

## Effect of Empowerment Program on Self-efficacy among Children with Thalassemia

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### Abstract

Thalassemia is the most common hereditary hemoglobinopathy, enhancing self-efficacy in children's with thalassemia remains so important; as it is related to the capability to achieve some important goals together with their psychological well-being. **Aim:** The study aimed to evaluate the effect of empowerment program on self-efficacy among children with thalassemia. **Methods:** One-group quasi-experimental design with pre-post evaluation, which was conducted in the hematology clinics at El-Monira pediatric hospital, affiliated to Cairo- University. A purposive sample of 100 children, aged from 8-12 years old. **Tools:** 1) Structured interview sheet, 2) knowledge structured questionnaire, 3) and the self-efficacy questionnaire for children were used for data collection. **Results:** All children had unsatisfactory knowledge about thalassemia before the program implementation. Meanwhile, for total knowledge satisfactory level of children increased to slightly, more than three quarter, near to three fifths, immediate post and one month after the program respectively with highly statistically significant difference  $P < 0.001$ . Also, highly significant improvements of academic, social and emotional self-efficacy of children were observed after one month  $P < 0.001$ . **Conclusion:** Significant improvement in knowledge of children detected immediate post and one month after the empowerment program, but self-efficacy improved significantly only after one month. **Recommendations:** The study recommended that the empowerment program should be implemented in the routine care for children with thalassemia.

**Keywords:** Empowerment program, children, self – efficacy, thalassemia.

### Introduction

Thalassemia is the most common hereditary hemoglobinopathy, and occurs in 4.4/10,000 live births worldwide. About 66.0% of children were under 15 years old. Thalassemia major affects approximately 200 million children worldwide. Globally, there are about 240 million carriers of  $\beta$ -thalassemia. In Egypt,  $\beta$ -thalassemia is considered the most common monogenic disorder with a carrier rate of almost 5.3 to 9.0 %, representing the most common genetically determined chronic hemolytic anemia (85.1%) (Biswas et al., 2019 & Sahnoud et al., 2020).

Thalassemia is a type of inherited anemia. Its management is complex and expensive, and requires a multiple-team approach. Optimal and sufficient clinical care is demanding. Various aspects of life of the children suffering from thalassemia are usually affected adversely influence the children physical and psychological health, quality of life and self-efficacy (Vahedparast et al., 2017).

The term self-efficacy was first introduced by Bandura and refers to the ability of performing a particular function that a person expects from his/her ability to do in different situations. Self-efficacy is the most important precondition to change behavior (Cerezo et al., 2011). Measuring self-efficacy can be a predictor of a person's ability to change his/her behavior and decision to increase self-care. Self-efficacy is one of the concepts of family-centered empowerment model. In fact, empowering the patient and his family and increasing the involvement of patients in self-care reflects the emphasis on health, prevention and health education, not just focusing only on illness and its treatment (Mohamed, 2017 & Motta et al., 2020).

Self-efficacy plays a significant role in improving one's general health and dealing with chronic diseases. Higher self-efficacy leads to a more effective response to fatigue and stressful events, greater life satisfaction, more dynamic physical performance, and a significant improvement in daily activities and

self-care. Poor treatment outcomes among thalassemia children necessitate different educational interventions in order to improve the quality of treatments (*Gupta, 2017*).

One of the strategies to improve health, knowledge, awareness, and self - efficacy is to empower children and their families in order to effectively cope with the consequences and the complications of their illnesses and manage their illnesses and lives. Consequently, one of the aims of care services should be to improve the self-efficacy of children through empowerment (Pahang et al., 2018). Empowerment is the process of people obtaining the knowledge and skills that enables them to become active partners with professionals in making informed decisions and choices about their own treatment and care and of enabling communities to exert informed influence on the health system (*Cortez et al., 2017*).

The aim of empowerment program is to improve children's health, manage their illnesses, reduce the incidence of the acute episodes of their illnesses, and improve self-efficacy in the afflicted children and their parents through helping families provide higher quality (*Cerezo et al., 2016*).

By emphasizing the fact that chronic illness such as thalassemia causes fundamental changes in children and their parents which leads to serious complications, empowerment program can reduce the cost of hospitalization and the number of absences from school. It also improves the physical and psychological functions and achievements of children with thalassemia. Since empowerment programs are based on educational needs assessments, they may help nurses and physicians offer higher quality healthcare services to children with thalassemia, leading to peace and the promotion of healthcare-related competencies among these children (*Al-Kherbash et al., 2018*).

Studies have shown that the use of empowerment programs for children with chronic illness enhances their self-reliance and problem-solving abilities. In addition, implementation of empowerment programs can increase self-care power in children's with chronic diseases (Ankush et al., 2019).

Moreover, the result of a study done by Borimnejad et al (2018) showed that, the effectiveness of implementing family-centered empowerment program on improvement of general self-efficacy and disease-related self-efficacy scores of children with thalassemia major.

#### ***Significance of the study:***

Thalassemia is a major health problem in Egypt where 1-5 million children are anticipated to be affected with this illness and it is the greatest common hemolytic anemia(85.1%).Thalassemia as a chronic illness has serious physical, socio psychological, and economic impacts on children and their families (*Elzaree et al, 2018*). The concept of the self-efficacy in chronic diseases reflects one's beliefs, ability, and motivation to integrate his/her behavioral, social, psychological, and cognitive skills to deal more effectively with the disease and to tolerate its complications (*Willis,2018*). Regarding the effect of empowerment program on the self-efficacy of children with thalassemia; researches found were scanty in Egypt. Shedding light on this area though researches is required. So that this study is designed to fill the gap of knowledge in this area and to empower thalassemic children with needed knowledge to improve their self-efficacy either academically, socially or emotionally.

#### ***Aim of the study:***

This study aimed to evaluate the effect of empowerment program on self-efficacy among children with thalassemia.

#### ***Subjects and Methods***

##### ***Specific objectives:***

- 1- Implement an educational intervention to help thalassemic children to improve their knowledge and increase self-efficacy levels.
- 2- Compare the studied children knowledge about thalassemia pre, immediate post and one month after the empowerment program.
- 3- Assess the self- efficacy domains; academic, social and emotional as

reported by the studied children pre, immediate post and one month after the empowerment program.

#### The research hypotheses:

H1. Children who would receive the empowerment program would have satisfactory knowledge than before.

H2. Children who would receive the empowerment program would have higher self-efficacy score than before.

#### Operational definition:

**Empowerment:** for the purpose of this study the term empowerment program was an educational material prepared by the researchers to increase children's knowledge about thalassemia. It enabled children to make the most of the opportunities that arise. It referred to management of children with thalassemia, it highlighted the importance of applying knowledge or the ability to translate one's knowledge into action or resources which measured by knowledge questionnaire (pre-posttest). The beneficial outcomes to empowerment programs improved social, emotional, and academic self-efficacy.

**Self-efficacy:** it reflected confidence in the ability to exert control over one's own emotion, social environment, and academic achievement which measured by Self-Efficacy Questionnaire for Children (SEQ-C).

**Research design:** A quasi-experimental one-group design with pre-post evaluation was used in this study.

**Setting:** the study was conducted in the hematology out-patient clinics at El-Monira Pediatric Hospital, affiliated to Cairo University hospitals, the largest hospital for children in Egypt, and provided its services free of charge. The out-patient had a large health teaching class with children chairs and desk computer, projector and screen where the researchers implemented the program.

**Sample:** A non-probability purposive sample of 100 children in the selected study setting was included in the study sample. The inclusion criteria for children were 8-12 years old, going to school, able to read and write, diagnosed as beta- thalassemia major and

undergoing blood transfusion therapy. The only exclusion criteria for children were those children who had previously attended similar intervention empowerment program.

#### Data collection tools:

- 1) Structured interview questionnaire was developed by the researchers that included child personal data as age, sex, educational level, place of residence and the medical history as disease duration.
- 2) Knowledge structured questionnaire was developed by the researchers based on relevant literature (Hockenberry & Wilson, 2021). It included questions about thalassemia definition, causes, symptoms, signs, complication, importance of blood transfusion, iron chelation therapy, its action, side effects, prevention of desferal toxicities, diet and sports recommended for those children.

For scoring system, a correct response was scored 1 and the incorrect zero. For each area of knowledge, the scores of the items were summed-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into percent scores. Knowledge was considered satisfactory if the percent score is 60% or more and unsatisfactory if less than 60%.

- 3) Self-Efficacy Questionnaire for Children (SEQ-C) was developed by Muris (2001). It contained 24 items representing three domains of self-efficacy: (1) social self-efficacy (8 items), which implied the perceived capability for peer relationships and assertiveness; (2) academic self-efficacy (8 items), which concerned with the perceived capability to manage one's own learning behavior, to master academic subjects, and to fulfill academic expectations; and (3) emotional self-efficacy (8 items), which pertained to the perceived capability of coping with negative emotions. Each item was to be scored on a 5-point scale with 1 = not at all, 2 = not too well, 3 = okay, 4 = pretty well and 5 = very well. The final total score is calculated as the sum of all the 5 parameters, varying from 5 to 24. The child's self-efficacy considered to be low if the total score was 24-56, moderate if

the total score was  $56 > 88$  and high if the total score was between 88 and 120.

**Tools validity and reliability:** The tools were thoroughly reviewed by three experts: Professor of Pediatric Nursing and Professor of Psychiatric Mental Health Nursing they are members of research ethics committee of the Faculty of Nursing, Cairo University and Professor of Pediatric Medicine Cairo University; a director of the hematology out-patient clinics at El-Monira Pediatric Hospital, for face and content validation. As per their opinions, no modifications were required. The internal consistency reliability of the SEQ-C appeared to be satisfactory: Cronbach's  $\alpha$  were 0.88 for the total self-efficacy score and subscales scores were 0.85 for academic, 0.86 for social and 0.88 for emotional (Tan & Chellappan, 2018 and Muris 2001). As regards the reliability of the knowledge structured questionnaire, The Coefficients' Alpha was 0.72.

**Pilot Study:** A pilot study was carried out on 10 children representing 10% of the total sample to test study tools in terms of their clarity, applicability and time required to fill. Since no modifications were done, these children were included in the sample.

**Procedure:** After getting the ethical approval from the ethics committee at Faculty of Nursing, Cairo University (ethical approval reference number is 2021-17), an official approval was obtained from directors of the El-Monira Pediatric Hospital and hematology out-patient clinics, Then, the empowerment program was implemented through the following phases:

**Assessment phase:** The researchers met the children and their parents for a clear and simple explanation of the aim and nature of the study. Those who gave their consent (parents), and assent (children) and fulfilled the eligibility criteria were recruited in the study sample. For the children, they were handed a structured interview questionnaire and instructed about how to fill it and they filled the structured knowledge questionnaire. It took around 30 minutes for each child to complete the questionnaire and this was constituted the knowledge pretest. Then, each child was asked to fill the Self-Efficacy Questionnaire as reported by children and this was considered as

the self-efficacy pre-assessment. It took around 40 minutes to complete the questionnaire per child.

**Planning phase:** During this phase, the researchers developed the empowerment program based on assessment information and pertinent literature (*Hockenberry & Wilson, 2021*). An illustrated booklet was prepared in simple Arabic language covering knowledge about the definition of thalassemia, causes, symptoms, signs, complication, importance of blood transfusion, iron chelation therapy, (action, side effects, prevention of iron chelation toxicities), diet and sports recommended for those children. Time took in assessment and planning phase was one month.

**Implementation phase:** The educational content was explained by the researchers to children in small group (around seven children per each group) on two sessions were given immediately after the pretest, each session lasted for one hour using Power Point presentation that contained knowledge in the Arabic illustrated booklet. After the two sessions completed, the researchers distributed the booklet and gave children the opportunity to study and assimilate the educational content. Time took in implementation phase was three months.

**Evaluation phase:** The effect of the empowerment on children's knowledge was assessed twice: immediately after the implementation phase (post-intervention test), and after one-month later during children follow up visit to the clinic using knowledge structured questionnaire and the self-efficacy questionnaire for children. Time took in evaluation phase was three months.

**Ethical considerations:** Ethical approval of the study protocol was obtained from the research ethics committee of the Faculty of Nursing, Cairo University (ethical approval reference number is 2021-17). Informed consents were signed by parents after being informed about their rights to refuse and/or withdraw at any time without providing a reason and without any effect on the children routine care. Participants were reassured that their information would remain confidential. Permission obtained by the researchers from the author to use the self-efficacy questionnaire for children (SEQ-C). The researchers and children as well as their parents were strictly

adherent to COVID-19 universal preventive measures.

**Statistical analysis:** Data entry and statistical analysis were done using SPSS 21.0 statistical software package. Descriptive statistics included frequencies and percentages for qualitative variables. Means and standard deviations for quantitative ones. Parametric and non-parametric inferential statistics as (paired t-test, ANOVA and Fisher test) were used. Spearman rank correlation was used for assessment of the inter-relationships among quantitative variables and ranked ones. Statistical significance was considered at P-value  $\leq 0.05$ .

### Results

Table (I) revealed that more than three quarters (77%) of children aged between (11-12) years with mean age ( $9.98 \pm 1.491$ ) years. More than half (57%) of the children were boys. However; most (84%) of children were enrolled in primary school and less than two thirds of them (63%) lived in urban areas. More than half of the children (56%) were diagnosed with thalassemia from (9-11) years with mean period of duration ( $8.59 \pm 2.090$ ) years.

Table (II) clarified that children under study had no knowledge about iron chelation therapy before the empowerment program, only (2% and 3%) of them had correct knowledge about diet, signs and symptoms of thalassemia respectively. Also, only (8%) had correct knowledge about blood transfusion and type of allowed activities sequentially. All items of knowledge improved immediate and after one month of the empowerment program and a highly statistical significant difference evidenced ( $P = 0.001$ ). In total, none of children had satisfactory knowledge pre the program; this increased to (76%) immediate post the program and (58%) after one month at ( $P = 0.001$ ).

Table (III) visualized that the studied children in all items of academic self-efficacy reported themselves a "not do well at all/or not do very well" pre and immediate post the empowerment program. After one month, more than three fifth (62%) were "pretty well" in getting teachers help when stuck on school work followed by (59% & 54%) respectively stated that they studied when there were other interesting things to do and studied a chapter for a test well. All the rest of items improved

with highly statistically significant differences  $P < 0.001$  after one month of the program.

Table (IV) indicated that the studied children in all items of social self-efficacy stated that they were "not do well at all/or not do very well" pre and immediate the empowerment program. After the program more than three fifths (61%) were "pretty well" in "expressing opinions when other classmates disagreed with them" followed by (56%, 54% and 52%) respectively in item 2,3,4 "become friends with other children easily", "being had chat with an un familiar person", "work with harmony with classmates and "tell other children that they were doing something that they didn't like". There were statistically significant differences toward improvement after application of empowerment program in all items of social self-efficacy with  $P = 0.001$ .

Table (V) illustrated that the studied children in all items of social self-efficacy stated that they were "not do well at all / or not do very well" pre and immediate post the empowerment program. The most improved items after one month of the program were "pretty well" (61%) in item 1 "cheering themselves up when unpleasant event happen", (55%) for item 5 "giving themselves a pep-talk when they feel low", and (54% followed by 53%) for item 3 and 4 "prevent becoming nervous" and "controlling their feelings" respectively. The difference proved to be highly significant with  $P = 0.001$ .

Table (VI) showed that all the studied children had low academic, social and emotional self-efficacy before attending the empowerment program while after one month of the program (51% and 50%) of them had high academic and social self-efficacy respectively. Also, more than three quarters of children (76%) had moderate emotional self-efficacy after one month of the program. There were highly statistical significance differences between academic, social and emotional self-efficacy of children before and after the program toward improvement with  $P = 0.001$ .

Table (VII) highlighted that a highly statistically significant improvement were detected in the total mean scores of children knowledge about thalassemia immediate post and one month after attending the empowerment program with  $P = 0.001$ .

Table (VIII) displayed that the total mean scores of self-efficacy among the studied children improved after one month of empowerment program implementation with highly statistical difference evidenced by  $P = 0.001$ .

Table (IX) demonstrated that statistically significant positive correlations were detected

between the studied children' knowledge, self-efficacy total level and their demographic characteristic age and educational level after implementation of the empowerment program. No correlations between children' knowledge, self-efficacy and their sex and disease duration  $P > 0.05$ .

**Table (I):** Percentage distribution of personal data and medical history of the studied children with thalassemia (n=100).

Items	No	%
Age (years):		
9-<11	23	23
11-12	77	77
Mean±SD	9.98 ±1.491	
Sex:		
Male	57	57
Female	43	43
Level of education:		
Primary	84	84
Preparatory	16	16
Place of residence:		
Urban	63	63
Rural	37	37
Disease duration (years):		
3 < 6	11	11
6 < 9	33	33
9-12	56	56
Mean±SD	8.59±2.090	

**Table (II):** Difference in the studied children knowledge about thalassemia pre, immediate post and one month after the empowerment program (n=100)

Items of knowledge	Time												ANOVA	
	Pre				Immediate post				After one month				f	P
	Correct		Incorrect		Correct		Incorrect		Correct		Incorrect			
	No	%	No	%	No	%	No	%	No	%	No	%		
-Definition	43	43	57	57	85	85	15	15	79	79	21	21	28.45	0.001
-Signs and symptoms	3	3	97	97	66	66	34	34	36	36	64	64	82.27	0.001
-Nursing management	21	21	79	79	76	76	24	24	39	39	61	61	39.84	0.001
-Blood transfusion	8	8	92	92	77	77	23	23	56	56	44	44	74.74	0.001
-Iron chelation therapy	0	0	100	100	79	79	21	21	63	63	37	37	22.12	0.001
-Diet	2	2	98	98	52	52	48	48	46	46	54	54	37.47	0.001
-Personal hygiene	59	59	41	41	89	89	11	11	61	61	39	39	14.46	0.001
-Type of allowed activities	8	8	92	92	81	81	19	19	40	40	60	60	85.06	0.001
Total: Satisfactory (60%+)	0.00		0.00%		76		76%		58%		58%		60.16 0.001	
Unsatisfactory (< 60%)	100		100%		24		24%		42		42%			

Statistically significant at  $P \leq 0.05$

Highly significant  $P < 0.001$

**Table (III):** Difference in academic self- efficacy score as reported by the studied children pre, immediate post and one month after the empowerment program (n=100).

Items	Time						ANOVA	
	Pre		Immediate post		After one month		f	p
	No	%	No	%	No	%		
1- Get teachers help when stuck on school work								
-Not at all	52	52	52	52	10	10	63.12	0.001
-Not very well	48	48	48	48	12	12		
-Okay	00	00	00	00	16	16		
-Pretty well	00	00	00	00	62	62		
-Very well	00	00	00	00	00	00		
2- Study when there are other interesting things to do								
-Not at all	93	93	93	93	11	11	82.12	0.001
-Not very well	7	7	7	7	11	11		
-Okay	00	00	00	00	19	19		
-Pretty well	00	00	00	00	59	59		
-Very well	00	00	00	00	00	00		
3- Study a chapter for a test well								
-Not at all	88	88	88	88	13	13	21.11	0.001
-Not very well	12	12	12	12	11	11		
-Okay	00	00	00	00	22	22		
-Pretty well	00	00	00	00	54	54		
-Very well	00	00	00	00	00	00		
4- Finish all homework every day								
-Not at all	87	87	87	87	13	13	12.34	0.001
-Not very well	13	13	13	13	12	12		
-Okay	00	00	00	00	23	23		
-Pretty well	00	00	00	00	52	52		
-Very well	00	00	00	00	00	00		
5- Can pay attention during every Class:								
-Not at all	82	82	82	82	13	13	23.15	0.001
-Not very well	12	12	12	12	12	12		
-Okay	00	00	00	00	24	24		
-Pretty well	00	00	00	00	51	51		
-Very well	00	00	00	00	00	00		
6- Understand all subjects in school								
-Not at all	82	82	82	82	14	14	23.26	0.001
-Not very well	12	12	12	12	11	11		
-Okay	00	00	00	00	26	26		
-Pretty well	00	00	00	00	49	49		
-Very well	00	00	00	00	00	00		
7- Satisfy my parents with school work								
-Not at all	83	83	83	83	15	15	16.73	0.001
-Not very well	17	17	17	17	11	11		
-Okay	00	00	00	00	31	31		
-Pretty well	00	00	00	00	43	43		
-Very well	00	00	00	00	00	00		
8- Passing a test easily								
-Not at all	82	82	82	82	14	14	24.06	0.001
-Not very well	12	12	12	12	10	10		
-Okay	00	00	00	00	24	24		
-Pretty well	00	00	00	00	52	52		
-Very well	00	00	00	00	00	00		

Statistically significant at  $P \leq 0.05$ Highly significant  $P < 0.001$ 

**Table (IV):** Difference in social self- efficacy score as reported by the studied children pre, immediate post and one month after the empowerment program (n=100).

Items	Time			ANOVA	
	Pre	Immediate post	After one		

					month		f	p
	No	%	No	%	No	%		
1- Express opinions when other classmates disagree with them							18.16	0.001
-Not at all	94	94	94	94	13	13		
-Not very well	6	6	6	6	8	8		
-Okay	00	00	00	00	18	18		
-Pretty well	00	00	00	00	61	61		
-Very well	00	00	00	00	00	00		
2- Become friends with other children easily							93.22	0.001
-Not at all	93	93	93	93	13	13		
-Not very well	7	7	7	7	9	9		
-Okay	00	00	00	00	22	22		
-Pretty well	00	00	00	00	56	56		
-Very well	00	00	00	00	00	00		
3- Have a chat with an unfamiliar person							45.13	0.001
-Not at all	91	91	91	91	13	13		
-Not very well	9	9	9	9	10	10		
-Okay	00	00	00	00	23	23		
-Pretty well	00	00	00	00	54	54		
-Very well	00	00	00	00	00	00		
4- Work in harmony with classmates							52.01	0.001
-Not at all	82	82	82	82	14	14		
-Not very well	18	18	18	18	10	10		
-Okay	00	00	00	00	24	24		
-Pretty well	00	00	00	00	52	52		
-Very well	00	00	00	00	00	00		
5- Tell other children that their are doing something that I don't like							0.001	0.001
-Not at all	84	84	84	84	14	14		
-Not very well	16	16	16	16	11	11		
-Okay	00	00	00	00	25	25		
-Pretty well	00	00	00	00	50	50		
-Very well	00	00	00	00	00	00		
6- tell a funny event to a group of children							24.16	0.001
-Not at all	84	84	84	84	14	14		
-Not very well	16	16	16	16	11	11		
-Okay	00	00	00	00	24	24		
-Pretty well	00	00	00	00	49	49		
-Very well	00	00	00	00	00	00		
7- Stay friends with other children							84.34	0.001
-Not at all	84	84	84	84	15	15		
-Not very well	16	16	16	16	11	11		
-Okay	00	00	00	00	28	28		
-Pretty well	00	00	00	00	46	46		
-Very well	00	00	00	00	00	00		
8- Prevent quarrels with other children							17.12	0.001
-Not at all	83	83	83	83	15	15		
-Not very well	17	17	17	17	11	11		
-Okay	00	00	00	00	31	31		
-Pretty well	00	00	00	00	43	43		
-Very well	00	00	00	00	00	00		

Statistically significant at  $P \leq 0.05$ Highly significant  $P < 0.001$ 

Table (V): Difference in emotional self- efficacy score as reported by the studied children pre, immediate post and one month after the empowerment program (n=100).

Items	Time			ANOVA
	Pre	Immediate post	After one month	



	No	%	No	%	No	%	f	P
1- Cheer themselves up when unpleasant event happens								
-Not at all	93	93	93	93	12	12	72.11	0.001
-Not very well	7	7	7	7	10	10		
-Okay	00	00	00	00	15	15		
-Pretty well	00	00	00	00	63	63		
-Very well	00	00	00	00	00	00		
2-Become calm after being very scared								
-Not at all	91	91	91	91	11	11	60.34	0.001
-Not very well	9	9	9	9	12	12		
-Okay	00	00	00	00	17	17		
-Pretty well	00	00	00	00	60	60		
-Very well	00	00	00	00	00	00		
3- Prevent becoming nervous								
-Not at all	91	91	91	91	13	13	22.13	0.001
-Not very well	9	9	9	9	11	11		
-Okay	00	00	00	00	22	22		
-Pretty well	00	00	00	00	54	54		
-Very well	00	00	00	00	00	00		
4- Control their feelings								
-Not at all	83	83	83	83	14	14	45.31	0.001
-Not very well	17	17	17	17	10	10		
-Okay	00	00	00	00	23	23		
-Pretty well	00	00	00	00	53	53		
-Very well	00	00	00	00	00	00		
5- Give themselves a pep-talk they feel low								
-Not at all	85	85	85	85	13	13	13.12	0.001
-Not very well	15	15	15	15	12	12		
-Okay	00	00	00	00	20	20		
-Pretty well	00	00	00	00	55	55		
-Very well	00	00	00	00	00	00		
6- Tell a friend that they don't feel well								
-Not at all	86	86	86	86	13	13	14.27	0.001
-Not very well	14	14	14	14	12	12		
-Okay	00	00	00	00	27	27		
-Pretty well	00	00	00	00	48	48		
-Very well	00	00	00	00	00	00		
7- Suppress unpleasant thoughts								
-Not at all	83	83	83	83	15	15	45.28	0.001
-Not very well	17	17	17	17	11	11		
-Okay	00	00	00	00	29	29		
-Pretty well	00	00	00	00	45	45		
-Very well	00	00	00	00	00	00		
8-Not worry about things that might happen								
-Not at all	83	83	83	83	15	15	56.14	0.001
-Not very well	17	17	17	17	11	11		
-Okay	00	00	00	00	31	31		
-Pretty well	00	00	00	00	43	43		
-Very well	00	00	00	00	00	00		

Statistically significant at  $P \leq 0.05$ Highly significant  $P < 0.001$

**Table (VI):** Comparison between total self-efficacy level of the studied children before and after one month of the empowerment program (n=100).

Self-efficacy	Time												T	p
	Before						After one month							
	Low		Moderate		High		Low		Moderate		High			
No	%	N0	%	N0	%	No	%	No	%	No	%			
Academic	100	100	00	00	00	00	23	23	26	26	51	51	-18.77	0.001
Social	100	100	00	00	00	00	23	23	27	27	50	50	-18.85	0.001
Emotional	100	100	00	00	00	00	24	24	76	76	00	00	-18.92	0.001

Statistically significant at  $P \leq 0.05$

Highly significant  $P < 0.001$

**Table (VII):** Comparison of total knowledge mean scores among the studied children pre, immediate post and one month after the empowerment program.

Time	Mean±SD	f	P
-Pre	3.64 ±1.5924	215.392	0.001
-Immediate post	13.54 ± 0.42650		
-After one month	10.78 ± 0.39532		

Statistically significant at  $P \leq 0.05$

**Table (VIII):** Comparison of total mean score of self-efficacy among the studied children pre, immediate post and one month after the empowerment program.

Time	Mean±SD	F	P
Pre	27.32 ±5.94398	18.977	0.001
Immediate post	27.32 ±5.94398		
After one month	75.48 ±24.30176		

Statistically significant at  $P \leq 0.05$

**Table (IX):** Correlation matrix of the studied children's self-efficacy, knowledge total scores and their characteristics after the empowerment program.

Children's characteristics	Spearman's rank correlation coefficient			
	Self -efficacy	Knowledge		
	After one month	Immediate post	After one month	
Age	r	.377**	.463**	.215*
	p	.001	.001	.032
Sex	r	.519	.589	.235
	p	.334	.389	.205
Educational level	r	.513**	.305**	.393**
	p	.001	.002	.001
Disease duration	r	.126	.190	.125
	p	.213	.059	.216

(\*) Statistically significant at  $P \leq 0.05$

(\*\*) statistically significant at  $p < 0.001$

## Discussion

Children with thalassemia need to know the disease process, signs and symptoms, complication, treatment effect to be able to resume control on their bodies and eventually fulfill their social and academic roles. One of the most important modifiable constructs for children's adjustment is self-efficacy. Coping with thalassemia major is best when the

children's demonstrates high self-efficacy (Bonjar & Allahyari, 2018)

According to the present study results, none of the children in the study sample had satisfactory knowledge about thalassemia and related management before implementation of the empowerment program. This finding is in accordance with the results of a study conducted in Abu-Reyhan specific diseases

center in Iran titled "The effect of family-centered empowerment program on self-efficacy of adolescents with thalassemia major" who noted that unsatisfactory children knowledge about thalassemia major before educational program implementation (Borimnejad *et al.*, 2018). This could be attributed to lack of knowledge about thalassemia because these children newly diagnosed and the highest percent of them were enrolled in primary school and younger to recall the knowledge related their chronic illness.

The results of current study revealed that significant improvements in children's knowledge, and the majority of them had satisfactory knowledge after attending the empowerment program. Moreover, the children's knowledge level was retained at one-month after the program, although with some slight declines, which indicated that the empowerment program had a long lasting effect on children's knowledge. In agreement with Tarakmeh *et al.* (2018), in a study of "The evaluation of the effect of self-care education on the self-efficacy of adolescents with thalassemia major", who reported that there is significant improvement in children's knowledge after implementation of the empowerment program.

As regards the total mean scores of children knowledge about thalassemia, the current study results revealed that there were highly statistically significant difference between children knowledge pre, immediate post and one month toward improvement after attending the empowerment program. These findings goes in line with Sadek *et al.* (2020), who studied "Self-efficacy of adolescents with thalassemia major" in Assiut, Egypt, and reported that, eighty percent of study participants had good knowledge on management of thalassemia after implementation of health education program.

The implementation of empowerment program to these children proved to be significantly effective in improving their knowledge. This leads to acceptance of the previously stated research hypothesis number (1): children who would receive the

empowerment program would have satisfactory knowledge than before.

Regarding academic self-efficacy most of school age children reported to be (not do well at all/or not do very well) pre the empowerment program. In line with present study result, Borimnejad *et al.* (2018), who stated that, thalassemia major have a significant negative impact on social and educational activities of children and adolescents as children cannot attend school because of hospitalization, frequent blood transfusions and treatment. Also Gupta (2017), emphasized that the chronic nature of thalassemia causes changes in different aspects of children's life, including their self-efficacy. The disease management may increase the child dependency on others and feel helplessness.

However, the current study result revealed that after the program implementation about forty-three children expressed that they were "pretty well" "able to satisfy their parents with their school work" and more than half of them stated that they were "pretty well" in "getting teachers help when they were stuck in schoolwork". A similar success in improving academic self-efficacy for children with thalassemia was reported in a study in Egypt by Sadek *et al.* (2020), who revealed that higher self-efficacy levels were noted among children with good knowledge levels.

With regard to social self-efficacy before the empowerment program, this present study noticed that highest percent of the children their social self-efficacy either "not at all" or "not very well" and stated that they could not "express opinions when other classmates disagree with them". While after the program the picture was totally reversed as more than half of them verbalized that they "pretty well" capable of "express opinions when other classmates disagree with them". These results go in line with Baghersalimi *et al.* (2021), in a study titled "The evaluation of self-efficacy in children and adolescents with thalassemia major"; concluded that the rate of social self-efficacy in children with thalassemia was moderate (52.5%) to good (45%). The authors clarified that allocation of a specific ward, easy access to health care staff, and social support for patients may seem to justify the moderate to

good self-efficacy in these patients. From the researchers' point of view the improvement of the children social self – efficacy might be due to increased children's' knowledge about thalassemia after the empowerment program and educational level of these children.

Regarding emotional self-efficacy, the present study finding displayed that before the program all the children were not able "pretty well" to carry out any of the emotional dimensions while after the program children were able to "pretty well" carry out emotional self-efficacy dimensions. These results were in accordance with a study done by Borimnejad et al. (2018), who concluded that implementation of family-centered empowerment program for children with thalassemia major is practically feasible and it can increase the emotional self-efficacy in these children.

Concerning self-efficacy levels, the current study showed clearly that all children had low academic, social and emotional self-efficacy before the implementation of the empowerment program. These results are supported by Sheibani et al. (2015), who studied "The self-efficacy of adolescents with major thalassemia and its influencing factors in Bandar Abbas", who highlighted that the majority of the adolescents had low self-efficacy levels. Concerning the effect of the empowerment program on the self-efficacy among the studied children, about half of them expressed high academic and social self-efficacy. Also the same findings demonstrated more than three quarters of children verbalized having moderate emotional self-efficacy. These study results disagree with Sadek et al (2020). who evaluated self-efficacy levels among the studied adolescents, and stated that most of them (80.0%) had low self-efficacy levels after the program.

In addition, the study results reported significant improvement in academic, social and emotional self-efficacy levels of children after one month of the program. On the same line, similar improvement of self-efficacy levels of children with thalassemia was reported in previous studies (*Moghadam et al, 2016*) and (*Parhiz et al., 2016*).

After receiving the empowerment program, there were highly significant

improvement in the total mean scores of self-efficacy of children in the current study sample. These results go in line with results of Hussein and Mansour (2015), who studied "Self-efficacy among thalassemic adults patients at hereditary anemia's centers in Baghdad", and reported that the mean score of self-efficacy in adolescent with major thalassemia was high after the program. The researcher's views that as school age children are cognitively in the stage of concrete operational thinking as well as psychosocially in the stage of achieving the positive sense of industry. Children at this age start to understand the cause and effect of concepts and also they strive to fulfill real tasks and they feel competent when this task is recognized by significant adults. As a result they comprehended the knowledge given to them in the empowerment program and that comprehension was reflected in better self-efficacy total scores achieved by them.

The empowerment program had highly significant positive impact on self-efficacy; social, emotional and academic achievement among school age children. This leads to acceptance of the previously set study hypothesis number (2): children who would receive the empowerment program would have higher self-efficacy score than before.

The present study identified a positive and significant influence of children's age on their self-efficacy and knowledge scores. In agreement with the current study results, Cikkaleli (2014) reported that positive relation between children age and their self-efficacy score was detected. Thus, Belil et al (2018) stressed that the importance of taking child's age and cognitive development into account in the empowerment programs. The researchers found that this is quite expected considering the increasing social abilities and the more eagerness to be self-dependent in school age children. Additionally, in the present study, educational level seemed to have a significant positive influence on children self-efficacy and knowledge scores, which is supported by the findings of Thalassemia International Federation (2019) that highlighted the presence of a positive relation between knowledge about disease level and better health behaviors. Meanwhile, the current study revealed that children's gender and disease duration had no

influence on their self-efficacy and knowledge, which is congruent with the results reported by Hoffman (2014).

### **Conclusion:**

The current study results concluded that children with thalassemia who attending the empowerment program had a significant improvement in knowledge of children which detected immediate post and one month after the empowerment program, but self-efficacy improved significantly only after one month.

### **Recommendations:**

Based on the study findings the following is recommended:

- 1- Empowerment programs must be implemented in all settings providing care to school age children with thalassemia.
- 2- The impact of such empowerment program on the self-efficacy needs further research studies using a randomized clinical trial design for more robust evidence.

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