

Autism Spectrum Disorder Care Education: Improving Parents' Knowledge and Caregiving Practices for their Children

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Abstract: Background: Parents of children with Autism Spectrum Disorder (ASD) are an integral component of the healthcare system as they have a substantial role in providing care and support for their children. Therefore, implementing effective parent training programs is of paramount importance. Hence, parents feel self-assured in their capacity to navigate challenges that come with caring for their children with ASD. **Purpose:** This study aimed to determine the effect of health education program using an illustrated booklet on knowledge and practice of parents who have children with ASD. **Design:** a quasi-experimental pretest-posttest study design was used. Settings: This study was conducted at the Psychiatric and Neurological Outpatient Clinics of both Smouha Specialized University Hospital for Children as well as the Main University Hospital in Alexandria. **Sampling:** A convenient sample of 60 parents who were attending with their children having ASD in the previously mentioned settings. **Instruments:** Two instruments were used for data collection; Instrument one: Knowledge of parents having children with ASD interview scheduled sheet, and Instrument two: Parents' caregiving practices for their children with ASD. Results: revealed that 83.3% of parents of the study group exhibited good level of knowledge following the health education sessions with total mean score (5.27±0.91) compared to none of the control group (1.47±1.07) and the difference was statistically significant (p< 0.001*). Regarding caregiving practices, 76.7% of parents in the study group displayed a satisfactory level after the health education sessions with total mean score (25.11±8.20) compared to only 3.3% of the control group (11.40±1.54) with statistically significant difference (p <0.001). **Conclusion:** this study demonstrated the substantial positive impact of the well-designed comprehensive health education program on parents' knowledge, and subsequently their caregiving practices. **Recommendations:** Continuous health education and counseling programs should be launched for parents about the care of their children with ASD.

Keywords: *Autism Spectrum Disorder, Care Education, Caregiving Practices, Children, Knowledge, Parents.*

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Introduction

Autism Spectrum Disorder (ASD) is a multifaceted neuro-developmental disability that is characterized by impairment in communication skills and social relations combined with repetitive and stereotyped behaviors (National Center on Birth Defects and Developmental Disabilities [NCBDDD], Centers for Disease Control and Prevention [CDC], 2022). It is more prevalent among boys than girls (Zeidan et al., 2022). The feature of the illness usually starts in the first year of life and the symptoms tend to manifest gradually over time. However, in certain situations, the child initially develops normally and subsequently experiences a relapse (Susan et al., 2020).

Parenting a child with ASD presents significant difficulties and challenges as parents consistently go through heightened levels of fear, stress, rejection, shame, restlessness, and anxiety (Hall et al., 2017; Ilias et al., 2017). Furthermore, the responsibilities of providing care such as feeding, toileting, grooming, maintaining hygiene, and facilitating communication, along with the financial burden and ongoing medical care, contribute to additional stress. This stress is evident in various aspects of life such as dealing with depression besides encountering parental conflicts and negative social consequences (Weissheimer et al., 2021). Moreover, parents experience numerous challenges in accessing information about ASD, available treatments, and support services. Therefore, providing parents with up-to-date knowledge on

ASD becomes essential to enhance their caregiving skills and self-efficacy in addition to reducing family stress (Musetti et al., 2021).

Health education regarding care of children with ASD is crucial for providing parents with the necessary knowledge and skills to better comprehend the nature of the disorder and ensure proper treatment modalities and follow-up. Accordingly, they support their children's unique needs (Fathi et al., 2016). As well, educating parents about their ASD children can enhance their awareness, cognitive abilities, recognition, and capacity to effectively manage associated challenges and risks (Bradshaw et al., 2018). Moreover, it can assist them in understanding and managing the disruptive behaviors and impaired social skills of their children. Supporting parents and families in effective management of the chronic condition of ASD can empower them to participate in the decision-making process regarding their children's health. Therefore, it is a must to provide comprehensive educational services for parents to help them independently handle their children's illness and provide optimal care with minimal side effects (Carrier et al., 2020).

Pediatric nurses are expected to play an imperative role in the early detection of ASD through infant's health checkup. They are in a good position to refer those children to a specialist for developmental support at an early stage in addition to preparing them sufficiently for independent roles

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(Neyoshi, 2018). They also carry out a vital role in evaluating parents' and families' awareness about ASD, educational needs, coping capacities and access to support groups and resources (Sidig et al., 2022). Moreover, they are uniquely positioned to support parents for their depleted quality of life and recommend appropriate physical and mental health services. A proper channel of communication must also be maintained with parents to empower them and enhance their self-efficacy (Turnage & Conner, 2022).

Significance of the study

The incidence and prevalence of ASD is rising globally as it currently ranks as the third most common developmental disorder. According to the World Health Organization, the estimated prevalence of ASD worldwide is 1 in every 100 children (WHO, 2023). Recent demographic research conducted in Egypt found that among children with special needs, the prevalence of ASD was 33% (Abdel Meguid et al., 2021). Considering the developmental nature of ASD symptoms and the importance of early and effective interventions, the active participation of parents in educational programs is vital for efficient treatment (Iadarola et al., 2019). So, pediatric nurses are in an important position to provide health education regarding the care of children with ASD. They can help parents to discuss their problems openly, cope with threats they experience, and have a more positive outlook in life. Accordingly, the purpose of the current study was to

determine the effect of health education program using an illustrated booklet on knowledge and practice of parents who have children with ASD.

Hypothesis

Parents who receive health education program using illustrated booklet about care of their children with ASD are expected to have higher knowledge and practice scores than those who do not receive such health education.

Method

Study design

A quasi-experimental pretest-posttest study design was used.

Settings

This study was conducted at the Psychiatric and Neurological Outpatient Clinics of both Smouha Specialized University Hospital for Children and the Main University Hospital in Alexandria. These settings offer follow-up and rehabilitation services for children with psychiatric and neurological disorders, as well as developmental disabilities. Their services cater not only to the residents of Alexandria but also extend to the neighboring governorates, including El-Behera, Matrouh, and Kafr El-Sheikh.

Sampling

A purposive sample of 60 parents who were attending with their children having ASD in the previously mentioned settings comprised the study subjects. The study subjects were selected according to the following inclusion criteria; ability to read and write and having only one child

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diagnosed with any level of ASD. Their autistic children were in the preschool stage and free from other neurological or physical disorders. The researchers divided the subjects into study and control groups (30 for each). The researchers considered matching methods to confirm the representativeness and homogeneity between both groups.

Epi info program version 10 was used to estimate the sample size using the following parameters:

- Population size was 150,
- Expected frequency is 50%.
- Margin of error is 10%.
- Confidence coefficient is 99%.
- Minimum sample size was 50. So, the final sample size was 60 parents.

Instruments:

Two instruments were used for data collection:

Instrument one: Knowledge of Parents Having Children with Autism Spectrum Disorder, Interview Scheduled Sheet:

This instrument was developed by the researchers after an extensive review of recent and relevant literature to evaluate the knowledge of parents having children with ASD (Ilias et al., 2017, Hall et al., 2017, Harris et al., 2009). It contained two parts:

- **Part 1:** Socio-demographic and clinical data of parents: which included age, gender, educational level, occupation, and the number of children they have.
- **Part 2:** Parents' Knowledge about ASD: It consisted of 25 questions related to various aspects of

knowledge, including its definition, diagnostic features, signs and symptoms, predisposing factors, treatment options, and components of care.

Each question was scored as either true (1) or false/don't know (0). Subsequently, the total score was converted to a percentage, and participants' knowledge levels were classified as follows:

- **Poor:** Less than 65%
- **Fair:** 65% - 75%
- **Good:** More than 75%

Instrument two: Parents' Caregiving Practices for Children with Autism Spectrum Disorder Interview Scheduled Sheet

The instrument was developed by the researcher after thorough review of current and relevant literature to assess the care provided by parents for their children with ASD (Hyman, et al., 2020, Meguid, et al., 2021, Harris, et al., 2009). It consisted of 55 questions, encompassing various aspects of care such as feeding, elimination, dressing, hygiene, physical activity, sleeping, managing attention and concentration difficulties, implementing safety measures, as well as promoting social interaction and communication skills.

Each item of care was rated on a 3-point Likert scale, with the following options: always done (2), sometimes done (1), rarely/not done (0). The overall care provided by the parents was then computed as a percentage, and the scores were categorized as follows:

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- Satisfactory practice: 60% or more.
- Unsatisfactory practice: less than 60%

Reliability

The reliability of both instruments was checked by Cronbach alpha coefficient statistical test and showed high reliability values ($r = 0.78$ for instrument one and $r = 0.86$ for instrument two).

Validity

The content validity of the instruments was assessed by five experts in the fields of Pediatrics, Pediatric Nursing, and Nursing Education. Instrument one demonstrated a content validity of 92%, while instrument two showed a content validity of 96%.

To ensure the validity, representativeness, and accuracy of knowledge and care practices related to Autism Spectrum Disorder (ASD), the content of the handout was reviewed by a panel of five experts in the fields of pediatric nursing and nursing education. Furthermore, the handout was assessed for the extent to which its details were supported by studies and theories. Additionally, the handout was tested for its practicality by five parents of autistic children who were not part of the study groups

Ethical considerations

Approval from the Research Ethics Committee of the Faculty of Nursing at Alexandria University was obtained. The researcher explained the purpose of the study and methods of data collection to the participants. Written informed consents were obtained from the parents. all information was treated

as confidential, and the data was handled anonymously. Participants were informed that their participation was voluntary and they had the right to withdraw at any time.

Pilot study

It was conducted to assess the clarity, simplicity, and acceptability of the instrument's items, the pilot study was carried out on six parents from the previously mentioned settings. No modifications were made based on the pilot study.

Procedure

An official letter was submitted from the dean of the Faculty of Nursing, Alexandria University to the directors of the previously mentioned settings. The letter explained the purpose and methods of data collection. An interview was conducted with parents of children having autism spectrum disorder to collect data about their Knowledge about autism and reported practices related to their care.

Afterwards, a thorough examination of relevant literature, to develop a health education program that could satisfy the requirements of parents of parents. This program encompassed specific objectives, teaching content, teaching strategies, and timing, visual aids such as photos, instructions, explanations, and examples.

Then, the researchers implemented the health education program exclusively with the study group, while the control group received the regular health teachings provided by the clinics. Parents in the study group were distributed into small subgroups. Each parent in the study group underwent

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three consecutive health education sessions. The first session included knowledge about ASD, The second session included caregiving practices about ASD, The third session involved answering any questions and issues from the parents about ASD. The duration of each session ranged between 30 to 45 minutes, and all three sessions were conducted within a span of one week. Follow-up sessions were diligently scheduled every two days at the specified locations, and telephone communications were maintained for ongoing support and assistance.

The researchers actively engaged with the parents during the instruction, through providing examples, clarifications, answering questions, and offering explanations. Parents were encouraged to demonstrate and discuss the care practices with the researchers. This ensured that all givers had a comprehensive understanding of how to manage their children's care effectively.

Handouts were distributed between parents as self-learning references, to be used if needed at home.

After the completion of the health education sessions, both the study group and the control group underwent reassessment using the same study instruments in the week following the sessions. The scores obtained from the study instruments were compared for both groups, both before and after the health education sessions. By examining the difference in scores, the researchers aimed to evaluate the impact of the newly developed health education program on the knowledge and practical skills of the parents.

Statistical analysis

The collected data was computerized, coded, analyzed, and organized into tables. Statistical analysis was conducted using Statistical Packages for the Social Sciences (SPSS) version 23.0 for Windows and Microsoft Excel Spreadsheet Package (Office 2010). Tests for significance were used; mean and standard deviation as well as percentage, frequency, chi-square (Monte Carlo or Fisher Exact), Student t-test, Mann Whitney test and Significance of the obtained results was judged at the 5% level of statistical significance.

Results

Table 1: illustrates socio-demographic characteristics of parents. It is clarified from the table that the age of more than one-third of parents in both control and study groups ranged from 25 to less than 30 years (40%, 36.7 % respectively) and about two-thirds were females (70%, 66.7% respectively). Thirty percent of both control and study groups were employees while 26.7% were unemployed. Additionally, more than one-third of parents in the control and study groups had the ability to read and write (40%, 36.7% respectively). Moreover, both groups had the same percentage of parents (40% and 36.7%, respectively) who had three children, including the autistic child. Regarding education, the majority of parents in both groups (86.6% and 83.3%, respectively) had not attended any educational courses related to ASD.

Table 2: depicts the parents' knowledge of autism spectrum disorder, as perceived by both the study and control groups before and after participating in the health education intervention. It was clear that

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there was a lack of knowledge about ASD among both control and study groups before the health education sessions. However, after the sessions, there was a significant improvement in the parents' knowledge, particularly in the study group. For instance, a large percentage of them were able to identify the definition, signs and symptoms, predisposing factors, features, treatment, and components of ASD care after the health education (83.3%, 90%, 90%, 90%, 83.3%, and 83.3% respectively), showing highly significant statistical differences ($p > 0.0124$, 0.0000 , 0.0000 , 0.0001 , 0.0000 , and 0.0000 respectively). In contrast, when comparing the observations with the control group, the improvement in knowledge was negligible.

Table 3: presents the total score of parents' knowledge in the study and control groups about ASD. The table clearly shows that the majority of parents in both control and study groups (90% & 93.3% respectively) had a poor level of knowledge regarding ASD before participating in the health education sessions. However, following the health education sessions, 83.3% of parents of the study group exhibited a good level of knowledge after the health education sessions compared to none in the control group. Overall, the table indicates that the total mean score of parents' knowledge in the study group (5.27 ± 0.91) was higher than that of the control group (1.47 ± 1.07) with a highly significant statistical difference ($p < 0.001$).

Table 4: displays the mean scores of the practices carried out by parents for

their children with ASD. Following the health education sessions, positive changes were observed in favor of the study group across all aspects of care, including feeding, elimination, dressing, hygiene, sleep routines, social interaction, attention and concentration, communication, and physical activity. The mean scores for each aspect of care were higher in the study group (2.1 ± 0.8 , 2.5 ± 1.6 , 2.2 ± 1.4 , 2.4 ± 0.7 , 2.7 ± 0.9 , 2.4 ± 0.8 , 3.1 ± 1.4 , 2.8 ± 1.4 , and 2.4 ± 1.1 , respectively) compared to the control group (0.9 ± 0.8 , 1.2 ± 1.9 , 1.0 ± 0.7 , 1.1 ± 1.4 , 1.3 ± 0.7 , 0.9 ± 1.1 , 1.6 ± 1.5 , 1.4 ± 1.1 , and 0.9 ± 0.7 respectively).

Table 5: demonstrates levels of caregiving practices provided by the parents for their children with ASD. It was observed that prior to health education, all parents in both the control and study groups exhibited an unsatisfactory level of caregiving practice (100% for each). Nonetheless, following the health education sessions, more than three-quarters of parents in the study group displayed a satisfactory level of practice (76.7%), compared to only 3.3% of the control group. Therefore, a highly statistically significant difference was found between the two groups after the health education sessions ($p < 0.001$).

Table 6: depicts the correlation between parents' knowledge and their caregiving practices. The table clearly indicates that there is moderate, positive and significant correlation between parents' knowledge and their caregiving practices performed for their children having ASD ($r = 0.418$, $p = 0.021$).

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Table 1: Socio-demographic Characteristics of Parents

Socio-demographic characteristics	Control Group (n=30)		Study Group (n=30)		Test of Significant (X ²)
	No.	%	No.	%	
Age					
▪ 20 -	6	20	8	26.7	0.420
▪ 25 -	12	40	11	36.7	
▪ 30 -	6	20	6	20	
▪ 35 - 40	6	20	5	16.6	
Sex					
▪ Male	9	30	10	33.3	0.77
▪ Female	21	70	20	66.7	
Occupation					
▪ Worker	5	16.6	4	13.3	0.602
▪ Employee	9	30	9	30	
▪ Farmer	8	26.7	9	30	
▪ Unemployed	8	26.7	8	26.7	
Educational level					
▪ Read & write	12	40	11	36.7	1.745
▪ Primary education	10	33.3	8	26.6	
▪ Secondary education	5	16.6	6	20	
▪ University education	3	10	5	16.6	
Low literacy (reading & writing)					
Number of children					
▪ 3	12	40	11	36.7	0.420
▪ 4	6	20	7	23.3	
▪ 5	6	20	7	23.3	
▪ 6	6	20	5	16.6	
Family income					
▪ Enough	9	30	12	40	0.659
▪ Not enough	21	70	18	60	
History of ASD					
▪ Positive	9	30	10	33.3	0.77
▪ Negative	21	70	20	66.7	
Attendance of educational courses about ASD					
▪ Yes	4	13.3	5	16.6	0.74
▪ No	26	86.6	25	83.3	

X² = Chi square test,

P: level of significance ≤ 0.05

Table 2: Parents' Knowledge Regarding Autism Spectrum Disorder

Parents' knowledge	Before				X ²	P	After				X ²	P
	Control group (n=30)		Study group (n=30)				Control group (n=30)		Study group (n=30)			
	No.	%	No.	%			No.	%	No.	%		
Definition	12	40	11	36.7	0.071	0.7898	16	53.3	25	83.3	6.239	0.0124**
Signs & symptoms	1	3.3	2	6.6	0.351	0.5534	1	3.3	27	90	45.268	0.0000***
Predisposing factors	10	33.3	2	6.6	0.317	0.0622	10	33.3	27	90	20.376	0.0000***
Features	9	30	8	26.7	0.082	0.7746	11	36.7	27	90	18.373	0.0001***
Treatment	2	6.7	3	10	0.218	0.6405	4	13.3	26	83.3	32.267	0.0000***
Components of care	2	10	2	6.6	0.0	0.2680	2	6.6	26	83.3	38.571	0.0000***

* P < 0.05 ** P < 0.01 *** P < 0.001 DF = Degree of freedom = 1

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Table 3: Total score of Parents' knowledge in the Study and Control Groups about ASD

Parents' Knowledge	Before				Significance		After				Significance	
	Control group (n=30)		Study group (n=30)				Control group (n=30)		Study group (n=30)			
	No.	%	No.	%	□ [□]	P	No.	%	No.	%	□ [□]	p
Poor	27	90.0	28	93.3	0.218	FE p=1.000	28	93.3	2	6.7	56.829*	MC p<0.001*
Fair	3	10.0	2	6.7			2	6.7	3	10.0		
Good	0	0.0	0	0.0			0	0.0	25	83.3		
Total score												
Mean ± SD	1.27±1.20		0.93±1.20		U=358.0	p<0.150	1.47±1.07		5.27±0.91		U= 9.0*	p<0.001*

χ²: Chi square test

MC: Monte Carlo

FE: Fisher Exact

U: Mann Whitney test

*: Statistically significant at p ≤ 0.05

Table 4: Mean Scores of the caregiving Practices Carried Out by Parents for their Children with ASD

Caregiving practices by parents	Before				After			
	Control Group (n=30)		Study Group (n=30)		Control Group (n=30)		Study Group (n=30)	
	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD
- Feeding	0.7	0.7	0.6	1.1	0.9	0.8	2.1	0.8
- Elimination	0.9	1.6	0.8	1.5	1.2	1.9	2.5	1.6
- Dressing	0.8	1.3	1.1	1.6	1.0	0.7	2.2	1.4
- Hygiene	0.7	1.4	0.8	1.4	1.1	1.4	2.4	0.7
- Sleeping rituals	1.2	1.1	1.2	0.6	1.3	0.7	2.7	0.9
- Social interaction	0.6	1.3	0.9	1.1	0.9	1.1	2.4	0.8
- Attention & concentration	1.3	0.7	1.4	1.1	1.6	1.5	3.1	1.4
- Communication	1.3	1.1	1.2	1.2	1.4	1.1	2.8	1.4
- Physical activity	0.7	1.3	1.0	1.5	0.9	0.7	2.4	1.1

Table 5: Levels of Caregiving Practices Provided by Parents for their Children with ASD.

Caregiving practices	Before				Significance		After				Significance	
	Control group (n=30)		Study group (n=30)				Control group (n=30)		Study group (n=30)			
	No.	%	No.	%	□ [□]	P	No.	%	No.	%	□ [□]	p
- Unsatisfactory	30	100%	30	100%	-	-	29	96.7%	7	23.3%	10.631*	FE p=0.011*
- Satisfactory	0	0.0%	0	0.0%			1	3.3%	23	76.7%		
Total score					U=	P					U=	p
Mean ± SD	9.12±1.10		10.01±2.21		343.50	0.115	11.40±1.54		25.11±8.20		118.0*	<0.001*

χ²: Chi square test

FE: Fisher Exact

U: Mann Whitney test

*: Statistically significant at p ≤ 0.05

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Table 6: Correlation between Parents' Knowledge and their Caregiving Practices (n=30)

Correlation	Overall Parents' knowledge	
	R	P
Total Score of Care	0.418*	0.021*

r: Pearson coefficient

0.00-0.19: “very weak”

0.60-0.79: “strong”

0.20-0.39: “weak”

0.80-1.0: “very strong”

*: Statistically significant at $p \leq 0.05$

0.40-0.59: “moderate”

Discussion

Autism spectrum disorder is a lifelong complex neurological condition which yields a challenging and stressful experience for both children and parents (Shattnawi et al., 2021; Tathgur, & Kang, 2021). Hence, it presents a plethora of psychosocial problems to parents such as stress, depression, anxiety, restrictions of activities, strain in marital relationships, and diminished physical health (Kheir, 2012). Therefore, pediatric nurses have a pivotal role in providing health education and support for these parents (Neyoshi, 2018).

The findings of the current study revealed that before receiving health education, both the control and study groups exhibited limited knowledge in various aspects of ASD. This finding corroborates with the finding of a relatively recent study carried out in Egypt by Meguid et al. (2021) who reported that parents had limited awareness of ASD as they were familiar mainly with the term "ASD" rather than having a deeper comprehension of its nature. Moreover, during the past two decades, earlier studies were conducted in Egypt by Mahmoud (2009) and Mansour (2010) and reported that a significant proportion of parents had limited knowledge about ASD. Their poor knowledge was potentially due to limited participation in previous training and educational programs on the subject. The same level of

knowledge was also seen in a previous study conducted in Pakistan by Anwar et al. (2018) who assessed the level of awareness regarding ASD, and found that parents displayed poor knowledge scores. All these studies indicate that in Egypt, as in some other countries, there has been historically a lack of widespread awareness and understanding of ASD, emphasizing the crucial need for educating parents (Meguid et al., 2021).

In accordance with the present results, previous studies have found that a well-designed health education intervention can improve parents' understanding of ASD (Chandran et al. 2019, Keshk et al., 2020, ELHawat et al., 2023). The findings of the current study revealed that the health education provided to the parents has a substantial impact on their knowledge and understanding of ASD. Those parents showed better understanding and awareness following the health education sessions. When comparing the knowledge scores of parents in both groups, a significant difference was observed, favoring the study group. Whereas the parents of the control group exhibited only marginal improvement in their knowledge. The improvement in parents' knowledge after health education sessions can be attributed to the effectiveness of the educational program as it satisfied all the needed knowledge about signs and symptom of ASD, predisposing

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factors, features, treatment, and components of care.

Regarding the second outcome of the current study, parents in both groups initially exhibited unsatisfactory caregiving practices before health education. However, following the health education sessions, the study group demonstrated significant improvements in caregiving practices across multiple domains, including feeding, elimination, dressing, hygiene, sleep routines, social interaction, attention and concentration, communication, and physical activity. This finding accords with earlier studies that highlighted that health educational programs enhanced the practices of parents who have children with ASD (Keshk et al., 2020, ElHawat et al., 2023). Khushabi et al. (2010) also emphasized that parents of autistic children frequently benefited from instruction and education to enhance their competencies and become more adept at acquiring new caregiving skills.

The improvement in the parents' caregiving practices can be attributed to the increase in their knowledge and comprehension of ASD following their participation in the health education sessions. It has been argued that parents' knowledge, practices, and attitude are influencing each other. Caregiving practices are closely linked to both knowledge and attitudes and frequently involve the practical application of knowledge (National Academies of Sciences et al., 2016). This is consistent with the findings of the current study, which revealed a moderate, positive, and significant correlation between parents' knowledge and caregiving practices. Previous studies were also carried out on parents of children with ASD and reported a significant positive correlation between the total

knowledge score and total practice score (Chandran et al., 2019; El Hawat et al., 2023).

Meanwhile, the findings of the present study indicate that parents who are well-informed about ASD are better equipped to provide appropriate care and support for their children. It is possible that through the health education intervention, the parents acquired a deeper understanding of the unique needs of their children with ASD and the evidence-based caregiving practices. The correlation between parents' knowledge and caregiving practices emphasizes the importance of ongoing support and training. Wang et al. (2022) reported the importance of increasing parents' awareness about ASD as a crucial step in assisting them in caring for their children. Nurses have the capacity to play a significant role in delivering continuous education and guidance to parents, thereby promoting consistent and evidence-based care practices (Fraatz and Durand, 2021).

Lastly, the study underscores the critical role of pediatric nurses in providing continuous education and guidance to parents. This role aligns with the call for provision of early and continuous support to maximize the child's ultimate functional independence and quality of life, facilitating their development and learning, and promoting socialization, all while minimizing core ASD features, (Salleh et al., 2020; Zaky et al., 2015)

Conclusion

The findings of this study draw attention to the substantial positive impact of the well-designed comprehensive health education program on parents' knowledge, and subsequently their caregiving practices. Moreover, the study identifies the significant positive correlation between

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parents' knowledge of ASD and their caregiving practices.

Recommendations

Based on the findings of the current study, it is recommended that:

- Health education programs about ASD should be expanded and made available to a wider spectrum of parents across Egypt.
- A collaboration with healthcare institutions, educational facilities, and local communities should be established to disseminate information and educational resources about ASD to parents.
- A hotline should be established where parents can receive assistance and support without stigma.

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