Original Article

Relationship Between Anthropometric Indices, Depression and Quality Of Life In Patients Of Thalassemia Major After Covid-19

Mah Noor,[1] Quratulain Saeed,[2] Sanna Pervaiz [3]

Abstract

Objective: Thalassemia, a blood disorder, characterized by aberrant red blood cell formation, leading to anaemia, a primary symptom. Anthropometry examines human body measurements including age-relative height and weight. Individuals with beta-thalassemia major are short stature and experience depressive moods due to social limitations, affecting their standard of living. This study aims to investigate the correlation between anthropometric indices, depression and the quality of life of individuals with thalassemia major post Covid-19.

Study design: It was a Analytical Cross Sectional study.

Place and duration of study: The study was conducted within the community of Rawalpindi and Islamabad from May 02nd, 2022 to July 02nd.

Material and Methods: Analytical cross-sectional study conducted within the community of Rawalpindi and Islamabad from May 02nd, 2022 to July 02nd, 2022. We included both male and female thalassemia patients aged 05-18 years equally. Data collection utilized Beck-Inventory Depression, Paeds-Ql questionnaires, Stadiometer, and Body Mass Index-calculator.

Results: Our study included 40 participants and we confirmed a normal distribution via Shapiro-Wilk test. Employing Pearson's correlation, we explored the relationships between Paeds QOL and BMI, as well as Paeds Quality of Life and Beck Depression Inventory. The results showed a very weak, statistically insignificant correlation ($p>0.05$). Participants were categorized into two height groups: normal and short stature. Analysis revealed a weak correlation ($p = 0.2$) between normal and short stature groups with Paeds QOL and BMI. However, no statistically significant correlation existed between both groups and Paeds QOL and BDI.

Conclusion: Our study concluded that Thalassemia major has no relationship between mental health and quality of life. However, considering half the population had short-stature in early teens, timely detection and intervention could prevent growth delay and comorbidities.

Keywords: BMI, Depression, Quality of life, Short stature, Thalassemia.

1. Introduction

The anemia that results from faulty synthesis of one or more hemoglobin chains is the hallmark of thalassemia, an autosomal recessive blood disease. (1) According to a report approximately 100,000 patients are suffering from Thalassemia in Pakistan and every year 5,000 babies are born with this deadly disease. Anthropometric is the study of measurements and proportions of the human body, including their height, weight comparison with their age factor. Patients with beta-thalassemia major frequently have short stature, which negatively impacts their standard of life. (2) Children with beta-thalassemia major frequently have a low body mass index, short stature, and delayed sex development. (3) mortality. Forty percent of the children with beta thalassemia major in a Karachi research were found to have scores a standard deviation of 2.5 below the average value. (4) Treating the underlying cause, individuals suffers from the psychosocial distress, they are being teased and belittled by their peers and family effecting their daily life and imposing a negative

MS(MSK) PT Scholar ,[1] Assistant Professor, Foundation University Islamabad, [2] Lecturer , Foundation University Islamabad.[3]
Correspondence: Mah Noor, MS(MSK) PT Scholar ,Foundation University Islamabad **Email:** mahnoorbasharat33@gmail.com

effect on their quality of life. [5] Body mass index (BMI) defines the degree of adiposity based on an association between both height and weight, hence removing frame size dependency and accounting for the variation in body composition., by which underweight in adults is defined as BMI < 18.5 and obesity is BMI > 30. The following equation can be used to determine BMI:

$$BMI = \frac{\text{Weight (kg)}}{\text{Height (m2)}}$$

This disease plays a major role in psychological and social health state of patients, concerning their parents about their child's appearances, bone abnormalities, small stature, low self-esteem, frequent hospital stays, and other related problems such infections, heart disease, and bone disease, among other things. [5]

Depression is the common psychiatric disorder among patients of Thalassemia-major and could occur due to the chronic nature of the disease, prolonged treatment periods, changes in appearance, and feelings of deprivation. [6] Children with chronic hematological disorders can be predisposed to anxiety and depressive mood because of social problems such as, restricted social activities, and limitations in school and play activities. [7] These factors are influencing the health related quality of life of thalassemia major patients. This all results in the denial of quality of life, in individuals suffering from β-thalassemia major (β-TM).

Covid-19 pandemic effected the health sector in Pakistan. All the resources were put for covId-19 pandemic which resulted in neglecting other diseases. According to the recent study, the transfusion of Thalassemia major patients was neglected and delayed due to the lockdown in Covid-19 and because of the shortage of blood supply, patients were put in to a life-threatening situation. [8]

This study was conducted to determine relationship between anthropometric indices, depression and quality of life of Thalassemia major patients after Covid-19. This study will be a step to understand the challenges better and to look for the solution of these issues to improve the life quality.

2. Materials & Methods

This Analytical cross-sectional study was conducted from May 2022 to July 2022 within the community of Rawalpindi and Islamabad. Estimated sample size calculated through open epi tool was 40. Participants were informed about the study and were assessed for selection citeria after content. We assessed 70 patients out of which 40 fulfilled our criteria. We recruited both male and female thalassemia major with age ranging from 5 to 18 years through purposive sampling technique. Subjects with any neurological and musculoskeletal problem were excluded. The data was collected through beck-inventory depression, paeds-ql questionnaires, stadiometer and BMI-calculator.

The FUSH/FFH Ethical Review Committee (FF/FUMC/215-220-1 PHY/22) granted approval. Prior to start the data gathering process, the participants' consent was obtained. The information in question was kept hidden. Participation of the voluntary kind was urged. None of the participants' religious beliefs were offended. The individuals experienced no physical or psychological discomfort from the procedure.

3. Results

In the current study, this table shows descriptive statistics:

Total of 40 participants were recruited in the study with Mean ± Standard Deviation of Age of 13.4 ± 3.5 (years).

As the data was normally distributed for variables of Paeds quality of life and BMI, therefore, Pearson's correlation was applied. Results showed that there was very weak correlation between Pediatric Quality of Life and Body Mass Index which was also not statistically significant ($p > 0.05$).

Table 1: **Pearson's Correlation**

Pearson's Correlation			
Variables	**Mean ± SD**	**Pearson's correlation**	**P-value**
Paeds QOL	23.3 ± 6.6	-.049	.765
BMI (kg/m^2)	16.8 ± 3.1		
Paeds QOL	23.3 ± 6.6	-.049	0.765
BDI	11.85 ± 4.6		

Paeds quality of life and Beck Depression Inventory variables were also skewed, therefore, Pearson's correlation was applied. Results showed that there was very weak correlation between Pediatric Quality of Life and Beck Depression Inventory which was also not statistically significant($p>0.05$).

Our data was composed of both short stature and normal height individuals. We also analyzed relationship within short stature and normal height groups. We didn't find any statistically significant relationship in either groups ($p>0.05$). (Table 2)

Table 2: Pearson's Correlations of Paeds QOL with BMI & Paeds QOL with BDI within Normal and Short Stature Groups

Pearsons Correlations of Paeds QOL with BMI & Paeds QOL with BDI within Normal and Short Stature Groups				
Height group	**Variables**	**Mean ± SD**	**Pearsons correlation**	**P-value**
Normal	Paeds QOL	22.4 ± 6.9	-.205	.385
	BMI	16.7 ± 3.1		
Normal	Paeds QOL	22.4 ± 6.9	.122	.608
	BDI	11.2 ± 3.5		
Short-Stature	Paeds QOL	24.2 ± 6.3	-.347	.134
	BMI	16.7 ± 3.1		
Short-Stature	Paeds QOL	24.2 ± 6.3	-.034	.886
	BDI	12.5 ± 5.5		

Majority participants (normal height: 55%; short-stature: 85%) were from ages of 13 to 18 years. Among children with normal height, 45% were normal, 50% were slightly depressed while 5% were clinical depressed. While among children with short Strature, 30% were normal, 55% were slightly depressed, 10% moderately depressed while 5% was clinically depressed.

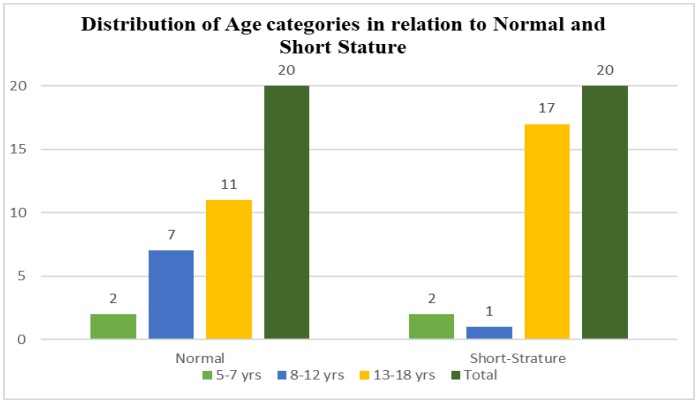

Figure 1: Distribution of Age categories in relation to Normal and Short Stature

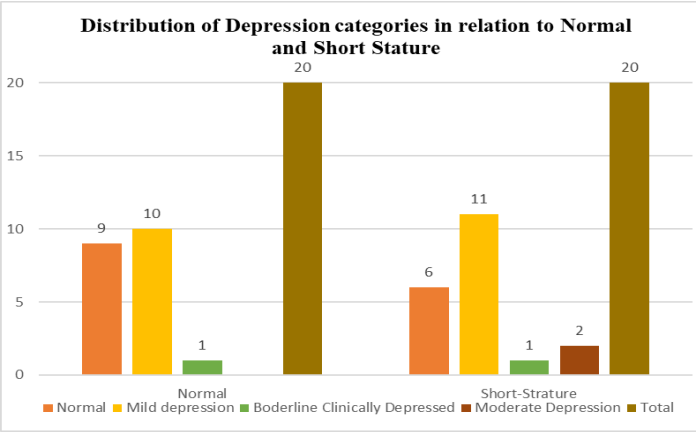

Figure 1: Distribution of Depression categories in relation to Normal and Short Stature

Discussion

Our study didn't find any relationship between Paeds quality of life with both depression and BMI. Considering anthropometric indices as confounding factor, we also assessed these relationships within normal and short stature groups of thalassemia children and found similar results. A study in 2022 shows that frequent blood transfusions in pediatric patients diagnosed with beta-thalassemia major are linked to higher levels of serum ferritin and a decreased BMI percentile in these individuals. In contrast with our study BMI and QOL is not having any significant relation in thalassemic children. [9]

We found almost equal and slightly greater frequency distribution of normal height among thalassemic children with in pre-teen years i.e. 50% in 5-7 years and 87.5% in 8-12 years. However, this trend changes and majority teen-age children were short stature i.e. 61%. These results are similar to the study of Vyas Kumar, showing that there are other causative factors which had influence on the short stature of thalassemic children. [10] We found occurrence of depression more among short stature thalassemic children (70%) as compared to normal height (55%). Besides, that both groups have majority teen-age thalassemic children i.e. 13-18 years. Our results are supported by the literature concluding high prevalence of depression among thalassemic children irrespective of gender, but our study results shows no effect of depression with the quality of life of patients with Thalassemia. [11] It must be diagnosed and addressed at earliest. [12] The necessity to identify depression risk factors is a limitation within the scope of our study.

Numerous health issues are linked to being underweight or having a low body mass index (BMI). BMI has not been sufficiently researched, despite the fact that patients with beta thalassemia major exhibit several growth problems. Patients with beta-thalassemia major, especially those over ten years old, are often underweight. This is likely due to poor nutrition and the presence of hormonal disorders. Therefore, it is important to regularly monitor development to identify any fall in growth velocity and any BMI abnormalities, and to design a suitable plan for inquiry and therapy. [9] Our research indicates that the BMI of patients remained largely unaffected, aligning with norms based on their age and height. Upon examining the data, it was evident that among 20 children with normal height and 20 with short stature, their BMI displayed a very minimal correlation.

The causes of growth retardation in people with thalassemia major are complex and include tissue hypoxia. According to a study, short stature was significantly greater in those over 10 than in people under 10 (83.3% vs. 16.7%). Deceleration of growth may take place in the second decade as it is the critical period for growth especially during puberty. Similar to our study results growth impairment is commonly seen with growing age as out of 20 short stature patients 17 thalassemic children were in their second decade of age (13-18 years).

The present study was conducted to estimate the pooled prevalence of depression among these

patients. The Beck Depression Inventory (BDI) is a self-reporting questionnaire for evaluating the severity of depression in normal and psychiatric populations. According to our study, patient's quality of life is not affected by the depression, as out of 40 individuals only 2 were clinically depressed.

Patients with the rare illness known as thalassemia major must get transfusions for the rest of their lives in order to survive. As a patient ages, the disease's cumulative effects have an influence on their quality of life. Naderi M. and colleagues' study determined that children diagnosed with thalassemia major need specific care in different facets of their lives due to their reduced Quality of Life, which can adversely affect their health and treatment regimen. (13)

Our study encompassed a limited sample size (n=40) which is very small to effectively represent the targeted population. Furthermore, it was crucial to identify the risk factors associated with depression. Numerous effective tools are available for use in general as well as populations with a specific condition. Beck depression inventory questionnaire used in this study is comparatively not as effective in interpreting the depression level in pediatric population suffering from thalassemia.

Conclusion:

Our research findings indicate that there is no significant relationship between quality of life and either BMI or depression levels in thalassemia major patients after COVID-19. Even among those with short stature, depression did not significantly affect their quality of life.

Disclosure /Conflict of interest:

The current manuscript has not been presented or published in a conference or abstract book and is not a part of thesis/project. There has been no conflict of interest. No funding has been provided by agency in the public, commercial or non-profit sectors.

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