

# Designing a psychosocial empowerment model for children with Down Syndrome

Fataneh Ghalichin<sup>1\*</sup>, Mohammad Mostafavi<sup>2</sup>

<sup>1</sup> Department of Psychology and Consulting, South Tehran Branch, Islamic Azad University, Tehran, Iran. <sup>2</sup> Department of Consulting, Faculty of Education and Psychology, University of Isfahan, Isfahan, Iran.

**Correspondence:** Fataneh Ghalichin; Department of Psychology and Consulting, South Tehran Branch, Islamic Azad University, Tehran, Iran. Email: f\_ghalichin54@yahoo.com

## ABSTRACT

In a descriptive-testing study to design and develop a tool for measuring the capabilities and resources that affect the development and adaptation of children with Down Syndrome, 300 children with Down Syndrome in Sistan and Baluchistan Province were selected via total sampling method. The required data were collected through a 19-item researcher-made questionnaire, namely the Down Syndrome Empowerment Scale, and the Vineland Social Maturity Scale. The results of Exploratory Factor Analysis with oblique rotation (direct oblimin) revealed a 17-item construct with three subscales of personal (9 items), family-related (4 items) and social (3 items). Using AMOS software, the results of Confirmatory Factor Analysis also supported the adequacy of the extracted factors to the data. The significant positive Pearson correlation coefficient confirmed the concurrent validity of the Down Syndrome Empowerment Scale compared to the Vineland Social Maturity Scale. Calculating Cronbach's alpha and test-retest correlation, the reliability of the Empowerment scale was also confirmed. Normative tables were calculated based on the percentage ratings and standard t-scores by gender for the Down Syndrome Empowerment Scale. The results of this study supported the adequacy and reliability of the designed 3-construct scale for the assessment of capabilities and resources affecting the development and adaptation of children with Down Syndrome.

**Keywords:** the Down Syndrome Empowerment Scale, Personal Factors, Family-related Factors, Social Factors

## Introduction

One of the most common and detectable genetic disorders is Down Syndrome (DS). People with Intellectual Disability (ID) exist in all social classes, races, relatives, and genders. However, some types of ID are mainly found in socially-economically poor families, or those who receive little parental care. The ID is related to the basic constraints in current functioning. The ID is defined as intellectual functioning well below the average and simultaneous limitations in two or more adaptive skills (e.g. communication, self-care, living at home,

social skills, self-management, health and safety, functional education, and leisure activities and work). ID first appears in children under the age of 18 [1]. According to the results of previous studies, 20-30% of intellectually disabled children, compared with 4-10% of healthy children, have behavioral problems [2]. Almost 15% of children diagnosed with a mental health problem are also intellectually disabled [3], while 16-41% of intellectually disabled adults experience mental health problems [4]. The results of epidemiological studies have shown that intellectually disabled children show four times more emotional or behavioral disorders than their healthy peers [2]. In a study on the analysis of mental disorders and behavioral problems in people with ID, Myrbakk and Tetzchner (2015) reported that people with mild to moderate ID showed higher levels of depression and more psychological symptoms than those with severe or profound ID [5]. Meanwhile, symptoms of mental disorders in a group of people with behavioral problems indicated that most behavioral problems are possibly uncommon symptoms of mental disorders, or that life difficulty can cause behavioral problems [6]. Theories of social learning

### Access this article online

Website: [www.japer.in](http://www.japer.in)

E-ISSN: 2249-3379

**How to cite this article:** Fataneh Ghalichin, Mohammad Mostafavi. Designing a psychosocial empowerment model for children with Down Syndrome. *J Adv Pharm Edu Res* 2019;9(S2):126-134. Source of Support: Nil, Conflict of Interest: None declared.

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empowerment have hypothesized how environmental conditions and social cognition affect interpersonal behaviors. Their two major propositions are conditional learning and observational learning. In the conditional learning, helping, sharing, aggressive or gender-specific behaviors, and many other social performances are affected by punishment or reward they bring about. Social empowerment is very important for children with DS; thus, it is necessary to know the obstacles to their social adaptation in school, and later, in their workplaces. Being credulous (believing things easily) and naïve (lacking wisdom, or judgment) are two qualities attributed to children with DS. These children cannot properly detect the most revealing and funny lies as false propositions. The development of self-image and the ability to build and maintain social relations are only two examples of psychosocial processes that may be assessed. The ways children cope with their disabilities may be the most important factors in their success in life and education. Some people strongly believe that psychosocial deprivation (i.e., a combination of poor social and cultural environments that affect the first years of life) may play an important role in the incidence of IDs. The lack of rich cultural experiences has a dramatic effect on the life of a child, but the kind of cultural experiences is trivial. The results of various studies have indicated that environmental deficiencies, especially in the first years of life, are the causes of many types of IDs. Poverty and social chaos in the family environment increase the risk of ID; they also play an important role in the occurrence of primary and progressive defects and cognitive problems. Rehabilitation is a purpose-oriented process; this process has a time limit, aimed at empowering a disabled person to reach a specific functional, physical, mental and social level. In this regard and based on Article 144 of the Constitution, Iran's Welfare Organization have been seeking to concede public rehabilitation centers to the private sector since 1993 in order to reduce government enterprises and expenditures, improve employment opportunities and strengthen the target population. From the very beginning, the lack of appropriate educational-interventional content for empowering personal, social and family-related skills of children with DS based on the local context and poverty of culture in Sistan and Baluchistan province was felt. On the other hand, only one tool existed for assessing the developments of children with DS in the contexts of speech therapy, occupational therapy, physiotherapy and education: the Welfare Organization distributed the tool among health centers; then, therapists and active specialists in those centers tried out the tool as pretests-posttests; and finally, the results were reported four times a year to parents and experts in the field of rehabilitation. Thus, in 2006, the Welfare Organization sent seven educational books to every province; the books were developed to educate people on self-help and social skills. However, the skills were dealt with only at the individual level, and as the data revealed, no significant change was observed in people's behaviors. Given the mentioned problems resulting from the lack of a proper theoretical-empirical foundation, the present study was carried out to design a native educational

model based on the specific social and environmental limitations that exist in Sistan and Baluchistan province of Iran. Accordingly, the present study was conducted to answer the following question:

What is the most appropriate empowerment model for children with DS?

## Methodology

This study is an applied and quantitative research because its results can be directly used to measure capabilities that affect the development and adaptation of children with DS. In terms of design, this is a descriptive-testing study. The population consisted of all children with DS in Sistan and Baluchistan province (the exact number was not available, but based on the number of cases received by the Welfare Organization, the size of the population was estimated to be 2000). According to the Morgan table, the sample size was determined to be 322 (for a population of 2000 children). However, since 22 questionnaires were not completed, the study was conducted on a sample of 300 children. The samples were selected via the total sampling method. Families of children with DS agreed to participate in this study, done in nine rehabilitation centers in Sistan and Baluchistan province. The researcher's colleagues, who had already received the necessary training on how to interview with the participating family members, helped them (253 mothers & 47 fathers) complete the study's questionnaire. The descriptive statistics of the samples will be presented in the Results section. Exploratory Factor Analysis (EFA) was performed on the data obtained from the total samples; then, Confirmatory Factor Analysis (CFA) was conducted on the data obtained from 200 samples. 45 participants were tested twice and with a 2-week interval. 100 participants completed the Down Syndrome Empowerment Scale (DSES) and the Vineland Social Maturity Scale (VSMS). The theoretical basis of the DSES development was shaped based on a review of all related books and studies (n=75). In addition to the demographic questionnaire, two other research tools were used in the present study. The DSES was designed by the study's researcher to assess factors that affect the empowerment of children with DS. The goal was to develop a tool for the measurement of effective factors in the development and adaptation of children with DS. The VSMS was developed by Doll (1953) to measure the social competence of intellectually disabled people in the age range of 0-25 years. The VSMS has been translated into Persian language and validated to be used for the Iranian population by Barahani, Vali Akhvat and Loghman in 1978. The VSMS has 117 items, each of which is answered via holding an interview with either the subject or his/her caretaker. The VSMS has eight subscales of communication skills, general self-help ability, locomotion skills, occupation skills, self-direction, self-help eating, self-help dressing, and socialization skills. The VSMS's items are grouped into year levels. For each person, the year level starts one level before his/her chronological age. In case of success in each level (i.e., all items are answered positively), the test goes on to the next level, but in the event of

failure (i.e., one or more items are answered negatively), the test goes back to the previous level. An example of this tool's item for the age level of 8-9 years is "does routine household tasks", which receives a passing score (i.e., 1) under three different scenarios: 1) the subject can perform the task successfully; 2) the subject has the ability to perform the task, but his/her parents have not let him/her do that so far; and 3) the subject has not performed the task so far due to a specific reason, not the lack of ability. In scoring this tool's items, the point 0.5 is allocated to an item, when the subject can do a specific task successfully in 50% of cases. Based on the VSMS's scoring key, the subject's score in each of the eight subscales is determined. Then, the VSMS's normative table is used to determine the subject's social age. Finally, the obtained social age is divided by the subject's chronological age, and then, the result is multiplied by 100. The resulting score is the individual's social maturity score. The SPSS software was used for the analysis of descriptive data and EFA to extract appropriate items from the initial 19-item scale. AMOS software was applied to perform CFA. The SPSS software was also used to determine concurrent validity (Pearson correlation between DSES and the VSMS scores) and construct validity (internal consistency) (calculating the correlation between different items and estimating the role of each item in the reliability of the total scale) of the scale. Reliability of the scale was confirmed through the calculation of internal consistency and Cronbach's alpha and test-retest reliability coefficient (the correlation between pretest and posttest scores with a 2-week interval). Percentage ratings and standard t-scores were likewise calculated via the SPSS software.

## Results

The descriptive statistics, including maximum and minimum scores, means and Standard Deviations (SD) of the 19 initial items of the DSES are presented in table (1).

**Table 1. Descriptive statistics in the initial items of the DSES**

Items	Minimum	Maximum	Mean	SD
(4) S/he can communicate well with others.	1.00	5.00	2.67	0.96
(6) S/he has speed and agility in the physical activities as required by her/his age.	1.00	5.00	2.57	1.00
(9) S/he understands and responds to others' feelings and emotions properly.	1.00	5.00	3.14	0.86
(10) S/he has access to appropriate systems for specialized assistance in her/his living environment.	1.00	5.00	2.62	1.03
(15) His/her family have achieved a clear understanding of their child's condition.	1.00	5.00	3.19	0.81
(16) His/her family can coherently support their child.	1.00	5.00	3.10	0.89

As shown in table (1), the items 15 (mean=3.19; SD=0.81), 9 (mean=3.14; SD=0.86) and 16 (mean=3.10; SD=0.89) had

respectively the highest means, and the items 6 (mean=2.27;SD=0.1), 10 (mean=2.62; SD=1.03) and 4 (mean=2.67; SD=0.96) had respectively the lowest means.

**Table 2. Bartlett test results to examine the adequacy of the sample size in EFA**

KMO	Chi-square	DF	Sig.
0.93	2398.31	171	<0.001

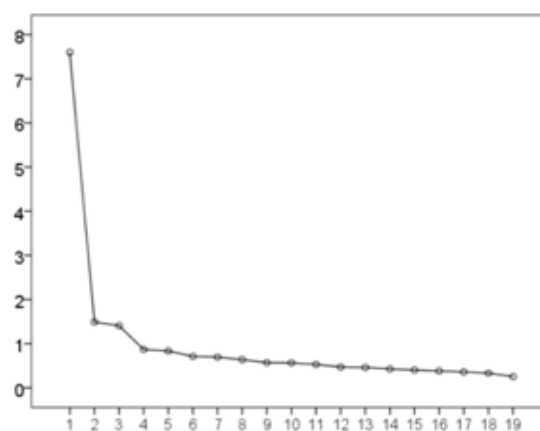
According to the results presented in table (2), KMO (=0.93)>0.80 and Sig. (i.e.,  $p<0.001$ ) <0.05 confirmed the adequacy of the sample size.

**Table 3. Results of factors extracted through EFA of the initial items of the DSES**

Factor	Specific value	Percentage of variance	Cumulative percentage
1	7.60	39.100	39.100
2	1.49	7.84	47.84
3	1.41	7.40	55.24

As shown in table (3), in the initial version of the DSES, only three factors had specific values>1; the mentioned factors covered more than 55% of the items' variance.

A more detailed view of the extracted factors along with each factor's share in explaining the items' variance are presented in Figure (1).



**Figure 1. The extracted factors in EFA of the initial items of the DSES**

As can be seen in Figure (1), only three factors had specific values>1. Since factors affecting empowerment were considered a correlated compound, oblique rotation technique was used in EFA (direct oblimin with delta value=0).

**Table 4. Results of EFA for the primary version of the DSES**

Items	Factor 1	Factor 2	Factor 3
(2) S/he has a positive attitude toward her/himself.	0.84		
(17) S/he has a good performance in performing her/his affairs.	0.73		
(18) S/he can properly communicate with her/his peers.	0.71		

(4) S/he can properly communicate with others.	0.65
(19) S/he can understand and express her/his feelings and emotions.	0.62
(5) S/he can properly express her/himself and her/his needs to her/his family.	0.61
(1)S/he has precision in her/his physical movements as required by her/his age.	0.49
(6) S/he has speed and agility in the physical activities as required by her/his age.	0.48
(7) S/he properly responds to environmental sensory stimuli.	0.47
(8) S/he can properly understand and respond to her/his life issues.	
(9) S/he understands and responds to others' feelings and emotions properly.	
(16) His/her family can coherently support their child.	0.82
(12) His/her family have properly accepted their child's condition.	0.77
(15) His/her family have achieved a clear understanding of their child's condition.	0.60
(14) After accepting their child's condition, his/her family have adapted themselves to everyday life issues and their relationships with others.	0.75
(13) His/her family have taken good measures to increase his/her chance of growth and adaptation.	0.65
(3) His/her family and friends support him/her.	0.62
(11) S/he has supportive peers.	0.59
(10) S/he has access to appropriate systems for specialized assistance in her/his living environment.	0.56

According to the results presented in table (4), the first factor included all items relating to the personal variables (physical, emotional, cognitive, social and communicational skills of each individual child). However, in the initial version of the DSES, the items 8 and 9 did not show proper factor loadings (factor loadings<0.40) for the three extracted factors.

The second factor included items relating to the social variables outside the family. All three items in this category had positive factor loadings.

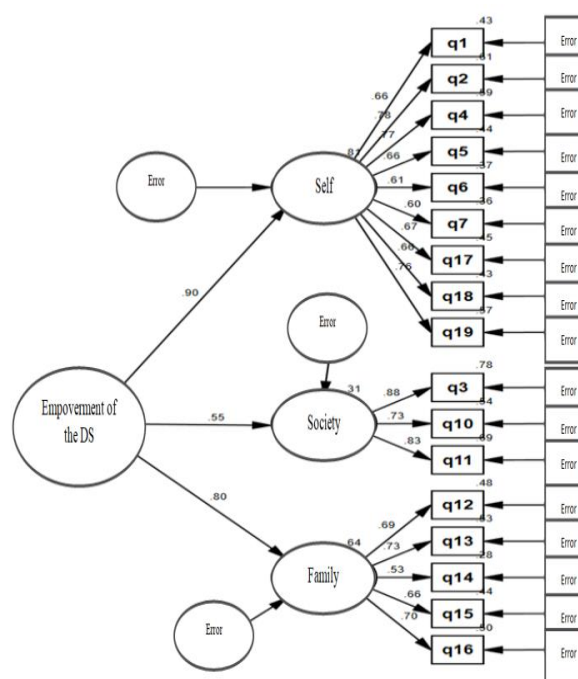
The third factor included all items relating to the role of family (internal, external and functional adaptation of family members in supporting their child); however, the item 9 did not play a significant role in neither this factor nor other factors.

**Table 5. Pearson correlation coefficients between the extracted factors in EFA of the DSES**

	Factor 1	Factor 2
Factor 2	0.50	-
Factor 3	0.64	0.45

As shown in table (5), the first factor (personal factor) had the strongest positive correlation with the third factor (family-related factor) ( $r=0.64$ ). Moreover, the second factor (social factor) was positively correlated with both personal ( $r=0.50$ ) and family related ( $r=0.45$ ) factors.

As previously mentioned, the data related to 300 samples were used for EFA; unfortunately, having access to other samples was very difficult; therefore, the data related to 200 samples (randomly selected out of the 300 samples) were used for CFA.



**Figure 2. Results of CFA of the DSES**  
\* n=200 (128 male, 72 female)

As shown in Figure (2), all items had good factor loadings ( $r>0.40$ ) in their respective factors. Furthermore, each extracted factor had a proper factor loading in the general variable of empowerment. Accordingly, the general variable of empowerment could explain 81% of the variance in personal factor, 64% of the variance in family-related factor and 50% of the variance in the social factor.

**Table 6. The output of calculating fit indices for CFA of the DSES**

	X2/df	P	SRMR	AGFI	NFI	IFI	TLI	CFI	RMSEA	PCLOSE
Limit	<5	>0.05	<0.08	>0.90	>0.90	>0.90	>0.90	>0.90	<0.08	>0.05
observed	1.41	0.002	0.047	0.89	0.90	0.97	0.96	0.97	0.045	0.68

\*the limit values for the indices were specified according to Dilalla (2000);  $X^2=163.44$ ;  $df=116$ .

As presented in table (6), only the values of P and AGFI were slightly beyond their limits. Regarding the appropriacy of other

observed indices, it was concluded that the model had a good fit with the data.

**Table 7. Statistical significance of paths presented in Figure (2)**

Paths	Non-standard estimation	Standard estimation	Standard Error	Critical Ratio	Sig.
Empowerment → Personal Factor	1.00	0.90	-	-	-
Empowerment → Social Factor	0.90	0.55	0.18	5.11	<0.001
Empowerment → Family-related Factor	0.98	0.80	0.19	5.19	<0.001
Personal Factor → q1	1.00	0.66	-	-	-
Personal Factor → q2	1.25	0.78	0.13	9.45	<0.001
Personal Factor → q4	1.28	0.77	0.14	9.37	<0.001
Personal Factor → q5	1.04	0.66	0.13	8.22	<0.001
Personal Factor → q6	1.03	0.61	0.14	7.64	<0.001
Personal Factor → q7	0.93	0.60	0.12	7.55	<0.001
Personal Factor → q17	1.10	0.67	0.13	8.35	<0.001
Personal Factor → q18	1.07	0.66	0.13	8.20	<0.001
Personal Factor → q19	1.19	0.76	0.13	9.21	<0.001
Social Factor → q3	1.00	0.89	-	-	-
Social Factor → q10	0.84	0.73	0.08	11.30	<0.001
Social Factor → q11	0.85	0.83	0.07	12.84	<0.001
Family-related Factor → q12	1.00	0.69	-	-	-
Family-related Factor → q13	0.99	0.73	0.11	8.70	<0.001
Family-related Factor → q14	0.73	0.53	0.11	6.57	<0.001
Family-related Factor → q15	0.85	0.66	0.11	8.06	<0.001
Family-related Factor → q16	0.99	0.71	0.12	8.48	<0.001

As the results presented in table (7) indicate, the paths presented in Figure (2) were statistically significant ( $p < 0.05$ ). the results also showed that all items had positive factor loadings in their respective factors.

The correlation between DSES and VSMS scores of 104 subjects was calculated to determine the concurrent validity of the DSES.

**Table 8. Pearson correlation coefficients between DSES and VSMS scores**

	The DSES			
	Personal Factor	Family-related Factor	Social Factor	Total score
Person correlation coefficient with the VSMS	0.46	0.32	0.28	0.36
Sig.	<0.001	0.001	0.005	<0.001

\*n=104 (52 female, 52 male)

As shown in table (8), the DSES scores had a significant positive correlation with the VSMS scores, indicating the proper concurrent validity of the DSES.

The reliability of the DSES was determined by the two methods of internal consistency (Cronbach's alpha) and test-retest reliability.

To calculate the validity coefficients of the DSES' subscales, the correlation between each item's score and that item's respective factor's total score was calculated for a subsample of 200 people.

To calculate the reliability coefficients of the DSES, the correlation between each factor's total score and the DSES total score was calculated.

**Table 9. Internal consistency of personal factor items**

Item number	Case-deletion variance	Correlation with the total score	Case-deletion reliability
-------------	------------------------	----------------------------------	---------------------------

1	25.95	0.55	0.85
2	24.11	0.70	0.84
4	24.70	0.64	0.84
5	24.96	0.58	0.85
6	23.82	0.58	0.85
7	26.60	0.42	0.86
17	24.22	0.62	0.85
18	24.54	0.59	0.85
19	24.54	0.67	0.84

\*Reliability of the total scale was 0.86; n=200 (128 male, 72 female)

As shown in table (9), none of the items had a negative impact on the total reliability of the DSES; moreover, all items had a proper correlation with the total DSES score ( $r > 0.40$ ). Therefore, the DSES had a proper validity coefficient concerning the subscale of the personal factor.

**Table 10. Internal consistency of family-related factor items**

Item number	Case-deletion variance	Correlation with the total score	Case-deletion reliability
12	6.39	0.51	0.77
13	5.98	0.69	0.71
14	6.52	0.46	0.79
15	6.88	0.56	0.76
16	6.29	0.66	0.72

\*Reliability of the total scale was 0.80; n=200 (128 male, 72 female)

As shown in table (10), none of the items had a negative impact on the total reliability of the DSES; moreover, all items had a proper correlation with the total DSES score ( $r > 0.40$ ). Therefore, the DSES had a proper validity coefficient concerning the subscale of family-related factor.

The results of calculating internal consistency of the subscale of social factor are presented in table (11).

**Table 11. Internal consistency of social factor items**

Item number	Case-deletion variance	Correlation with the total score	Case-deletion reliability
3	3.08	0.54	0.77
10	2.68	0.66	0.65
11	2.62	0.64	0.67

\*Reliability of the total scale was 0.77; n=200 (128 male, 72 female)

As shown in table (11), none of the items had a negative impact on the total reliability of the DSES; moreover, all items had a proper correlation with the total DSES score ( $r > 0.40$ ). Therefore, the DSES had a proper validity coefficient concerning the subscale of the social factor.

The results of calculating internal consistency of the overall DSES are presented in table (12).

**Table 12. Internal consistency of the DSES factors**

Factor	Case-deletion variance	Correlation with the total score	Case-deletion reliability
Personal Factor	16.80	0.68	0.81
Family-related Factor	46.65	0.75	0.52
Social Factor	56.33	0.66	0.68

\*Reliability of the total scale was 0.85; n=200 (128 male, 72 female)

As shown in table (12), none of the factors had a negative impact on the total reliability of the DSES; moreover, all factors had a proper correlation with the total DSES score ( $r > 0.40$ ). Therefore, the overall DSES had a proper validity coefficient.

In order to determine the reliability of the DSES, internal consistency (Cronbach's alpha) and test-retest (with a 2-week interval) reliability coefficients were calculated.

In table (13), the results of calculating internal consistency based on the data related to a subsample of 200 persons are

presented. To calculate the reliability of the total DSES, instead of 17 scores of 17 items, three scores of three subscales were used since increasing the number of items could lead to an unrealistic reliability coefficient.

**Table 13. Cronbach's alphas for calculating the internal consistency of the DSES**

	Personal Factor	Family-related Factor	Social Factor	Total scale
Number of items	9	5	3	17
Cronbach's alpha	0.86	0.80	0.77	0.85

\* n=200 (128 male, 72 female)

As the results presented in table (13) indicate, the DSES had proper reliabilities concerning its three subscales as well as the total scale ( $\alpha > 0.70$ ).

In table (14), the output of calculating Pearson correlation between the DSES scored in a 2-week interval are presented for 45 children with DS.

**Table 15. Pearson correlation coefficients between the DSES' scores in a two-week interval**

	Personal Factor	Family-related Factor	Social Factor	Total scale
Pearson correlation coefficients	0.86	0.75	0.73	0.93
Sig.	<0.001	<0.001	<0.001	<0.001

\*n=45 (23 male, 22 female)

As shown in table (15), the Pearson correlation coefficient was higher than 0.70 in all subscales as well as the total scale, indicating the proper reliability of the DSES.

In tables (16, 17, 18 & 19), the results of calculating percentage rankings of the DSES three subscales as well as the total scale are presented in terms of gender.

**Table 16. Percentage rankings in personal factor of the DSES**

Raw scores	Males		Females		Raw scores	Males		Females	
	Frequency	Percentage rating	Frequency	Percentage rating		Frequency	Percentage rating	Frequency	Percentage rating
12.00	1.00	0.67	0.00	0.00	25.00	3.00	61.74	11.00	55.63
13.00	1.00	1.34	2.00	1.32	26.00	7.00	66.44	6.00	59.60
14.00	1.00	2.01	2.00	2.65	27.00	6.00	70.47	6.00	63.58
15.00	3.00	4.03	1.00	3.31	28.00	10.00	77.18	7.00	68.21
16.00	4.00	6.71	1.00	3.97	29.00	8.00	82.55	6.00	72.19

As specified in table (16), the 50% ranking for male participants was almost equivalent to the raw score of 23 and the total score of 24 for female participants.

**Table 17. Percentage rankings in family-related factor of the DSES**

Raw scores	Males		Females		Raw scores	Males		Females	
	Frequency	Percentage rating	Frequency	Percentage rating		Frequency	Percentage rating	Frequency	Percentage rating
6.00	1.00	0.67	0.00	0.00	15.00	21.00	67.79	13.00	50.33
8.00	5.00	4.03	1.00	0.66	16.00	11.00	75.17	18.00	62.25

As specified in table (17), the 50% ranking for male participants was almost equivalent to the raw score of 14 and the total score of 15 for female participants.

**Table 18. Percentage rankings in social factor of the DSES**

Raw scores	Males		Females		Raw scores	Males		Females	
	Frequency	Percentage rating	Frequency	Percentage rating		Frequency	Percentage rating	Frequency	Percentage rating
4.00	0.00	0.00	1.00	0.66	9.00	22.00	69.80	29.00	66.89
5.00	6.00	4.03	0.00	0.70	10.00	19.00	82.55	19.00	79.47

As specified in table (18), the 50% ranking for male participants was almost equivalent to the raw score of 8 and the score of 8 for female participants.

**Table 19. Percentage rankings in the total DSES**

Raw scores	Males		Females		Raw scores	Males		Females	
	Frequency	Percentage rating	Frequency	Percentage rating		Frequency	Percentage rating	Frequency	Percentage rating
4.00	0.00	0.00	1.00	0.66	49.00	6.00	63.76	4.00	54.30
24.00	1.00	0.67	0.00	0.00	50.00	3.00	65.77	7.00	58.94
29.00	0.00	0.67	1.00	0.66	51.00	8.00	71.14	5.00	62.25
31.00	1.00	1.34	0.00	0.66	52.00	5.00	74.50	4.00	64.90
32.00	2.00	2.68	1.00	1.32	53.00	2.00	75.84	2.00	66.23

As specified in table (19), the 50% ranking for male participants was almost equivalent to the total raw score of 45 and the total score of 48 for female participants.

**Table 20. Standard t-scores in personal factor of the DSES**

Raw score	Males standard t score	Females standard t score	Raw score	Males standard t score	Females standard t score	Raw score	Males standard t score	Females standard t score
9.00	24.76	22.74	22.00	46.47	44.23	34.00	66.51	64.07
10.00	26.43	24.39	23.00	48.14	45.88	35.00	68.18	65.72
11.00	28.01	26.04	24.00	49.81	47.54	36.00	69.85	67.38
12.00	29.77	27.70	25.00	51.48	49.19	37.00	71.52	69.03
15.00	34.78	32.66	28.00	56.49	54.15	40.00	76.53	73.99

As shown in table (20), the standard t-score of 50 for male participants was almost equivalent to the raw score of 24 and the raw score of 25 for female participants.

**Table 21. Standard t-scores in family-related factor of the DSES**

Raw score	Males standard t score	Females standard t score	Raw score	Males standard t score	Females standard t score	Raw score	Males standard t score	Females standard t score
5.00	21.95	15.75	12.00	43.01	38.52	19.00	64.26	61.29
6.00	24.97	19.00	13.00	46.13	41.77	20.00	67.28	64.54
7.00	27.99	22.25	14.00	49.15	45.02	21.00	70.30	67.79

As shown in table (21), the standard t-score of 50 for male participants was almost equivalent to the raw score of 14 and the raw score of 16 for female participants.

**Table 22. Standard t-scores in social factor of the DSES**

Raw score	Males standard t score	Females standard t score	Raw score	Males standard t score	Females standard t score	Raw score	Males standard t score	Females standard t score
3.00	22.23	20.18	8.00	47.55	45.97	13.00	72.87	71.76

4.00	27.30	25.34	9.00	52.62	51.13	14.00	77.94	76.92
5.00	32.36	30.49	10.00	57.68	56.29	15.00	82.10	82.08

As shown in table (22), the standard t-score of 50 for male participants was almost equivalent to the raw score of 8 and the raw score of 9 for female participants.

**Table 23. Standard t-scores in the total DSES**

Raw score	Males standard t score	Females standard t score	Raw score	Males standard t score	Females standard t score	Raw score	Males standard t score	Females standard t score
17.00	19.48	17.30	41.00	43.10	41.22	65.00	68.51	65.15
18.00	20.50	18.29	42.00	45.02	42.22	66.00	69.53	66.15
19.00	21.53	19.29	43.00	46.04	43.22	67.00	70.55	67.15
20.00	22.55	20.29	44.00	47.06	44.22	68.00	71.57	68.14

As shown in table (23), the standard t-score of 50 for male participants was almost equivalent to the raw score of 47 and the raw score of 50 for female participants.

## Discussion and Conclusion

The results of this study revealed that an efficient model of empowerment for children with DS must address at least the three domains of personal, family-related and social compatibilities and resources.

In line with this finding, the results of Mazaheri Tehrani (2013), Zamani (2014)<sup>[7]</sup>, Abtahi (2017)<sup>[8]</sup>, Hamzeh (2012)<sup>[9]</sup>, Burden and Byrd (2015)<sup>[10]</sup>, and Johnly (2017) studies also confirmed the importance of personal factors, especially physical capabilities, in the process of empowering children with DS. Personal, and especially physical capabilities play important roles in the development of problem-solving and self-care skills<sup>[10]</sup>; therefore, the improvement of these capabilities can help children with DS solve their problems more efficiently.

Regarding personal factors, as indicated by Reis and Benson (2013), IDs, such as DS, can lead to self-esteem and self-image problems, which cause an increase in negative emotions and inability to manage those emotions. This increase in negative emotions can be a serious stimulus for behavioral and mental disorders. The results of this study, concerning the structural nature of the empowerment model and the observed positive relationship between the empowerment model and social growth, are in line with the results of Matson, Fodstad and Sivert (2013) study, emphasizing the effectiveness of developing personal competencies at both personal and interpersonal levels in reducing the incidence of mental disorders and increasing the overall psychological well-being<sup>[11]</sup>.

In line with the results of Achenbach and Zeiger (2006) study, the results of this study showed that the growth of social competencies can be an important factor in the growth of problem-solving and adaptation capabilities.

Concerning the effectiveness of personal and interpersonal interventions in empowering children with DS, the results of this study were in line with the results of previous studies by Naeemi (2013), Ghodsi (2013), Behnam Muqaddam (2014),

Bakdeli Nasrabad (2016), Vess, et al. (2013), and Kara (2013). Therefore, the simultaneous growth of personal and interpersonal capabilities can guarantee the empowerment of children with DS.

The results of this study, concerning the importance of the correlations found between the personal, family-related and social factors in the growth and adaptation of children with DS, were in line with the World Health Organization (WHO) reports concerning that successful treatment of these children depends on the family and community's participation<sup>[12]</sup>. Thus, interventions -such as family training programs- can provide children with DS with more relaxed and protective environments, that can significantly contribute to their growth and adaptation.

As Greenspan and Greenfield (2010) indicated, negative family-related factors (e.g., poor communication with other family members, inappropriate care provided by caretakers and peers, and poor access to the social resources and mental health services) can have significant negative impacts on the growth and adaptation of children with DS.

Considering the importance of the role society and social resources play in the empowerment process of children with DS, the results of this study were consistent with findings of Mack and Kaufman (2002), who recommended the alignment of society (especially teachers and the educational system) with empowerment programs as one of the requirements for the growth of children with DS. Hence, it is expected that improving the social adaptation of children with DS and providing them with the most supportive environment -at least because of the effectiveness of such environments in reducing their anxiety levels- can have positive effects on their psychological well-being.

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