

Impact of educational interventions on mothers' awareness and communication with their attention-deficit hyperactivity disorder children

ABSTRACT

Objective: The objectives of this study are to evaluate the effects of the educational intervention on mothers' knowledge, awareness, and communication difficulties experienced with their children and mothers' capacity to successfully interact with their affected child before and after the intervention.

Materials and Methods: A quasi-experimental research design was used. A total of 30 mothers and their children complaining of attention-deficit hyperactivity disorder from four Dawadmi primary schools were included. Data were collected through a self-developed questionnaire from September 2023 to January 2024 after study acceptance by Shaqra University's scientific deanship. Intervention prepared according to subjects' needs and current scientific base and demonstrated in 10 sessions in schools.

Results: Regarding mothers' age, more than one-fourth of them (26.7%) ranged from 31 to 35 year old, and about a third (36.7%) had secondary education. Regarding mother's job, about 76.7% do not work, and the majority of affected children (66.6%) were male, there were significant improvements in mothers' knowledge pre- and postintervention also a significant improvement in mothers' awareness about symptoms of poor attention, hyperactivity, and impulsivity pre- and postintervention was found. Significant differences were found before and after the intervention regarding the impact of the intervention in decreasing mothers' challenges.

Conclusion: The study hypothesis was accepted, and the intervention improved mothers' knowledge, awareness, and communication challenges. The intervention should be conducted and followed up for a long period of time to manage all mother's and children's daily challenges, improve children's daily activities, and stabilize effective communication patterns between children and their family members.

Keywords: Attention-deficit hyperactivity disorder, awareness, communication, educational interventions

INTRODUCTION

Attention-deficit hyperactivity disorder (ADHD) is a prevalent neurodevelopmental condition that often begins in infancy where a profound developmental abnormality is distinguished by widespread and debilitating symptoms.^[1] ADHD is characterized by two distinct behavioral characteristics, namely hyperactivity, impulsivity, and inattention. Child and adolescent psychological health issues are becoming prevalent worldwide.^[2] The worldwide prevalence rate of ADHD in children is 7.2%, with some countries reporting rates as high as 15.5%. In the Kingdom of Saudi Arabia, the average incidence of ADHD is 9.2%, ADHD is the prevailing

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Submitted: 04-Aug-2024

Accepted: 21-Oct-2024

Revised: 17-Oct-2024

Published: 04-Dec-2024

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How to cite this article: Alseraty WH, Abdullhameed SM, Alenezi A. Impact of educational interventions on mothers' awareness and communication with their attention-deficit hyperactivity disorder children. J Integr Nurs 2024;6:187-95.

Access this article online	
Website: https://journals.lww.com/jinm	Quick Response Code 
DOI: 10.4103/jin.jin_90_24	

behavioral condition in children, with a notable incidence rate of 52.5% among youngsters in Makkah. Boys are more affected by the illness compared to females,^[3] and children who are diagnosed with disorders have a strong genetic basis. The prevalence of ADHD was 10.9% among medical students in Riyadh city.^[4]

The primary disorder manifestations were lack of focus, impulsive behavior, physical agitation, impaired focus, diversion, excessive activity, and subpar academic performance in educational or domestic settings. ADHD may be influenced by several contributing variables and a variety of genes. The illness management involves multimodal interventions, beginning with psychoeducation for parents and affected patients, delivered in an age-appropriate way known as cognitive behavioral therapy.^[3] Pharmacological and nonpharmacological interventions are used to address symptoms and enhance the functioning of children with ADHD. However, it is commonly observed that the functioning results of these children do not reach the same level as their peers without ADHD.^[5,6]

Parents of children with ADHD complain of feelings of frustration, guilt, stress, low self-esteem, dissatisfaction with their role as parents, and lack of confidence in their parental skills. They consider themselves less self-efficacious in educating their affected child, have a poor quality of life due to their child's illness, and may use inappropriate aggressive strategies, which finally lead to ineffective communication patterns with their affected child. Parents' training programs on how to manage and deal with ADHD have a positive impact, which is considered one of the most appropriate psychosocial management strategies for child behavior and everyday problems, which reduce family stress, improve parental awareness, raise their communication skills, and improve children's social skill.^[7]

The disease unfavorably affects children's all-life aspects, as learning, sense of competence, psychological well-being, and interpersonal relationships with all their surroundings.^[8] As a chronic condition, inadequate child management may result in negative functional consequences that may last into adulthood, causing challenges for the kid, which constitutes a significant source of stress for parents and may lead to challenging parent-child contact. The primary obstacles encountered by women, particularly in relation to their children, are scholastic difficulties, physical aggression, and stubbornness, all of which are attributed to the family's financial hardships. Pediatric ADHD is a major stressor for parents and may result in a problematic parent-child interaction. Major challenges as mentioned by mothers are child's academic problems, physical

aggressiveness, stubbornness, and family's financial difficulties. Mothers' need educational intervention to improve their parenting skills. Mothers' awareness of the disorder is a mainline in the successful management process of this disease.^[9,10] They often endure heightened levels of stress, diminished quality of life, reduced levels of maternal contentment, and perplexity over their children's conduct, leading them to feel subjected to severe punishment. Educational intervention to improve mothers' practice, their communication abilities, and their daily activities practice, consequently raises their awareness and improves communication with their children.^[11] Parent-teacher training has been shown to enhance children's fundamental symptoms and academic achievement and reduce parental worry.^[12] The implementation of nursing treatments for mothers had favorable outcomes in terms of enhancing mothers' knowledge and practice, as well as ameliorating symptoms in children with ADHD.^[13]

Mothers are the main caregivers for children in all families and the first person who is attached to their children and stay along time with them daily. If a mother had a child with ADHD, it would constitute a major stress in all aspects of life. Most of the times, mothers did not know how to deal with the affected child, which care is ideal to provide for their child, and how to resolve communication challenges between mother and her child, which are considered the main challenges to mothers. Solving mothers' challenges and communication difficulties with their children with ADHD constitute the first line of treatment. The objectives of this study is to evaluate the effects of the educational intervention on mothers' knowledge, awareness, and communication difficulties experienced with their children and mothers' capacity to successfully interact with their affected child before and after the intervention, so as to resolve communication challenges facing children and their mothers, improve mothers' knowledge and awareness about ADHD, and finally improve mothers' abilities to communicate effectively with the affected child.

MATERIALS AND METHODS

Ethical considerations

Ethical approval for this study (ERC_SU_F_202300001) was provided by the Ethical Committee of Scientific Deanship of Shaqra University, Shaqra governorate, Saudi Arabia on June 14, 2023 (25/11/1444 H). Participation is voluntary, and subjects' responses are confidential and used for research purposes only, and written informed consent was obtained from all participants.

Study design and setting

This study used a quasi-experimental research design. Four

Dawadmi primary schools were included named as 3rd, 4th, 7th, and 8th primary schools.

Participants, inclusion and exclusion criteria

A purposive sample of all mothers and their primary schoolchildren; their number was 30 mothers and their ADHD children. Inclusion criteria: All participants whom willing to participate in the study, not exposed to a similar study, and successfully finish the study. Exclusion criteria: Mothers, who demonstrate unwillingness to engage, fail to finish the study or participate in a similar study.

Study tools

Based on study aims, relevant literature, and current needs, a questionnaire sheet was developed in consultation with pediatric and psychiatric nursing and includes six parts: Part 1: to assess the sociodemographic characteristics of subjects. Part 2: evaluate the influence of the interventions on mothers' awareness level (pre- and postintervention). Part 3: evaluate the influence of the intervention on mothers' knowledge (pre- and postintervention); Part 4: assess ADHD hyperactivity and impulsivity symptoms (pre- and postintervention). Part 5: assess communication challenges facing children and their mothers (pre -and postintervention). Part 6: assess the impact of the interventions on mothers' communication with their children (pre- and postintervention). Five specialists specializing in pediatric and psychiatric nursing evaluated the validity of the research tool. They were asked for their comments on the consistency, accuracy, and relevance of the tools according to their opinions modification was done. The statistical tool's reliability was checked with Cronbach's alpha, which provided a value of 0.967.

Pilot study

It was conducted on 3 mothers with their ADHD children, and they were excluded from the main study sample.

Intervention process

A review of significant references to be acquainted with all aspects of the study problem was done. Based on the pilot study and review of literature, the intervention plan was formulated to cover the study's aim and satisfy the subject's needs. Data were collected after the study acceptance by Shaqra University's scientific deanship. The study was conducted from September 2023 to January 2024.

It was demonstrated in 10 sessions in schools, 50 min each, with only one session in the day according to subjects' preferences and free time. Each mother was met individually with her ADHD child during the school day. In the first session, the researchers introduce themselves, get subjects' expectations,

illustrate the study's aim, and arrange a meeting schedule with the participant. The second session used for the pretest, which assesses participants' baseline knowledge, communications' challenges, investigates mothers' knowledge and awareness about symptoms of ADHD, and assesses mothers' ability to communicate with their affected children. From the 3rd to 8th sessions, the researchers' discussion included meaning, causes, predisposing factors, manifestations, prognosis, and complications of ADHD. They illustrated the main communication challenges facing children and families, demonstrated effective communication methods with the affected children, and trained mothers to cope with their children and maintain a positive communication environment with the child. Moreover, the researchers discussed mothers' methods to improve their quality of life and illustrated the importance of contacting the school teachers and following the child academic improvement. At the 9th session, the researchers review with mothers all intervention aspects and discuss their requirements. The 10th session used the posttest format, ending the study, and each subject was given a booklet covering all ADHD-relevant information.

Statistical analysis

Data were analyzed, and the study hypotheses were tested using SPSS IBM Corp. Released 2019. IBM SPSS Statistics for Windows, Version 26.0. (Armonk, NY: IBM Corp). Descriptive statistical methods, such as frequencies, percentages, means, and standard deviations, were used to demonstrate the study areas of the participants. Cronbach's alpha reliability is used to analyze the strength of the correlation and coherence between questionnaire parts. It also measures the stability of consistency with which the instrument measures the idea. In addition, it helps to evaluate the quality of the measure. The Chi-square test was used to compare qualitative variables. The Wilcoxon test, a kind of nonparametric test, is a statistical analysis test that is used to compare the pretest and the posttest. $P < 0.05$ indicates statistical significance.

RESULTS

Table 1 represents sociodemographic characteristics of ADHD children and their mothers; regarding mother's age, more than a quarter of them (26.7%) ranged from 31 to 35 years old and about a third (36.7%) of them was secondary school education, and 76.7% of the mother's does not work. Related to affected children, the majority of them (66.6) were male, as clear also 60% of the affected children were 5 years old.

Table 2 represents the effect of the intervention on maternal awareness of ADHD before and after the intervention. Preintervention results show that most participants (96.7%)

Table 1: Sociodemographic characteristics of attention-deficit hyperactivity disorder children and their mothers

Items	n (%)
Mother's age (years)	
20–25	8 (23.3)
26–30	2 (6.7)
31–35	7 (26.7)
35–39	2 (6.7)
36–40	2 (6.7)
40–45	3 (10.0)
45–50	2 (6.7)
More than 50	4 (13.3)
Mother's educational level	
Illiterate	8 (26.7)
Middle	4 (13.3)
Secondary	7 (36.7)
Bachelor's	11 (23.3)
Mother's job	
Does not work	23 (76.7)
Work teacher	7 (23.3)
Name of the school	
Third primary	6 (20.0)
Forth primary	9 (30.0)
Seventh primary	7 (23.3)
Eighth primary	8 (26.7)
The sex of the affected child	
Male	20 (66.6)
Female	10 (33.3)
Age of the affected child	
5.00	18 (60.0)
6.00	12 (40.0)
Number of children in the family	
0.00	6 (20.0)
1.00	3 (10.0)
2.00	11 (36.7)
3.00	1 (3.3)
4.00	2 (6.7)
5.00	4 (13.3)
7.00	2 (6.7)
8.00	1 (3.3)
Number of children affected with hyperactivity within the family	
0.00	14 (46.7)
1.00	10 (33.3)
2.00	6 (20.0)

had not sufficient knowledge regarding the meaning of attention deficit and the meaning of hyperactivity, and (93.4%) did not have sufficient knowledge of disease symptoms. In the posttest, the majority of participants (83.3%) had sufficient knowledge of the meaning of attention deficit, symptoms of attention deficit, and the meaning of hyperactivity. In addition, 83.3% reported symptoms of hyperactivity, causes, disease recovery rate, complications, the treatment provided to the affected child, and treatment side effects. As is clear from Table 2, there are significant improvements in the subjects' knowledge postintervention.

Table 3 represents the impact of the interventions on mothers' awareness about poor attention symptoms. There was a significant improvement in subjects' awareness about symptoms of poor attention pre -and postintervention as these symptoms include: Children avoid engaging in things that require constant effort, forgetting things, ease of mental distraction, loss of things needed to complete tasks or activities, inability to organize activities well, failure to complete work, not following instructions, and inability to listen well also failure to pay attention to fine details, committing trivial and hasty mistakes that have nothing to do with lack of knowledge, inability to sustain or maintain attention during tasks and activities, which reflect significant improvements in mothers' awareness level due to the impacts of the intervention which improve mothers' awareness level.

Table 4 represents the impact of the interventions on mothers' awareness of symptoms of hyperactivity and impulsivity (pre and postintervention). The data presented in Table 4 demonstrate a substantial improvement in participants' awareness as a result of the direct outcome of the intervention and 87% were aware of symptoms of hyperactivity and impulsivity, such as; leaving the seat without a reason in situations that require him to sit, always restless hands or feet. Running in every direction or climbing things in inappropriate places, enabled to play quietly, and rush at any opportunity as if the child were a motorcycle, interrupting others or interfering in their activities.

Table 5 represents the impact of the interventions on communications' challenges facing mothers and their children (pre- and postintervention); difficulty communicating between mother and child difficulty completing tasks was always mentioned by 37% of mothers preintervention, and 50% of children had difficulty communicating during the school day with their classmates, had difficulty communicating with teachers during the school day, had difficulty in academic achievement, had difficulty communicating with their siblings at home, and 50% of mothers' suffered from anxiety preintervention compared to none of them suffering from all the abovementioned challenges postintervention, which reflect the impact of the intervention in decreasing mothers challenges with significant differences.

DISCUSSION

Mothers are the most dynamic members of the family to provide care, management, and support services for their children with ADHD. Therefore, their exclusive skills and training were significant in supporting children's. Children with ADHD are the most important stressors for their mothers and result in problems in the mother-child relationship.

Table 2: Impact of the interventions on mother's knowledge about attention deficit hyperactivity disorder (pre- and post-intervention)

Items knowledge	Before intervention		After intervention		P
	Sufficient, n (%)	Not sufficient, n (%)	Sufficient, n (%)	Not sufficient, n (%)	
Meaning of attention deficit	1 (3.3)	29 (96.7)	25 (83.3)	5 (16.7)	0.026
Symptoms of attention deficit	2 (6.6)	28 (93.4)	25 (83.3)	5 (16.7)	0.030
Meaning of hyperactivity	1 (3.3)	29 (96.7)	25 (83.3)	5 (16.7)	0.026
Symptoms of hyperactivity	2 (6.6)	28 (93.4)	24 (80.0)	6 (20.0)	0.028
Causes of the disease	-	30 (100.0)	24 (80.0)	6 (20.0)	0.027
Disease recovery rate	-	30 (100.0)	24 (80.0)	6 (20.0)	0.027
Complications of the disease	-	30 (100.0)	24 (80.0)	6 (20.0)	0.027
The treatment provided to him	-	30 (100.0)	24 (80.0)	6 (20.0)	0.027
Side effects of this treatment	-	30 (100.0)	24 (80.0)	6 (20.0)	0.027
Your source of information	Doctor	25 (83.3)	13 (43.3)		0.029
	Social media	5 (16.7)	4 (13.3)		
	College staff	-	13 (43.3)		

Table 3: Impact of the interventions on mother's awareness about symptoms of poor attention (pre- and post-intervention)

Items	Before intervention			After intervention		P
	Don't know, n (%)	Not aware, n (%)	Aware, n (%)	Not aware, n (%)	Aware, n (%)	
Failure to pay attention to fine details	3 (10.0)	13 (43.0)	14 (47.0)	4 (13.3)	26 (86.7)	0.014
Committing trivial and hasty mistakes that have nothing to do with lack of knowledge	3 (10.0)	13 (43.0)	14 (47.0)	4 (13.3)	26 (86.7)	0.014
Inability to sustain or maintain attention during tasks and activities	2 (7.0)	13 (43.0)	15 (50.0)	3 (10.0)	27 (90.0)	0.024
Inability to listen well. He does not seem to listen or listen	5 (17.0)	10 (33.3)	15 (50.0)	4 (13.3)	26 (86.7)	0.030
Not following instructions	5 (17.0)	9 (30.0)	16 (53.0)	4 (13.3)	26 (86.7)	0.030
Failure to complete work	5 (17.0)	9 (30.0)	16 (53.0)	4 (13.3)	26 (86.7)	0.030
Inability to organize activities well	5 (17.0)	10 (33.3)	16 (53.0)	4 (13.3)	26 (86.7)	0.030
Avoid engaging in things that require constant effort	4 (13.0)	8 (27.0)	18 (60.0)	5 (16.7)	25 (83.3)	0.030
Loss of things needed to complete tasks or activities	4 (13.0)	10 (33.3)	16 (53.0)	5 (16.7)	25 (83.3)	0.029
Ease of mental distraction (easily distracted)	4 (13.0)	10 (33.3)	16 (53.0)	5 (16.7)	25 (83.3)	0.029
Forgetting things	4 (13.0)	9 (30.0)	17 (57.0)	5 (16.7)	25 (83.3)	0.029

Table 4: Impact of the interventions on mother's awareness about symptoms of hyperactivity and impulsivity (pre- and postintervention)

Items	Before intervention			After intervention		P
	Do not know, n (%)	Not aware, n (%)	Aware, n (%)	Not aware, n (%)	Aware, n (%)	
Restless hands or feet or squeaking and movement in the seat	4 (13.3)	9 (30.0)	17 (56.7)	5 (16.7)	26 (86.7)	0.030
Leaving the seat without a reason in situations that require him to sit	3 (10.0)	9 (30.0)	18 (60.0)	5 (16.7)	26 (86.7)	0.030
Running in every direction or climbing things in inappropriate places	4 (13.3)	9 (30.0)	17 (56.7)	4 (13.3)	26 (86.7)	0.029
Inability to play quietly	4 (13.3)	9 (30.0)	17 (56.7)	4 (13.3)	26 (86.7)	0.029
Tendency to always move and rush at any opportunity as if the child were a motorcycle	4 (13.3)	9 (30.0)	17 (56.7)	4 (13.3)	26 (86.7)	0.029
Answer the questions asked before completing question	4 (13.3)	10 (33.3)	16 (53.3)	4 (13.3)	26 (86.7)	0.029
Inability to wait	4 (13.3)	10 (33.3)	16 (53.3)	4 (13.3)	26 (86.7)	0.029
Interrupting others or interfering in their activities	4 (13.3)	10 (33.3)	16 (53.3)	4 (13.3)	26 (86.7)	0.029

Therefore, this study aimed to evaluate the effectiveness of educational intervention guidelines on mothers' knowledge, communication challenges, and practices with their children with ADHD. The current study revealed that the majority of affected children were male, and about two-thirds of their age were 5 years old. This may be related to the age of disease detection, and the main complaints at this age are

hyperactivity and a lack of attention to school performance and learning. These results were consistent with El-Nagger *et al.*,^[14] who reported more than half of the children were boys, these findings were in line with Danielson *et al.*,^[15] who revealed that the rate of ADHD was higher in boys and was more likely to be detailed 4.5 times among boys than girls. On the other hand, Al-Hariri and Faisal^[16] illustrated that a higher

Table 5: Impact of the interventions on communication's challenging facing mothers and their children (pre- and post-intervention)

Items	Before intervention			After intervention		P
	Little, n (%)	Often, n (%)	Always, n (%)	Rarely, n (%)	Little, n (%)	
Difficulty communicating between the mother and the child	4 (13.3)	15 (50.0)	11 (36.7)	6 (20.0)	24 (80.0)	0.049
Child difficulty completing tasks	4 (13.3)	15 (50.0)	11 (36.7)	7 (23.3)	23 (76.7)	0.049
Child difficulty in the child communicating during the school day with his classmates	3 (10.0)	12 (40.0)	15 (50.0)	7 (23.3)	23 (76.7)	0.026
Child difficulty in communicating with teachers during the school day	3 (10.0)	12 (40.0)	15 (50.0)	7 (23.3)	23 (76.7)	0.026
Child difficulty in academic achievement	3 (10.0)	12 (40.0)	15 (50.0)	7 (23.3)	23 (76.7)	0.026
Child difficulty in communicating with his siblings	3 (10.0)	12 (40.0)	15 (50.0)	7 (23.3)	23 (76.7)	0.026
Mothers suffer from anxiety	3 (10.0)	12 (40.0)	15 (50.0)	7 (23.3)	23 (76.7)	0.026

rate of ADHD was among school-age children (4%–12%). The current study reported that more than a quarter (26.7%) of the mothers ages ranged from 31 to 35 years old, and 26.7% of the mothers do not work.

This data contradict the statement made by Naderi *et al.*,^[17] which indicated that the age range of mothers was between 35 and 45 years. Furthermore, there is a contradiction with the findings of Danielson *et al.*,^[15] who reported that children from economically disadvantaged homes were also affected. The findings of the present study also demonstrated third of mothers had a secondary school education. From the researcher's perspective, the study findings indicate that mothers need intervention guidelines and health education programs to enhance their understanding and behaviors. Effective communication with mothers is crucial in addressing the demands associated with ADHD. Preintervention results revealed that most of mothers did not sufficient knowledge about the symptoms of ADHD. In the posttest, mothers' knowledge has improved almost. This may be related to mothers who have a secondary school education and are shy about asking for details about their children's illnesses, resulting in closed communities. Nevertheless, after the intervention and because of the many teaching approaches used by the researchers, their knowledge and understanding of the condition expanded. This indicates the importance of conducting training programs for families, since the initial study question was fully supported, leading to an enhancement in mothers' knowledge after the intervention.

The findings of this study align with those of Kandjani *et al.*,^[18] who reported that the total percentage of parents providing extensive information was 66%. The participants showed the highest levels of knowledge in the domains of diagnosis, drugs, symptoms, and causes. In addition, most of them had a favorable attitude toward ADHD after the implementation of the educational intervention. According to Al-Mohsin *et al.*,^[19] half of the mothers with children who had ADHD had insufficient understanding of ADHD. In addition, a study conducted by Dodangi *et al.* in 2017^[19]

revealed that mothers of children with ADHD had a high degree of ignorance and may hold erroneous ideas. In Taif City, Saudi Arabia, the study conducted by Alzahrani and Abd El-Fatah in 2023 found that female primary schoolteachers had insufficient knowledge of ADHD.^[20] El-Nagar *et al.*^[21] emphasized that ADHD was a significant issue that existed in all communities. They highlighted that raising a kid with ADHD necessitated acquiring specific information, strategies, and understanding of ADHD. Parents needed assistance and direction in the upbringing of their children, which may mitigate issues by fostering enough awareness and sound understanding among mothers and communities. In addition, timely intervention enhances the quality of treatment results. The primary objective of the current research was to enhance the knowledge of mothers, so enabling them to acquire further expertise and assistance. Balagan and Tarroja^[10] demonstrated that mothers had a pressing need to acquire knowledge about ADHD and enhanced their parenting skills. Consequently, a psychoeducational program focusing on parenting, self-management, and ADHD awareness was provided. In addition, children with ADHD necessitated increased care and direct supervision compared to typical children, thus mothers required sufficient expertise in managing such cases. Nurses should also intensify their efforts in supporting mothers of children with ADHD.^[22]

The results of the current study indicated significant improvement in subjects' awareness about symptoms of poor attention pre- and postintervention as child avoided engaging in things that required constant effort and forgetting things, easily distracted, loss of things needed to complete tasks or activities, inability to organize activities well, etc., which reflect significant improvements in mothers' awareness level due to impacts of the intervention. However, they have satisfactory knowledge of postintervention guidelines implementation. This may be attributed to the fact that after attending educational interventions, mothers became interested in the information because they understood how dangerous the disease was, especially for children, so

their information actually improved so the second research hypothesis was accepted, and the intervention-improved mothers' awareness about symptoms of ADHD.

In addition, according to Shattla *et al.*,^[13] the introduction of an ADHD protocol resulted in a statistically significant improvement in mothers' understanding and use of caregiving techniques for their children. Abd El-Moneam *et al.*^[22] reported that implementing an educational program for mothers and their children with ADHD resulted in improvements in the mothers' knowledge, actions, and attitudes. Zaki^[23] further validated that around eight caregivers had enough knowledge before to the program, but their knowledge increased to over one-third after the program was implemented. Insufficient maternal understanding may lead to inaccurate diagnosis or treatment of this prevalent and important illness. To address this issue, it is necessary to implement more measures to educate mothers about these illnesses, particularly through television media.^[19] The primary objective of the study, as seen by the researchers, was to assess the advancement in mothers' knowledge. The observed enhancement in knowledge levels confirmed the research premise. Regarding the practices reported by mothers, there were statistically significant variations in the practices of mothers after the intervention. This improvement may be related to the fact that the mothers cooperated with the researchers' intervention and obtained correct and repeated training from them. Shata *et al.*^[24] found significant alterations in maternal caregiving strategies for children with ADHD after the intervention. In addition, there was a statistically significant improvement in the management of tantrums, hyperactivity, and completion of homework tasks postintervention. The heightened maternal perception and knowledge of activities may be attributed to the existence of postguidelines, there were better interactions between mothers and their children, and their mothers were provided with confidence about effective care provision. According to the study conducted by El-Nagar *et al.*,^[21] children with ADHD rely on their mothers for their daily activities and care, whereas mothers have challenges in managing their children. Therefore, it is crucial to enhance mothers' skills in caring for their children, as this will provide them valuable experience. The results of Dodangi *et al.*'s study were in line with the findings of this study, indicating a substantial correlation between mothers' knowledge and their educational level.^[19] In the same line, a study carried out by Silver^[25] revealed that children's hyperactivity, deviation, and aggression were decreased by mothers' instruction. The current study revealed that there was difficulty communicating between the mother and the child. In addition, the children had difficulty completing tasks, as always mentioned by their mothers; they had

difficulty in communicating during the school day with their classmates and in communicating with teachers. In addition, mothers suffered from anxiety preintervention compared with none of them suffer from all the abovementioned challenges postintervention, which reflected the impact of the intervention in decreasing mothers' challenges with significant differences pre- and postintervention.

These data are consistent with the results of the study by Dodangi *et al.*,^[26] which revealed that over 50% of mothers handle their children with ADHD using preprogrammed punishments. Although only a small portion of them participated in the postprogram intervention, this could be attributed to the fact that the majority of mothers in the preintervention phase resorted to disciplining their children for disobedience, remaining silent, making noise, refusing to study, or failing to maintain a clean home. Their inability to effectively manage these behaviors or handle their children may have contributed to their limited involvement in the intervention. Following the implementation of nursing intervention, the mothers exhibited enhanced proficiency in managing their infants, resulting in improved interactions. This might be attributed to the straightforward and concise nature of the protocol material, as well as the regular feedback provided throughout the protocol session, which aided mothers in focusing on various strategies for managing their ADHD children's behaviors and issues. The intervention considerably enhanced mothers' capacity to communicate successfully with their children, thereby confirming the fourth study hypothesis. This finding aligns with the guidance provided by the American Academy of Pediatrics,^[27] which advises parents to refrain from repeating demands to their kid and to follow disciplinary actions with praise when the child adheres to the rules and behaves well. Consequently, a greater portion of the child's attention is directed into learning. Parents whose children attended their office reported having a high tolerance for signs of inattention and hyperactivity. The participants' lack of capacity to regulate their child's conduct led to a sense of powerlessness and insufficiency. According to Barkley,^[28] parents of children with ADHD see themselves as having lower levels of competence and expertise, and they have less satisfaction and reassurance in their parenting endeavors compared to parents of typically developing children. The mothers' social well-being was affected as they restricted their social engagements to allocate more time to their children and family. They decreased their involvement in social activities with friends, shown discernment in choosing which social meetings to participate in, and imposed a restriction on the duration of time allocated for social engagements. According to Medina's 2001 study,^[29] childcare, in general, reduces the amount of time parents may spend on

productive jobs or leisure activities. The development may be attributed to the researcher's use of many pedagogical methods, such as lectures, films, and conversations. Many educational programs put an increased focus on the provision of written content in the form of booklets. The booklets can use different methods to remind mothers of the lessons they have learned, and for people who are particularly interested in a certain health practice, they can offer more information. The research found that the participants' requirements were linked to their difficulties, everyday stress, and abilities as parents.

CONCLUSION

From the study results, it was concluded that the intervention improved mothers' knowledge, raise mothers' awareness, and solve mothers' communication challenges with when dealing with their ADHD child. It is recommended that: (1) the educational interventions should be conducted for a long period of time to manage all mothers and children daily challenges, improve children's daily activities, and stabilize effective communication between children and their family members; (2) the interventions also increase awareness of families and community with appropriate community mental health services that achieve the needs of those children through mass media and social media; and (3) it is recommended to use a variety of educational and therapeutic methods which assist families of the children who suffer from ADHD in choosing the appropriate method of therapy suitable for child's needs and abilities.

Acknowledgment

The authors extend their appreciation to the deanship of scientific research at Shaqra University, Saudi Arabia for funding this research work through project number SU-ANN-202307. The researchers also thank all mothers and their children who are willing to participate and complete the study.

Financial support and sponsorship

This research was funded by the deanship of Scientific Research at Shaqra University in Saudi Arabia, which funded this research work through project No. SU-ANN-202307.

Conflicts of interest

There are no conflicts of interest.

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