairo University (Egypt). It includes detailed
developmental, family, educational, and past history. It also includes a mental state examination.

**Patient Health Questionnaire** [15]
The Patient Health Questionnaire (PHQ) is a self-administrative version of the PRIME-MD diagnostic instrument for common mental disorders. The PHQ-9 is the depression module, which scores each of the Diagnostic and Statistical Manual of Mental Disorders-IV criteria as 0 (not at all) to 3 (nearly every day). It has been validated for use in Primary Care. It is a highly valid tool. Validity has been assessed against an independent structured mental health professional interview; a PHQ-9 score greater than 10 has a sensitivity of 88% and a specificity of 88% for major depression.

**Hospital Anxiety and Depression Scale** [16]
The Hospital Anxiety and Depression Scale (HADS) is a 14-item self-report measure to assess anxiety and depressive symptoms in a simple way. Statements 2, 4, 6, 8, 11, 12, and 14 are for anxiety symptoms and statements 1, 3, 5, 7, 9, 10, and 13 are for depressive symptoms. Each statement scores from 3 (yes definitely) to 0 (not at all), with higher scores reflecting a higher occurrence of symptoms of anxiety and depression.

**Middlesex Hospital Questionnaire** [17]
The Middlesex Hospital Questionnaire comprises 48 items grouped into six subscales covering the following psychiatric symptoms: free floating anxiety, phobic anxiety, obsessive symptoms, somatic symptoms, depressive symptoms, and hysteria. The items are answered as Yes, No, Sometimes, Never, and Little. The response to each item is scored as 2, 1, or 0. A total score of 9 or more in any subscale is considered sufficient to indicate that the patient has clinically significant psychiatric symptoms. It was translated into Arabic by Al Rakhawi et al. [18].

**McGill Quality of Life Questionnaire** [19]
The McGill Quality of Life Questionnaire comprises two multiitem scales. These include three subscales: general, physical, and emotional. It includes 17 questions. Each question in this questionnaire begins with a statement, followed by two opposite answers. Numbers extend from one extreme answer to its opposite. Higher scores indicate a higher (better) level of QoL. Thus, a high score for the general and emotional subscales and a high score for the physical subscale represent a high level of symptomatology/problem.

All scales were applied in the Arabic language; first, all scales were translated into Arabic and then back translated into English and revised by the study team. Tools were applied on 10 patients in a pilot study by two senior medical doctorate (MD) staff separately.

**Statistical analysis**
Data were collected, coded, and analyzed using SPSS software (Statistical Package for the Social Sciences; SPSS Inc., Chicago, Illinois, USA) (version 16) under Windows XP. The χ²-test was used for the analysis of categorical data. The Pearson product-moment correlation coefficients ‘r’ were calculated for the different parameters investigated [20]. The level of significance was set at P<0.05.

**Results**

**Sociodemographic and clinical data**

**Age**
The age distribution in both the groups is shown in Table 1.

**Sex**
The sex distribution in both groups is shown in Table 2.

**Education**
Education distribution in both groups is shown in Table 3.

**Family history of psychiatric illness**
The family history of psychiatric illness distribution in both groups is shown in Table 4.

### Table 1 Age distribution in both groups

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>12.00</td>
<td>15.00</td>
<td>13.03</td>
<td>1.13</td>
<td>1.18</td>
</tr>
<tr>
<td>Controls</td>
<td>12.00</td>
<td>15.00</td>
<td>12.67</td>
<td>0.96</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2 Sex distribution in both groups

<table>
<thead>
<tr>
<th>Sex</th>
<th>Number (%)</th>
<th>Number (%)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>14 (46.7)</td>
<td>19 (63.3)</td>
<td>0.194</td>
</tr>
<tr>
<td>Male</td>
<td>16 (53.3)</td>
<td>11 (36.7)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>30 (100)</td>
<td>30 (100)</td>
<td></td>
</tr>
</tbody>
</table>

### Table 3 Education distribution in both groups

<table>
<thead>
<tr>
<th>Education</th>
<th>Patients Number (%)</th>
<th>Controls Number (%)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illiterate</td>
<td>6 (20)</td>
<td>2 (6.7)</td>
<td>0.047</td>
</tr>
<tr>
<td>Primary students</td>
<td>8 (26.7)</td>
<td>18 (60)</td>
<td></td>
</tr>
<tr>
<td>Preparatory</td>
<td>16 (53.3)</td>
<td>10 (33.3)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>30 (100)</td>
<td>30 (100)</td>
<td></td>
</tr>
</tbody>
</table>

### Table 4 Family history of psychiatric illness distribution in both groups

<table>
<thead>
<tr>
<th>Psychiatric illness</th>
<th>Patients Number (%)</th>
<th>Controls Number (%)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative family history</td>
<td>27 (90)</td>
<td>28 (93.4)</td>
<td>0.503</td>
</tr>
<tr>
<td>Family history of mood disorder</td>
<td>2 (6.7)</td>
<td>1 (3.3)</td>
<td></td>
</tr>
<tr>
<td>Family history of psychotic disorder</td>
<td>0 (0.0)</td>
<td>1 (3.3)</td>
<td></td>
</tr>
<tr>
<td>Family history of mental retardation</td>
<td>1 (3.3)</td>
<td>0 (0.0)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>30 (100)</td>
<td>30 (100)</td>
<td></td>
</tr>
</tbody>
</table>
Psychometric data

**Patient Health Questionnaire-9**
The PHQ-9 distribution in both groups is shown in Table 5.

**Hospital Anxiety Depression Scale**
The HADS distribution in both groups is shown in Table 6.

**Middlesex Hospital Questionnaire**
The Middlesex Hospital Questionnaire distribution in both groups is shown in Table 7.

**McGill Quality of Life Questionnaire**
The McGill Quality of Life Questionnaire distribution in both groups is shown in Table 8.

Correlation studies
The correlation between the HADS and the Middlesex Hospital Questionnaire is shown in Table 9.
The correlation between the Middlesex Hospital Questionnaire (depression) and the McGill Quality of Life Questionnaire, general and physical subscale is shown in Table 10.

Discussion
There was no statistically significant difference between the two groups with regard to age ($P = 1.18$) (Table 1). Participants from both groups were selected from the Pediatrics Outpatient Clinic. There was no statistically significant difference between the two groups with regard to sex ($P = 0.194$) (Table 2). The majority of the patient group were men (53.3%). This was consistent with the results of Sabry and Salama [21], who found that 54% of patients with thalassemia in their study in Egypt were men.

There was a statistically significant difference between the two groups with regard to the educational level ($P = 0.047$). Twenty percent of the individuals in the patient group were illiterate, whereas only 6.7% of adolescents in the control group were illiterate (Table 3). This was in line with the study of Sabry and Salama [21]; a statistically significant difference was found in the levels of education between the patient group and the control group: 55% of cases did not attend school compared with 12% of the control group. This could be explained by the physical weakness caused by their chronic illness, and frequent blood transfusion. Another explanation for the lack of school attendance could be an overprotective parenting style among Egyptian families which is prevalent during the illness of their children. Ratip et al. [22] found that, in the United Kingdom, among 27 patients with thalassemia, 90% had to take time off from school because of their medical condition. In addition, thalassemia affected the scholastic performance of 70% of Indian adolescents adversely [22].

There was no statistically significant difference between both groups with regard to a family history of psychiatric illness ($P = 0.503$). The majority of adolescents in both the groups had a negative family history of psychiatric illness (90% of the patient group, 93.4% of the control group) (Table 4). This was similar to the study of Mazzone et al. [3], who found a statistically significant difference between a group of adolescents with thalassemia (28 patients) and

### Table 5 Patient Health Questionnaire-9 distribution in both groups

<table>
<thead>
<tr>
<th></th>
<th>Patients</th>
<th>Controls</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>No depression</td>
<td>0 (0.0)</td>
<td>28 (93.3)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mild depression</td>
<td>4 (13.3)</td>
<td>2 (6.7)</td>
<td></td>
</tr>
<tr>
<td>Moderate depression</td>
<td>16 (53.4)</td>
<td>0 (0.0)</td>
<td></td>
</tr>
<tr>
<td>Moderate-to-severe depression</td>
<td>9 (33.3)</td>
<td>0 (0.0)</td>
<td></td>
</tr>
<tr>
<td>Severe depression</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>30 (100)</td>
<td>30 (100)</td>
<td></td>
</tr>
</tbody>
</table>

PHQ-9, Patient Health Questionnaire-9.

### Table 6 Hospital Anxiety Depression Scale distribution in both groups

<table>
<thead>
<tr>
<th></th>
<th>Patients</th>
<th>Controls</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>HADS total</td>
<td>18.70±3.41</td>
<td>0.30±1.15</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>HADS anxiety</td>
<td>8.63±1.65</td>
<td>0.30±0.183</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>HADS depression</td>
<td>10.07±2.12</td>
<td>0.28±1.03</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

HADS, Hospital Anxiety Depression Scale; SD, standard deviation.

### Table 7 Middlesex Hospital Questionnaire distribution in both groups

<table>
<thead>
<tr>
<th></th>
<th>Patients</th>
<th>Controls</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middlesex anxiety</td>
<td>9.23±0.57</td>
<td>0.27±0.83</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Middlesex phobia</td>
<td>5.60±1.89</td>
<td>0.00±0.00</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Middlesex obsession</td>
<td>3.57±1.91</td>
<td>0.00±0.00</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Middlesex somatization</td>
<td>7.80±1.90</td>
<td>0.17±0.913</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Middlesex depression</td>
<td>9.60±1.48</td>
<td>0.63±1.47</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Middlesex hysteria</td>
<td>4.87±1.83</td>
<td>0.00±0.00</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

SD, standard deviation.

### Table 8 McGill Quality of Life Questionnaire distribution in both groups

<table>
<thead>
<tr>
<th></th>
<th>Patients</th>
<th>Controls</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>McGill Quality of Life Questionnaire total</td>
<td>83.57±11.60</td>
<td>128.7±1.93</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>McGill Quality of Life Questionnaire general</td>
<td>3.70±0.92</td>
<td>9.90±0.31</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>McGill Quality of Life Questionnaire physical</td>
<td>31.60±2.73</td>
<td>3.33±3.33</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>McGill Quality of Life Questionnaire emotional</td>
<td>48.60±13.05</td>
<td>115.5±3.99</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

SD, standard deviation.
the control group (28 normal participants) with regard to a family history of psychological illness.

There was a statistically significant difference between the two groups with regard to PHQ-9 (P < 0.001). All adolescents in the patients group were depressed (13.3% had mild depression, 53.4% had moderate depression, and 33.3% had moderate-to-severe depression). In contrast, only 6.7% of the participants in the control group had mild depression (Table 5). This was in line with the study of Sabry and Salama [21], who found that patients with thalassemia have three times higher likelihood of having depression. No patient with thalassemia was found to be free of depressive symptoms compared with 70% of the controls. Dysphoric moods and low self-esteem were reported by the majority of children with thalassemia [23]. Woo et al. [24] reported that two-thirds of the patients were worried about pain, death, and the unknown in a sample of 22 children with thalassemia. This conclusion was also supported by Khurana et al. [23], who reported that chronic illnesses such as thalassemia give rise to feelings of being different and inferior, with a consequent loss of self-esteem and increased dependence. Facial characteristics in thalassemia occur as a consequence of the expansion of bones, particularly the skull and the jaw bones. Anemia and iron overload in these patients often lead to short stature and delayed puberty. Delayed puberty is associated with other endocrine disturbances, which can cause depression. They are likely to have reduced self-esteem, feelings of difference, poor self-image, being dependent, and anxiety over issues such as pain and death. Huurre and Aro [25] observed that patients with chronic illness limiting their daily life experience more depression than those with illnesses that do not limit daily life.

There was a statistically significant difference between the two groups with regard to the HADS (P < 0.001). Adolescents with thalassemia showed significantly higher levels of anxiety and depression than the control group (mean = 8.63 ± 1.65, 10.07 ± 2.12 and mean = 0.30 ± 0.183, 0.28 ± 1.03, respectively) (Table 6). Depression has been listed as a major cause of morbidity in thalassemia. The rate of depression in patients with thalassemia is higher than that in the controls [26]. In addition, Saravi et al. [27] claimed that frequent blood samplings for laboratory tests, multiple transfusions, and frequent subcutaneous injections of iron chelator drugs, which altogether can be considered severe stresses, are likely to make patients susceptible to psychological burdens namely depression and anxiety. They found that the rate of depression among patients with thalassemia was 14% in comparison with 5.5% in the control group (P < 0.001). Aydin et al. [28] concluded that Hopelessness and Trait-Anxiety Scores were found to be significantly higher in adolescents with thalassemia than in control cases (P < 0.01 and < 0.05, respectively).

There was a statistically significant difference between both groups with regard to the Middlesex Hospital Questionnaire (P < 0.001). Adolescents with thalassemia showed significantly higher levels of anxiety, phobia, obsession, somatization, depression, and hysteria (mean = 9.23 ± 0.57, 5.60 ± 1.89, 3.57 ± 1.91, 7.80 ± 1.90, 9.60 ± 1.48, and 4.87 ± 1.83, respectively) (Table 7). Moorjani and Issac [5] reported higher total neuroticism, anxiety, phobia, somatic anxiety, obsession, and depression in patients with thalassemia than in the controls. Interviews with parents of adolescents with thalassemia indicated various behavioral problems in these adolescents. Adolescents with thalassemia had higher scores in neuroticism. Some behavioral problems were also found, along with neurotic manifestations. Adolescents with thalassemia had several physical problems, which led to stress. A recent study suggests that anxiety disorders may be more strongly related to early stress exposure, Manevich et al. [29]. Moussa et al. [30] found that children are anxious about the treatment modalities, effectiveness of iron chelation, and complications related to the iron chelation. Adolescence itself is a time that demands more adjustment skills. An illness, in addition to the existing problems, may cause an emotional outburst, which needs to be handled properly. If not, the overlooked needs may manifest as anxiety disorders. Thalassemia, being a chronic disease, can cause the same kind of anxiety and worry as other chronic illnesses such as type 1 diabetes and cancer. Hayward et al. [31] stated that because of the overgrowth of bones and disfigurement that occurs in the long run, a thalassemic child may confine him/herself within the home, which can manifest as a social phobia. These kinds of phobias have been documented earlier. A study carried out by Moorjani and Issac [5] revealed a marked difference in adolescents with thalassemia and adolescents without thalassemia in terms of phobia. Most of the population with thalassemia reported fear related to blood transfusions. Some of these children had a fear of death. Parents reported fear of new people and places in 33.3% of these children. Many adolescents with thalassemia may experience fear related to intravenous line insertion and subcutaneous infusion pumps. However, it is impossible for a child with thalassemia to remain symptom-free most of the time, which predisposes him or her to a certain degree of anxiety phobic reactions. Bush et al. [32] found that a marked difference in obsession

<table>
<thead>
<tr>
<th>Table 9 Correlation between the Hospital Anxiety Depression Scale and the Middlesex Hospital Questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>HADS total</td>
</tr>
<tr>
<td>P</td>
</tr>
<tr>
<td>N</td>
</tr>
</tbody>
</table>

HADS, Hospital Anxiety Depression Scale; n, number; P, P value; r, statistical parameter.

<table>
<thead>
<tr>
<th>Table 10 Correlation between the Middlesex Hospital Questionnaire (depression) and the McGill Quality of Life Questionnaire (general and physical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>McGill Quality of Life Questionnaire (general)</td>
</tr>
<tr>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>Mid. 6</td>
</tr>
<tr>
<td>depression</td>
</tr>
<tr>
<td>N</td>
</tr>
</tbody>
</table>

Mid., Middlesex.
between adolescents with thalassemia and adolescents without thalassemia in which adolescents with thalassemia inclined more towards the negative side. Adolescents with thalassemia have frequent intrusive thoughts of death and parting from loved ones. This should be addressed because at a later stage these obsessions may result in blurring of the boundaries between internal (cognitive) and external events. Moorrani and Isaac [5] claimed that adolescents with thalassemia revealed an increased level of somatic anxiety when compared with normal controls. The somatic anxiety is marked by a history of diverse physical complaints that may be psychological in origin.

There was a statistically significant difference between the two groups with regard to the McGill Quality of Life Questionnaire ($P<0.001$). Adolescents with thalassemia showed significantly lower scores in different aspects of QoL: total, general, physical, and emotional (mean $=83.57\pm11.60$, $3.70\pm0.92$, $31.60\pm2.75$, and $48.60\pm13.05$, respectively) (Table 8). Triantis et al. [33] stated that thalassemia can be challenging to an individual at the physical, emotional, and cognitive levels and disrupts QoL. Its frequent and complex treatment might also lead to financial burden for the individual and his/her family, which may further result in reduced adaptive and coping ability of affected children. Sachdeva et al. [34] stated that the overall QoL was affected in 88% of patients with thalassemia in multiple domains, including physical, psychological, social, and cognitive.

There was a significant positive correlation between the HADS and the Middlesex Hospital Questionnaire, obsession subscale ($P=0.032$) (Table 9). This means that anxiety and depression are highly associated with the occurrence of obsessive symptoms. Messina et al. [35] concluded that patients with thalassemia showed a personality characterized by somatization, depression, and obsessive–compulsive traits. Ahmad et al. [36] found that the most common psychiatric disorders among adolescents with thalassemia were major depressive disorder and separation anxiety disorder. In addition, they found that more than 43% of the adolescents had recurrent thoughts of death.

There was a significant negative correlation between the Middlesex Hospital Questionnaire, depression subscale, and the McGill Quality of Life Questionnaire, general and physical ($P=0.005$) (Table 10). This means that a higher degree of depression is associated with lower QoL among adolescents with thalassemia. Pakbaz et al. [12] found that all patients with thalassemia reported severe impairments in the QoL assessment. Feelings such as anxiety, depression, and concern with regard to one’s overall health status, which had marked effects on different aspects of QoL, were the most commonly reported. In addition, Azarkeivan et al. [37] claimed that depression is associated with both poor physical and mental HRQoL among patients with major/intermedia $\beta$-thalassemia. Kullowatz et al. [38] found that the negative impact of anxiety and depression on HRQoL in patients with thalassemia is consistent with previous studies of other chronic conditions that demonstrated that individuals with comorbid medical illness and depression and anxiety show significantly greater impairment with Health related quality of life (HRQoL). In addition, Ahmad et al. [36] reported that psychological problems, including depression and anxiety, were significant predictors of impaired QoL.

**Conclusion**

Depressive and anxiety symptoms are more prevalent among adolescents with thalassemia. In addition, in the same group, there were higher degrees of free floating anxiety, phobic anxiety, obsessive symptoms, somatic symptoms, depressive symptoms, and hysteria. QoL was highly affected among adolescents with thalassemia. A higher degree of depression is associated with lower levels of QoL among adolescents with thalassemia.

**Limitations**

The small-sized sample in this study can be considered as one of the limitations of this study. A large-sized sample may be needed to assess other possible psychological profiles of adolescents with thalassemia. In addition, follow-up studies may be valuable in the assessment of the course and prognosis of depression and anxiety among adolescents with thalassemia.

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**References**


المظاهر النفسية لدى المراهقين المصابين بمرض التلاسيميا

يؤدي مرض التلاسيميا ومضاعفاته إلى تأثر نفسي كبير، مما يتسبب في زيادة العأمل العاطفي، والذين، وصعوبة في الاندماج الاجتماعي.

وتشمل هذه البحوث على دراسة مقارنة تضم ثلاثين من المراهقين المصابين بمرض التلاسيميا ومجموعة أخرى من عدد مماثل من المراهقين من العيادة الخارجية (عيادة الجهاز البصري) كمجموعة ضابطة. هذا وقد تم جمع البيانات الخاصة بالمخزون، مثل السن والجنس ومستوي التعليم والتاريخ المرضي السابق.

وقد تم عمل الاتصال للمتخصصين: استبيان صحة المريض، ومقياس الفتق والاكتاب بالمستشفى، واستبيان ميلزكس المستشفى، واستبيان ماكجيل لجودة الحياة.

وقد كشفت النتائج عن أن مجموعة المراهقين المصابين بالتصلبيميا كانوا يعانون من الاكتساب والفقف بدرجة ذات دالة إحصائية بالمقارنة مع المجموعة الضابطة. كما وجد أيضاً فروق ذات دالة إحصائية فيما يتعلق باستبيان ميلزكس المستشفى، واستبيان ماكجيل لجودة الحياة.

كما اوضحَت هذه الدراسة أيضاً أن اعراض الفتق والرها والاختناق والجسيمة العتيقية كانت أكثر انتشاراً ضمن مجموعة المراهقين المصابين بالتصلبيميا. وقد أظهر ذلك بالطبع على جودة الحياة بين أفراد نفس المجموعة.