

# Health Promotion Toolkit: An Approach for Empowering Families Caring For Children with Developmental Disabilities in Tabuk

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## Abstract

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**Keywords:** Developmental disabilities; Health promotion; empowerment

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**AIM:** The study aimed to determine the effects of the health promotion toolkit on empowering families caring for children with developmental disability. It hypothesised that health promotion toolkit would effectively improve families' empowerment and alleviate parental stress.

**METHODOLOGY:** The research design was quasi-experimental. A convenience sample of 30 children with DD and their families enrolled at Shoa'a ElAmal Center in Umluj participated. Tools were Health Promotion Assessment Sheet, Family Empowerment Scale, and the Parent Stress Index.

**RESULTS:** The results documented significant lower levels of parental stress and higher levels of family empowerment among mothers at posttest than pretest. A significant negative correlation between family empowerment and parental stress was reported.

**CONCLUSION:** Health promotion toolkit had a positive effect on empowering families as well as lowering parental stress. Recommendation Health promotion toolkit should be integrated as a monitoring method of health care needs of health promotional activities for children with developmental disabilities.

## Introduction

Developmental disability is a major health concern. It includes a wide range of impairments that begin before the age of 18 years. These impairments include physical, intellectual and behavioural domains of development that may affect day-to-day functioning [1]. An American study showed that about one in six or about 15% of children have at least one type of developmental disabilities. They include physical disabilities, sensory-related disabilities, communication disabilities and intellectual disabilities [2].

Intellectual disability is a complex phenomenon refers to the mental ability and self-care skills that are below the expected level of an individual's age [3]. It results in significant deficits at an intellectual level in addition to adaptive skills [4] [5].

Approximately, 10% of the population in

developed countries and 12% of the population in developing countries are disabled [6]. In Saudi Arabia, The prevalence MR is 8.9 per 1000 children [7]. Another study reported that mental retardation was the most common neurological disorder among Saudi children with a prevalence rate of 26.3 per 10000. The researchers stressed the priority for health care planning for those children [8]. As they are at high risk for adverse health conditions such as epilepsy, neurological, gastrointestinal and behavioural disorders [9]. Generally, they have poor or fair health status [10]. However, children who received early intervention, adequate education, appropriate supports and sustained care generally have improved life outcomes. In fact, they can live independently with family support [11].

Pediatric nurses are vital in providing support to families caring for a child with intellectual disabilities. To build the necessary supportive and collaborative relationships with those families, nurses should

understand the concept of empowerment and its process [12]. Empowerment concept is widely used in health sciences particularly nursing [13].

Family empowerment is upheld as a creative strategy to provide high quality of care for chronic childhood illnesses and intellectual disabilities across a family-centred care approach [14] [15]. This approach of care delves into providing the effective family strategies that adequate care and support intellectually disabled children [16].

In other words, educating parents about their child's condition, teaching them the needed new skills, offering and providing them with the support services they need is known as empowerment strategies [17]. Hence, empowerment strategies possess the essence of health promotion that is about "enabling individuals to take control over their health and its determinants that improve their health. Thereby, they will be able to live an active and productive life [18]. Additionally, health promotion maintenance is a method utilised to maintain and enhance the existed levels of health through the implementation of effective programs, services and policies [19].

It includes health teaching, decision-making, supportive activities (screening, self-care skills, advocating for environmental change, positive health behaviours, and choices) and supportive policies in work and community settings. Therefore, health promotion categorised into three activities: prevention, protection and health education [20].

As the goals of nursing care for developmentally disabled children with are to promote their optimal social, physical, cognitive and adaptive development [21], pediatric rehabilitation nurses must be a part of the interdisciplinary team that can establish an effective management plan. They can help to maximise children's potential by advocating, health teaching, promoting and coordinating health promotion practices as supportive care intervention [22].

Although the prevalence of developmental disabilities particularly, intellectual in Saudi Arabia is similar to that reported in other countries [7] [8], limited studies are conducted. Also, there are various obstacles when researching disability field in Saudi Arabia [23].

Moreover, the cost of preventive efforts is significantly lesser than the management of expected complication; thus, cost-effectiveness favours the prevention approach [24]. The earlier the health/rehabilitative care is delivered, the more the chance of reducing the effect of disability and its' expected complication, and the more quality of life of the person [25].

Therefore, the current study could be of great help for the development of comprehensive strategies for improvement of the quality of life for families that have

one or more child with intellectual disability. For these reasons, this study was conducted to determine the effectiveness of health promotion toolkit on empowering families caring for developmentally disabled children.

### **Research question**

1. What are the effects of a health promotion toolkit on empowering families caring for children with developmental disabilities?

This study aimed to determine the effectiveness of a health promotion toolkit for children with developmental disabilities on the family empowerment.

### **Research Objectives**

1. Identify basic health-care needs of children with developmental disabilities.
2. Set a health promotion toolkit for promoting the health of children with developmental disabilities.
3. Examine parental stress among families caring for children with developmental disabilities.

### **Hypothesis**

1. Health promotion toolkit would effectively improve families' empowerment.
2. Utilization of the health promotion toolkit would alleviate parental stress.

## **Methodology**

The current study utilised a quasi-experimental design.

The study carried out at Shoa El-Aml day care centre for disabled children in Umluj city at Tabuk region KSA. It is a non-profit organisation licensed by the Ministry of work.

The researcher calculated the sample size by the formula:  $n = [(Z\alpha)^2 * (S)^2] / d^2$  at a confidence level of 0.95 and test power 80%. Where n is the sample size,  $Z\alpha$  is the level of confidence, S is the standard deviation and d is the desired precision. The estimated sample size was 138 participants, however; the convenient number was 30 children and their families. They were included based on inclusion criteria (a) children who had a diagnosis of developmental disabilities, (b) age ranges between 3-18 years and (c) IQ ranges 50-70. The researcher

excluded children who had chronic renal failure and those who enrolled in a health education program during the last 3 months.

The Research Ethics committee at the Deanship of the academic research at Tabuk University granted ethical approval for this research. The researcher clarified the objectives, importance, and safety of the study to participants. Therefore parents were voluntary participate and assured confidentiality of their data.

The researcher utilised three tools for data collection, they include:

1. **Tool one:** Health promotion Assessment sheet. It is a structured interview questionnaire designed by the researcher to assess the current health status of children and mother's knowledge about developmental disabilities. It consisted of four parts.

a) Part one included data about children characteristic such as gender, age, weight, height, parental age, education and occupation and family number.

b) Part two included data regarding medical history, immunisation, health problems and dental problems.

c) Part three included self-care skills, social problems, behavioural problems, physical activity and eating habits and safety.

d) Part four contained data regarding mothers' perception of their children health and their knowledge about developmental disabilities.

**Scoring system:** - Scores for the evaluated items (health problems, medical history, dental problems, behavioral problems, social problems and safety) are absent (3), to some degree (2) and present (1); - Scores for self-care skills are independent (3), partially dependent (2) and completely dependent (1); - Scores for mothers' knowledge are complete (3), incomplete (2) and wrong (1).

2. **Tool two:** Family Empowerment Scale (FES) that developed by Koren [26]. The scale consisted of three subscales that related to family, child's services and parents' involvement in the community. The items of the scale ranged from 1 (never) to 5 (very often). Scores above 30 on the family and child's services sub-scales and above 25 on the parents' involvement in the community sub-scale indicated empowered families. Total scores on FES were 170 points. Scores above 85 indicate significant familial empowerment.

3. **Tool Three:** "Parent Stress Index-Short Form" developed by Abidin [27]. It is a 36-item self-reported questionnaire developed to measure parental stress. It composed of three domains that are parent-distress (PD); parent-child dysfunctional interaction (PCDI); and difficult child (DC). The items

of the scale range from 1 (strongly disagree) to 5 (strongly agree). Scores above 33 on the PD and DC sub-scales and above 27 on the PCDI sub-scale are considered clinically elevated. Total score of the scale was 180 points. Scores above 90 indicate significant high level of parental stress.

### **Validity and reliability**

1. Once the researcher adopted or designed the tools for data collection, she tested its content validity. Three experts in pediatric nursing and a paediatrician ascertain their relevance and completeness.

2. Reliability of the tools was determined to assess the extent to which items were related to each other. The reliability of Health Promotion Assessment tool was  $r = 0.69$  by Cronbach's test. Koren [32] documented that Family Empowerment Scale has adequate internal consistency for each of the three subscales (Family:  $\alpha = 0.88$ ; Service System:  $\alpha = 0.87$ ; Community/Political:  $\alpha = 0.88$ ). The test-retest reliability was also found to be adequate for the three subscales (Family:  $r = 0.83$ ; Service System:  $r = 0.77$ ; Community/Political:  $r = 0.85$ ). Abidin [33] confirmed the reliability of the parent stress index by Test-retest reliability coefficients that was 0.84 and by Cronbach's test was ( $r = 0.68$ ).

### **Data collection and procedure**

1. **Written permission:** The researcher attained an authorisation from Shoa'a El-Aml Day Care Center to conduct the study after explaining the purpose of the study and methods of data collection.

2. **Pilot study:** A pilot study carried out on 10 mothers to assure clarity, consistency and feasibility of the tools. The researcher did not modify the tools.

3. **Procedure:** Data collection process is starting from March 2017 to September 2017 and contained three phases:

i. **Phase I (assessment phase):** children and parents assessment were performed to obtain baseline data regarding children and parents' characteristics, parents' knowledge about developmental disabilities, parent's perception of children overall health, children self-care skills, health problems and/or symptoms, behavioral problems, dental health, children safety, parents' stress level and empowerment level. Referral to Umliuj hospital was done for five children.

ii. **Planning Phase:** the researcher designed health promotion toolkit. It consisted of educational and training sessions for mothers which developed based on the identified areas of weakness in mothers' knowledge and health practices; it included the number of sessions, content and

methods of teaching. The objectives for health promotion toolkit were set as follows.

### **General objective**

1. To provide mothers with knowledge, skills and positive attitudes toward caring for children with developmental disabilities.

### **Specific objectives**

**By the end of the educational sessions, mothers would be able:**

1. To list the causes and types of developmental disability.
2. To identify how to manage different stressors adaptively.
3. To explain how to manage different behavioural problems.
4. To determine the methods used for managing enuresis.
5. To utilise the healthy eating pyramid for planning healthy meals.
6. To follow the steps of prevention of infectious diseases.
7. To perform first aids skills for children.
8. To apply safety measures for children.
9. To show a positive attitude toward the importance of periodic checkup for children.
10. To show a positive attitude toward the importance of dental care and hygiene.
11. To show a positive attitude toward the importance of physical activity.

iii. **Implementation Phase:** The health promotion toolkit implemented in the training unit at Shoa'a ElAmal Day Care Center. The program implemented for five days with three educational and training sessions per day. Each session lasted from 30 to 45 minutes. Each session contained from 10-20 mothers. The researcher utilised think-pair-share, workshop, discussion, storytelling, debate, roleplaying, and demonstration teaching strategies. Also, PowerPoint presentation, videos, first aids' manikin, brochures, colouring books for children and dental care equipment teaching aids. These sessions held based on the four steps of family empowerment model which were:

#### **a) Knowledge increase**

During this stage, the researcher meant to increase mothers' knowledge. Mothers were assigned to four groups in which five mothers/group. The researcher discussed the following topic: concept of developmental disabilities, causes, types, diseases

associated with or caused by developmental disabilities, prevention of infectious diseases, periodic checkup schedule for children, dental health and care, healthy eating, physical activity, children safety, first aids skills, management of behavioral problems, enuresis management and stress management.

#### **b) Improvement of self-efficacy**

Once the researcher completed the content of the training sessions, she asked mothers to demonstrate the learned practical skills. Their participation and achievement increase their self-efficacy and encourage them to learn more.

#### **c) Increase self-esteem**

At this phase, the researcher asked mothers who achieved the trained skills correctly to train another mother who could not demonstrate the skill. Therefore, they actively participated in the education process that improves their self-esteem.

#### **d) Process evaluation**

By the end of each session, the researcher got oral feedback from the mothers by asking questions and allowed free comments. Also, demonstration of selected skills.

### **iv. Evaluation Phase**

Mothers' knowledge, stress and level of empowerment were evaluated after completion of the sessions.

### **Data Analysis**

i. The collected data were coded for entry and analysis. The researcher utilised IBM Statistical Package for Social Science (SPSS) statistical package version 19 for data analysis and Excel program for graphic design.

ii. Data analysed by the mean ( $\bar{X}$ ), standard deviation (SD), one-way ANOVA, frequency distribution, chi-square ( $\chi^2$ ) test. However, if the expected value of any cell in the table was less than 5, the researcher utilised the Fisher Exact test. The P-value  $< 0.05$  was the set level of significance for all statistical tests.

## **Results**

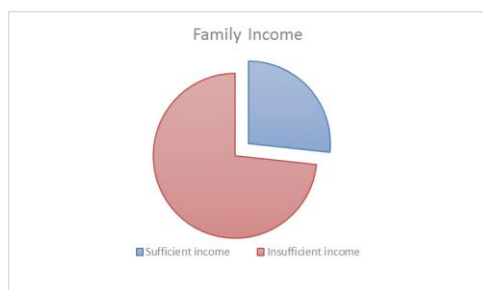
Table 1 shows the distribution of parents according to their characteristics. As indicated in the table, the mean and standard deviation of mothers' age was  $39.33 \pm 7.67$  and  $44.93 \pm 7.99$  for fathers. Approximately half of the mothers (56.7%) can read and write. Meanwhile, 56.7% of the fathers were illiterate. For occupation, most of the mothers (90%)

did not work and about half of the fathers (53.3%). More than half of families (53.3%) have a family number > 5-8 members.

**Table 1: Distribution of parents according to their characteristics**

Biosocial characteristics of studied parents	No	%
Age	<i>Mean ± SD</i>	
Mothers	39.33 ± 7.67	
Fathers	44.93 ± 7.99	
Mother's Education level		
Illiterate	0	0
Read and write	17	56.7
Secondary	8	26.7
University	5	16.7
Father's Education level		
Illiterate	17	56.7
Read and write	9	30.0
Secondary	4	13.3
University	0	0
Mother's occupation		
Work	3	10.0
Don't work	27	90.0
Father's occupation		
Work	16	53.3
Don't work	14	46.7
Family Number		
3-5	9	30.0
>5-8	16	53.3
>8	5	16.7

Figure 1 shows the distribution of families according to their income. It clarified that approximately 73% of families have an insufficient income per month.



*Figure 1: Distribution of families according to Family income*

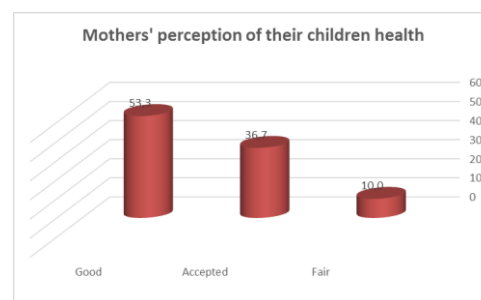
Table 2 shows the characteristics of the developmentally disabled children. It demonstrated that the mean age of children was 7.36 and more than half of them were boys (53.3%). The mean and standard deviation of their weight was 21.53 ± 5.9. For height, it was 99.32 ± 16.12. More than one-third of children diagnosed as mentally retarded.

**Table 2: Characteristics of developmentally disabled children**

Characteristics of Children	No	%
Age	<i>Mean ± SD</i>	
	7.36 ± 2.98	
Gender		
Girls	14	46.7
Boys	16	53.3
Weight	21.53 ± 5.9	
Height	99.32 ± 16.12	
Diagnosis		
Autism	7	23.3
Down syndrome	7	23.3
Attention Deficient Hyperactivity	5	16.7
Mental Retardation	11	36.7

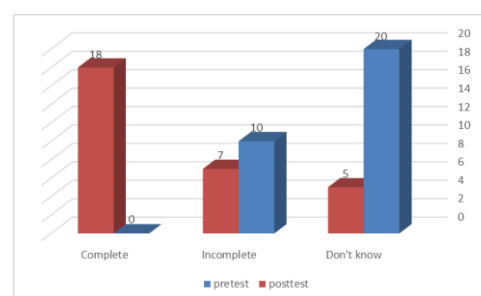
Figure 2 clarified mothers' perception regarding their children health. It demonstrated that about half of mothers (53.3%) perceive good health of

children and only 10 % perceive fair health.



*Figure 2: Mothers' perception regarding their children health*

Figure 3 shows mothers' knowledge about developmental disabilities at pretest and posttest. It clarified that there was an improvement in knowledge of mothers' about developmental disabilities at posttest than on pretest. For this reason, there was the statistical significant difference at 5% levels of statistical significance.



*Figure 3: Mothers' knowledge about developmental disabilities at pretest and posttest*

Table 3 describes the health problems among children with developmental disabilities. It illustrated that more than half of children (56.7%) have dental problems, more than a third of children (46.7%) have convulsion and more than half of children (60%) suffer from enuresis. Approximately one-third of children (36.7%, 33.3%) has fatigue and pain symptoms. For the sleep problem, 16.5 % of children have sleep problems.

**Table 3: Health problems among children with developmental disabilities**

Health problems	No (N = 30)	%
Dental problems	17	56.7
Convulsions	14	46.7
Enuresis	18	60
Fatigue	11	36.7
Pain	10	33.3
Sleep problems	5	16.5

Table 4 shows the distribution of common problems among children with developmental disabilities. It revealed that more than half of children (53.3%) have some independence in performing self-care skills and approximately one third (40%) were independent.

**Table 4: Distribution of problems among children with developmental disabilities**

Health problems	No (N = 30)	%
Self-care skills	12	40
Independent	16	53.3
Some independence	2	6.7
Dependent		
Mean $\pm$ SD	14.8 $\pm$ 4.86	
Behavioural problems	23	76.7
Self-injuries behaviours	28	93.3
Others- injuries behaviours	15	50
Masturbation	3	10
Mood fluctuation	20	66.7
Social problems	20	66.7
Hyperactivity	19	63.3
Agitation	16	53.3
Fear and anxiety	15	50

The majority of children (76.7%, 93.3%) have behavioural problems and self-injury behaviours. Meanwhile, two-thirds of children (66.7%) have mood fluctuation and social problems. Moreover, more than half of children (63.3%, 53.3%, and 50%) have hyperactivity, agitation and fear and anxiety problems consequently.

**Table 5: Means and Standard deviations of Parents Stress on Pretest and Posttest**

Parent stress index	Pre-test (n = 30) X $\pm$ SD	Post-test (n = 30) X $\pm$ SD	ANOVA test	P-value
Parental Distress	38.63 $\pm$ 7.13	34.0 $\pm$ 5.45	97.33	<0.001**
Parent-Child Dysfunctional Interaction	37.3 $\pm$ 6.07	33.63 $\pm$ 4.9	31.79	<0.001**
Difficult child	37.3 $\pm$ 3.24	33.1 $\pm$ 2.26	12.0	<0.001**
Total Parent stress index score	113.33 $\pm$ 12.12	101.46 $\pm$ 10.48	15.95	<0.001**

Table 5 demonstrates the means and standard deviations of parental stress on pretest and posttest. It clarified that mothers at posttest had lower levels of parental distress (34.0  $\pm$  5.45), parent-child dysfunctional interaction (33.63  $\pm$  4.9), difficult child (33.1  $\pm$  2.26) and total parent stress index score (101.46  $\pm$  10.48). There were high statistical significant differences between levels of parental stress among mothers at pretest and posttest.

**Table 6: Means and Standard deviations of family empowerment on pretest and posttest**

Family Empowerment	Pre-test (n = 30) X $\pm$ SD	Post-test (n = 30) X $\pm$ SD	ANOVA test	p-value
Family	30.0 $\pm$ 3.15	42.06 $\pm$ 4.79	2.44	0.045 <0.01*
Child's services	28.66 $\pm$ 4.06	37.66 $\pm$ 8.16	2.67	0.034 <0.01*
parents' involvement in the community	23.6 $\pm$ 4.94	25.73 $\pm$ 8.14	2.79	0.027 <0.01*
Total Family Empowerment score	82.6 $\pm$ 8.33	105.0 $\pm$ 16.48	2.87	0.049 <0.01*

\*P < 0.05.

Table 6 shows the means and Standard deviations of family empowerment on pretest and posttest. It clarified that mothers at posttest had the highest levels of family empowerment scores (105.0  $\pm$  16.48). Moreover, mothers at posttest demonstrated high levels of empowerment within the three subscales family (42.06  $\pm$  4.79), child's services (37.66  $\pm$  8.16) and parents' involvement in the community (25.73  $\pm$  8.14). Therefore, the difference

between the levels of family empowerment among mothers at pretest and posttest was statistically significant.

**Table 7: Pearson correlation test between parental stress and family empowerment subscales on the posttest**

Parameter	Parent stress index Score	
	R	p-value
Family	-0.51	0.004
Child's services	-0.083	0.66 <sup>ns</sup>
parents' involvement in the community	-0.476	0.008
Total Family Empowerment score	-0.439	0.015
		<0.001--

<sup>ns</sup> P > 0.05; \*P < 0.05; \*\*P < 0.001.

Table 7 clarifies the Pearson correlation test between parental stress and family empowerment subscales on the posttest. It clarified that there was a highly statistically significant negative correlation between parental stress index score and family empowerment total score (r = -0.439), family (r = -0.51) and parents' involvement in the community (r = -0.476) on posttest at 1% level of significance. Also, parent stress was not statistically correlated to child's service subscale (r = -0.083) of family empowerment.

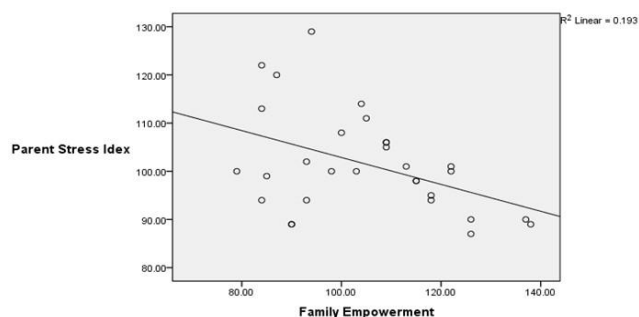
**Figure 4: Pearson correlation between parental stress and family empowerment on the posttest**

Figure 4 shows the Pearson correlation between parental stress and family empowerment on the posttest. It illustrated that there was a negative correlation at 1% between family empowerment and parental stress index on the posttest.

## Discussion

Developmental disability is a major health concern. It includes a wide range of impairments that begin before the age of 18 years. These impairments may affect day-to-day functioning. Developmentally disabled children have high rates of adverse health conditions such as neurological, gastrointestinal disorders and generally, poor health status [9] [10]. Therefore, nurses should promote and coordinate health promotion practices to maximise children potential. However, a family is a central component in

their children's life. Nurses should empower those families to maintain and enhance the existing levels of their children health and thereby being able to live an active and productive life [18]. The current study hypothesised that health promotion toolkit would effectively improve families' empowerment and utilisation of the health promotion toolkit would alleviate parental stress.

Concerning children characteristics, the current study revealed that the mean age of children 7.36 years and more than half (53.3%) of children were boys. These findings are consistent with the finding of a Saudi survey conducted by El-Hzmi et al., [7]. They found that 53.2 % of studied children were males. In agreement with Mash and Wolfe [28] who indicated that the prevalence rate of mental handicapping conditions among boys is about one-half times more than girls are. Also, they demonstrated that the majority of children (70%) were in 5-15 years age group that is consistent with the children's mean age (7.36 years) of the current study.

Regarding parents' level of education, the results of the current study revealed that approximately half (56.7%) of mothers and 30% of fathers were read and write meanwhile, 56.7% of fathers were illiterate. These findings are consistent with Ghoneim et al., [29] who demonstrated that about half (52.7% & 58.1%) of fathers and mothers were without educational qualifications. This reflects that perhaps those families need to know more information regarding developmental disabilities and its care.

Concerning frequency of health problems among children with developmental disability, findings of the current study illustrated numerous problems that were dental problems (56.7%), convulsions (46.7%), enuresis (60%), fatigue (36.7%) and pain (33.3%). In addition, self-injuries behavior (93.3%), behavioral problems (76.7%), social problems (66.7%), mood fluctuation (66.7%), hyperactivity (63.3%), self-care deficit (53.3%) with a mean and standard deviation  $14.8 \pm 4.86$ , agitation (53.3%) and anxiety (50%).

These findings are congruent with studies conducted by Moes et al., [30], Abbeduto et al., [31] who reported the great prospect of behaviour problems in children with DD. Moreover, Yousef et al., [32] documented that mentally disabled children had behavioural, emotional, speech and language problems. They stated that impulsivity comprised 55.5% of behavioural problems and 56.3% of children suffered from social problems. Also, Ghoneim et al., [29] reported that mentally disabled children suffered from problems related to growth and development, mood, behavioural and social.

The presence of these problems provides a further challenge and a potential source of stress to the family. Identification of these problems will help in recognising and enhancing parents' abilities to meet their children needs solve their problems and mobilise

the necessary resources [33].

Regarding mothers' perception of their children health, the current study documented that more than half (53.3%) of mothers perceived good health for their children and only 10% perceived fair health although those children had numerous health problems.

These findings could be related to traditions that impose mothers to hinder the actual health complaints of developmentally disabled children to protect them from social stigma. Moreover, some mothers still denial that her child has any developmental disability. Another reason could be attributed to inadequate mothers' awareness regarding their children health. This explanation is supported by another finding in the present study that two thirds (66.6%) of mothers did not know adequate knowledge about developmental disabilities before implementing the health promotion toolkit.

Regarding parental stress, findings of the current study revealed that parental distress levels were high in all three subscales and the total score of the Parent Stress Index. The mean and stander deviation of parental distress was ( $38.63 \pm 7.13$ ), parent-child dysfunctional interaction ( $37.3 \pm 6.07$ ), difficult child ( $37.3 \pm 3.24$ ) and total parent stress index score ( $113.33 \pm 12.12$ ). These results are consistent with the findings by Dardas and Ahmed [34]. They clarified that the highest score among the three subscales of parent stress index was PD (40.29) meanwhile; the lowest was PCDI (37.7).

Moreover, the scores of parental stress equal to or higher than 85<sup>th</sup> percentile that was pathologically high [35]. Also, high mean scores on child domain ( $132.38 \pm 24.01$ ) and parent domain ( $132.38 \pm 26.13$ ) of the PSI were documented [36]. Moreover, in agreement with Estes et al., [37] who proved the evidence for high levels of parent stress and psychological distress among parents of children with developmental disability.

This high level of parental stress could attribute to the fact that families of children with developmental disability have multiple demands on family resources. Another reason could be related to lack of sufficient income or adequate knowledge about developmental disabilities and access to community resources. This explanation was supported by the findings of the present study where the majority of families reported insufficient income and two-thirds of mothers lack adequate knowledge about developmental disabilities.

Concerning family empowerment, the current study revealed that mothers at posttest had significantly high levels of family empowerment total scores ( $105.0 \pm 16.48$ ) and within the three subscales family ( $42.06 \pm 4.79$ ), child's services ( $37.66 \pm 8.16$ ) and parents' involvement in the community ( $25.73 \pm 8.14$ ).



In agreement with Minjarez et al., [38], these findings were consistent with their pretest-posttest study in which they concluded that rating on family empowerment scale showed a significant change from pre to post-treatment indicating an increased level of family empowerment.

These findings are supported by the point of view of Dempsey and Dunst [39] who stated that enabling practices perceived as the prominent predictive variable of families' empowerment regardless of demographics. This could be attributed to the fact that educational programs increase mothers' knowledge and in turn change their practices and attitudes to become more adaptive. In other words, they indirectly empowered to provide adequate care for their children.

About the Pearson correlation test between parental stress and family empowerment subscales on the posttest. There was a high statistical significant negative correlation between parental stress index score and family empowerment total score ( $r = -0.439$ ), family ( $r = -0.51$ ) and parents' involvement in the community ( $r = -0.476$ ) on the posttest. These findings were consistent with Minjarez et al. who reported that parents felt a high level of empowerment when they had a low level of stress [38].

Also, behavioural problems of children associated with high levels of parental stress had a negative effect on family empowerment [36]. Moreover, a correlational analysis between FES and PSI scales' confirmed the presence of a linear inverse relationship between parental stress and empowerment [40].

Finally, the findings of the current study clarified that health promotion toolkit had a positive effect on empowering families as well as lowering parental stress. Therefore, health promotion toolkit should be utilised as an approach for empowering families caring for children with developmental disabilities in Tabuk.

### Recommendation

1. Health promotion toolkit should be integrated as a monitoring method of health care needs of health promotional activities for children with developmental disabilities.

2. Scientifically established clinical pathway of managing developmental disabilities using health promotion toolkit should be designed.

3. Home visits programs should be designed for families of developmentally disabled children to assess and meet their health needs based on implementing health promotion toolkit.

4. Establishing a support system for children with developmental disabilities and their families in Umulij and its surrounding villages through

coordination between Ministry of Health, Tabuk University, and Shoa'a El Aml Day Care Center.

5. Establishing a unit and/or outpatient clinic at Umljij general hospital provide sustained health and medical care for children with developmental disabilities.

6. Establishing societies in Umljij city to care for those families and their children.

7. The current study needs to be applied to a wider range of sample to ensure the generalizability of results.

The current study concluded that mothers of developmentally disabled children had high levels of parental stress and low levels of familial empowerment. Those levels are improved after implementing health promotion toolkit in which parental stress level is decreased, and familial empowerment level is increased. Also, a negative correlation between family empowerment and parent stress had been reported.

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