

Impact of Educational Program on Stress and Coping Strategies among Mothers Caring for Down Syndrome Children

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Abstract

Background: Down syndrome is a chromosomal abnormality linked to mental retardation. It does not only impede the development of the affected child but also poses a psychological threat to all other family members, particularly mothers. **Aim:** The study aimed to determine Impact of Educational Program on Stress and Coping Strategies among Mothers Caring for Down Syndrome Children. **Design:** A quasi experimental design was used. **Settings:** The study was conducted in the genetic counseling center affiliated to Ministry of Health in Port –Said city. **Sample:** A convenient sample of a total of fifty mothers and their children with Down syndrome aged 4-12 years participated in this study. **Tools of data collection:** Three tools were utilized to collect data for this study; A structured Interviewing questionnaire sheet, psychological Stress Scale and Coping strategies scale. **Results:** revealed that the percentage of high psychological Stress is significantly decreased, the average scores of all items of positive copying are significantly increased, while the average scores of all items of negative copying are significantly decreased after the educational Program. **Conclusion:** The educational Program implementation had statistically significant positive effect on lowered levels of psychological stress and increased positive coping strategies for mothers with Down syndrome children. **Recommendation:** Continuous educational program on Stress and Coping Strategies should provide for Mothers with children of Down syndrome.

Keywords: Coping strategies, Down syndrome Children, Mother Training, Stress.

Introduction:

Parenting a child with Down syndrome (DS) presents a unique set of challenges (Khamis., 2017). DS affects one out of every 700 children being born across the world (Bush et al., 2018). It is believed that 1 out of every 1000 live births is affected. Every year, 3000 to 5000 infants are born with Down syndrome (Da Rocha et al., 2017). In Egypt, the prevalence of DS ranges from 1555 to 1770. (Abou-Youssef, Kamal, &Mehaney, 2014). Most of them (95%) have trisomy 21. Individual development is affected by this hereditary disease throughout childhood and into adulthood. Serious learning challenges, exhibiting certain behavioral strategies to prevent learning situations, and communication issues are all common features among children with DS. Furthermore, when compared to other children, children with DS exhibit a high frequency of compulsive-like repetitive behaviors (for example, "repeating certain actions over and over" or "act out the same thing in pretend play"), as well as higher

rates of non-compliance, hygiene difficulties, high rates of self-talk, and social withdrawal. (Xanthopoulos et al., 2017).

Children with DS frequently have various chronic health diseases, such as congenital heart abnormalities, gastrointestinal illness, hypothyroidism, respiratory disorders, ophthalmologic issues, and hearing impairments, in addition to cognitive and social deficiencies (Ostermaier, 2019). Having a DS child is a unique and deeply personal experience. Parents must deal with the sickness as well as the stress that comes with this set of children's requirements. Families can adopt habits and mobilize efforts that change their functioning, making situations manageable and acceptable according to research dedicated to examining resilience and adaptability in situations of chronic diseases. Changes like this can help parents and families become stronger. Professionals should be aware of factors that restrict or inhibit family adaptation around DS, and they should help and encourage

families to use resources to cope with stressful situations. (Caples et al., 2018).

Individual or family-level efforts can be made to alleviate stress and find resources to deal with circumstances affecting DS. Coping should be understood as the coordination of behaviors for problem-solving in the family system, combining complementing individual efforts of its members, with the capacity to bring demands and resources into balance and lessen problems. As a result, coping refers to how people deal with stress and obstacles. In this context, a set of procedures for identifying resources to assist individuals in developing long-term crisis management skills may emerge. (Zimmer-Gembeck & Skinner, 2016).

Family caregivers who are caring for a child with Down syndrome have several obstacles, including assisting their children with daily living skills, managing their symptoms and comorbid behavior issues, and negotiating the complex disability service system. These difficulties are not confined to early infancy, but also continue throughout adolescence and maturity (Iadarola et al., 2018). Children with DS frequently remain with their family caregivers, resulting in greater levels of day-to-day caregiving obligations, stress, and hardship for family caregivers. (Lara., & de los Pinos 2017).

Various descriptions of the challenges faced by parents of DS children, particularly those relating to psychological circumstances, necessitate a solution so that parents may adjust to their DS child's condition. Acquiring new coping techniques is one way for parents of DS children to deal with challenges. (Cless, Nelson Goff, & Durtschi, 2017). Coping strategies can be defined as cognitive efforts or ongoing behavioral efforts to overcome the problem of feeling disappointed or hopeless because they are unable to meet internal or external demands due to limitations in each (Amireh, 2018). Effective coping strategies have been identified as an important mechanism of managing family caregivers' burdens and promoting their psychological well-being. (Fitzgerald & Ward, 2019).

Individuals can use coping to reduce dangerous situations in their environment and increase their motivation to recover from stress, prepare themselves to face any possibility and

adapt to bad situations, maintain a positive self-image, maintain emotional stability, and make themselves able to survive and build good relationships with those around them. The negative and positive aspects of raising a child with DS may not be at opposing ends of a spectrum. (Kong, et al., 2019).

Significance of the study:

The presence of a child with Down syndrome adds to the mother's responsibilities and generates stress in the household. Because of the unique nature of this impairment, it necessitates the provision of specialized services and treatment. Consequently, the significance of this study appears to be attempting to provide scientific and practical data that may be utilized to develop constructive techniques to lessen the psychological stress faced by mothers of Down syndrome children. In addition, this study provides a chance for mothers of Down syndrome children to communicate how they deal with psychological stress and receive guidance on how to address and adjust to it. As a result, the Effect of a Training Program on Coping Strategies on Reducing Stress among Mothers of Down Syndrome Children is an important principle in pediatric and psychiatric nursing to enhance their general health as well as that of other family members.

Aim of the study:

This study aimed to evaluate impact of educational program on stress and coping Strategies among mothers caring for Down syndrome children

Research hypothesis:

H1: Mothers with children of Down syndrome who received the educational program expected to have low-stress level than previously.

H2: Mothers with children of Down syndrome who received the educational program expected to have increase using coping strategies than previously

Subjects and Methods:

Technical Design:

It included research design, setting, subjects and tools for data collection.

Research Design:

A quasi-experimental design was used to conduct this study.

Research Setting:

The study was conducted in the genetic counseling center is affiliated with the Ministry of Health in Port –said city.

Research Subjects:

A convenience sample included (50) mothers and their children aged from 4- 12 years old

Tools of data collection:

Data were collected through using the following tools:

Tool I: A structured interviewing questionnaire sheet:

It was developed by the researcher to collect data, which included two parts,

Part (1): Demographic characteristics of the mothers: Age, educational level, and occupation,

Part (2): Demographic characteristic of the children: Age, gender, birth order

Tool II-psychological stress Scale: It was originally developed by (Al-Sartawi & Al-Khasher 1998) and adapted by Sabah, et al.,(2012) in an Arabic language, This scale consisted of 35 items categorized into the seven sub-items include physical symptoms questions number “1, 8, 15, 22, 29”, psychological symptoms”3, 9, 16, 23, 30”, financial problems “2, 14, 20’ 27, 35”, dependent function problems “7, 13, 21, 28, 34”, healthy problems “4,10,17,24,31”, social problems “5,11,18,26,32” and fear from future problems “6,12,19,25,33”. Items are arranged in a 3-point Likert format (1=Never, 2= Sometimes, and 3= A lot). The total score ranges from 35 to 105.

Scoring system:

Scores that fall between 35 and 58 are considered low levels of stress. Moderate level stress scores range from 59 to 81. Significant levels of stress from 82 to 105 is indicated to be a high level of stress

Content validity and reliability:

The content validity of the scale indicated 94.94%. Reliability was assessed through Cronbach's alpha reliability test $\alpha=0.78\%$ which revealed that each of the scales consisted of

relatively homogenous items as indicated by the high reliability

Tool III- Coping strategies Scale:

It was originally developed by (Folkman et al. 1986) and adapted by Sabah, et al., (2012) in the Arabic language, to assess thoughts and actions that individuals use to cope with stressful encounters of everyday living. It is divided into two parts, including positive coping and negative coping. Positive coping strategies divided into four coping strategies related to asking information (1, 2, 15, 16, 29 items), planning (3, 4, 17, 18, 30 items), acceptance (5, 6, 9, 20, 31 items), and religiosity (13, 14, 27, 28, 35 items). The scores on high range from 60 to 20. While three coping strategies related to Negative coping strategies including coping strategies related to denial (7, 8, 21, 22, 34 items), withdrawal (11, 12, 25, 26, 33 items), and self-blame (10, 19, 23, 24, 32 items) The scores on low range from 45 to 15. Respondents rated each statement of the scale using a three-point Likert scale ranging from 1= (No), 2= (Sometimes) to 3= (Yes).

Content validity and reliability:

The content validity of the scale indicated 94.03%. The reliability of the scale is tested by Cronbach's alpha reliability coefficient of the scale was found to be is 0.72 and tested for reliability by using test-retest reliability coefficient was 0.87

Pilot Study

Before beginning data collection, pilot study was conducted on 10% of the total sample (five) mothers and their children with Down syndrome to assess and guarantee the clarity and application of the instruments. The tools were not changed because of the outcomes of the pilot research. A total of 5 mothers were recruited for the pilot project, however, they were not included in the final sample.

Fieldwork

The actual fieldwork took to complete (from 15th of April 2020 to 15th of December 2020). The steps are described in-depth in the next section. The mother educational program was organized into four stages: pre-planning, planning, execution, and assessment.

Pre-Planning Phase:

The study instruments were built, tested, and modified before being applied to mothers, and the acquired data was examined before beginning the program design and planning.

Planning Phase:

The educational program was designed using the baseline information gathered in the pre-planning phase. The educational program was designed in the Arabic language after reviewing the related past and current Arabic and English literature covering various aspects of the problem. The educational program was designed by the researcher after a review of the literature to meet mothers' knowledge, practice deficits, decrease stress level and increase using coping strategies. The content was prepared according to the mothers' level of understanding.

Implementation Phase:

Educational program designed by the researchers using base line information in assessment phase. It was written in simple Arabic language. Mothers were allocated into small group sessions (each group was interviewed in the morning according to their availability) for three sessions. Auditory (verbal instructions, answering question sessions, and feedback), kinesthetic (demonstration and hands-on practice), and visual (video, written instructions, and learning materials translated into the Arabic language) teaching modalities were used. Each session was between 20 and 25 minutes long. Each session began with a recap of what had been covered in prior sessions as well as the next session's goal.

Three sessions of theoretical and practical assistance were given to each group contained of five to ten mothers as the following: the first session, the mothers were introduced to the program and its goal, and the mothers were given information about (definition, causes, risk factors, characteristic of Down syndrome disease). The second session included (definition, causes, types and management of stress). The third session, (practical) was included demonstration of using coping strategies. Researchers concluded each session by summarizing the main points and providing positive verbal feedback. At the end of the last session, each mother received an Arabic

informational booklet with theoretical and practical sections in order to increase their remembering and knowledge

Program Evaluation Phase:

After the program was implemented, a post-test was conducted using the same research instruments to assess the program's effectiveness. After six months of instruction, the post-test was conducted.

Ethical Considerations

After description of the study's nature and objective, the director of the prior setting granted official authorization to perform it. After explanation of the study's goal and nature, mothers gave their permission informally. Each mother was guaranteed their privacy, and they were informed that the information gathered would be utilized solely for research purposes and for their benefit. Code numbers were used to safeguard information submitted into the computer system. Only the researcher had access to the database's contents and the code key that included personal identification.

Data Analysis

- Data were coded, computerized, and then analyzed using the Statistical Package for Social Science (SPSS) software package version 20.0 the percentage, mean, and standard deviation were used to describe data.
- number and percentage: used for describing and summarizing the qualitative data.
- The most common and appropriate tests used in SPSS data analysis included Chi-Square for comparing categorical data, t-test for comparing continuous data between two groups, the 0.05 level was used as the cut-off value for statistical significance to assess the significance of the results.

Results:

(Table 1) :Describes frequency distribution of socio-demographic characteristics of studied sample, regarding children, it was revealed that their mean age was 6.60 ± 3.06 and more than half of the studied children (26%) aged between $6 < 10$. Nearly two-thirds of the studied children were males (68%). Regarding mothers, it was demonstrated that their mean age was 33.34 ± 7.79 and less than half of the studied

mothers (42%) aged between 30- < 40 years old while, 38 % of them were aged 20 < 30 years old. Also, 82% of them were preparatory education.

In terms of stressor scores, **Table (2)** and figure (1) demonstrate that following the educational program, the average score of all stressor items was significantly (P0.001) lower. In addition, the overall stressor average score decreased significantly (P0.001) from 88.90 \pm 10.08 (pre- educational program) to 63.58 \pm 15.93 (post- the educational program).

Table (3) demonstrates that the percentage of high stressors has fallen significantly (P0.001) from 80 percent (pre- educational program) to 18 percent (post- the educational program) When it comes to copying strategy scores, the average scores of all positive copying items are significantly (P0.001) higher following the training program, whereas the average scores of all negative copying items are significantly (P0.001) lower. In addition, the total average positive copying score increased significantly (P0.001) from 27.48 \pm 3.94 (before the

educational program) to 36.08 \pm 6.94 (after the educational program), whereas the total average negative copying score decreased significantly (P0.001) from 33.14 \pm 2.96 (before the educational program) to 28.44 \pm 4.43 (after the educational program) **Table (4) and Figure (2).**

Table (5) depicts the association between changes in stressor scores, positive and negative coping strategy scores, and personal traits because of the training program. The median percent drop in stressors' score is significantly (P=0.021) larger among mothers with children aged 6-10 years, but it is unaffected by the mother's education, age, or child's gender. The median rise in positive coping score percent is significantly (P=0.021) larger among mothers with children aged 6-10 years and educated moms (P=0.013), but it is unaffected by the mother's age or the child's gender. Furthermore, the median drop in negative copying score percent is significantly (P= 0.021) larger among mothers with children aged 4-6 years and educated moms (P=0.027), but it does not differ significantly by mother's age or child's gender.

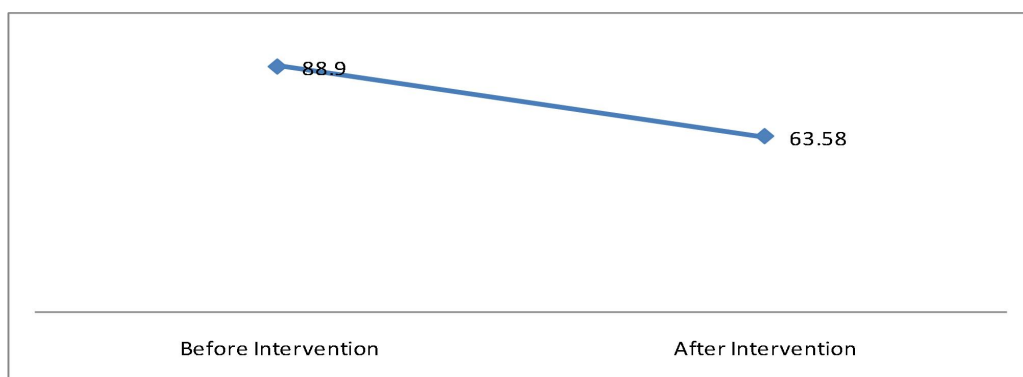
Table (1): Distribution of socio-demographic characteristics of the studied sample (50)

Characteristics	No	%
Child age (years)		
4 < 6	32	64.0
6 < 10	13	26.0
10 < 12	5	10.0
Range: 3 – 14, Mean \pm SD= 6.60 \pm 3.06, Median = 6		
Child's gender		
Males	34	68.0
Females	16	32.0
Mothers' Education		
-Illiterate	2	4.0
- Primary	5	10.0
- Preparatory	41	82.0
-Secondary	2	4.0
Occupation		
-Employment	15	30.0
-Un Employment	35	70.0
Mothers' age (years)		
20 –	19	38.0
30 –	21	42.0
40 – 50	10	20.0
Range: 23 – 50, Mean \pm SD = 33.34 \pm 7.79, Median = 31		

Table (2): Mean differences of the studied mothers regarding the Stress as pre and post after the educational program implementation

Stressors	Before educational program	After6 months educational program	Paired t-test, P
	Mean \pm SD	Mean \pm SD	
Physical symptoms	12.86 \pm 1.51	8.38 \pm 1.85	t=28.514, P<0.001*
Emotional	12.94 \pm 1.72	9.08 \pm 2.80	t=14.004, P<0.001*
Economic problems	11.94 \pm 1.74	8.72 \pm 2.50	t=15.585, P<0.001*
Independent functions	13.26 \pm 1.64	10.32 \pm 2.99	t=10.480, P<0.001*
Health problems	12.78 \pm 1.62	8.76 \pm 2.75	t=14.957, P<0.001*
Social Problems	12.62 \pm 1.76	9.16 \pm 3.06	t=12.283, P<0.001*
Fear from future	12.50 \pm 1.95	9.16 \pm 3.22	t=11.217, P<0.001*
Total score	88.90 \pm 10.08	63.58 \pm 15.93	t=18.598, P<0.001*

* Statistically significant differences

**Figure (1):** Average stressors score before and after the educational program**Table (3):** level of stress of mothers of children with Down syndrome pre and post the educational program

Stressors' Level	Before educational program		After6 months educational program		Significance test
	No	%	No	%	
High (82 – 105)	40	80.0	9	18.0	$\chi^2= 43.521$, P<0.001*
Moderate (59 – 81)	10	20.0	21	42.0	
Low (35 – 58)	0	0.0	20	40.0	

* Statistically significant differences

Table (4): Mean differences of the studied mothers of children with Down syndrome regarding Coping Strategies as pre and post the educational program implementation

Copying strategies	Before educational program	After6 months educational program	Paired t-test, P
	Mean \pm SD	Mean \pm SD	
Positive strategies			
Asking information	6.16 \pm 1.50	9.04 \pm 2.84	t=11.022, P<0.001*
Planning	7.26 \pm 1.26	10.01 \pm 1.55	t=18.185, P<0.001*

Acceptance	6.32 ± 1.38	8.72 ± 2.40	t=10.583, P<0.001*
Religiosity	7.74 ± 1.65	8.32 ± 2.40	t=10.011, P<0.001*
Total Positive Score	27.48 ± 3.94	36.08 ± 6.94	t=14.127, P<0.001*
Negative strategies			
Denial	6.38 ± 1.32	8.52 ± 1.90	t=10.419, P<0.001*
Withdrawal	13.83 ± 1.92	9.94 ± 2.74	t=11.171, P<0.001*
Self-blame	13.38 ± 1.51	10.08 ± 2.57	t=13.141, P<0.001*
Total Negative Score	33.14 ± 2.96	28.44 ± 4.43	t=10.483, P<0.001*

*Statistically significant differences

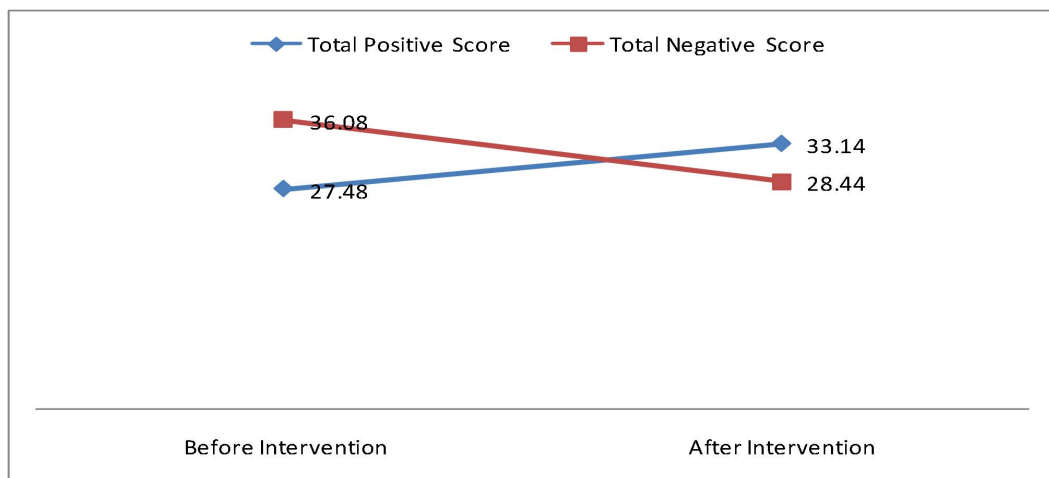


Figure (2): Average total positive & negative coping scores before and after the educational program

Table (5): Relationship between improvement changes in stressors score, positive and negative coping strategic scores by the educational program, and personal characteristics

Characteristics	No	Items	Percent decrease in stressors score	Percent increase in positive copying	Percent decrease in negative copying
Child age (y)					
4 < 6	32	Min-Max Median	10.8 – 39.29 26.5	9.01 – 56.5 31.0	2.8 – 28.6 16.4
6 < 10	13	Min-Max Median	23.8 – 53.9 37.2	31.3 – 77.2 46.4	13.5 – 29.4 13.9
10 < 12	5	Min-Max Median	10.1 – 50.0 10.1	10.0 – 29.2 10.0	2.9 – 12.9 2.9
Kruskal Wallis test			χ2=7.705,P0.021	χ2=7.705,P0.021	χ2=7.705,P0.021
Child's gender					
Males	34	Min-Max Median	14.4 – 53.9 31.0	9.01 – 77.2 31.3	5.7 – 29.4 16.2
Females	16	Min-Max Median	10.1 – 39.2 26.6	10.0 – 56.5 31.4	2.8 – 28.1 14.3
Mann-Whiney test			Z=1.729,P0.084	Z=0.250,P0.803	Z=1.876,P0.061
Mothers' Education					
No level	2	Min-Max Median	21.9 – 21.9 21.9	14.8 – 14.8 14.8	6.5 – 6.5 6.5
Primary	5	Min-Max Median	24.4 – 53.9 24.4	35.5 – 46.4 35.5	12.1 – 13.9 12.1

Preparatory	41	Min-Max Median	10.1 – 50.0 31.0	9.1 – 77.3 31.0	2.8 – 29.4 16.2
Secondary	2	Min-Max Median	39.3 – 39.3 39.3	37.4 – 37.4 37.4	28.1 – 28.1 28.1
Kruskal Wallis test			$\chi^2=4.346, P0.226$	$\chi^2=10.72, P0.013$	$\chi^2=14.29, P0.027$
Mothers' age (years)					
20 –	19	Min-Max Median	10.8 – 38.8 27.6	11.1 – 77.3 25.8	2.8 – 28.6 13.9
30 –	21	Min-Max Median	14.4 – 39.3 26.8	9.1 – 52.0 31.8	5.7 – 29.4 19.4
40 - 50	10	Min-Max Median	10.1 – 53.9 46.9	10.0 – 46.4 30.2	2.9 – 20.0 13.4
Kruskal Wallis test			$\chi^2=4.630, P0.099$	$\chi^2=0.987, P0.610$	$\chi^2=4.549, P0.103$

Discussion:

Stress is common among parents of children with developmental problems, especially mothers. Nonetheless, there is no evidence of a link between parental stress and the kind and severity of impairment. Health, role constraint, and spousal support were all judged to be more challenging for mothers who had greater responsibility for childcare. It's difficult for mothers to take care of a child with special needs. The reality is that the child's mother is frequently the first person he or she encounters during any situation. Appropriate clinical care aimed at assisting parents of children with varied impairments should include resources to educate and empower mothers in managing their children's disabilities and needs (Nathwani et al., 2021). Given the significance of this issue and the idea that progress may be made in this area, the current study was developed to examine the Effect of Coping Strategies Training Programs on Reducing Stress among Mothers of Children with Down syndrome as a critical issue.

In the current study, it was demonstrated that it was below the permitted level prior to program implementation; most mothers had a high degree of stress. These findings might be explained by the fact that most of the research participants are jobless, with the mother being compelled to stay at home longer to care for her impaired kid. This reflects the mother-child bond. So, a mother who quits her work or career to stay at home and handle most of the childcare duties. Also, maybe connected to culture, and habits have an influence on moms' psychological well-being. Lack of pertinent knowledge provided for mothers about raising a child with Down syndrome. This might be

owing to the unique challenges of caring for a child with Down syndrome, the most notable of which is the intellectual disability it creates. Mental retardation is accompanied by a lack of adaptive behavior. Also, he is unable to master care skills, such as personal hygiene, feeding, and dressing him, which are simple tasks that any child can perform.

The burdens of independent functions are a source of Anxiety and inconvenience to the mother who does these things on her own. The need for periodic medical care because he suffers from congenital malformations that he is born with, especially at the level of the heart or body's inability to resist the weakest viruses Increases the burden. The financial provision of medicine and healthy eating, special protective supplies, and tools, are all these problems. It makes the mother in a state of confusion, as she cannot make plans for the future, especially since her son cannot face life with its limited capabilities. The mother lives in a state of tightness and tension, trying to get out of it through an outlet outside the surroundings. For the mother who does these tasks on her own, the obligations of solitary functions are a cause of anxiety and difficulty. The load is increased by the need for frequent medical treatment due to congenital deformities that he was born with, particularly at the level of the heart or the body's incapacity to resist the weakest infections. All these issues are related to the financial provision of medicine and healthy food, as well as protective supplies and instruments. It leaves the mother befuddled, as she is unable to make plans, especially because her kid is unable to face life with his restricted abilities. The mother is in a constant state of tightness and

tension, attempting to escape through an outlet outside of her immediate circumstances.

In this regard, **Rocha and Souza (2018)** found that caring for a kid with DS lasts a lifetime and is characterized by emotions of worry and uncertainty, particularly when it comes to the need for long-term care and the influence this would have on the caregivers' personal lives. This finding supports **Blerina's (2016)** findings showing mothers of children with Down syndrome had greater levels of stress, anxiety, and depression. This finding is also in line with the findings of a study on parental stress in mothers of preschool-aged children with Down syndrome, which found significantly greater parent stress (**Sarimski, 2017**). On the other hand, this outcome is incompatible with **Amireh, (2018)** who found that the parents of DS children showed the lowest stress compared to another group. Moreover, the level of parenting stress differs depending on the child's disability (**Barakat & Mohamed., 2019**).

The average score of all stressors is significantly reduced following the educational program, according to the current study. This is most likely due to the mothers' anxiety and lack of confidence in coping with a kid who has been diagnosed with DS. Caring for these people had a significant influence on their caretakers' life, which had to make remarkable efforts to cope. Finding excellent education for people with DS and engaging in social activities was also difficult, and caregivers thought that greater services, facilities, and services for people with DS's families would help them cope better with the physical and psychological stress. These findings are in line with those of **AlShatti., et al., (2021)**. Caregivers initially struggled to accept the diagnosis, which drove them to seek solutions to many of their worries about raising a child with DS, according to who underlined that conveying messages required expertise. Dealing with the health issues that people with DS faced was originally challenging for the caregivers, who were usually mothers. According to **Alexander and Walenzik (2016)**, there is a pressing need for intervention programs for families of children with DS that address parents' reflection on their feelings, support posttraumatic development processes,

and teach long-term regenerative coping methods. **Remedios et al., (2019)** found significant variations in all variables between the pre-and post-test, as well as a substantial improvement in the parent stress index among the mothers investigated.

In terms of coping techniques, the current study's findings revealed statistically significant improvements in copying strategy scores, with the average scores of all positive copying items significantly increasing following educational program. In comparison to the pre program, this was noted after the program was implemented, indicating that the participants were very engaged in the program's content. Furthermore, the media and instructional approaches that were utilized were unquestionably effective in piquing their interest. While the average scores of all negative copying items are significantly lower after the intervention, this might be due to the fact that Arabian and Moslem nations cope with painful life events by praying, meditation, or participating in other religious activities. Needless to say that the women can decide appropriately the source of psychological, social as well as physical support, accept and plan for the future. This finding corresponds to **Barroso , et al., (2018)** who found that the mothers of children with special needs could potentially benefit from early intervention programs that provide support to help them to incorporate approach coping styles to their coping strategies.

The current study results represent that mothers' use planning was highest in positive strategies after program implementation. It may be due to the nature of the study sample where most mothers are illiterate, poor, and unemployed. All these factors lead mothers to have little chances for planning or active coping. This result is consistent with the result by **Ganjiwale et al., (2016)** who found that Problem-focused coping and positive coping was mainly used by parents of a child with DS. This result is incongruent with **Hayat, (2015)** who reported that family caregivers of children with DS stressed more use of Problem-focused coping strategies, and the most reported coping strategy was planning.

Following the completion of the educational program, the majority of mothers who utilize seeking information have the second-highest mean scores of positive coping methods. It might be due to their desire to learn more about their child's disability, their child's physical complaints related to disability, their DS child's changing behaviors, how to deal with those issues, and how to live with the load. This study supports the findings of **Amagad et al.,(2020)**, who found that a large percentage of family caregivers of children with DS employs instrumental help.

Accepting reality and being content with it, perceiving the child's impairment as a test from Allah, and requesting aid from Allah to overcome the child's issues were the third highest in the positive tactics following program implementation, according to the current study results. It might be related to the great prevalence of good faith and religion in our culture, where a crippled child is viewed as a gift from God. Such a positive outlook may aid caregivers in their adaption. When faced with a child's impairment, family caregivers typically find consolation in religious propitiation and surrendering to God's plan, according to an Indian study by **Sharma and Gupta (2017)** who reported that family caregivers often find relief in religious propitiation and surrender to the will of God when faced with child disability. This study result is also congruent with a study done by **Karen and Eva, (2016)** who found that acceptance and religion had the highest mean scores of the coping strategies sub-scales.

Concerning the relationship between improvement changes in stressors score, positive and negative copying strategic scores by the training program, and personal characteristics. The median decrease in stressors' score percent is significantly ($P=0.021$) higher among mothers with children aged 6-10 years. The median increase in positive coping score percent is significantly ($P= 0.021$) higher among mothers with children aged 6-10 years and educated mothers ($P=0.013$). Also, the median decrease in children aged 4-6 years and educated mothers ($P=0.027$). This is reflected in the effectiveness of educational programs in changing stress levels among mothers of children with Down syndrome and coping strategies. Because the educational

program process, helps mothers to learn, understand, and raise their children to care for Down syndrome, it may support the mother's psychological acceptance and improve the mother-child relationship. Also, it is meaning that mothers desire to have information about their child and the diagnosis and ask for strategies to improve their child's performance or manage difficult behaviors

Conclusion:

Based on the outcomes of this study, it can be stated that following educational program, the average score of all stressors is significantly diminished. In terms of copying strategy scores, after educational program, the average scores of all positive copying items are significantly higher. While following the educational program the average scores of all negative copying items are significantly lower.

Recommendations:

The study recommended the following:

- Continuous educational program should provide for Mothers with children of Down syndrome.
- Organizing religious and recreational programs, for mothers with Down syndrome children.
- Providing the necessary financial and emotional assistance for moms of children with Down syndrome until they are capable of taking proper care of their children
- Family orientation programs help parents better understand and care for their Down syndrome children by improving their response to stressors.

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