Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.47750/jptcp.2023.30.12.014

Impact of Educational Program Toward Autism spectrum disorder on caregivers' knowledge at Autism Center in Kirkuk City

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Submitted: 12 March 2023; Accepted: 18 April 2023; Published: 14 May 2023

ABSTRACT

Autism Spectrum Disorder is a spectrum of neurodevelopmental disorders occurring in early childhood period, characterized by persistent deficits in social communication and interaction with restricted, repetitive patterns of behavior, interests, or activities. A quazi-experimental study was carried out at Autism Center for autism at Kirkuk city starting from (15th November 2021) to (1 st february 2023), in order to planned apply an Educational program regarding autistic child to help Caregivers increase their knowledge more to find the relationship between Caregivers knowledge and their general information. A purposive (non-probability) sample of (40) Caregivers were selected from Pediatric Hospital in autism center at Kirkuk city to participate in the program. The program includes several lectures to teach Caregivers about autism and their work test before and after the program for Caregivers to measure the Impact of the program. The Questionnaire format prepared for the purpose of the study and consists of two parts, the first part is related to general information data of children and their Caregivers and the second part is related to Caregivers knowledge for their autistic children represent like a multiple choice which consists of (8) aspects for knowledge and divided into sub-items which to consisting of (56) items. A descriptive statistical analysis procedure like frequency, percentage and mean of score and standard deviation. In addition an inferential analysis procedure (correlation coefficient and ANOVA) were used to analysis the data. The result shows that there is no significant association between Caregivers (Age Groups, Occupation, Family Type, Marital Status, and Economic situation) and their knowledge concerning autistic child, while there is statistical significant association between Caregivers (level of education) and their knowledge at (pre-test& post-test).The Caregivers knowledge were low about autism spectrum disorder of the beginning of an educational programs of autism. The Caregivers knowledge concerning autistic of their children are increasing at post-test and become high at acceptable knowledge level after the beginning of an educational program.The study recommended providing an educational courses for Caregivers attending the autistic center and providing an educational materials like posters, guidelines, leaflets and brochures in autism centers to educate their mass media condition important especially television for Caregivers to educate their.

Keywords: *Educational Program , Autism , Kirkuk City*

J Popul Ther Clin Pharmacol Vol 30(12):e99–e129; 14 May 2023.

INTRODUCTION

Autism is a neurodevelopmental disorder that affects the quality of relationships, communication and language skills as well as emotional and imaginative development, the ASD was first described in 1943 by the American child psychologist, Leo Kanner. He presented 11 children whose behaviors' were obviously different from those of others. Kanner suspected that they had an inborn feature which had prevented their regular social contacts. (Surmen, et al., 2015).

Autism terms from the Greek word "auto" means "alone" officially presented by Kanner's 1943. Clinical name, autism or autism spectrum disorders (ASD), is a complex disorder involves abnormal nervous system development (Razali, et al., 2013).

Autism is a disorder of neural development, characterized by impaired social interaction and communication, with restricted repetitive behaviors. Onsets of this condition at birth or within the first two and a half years of life (Arif, et al., 2013).

Although behavioral differences in children and become more clear before age 2 years in most of them, usually diagnosed in 3 years old or more (Mandell, et al., 2005).

Even though the etiology and pathogenesis of ASD is not fully recognized and fully clarified, various genetic, prenatal, early postnatal, microbiological, biochemical and environmental factors have been implicated in the etiopathogenesis of autism. (Surmen, et al., 2015).

Autism have behavioral, medical, and psychological effects that found to be connected to nutrition, many children with autism have an undeveloped gastrointestinal tract leading to feeding behaviors such as constipation, regurgitation, rumination and selective eating. The underdeveloped gastrointestinal tract has thin mucosa lining, allowing food molecules to be absorbed in the blood stream prematurely it also causes inflammation and irritation. Behaviors may be a result of irritability due to inflammation and difficulty digesting food. The most common nutrient deficiencies found in children with Autism include vitamin A, vitamin C, thiamin, riboflavin, niacin, folic acid, vitamin B6, vitamin B12, calcium and iron. These missing vitamins and minerals exacerbate feeding behaviors as well as cause a decline in overall health (Abd El- haliem, et al., 2013).

Autism sufferers may have different signs and symptoms, that's why most of the healthcare provider thinks autism as a spectral disorder. Some autism sufferers use to have no eye contacts and don not like hugs and smile .Children may have varying verbal capabilities, fluctuating between nonverbally to advanced speech as well as intellectuality may vary from mental retardation to superior intellectuality . Some autism sufferers may show typical advancement in specific skills and may even show excel performance in specific areas like music, art and puzzles. However, generally Autistics often spend more time in solitary play (Ullah, et al., 2015).

Autism can present in all races, social status, religions and classes of people. It can occur in any child and family, so far the main causes of this disorder unknown that is why their is no medical cure completely (Murray, et al., 2013).

Not all children with autism are mentally incapable some of them could be smarter than normal children. However, in many cases, autistic children tend to have behavioral problems. Some of the characteristics among the autistic children can present severe problems for parents (Jiar, and Xi Lu, 2012).

ASD is a multifactorial disorder with a variety of causes. Among these, environmental factors like exposure to various toxic metal based pollutants have a significant role in ASD aetiology. These pollutants can elevate the proinflammatory profile of cytokines and aberrant expression of nuclear factor kappa B (NF-κB) (Bjørklund et al., 2018).

ASD has also a strong genetic root. Genes that affect synaptic maturation are involved in ASD, resulting in disturbance in connectivity of neurons which, in turn, disturbs information processing in the brain by changing connection and organisation of nerve cells and their synapses (Misra, 2014).

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It is evident that each autistic child expresses a unique pattern of behaviour with a particular level of severity that is from low functioning to high functioning.

The severity of this disorder is based on the nature of behavior restrictive and repetitive, or the level of impairment in social communication as well as how these can affect child's ability to function (Filipek et al.,1999).

The unusual behavioural changes among children are first noticed by the parents or the caregivers. When an active and normally developed child all of a sudden shows behavioural changes such as causing injury to self, destructive or withdrawal from social interactions and unresponsive, parents consider it as something is wrong with their kids. Even though parents notice these changes, it is difficult for them to identify/realise the specific nature and degree of the problem of their children (Turkington and Anan, 2007).

The severity of ASD, maladaptive behaviors of child with ASD as well as the level of general developmental delay and impairment in activities of daily living are challenging for parents who are the immediate caregivers of these children. Even if parents recognize the behavioural changes of their child, they should maintain a stable and positive attitude till they receive the diagnosis of the disorder and find/develop a proper intervention service for the child. Improvement in child's behaviour depends on the active involvement of parents in those educational interventional programs and they should ensure that the child practices those skills in home settings (Wang et al., 2012). In fact, several researches have shown that families of children with autism experience high levels of stress, more than families with other types of disabilities. This stress can sometimes lead to despair, depression and, in the worst cases, suicidal thoughts. These caregivers need our support. (Amr et al., 2011).

Families who experience high levels of stress in raising a child with a developmental disability may seek and need more social and organizational support to adapt to their situation. The caregivers of autistic children are vulnerable to psychological distress, families have been burdened by financial concerns, worries about health of autistic children. Coping with uncertain about child's development is another source of stress, also appear to show high degree of depression and chronic fatigue, there is inadequate support from community agencies, insufficient special skills training to the caregivers and family member is a major issue to the problem of who will care for the child if they become disabled and the provision of like, line care Giving bring with it, many problems like social isolation and loneliness (El-Baz et al., 2011).

In contrast to other types of disabilities, parents of children with autism appear to be at greater risk for depression, anxiety, social isolation, fatigue and frustration in obtaining accurate diagnoses and services. Indeed (Kamp-Becker et al., 2011) found autism to contribute more to family stress. Individuals with autism frequently engage in behaviours that are potentially disruptive to family life such as aggression, selfinjury, impulsivity, hyperactivity, temper tantrums and obsession ritualistic behavior (Al-Salehi&Ghaziuddin,2008).

Prior research has suggested that when parents and caregivers are actively involved in children's programming and training, the prognosis is better for both parent and children. However, not all families display the characteristics that allow them to take an active role. Parents and caregivers of autistic children also have widely different opinions and beliefs that contribute to their perspective on the critical issues impacting their level of involvement in children's education and training. (Gautam & Jain, 2010).

A family caregivers concern that has been reported in the literature is the need for information about the dimension of care to be provided. Such information and assistance regarding the disease, physical and psychological care, what symptoms to expect, their causes, and how to manage them, treatment regimens and expectation of future care. Therefore, nurses have a great role in helping children and their family to attain better quality of life, and help them to adjust psychologically and physically, in order to lead a life that is richer, happier &more meaningful (Kamp-Becker et al., 2011).

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Community psychiatric mental health and pediatric nurse plays an important roles regarding to the child and their families condition, identifying their problems and establish the goal to facilitate the nursing intervention to be carried out to move towards conditional acceptance. provide, preventive, curative and rehabilitative care to individuals, families and group within the community through systematic assessment and planned screening programs (Wang et al., 2012).

Importance of the Study

Though the number of autistic children in the world is quite substantial, and prevalence of autism according to Centers for Disease Control and Prevention (CDC) estimates that 1 in 44 children has been identified with autism spectrum disorder (ASD),(Center for Disease Control and Prevention,2022).

Yet the levels of knowledge about autism is still very low among caregivers especially in developing countries, early detection and recognizing by parents is important because early intervention services may be more effective in children with Autism than in other developmental disabilities (Upendra, 2013).

As well as no previous study done in Kurdistan Region about this important issue especially in nursing felid (applying educational health programs on caregiver knowledge regarding ASD).

The researcher realizes that Parents or primary caregivers of children with autism play multiple roles in their children life. Their level of motivation needs to be sustained with periodical updating of knowledge and sharpening of skills to deal with children in difficult circumstances. Knowledge of primary caregivers towards children with ASD are important factors in promoting health and wellness of children. Hence, also there is a need to improve the knowledge of caregivers of children with ASD.

Types of Treatments

There are many different types of treatments available. They are categorized as follows:

Educational Interventions

Applied Behavior Analysis (ABA)

According to reports by the American Academy of Pediatrics and the National Research Council, behavior and communication approaches that help children with ASD are those that provide structure direction and organization for the child in addition to family participation (Dillenburger, Keenan, 2009).

A notable treatment approach for child with an ASD is called applied behavior analysis (ABA). ABA has become widely accepted among health care professionals and used in many schools and treatment clinics. ABA encourages positive behaviors and discourages negative behaviors in order to improve a variety of skills. The child's progress is tracked and measured. There are different types of ABA. as shown in Table(2.1):-

TABLE 2.1: Different Types of ABA. Following are some examples.

No	Type of ABA	Explains
1-	Discrete Trial Training (DTT)	DTT is a style of teaching that uses a series of trials to teach each step of a desired behavior or response. Lessons are broken down into their simplest parts and positive reinforcement is used to reward correct answers and behaviors. Incorrect answers are ignored.
2-	Early Intensive Behavioral Intervention (EIBI)	This is a type of ABA for very young children with an ASD, usually younger than five and often younger than three.
3-	Pivotal Response Training (PRT)	PRT aims to increase a child's motivation to learn, monitor his own behavior, and initiate communication with others. Positive changes in these behaviors should have widespread effects on other behaviors.

4-	Verbal Behavior Intervention (VBI)	VBI is a type of ABA that focuses on teaching verbal skills

(Eikeseth, 2009)

Communication Interventions

The inability to communicate, verbally or non-verbally, is a core deficit in Autism. Children with Autism are often engaged in repetitive activity or other behaviors because they cannot convey their intent any other way. They do not know how to communicate their ideas to caregivers or others. Helping a child with Autism learn to communicate their needs and ideas is absolutely core to any intervention. Children with Autism require intensive intervention to learn how to communicate their intent. Communication interventions fall into two major categories. Social skills have been shown to be effective in treating children with autism. Interventions that attempt to improve communication are commonly conducted by speech and language therapists, (Schlosser and Wendt, 2008).

Environmental Enrichment

Environmental enrichment is concerned with how the brain is affected by the stimulation of its information processing provided by its surroundings including the opportunity to interact socially. Brains in richer more-stimulating environments, have increased numbers of synapses and the dendrite arbors upon which they reside are more complex. This effect happens particularly during neurodevelopment, but also to a lesser degree in adulthood. With extra synapses there is also increased synapse activity and so increased size and number of glial energy-support cells. Capillary vasculation also is greater to provide the neurons and glial cells with extra energy (Chisholm, et al., 2015).

Massage Therapy

A review of massage therapy as a symptomatic treatment of autism found limited evidence of benefit. Few high quality studies, concluded that their is no efficacy of massage of therapy (Lee, et al., 2013).

Music

Music therapy uses the elements of music to let people express their feelings and communicate. A study review found that music therapy may help in social interactions and communication (Gold, et al., 2006).

Parent Mediated Interventions

Parent mediated interventions offer support and practical advice to parents of autistic children. Parent training can lead to reduced maternal depression, improved maternal knowledge of autism and communication style, and improved child communicative behavior. Early detection of ASD in children can often occur before a child reaches the age of three years old. Methods that target early behavior can influence the quality of life for a child with ASD. Parents can play important role for this detection by learn methods of interaction and behavior management to assist their child's development (McConachie and Diggle, 2007).

Medical Management

Drugs supplements or diets are often used to alter physiology in an attempt to relieve common autistic symptoms such as seizures sleep disturbances irritability and hyperactivity that can interfere with education or social adaptation. There is plenty of anecdotal evidence to support medical treatment many parents who try one or more therapies report some progress, and ability to return to mainstream education after treatment, with dramatic improvements in health and wellbeing. (Levy and Hyman, 2005).

Prescription Medication

Many medications are used to treat problems associated with ASD. More than half of U.S.

children diagnosed with ASD are prescribed psychoactive drugs or anticonvulsants, with the most common drug classes being antidepressants stimulants and antipsychotics. Only the antipsychotics have clearly demonstrated efficacy. Research has focused on atypical antipsychotics especially risperidone, which has the largest amount of evidence that consistently shows improvements in irritability self injury aggression and tantrums associated with ASD. Risperidone is approved by the Food and Drug Administration (FDA) for treating symptomatic irritability in autistic children and adolescents. In short term trials up to six months most adverse events were mild to moderate with weight gain drowsiness and high blood sugar requiring monitoring long term efficacy and safety have not been fully determined.It is unclear whether risperidone improves autism's core social and communication deficits. The FDA's decision was not recommended for autistic children with mild aggression and explosive behavior (Posey, et al., 2008).

Dietary Supplements

Many parents give their children dietary supplements in an attempt to treat autism or to alleviate its symptoms. . A some studies support the use of vitamin B6 in combination with magnesium at high doses but the evidence was equivocal and there view noted the possible danger of fatal hypermagnesemia (Rossignol, 2009).

Dimethylglycine (DMG) is hypothesized to improve speech and reduce autistic behaviors, and is a commonly used supplement. Two double blind placebo controlled studies found no statistically significant effect on autistic behaviors, and reported few side effects. No peer reviewed studies have addressed treatment with the related compound trimethylglycine. Vitamin C decreased stereotyped behavior. (Levy and Hyman, 2005).

Melatonin is sometimes used to manage sleep problems in developmental disorders. Adverse effects are generally reported to be mild including drowsiness, headache, dizziness and nausea. however an increase in seizure frequency is reported among susceptible children. Several small randomized controlled trials (RCTs) have indicated that melatonin is effective in treating insomnia in autistic children (Malow, et al., 2012).

Although omega-3 fatty acids, which are polyunsaturated fatty acids (PUFA) are a popular treatment for children with ASD there is very little high quality scientific evidence supporting their effectiveness (Bent, et al., 2009).

Diets

Atypical eating behavior occurs in about three-quarters of children with ASD to the extent that it was formerly a diagnostic indicator. Selectivity is the most common problem, although eating rituals and food refusal also occur this does not appear to result in malnutrition (Erickson, et al., 2005).

In the 1990s it was hypothesized that autism can be caused or aggravated by opioid peptides like casomorphine that are metabolic products of gluten and casein. Based on this hypothesis, diets that eliminate foods containing either gluten or casein or both are widely promoted, and many testimonials can be found describing benefits in autism related symptoms notably social engagement and verbal skills. (Millward,et al., 2008).

However the other elimination of diets have also been proposed targeting salicylates, food dyes, yeast, and simple sugars. No scientific evidence has established the efficacy of such diets in treating autism in children. An elimination diet may create nutritional deficiencies that harm overall health unless care is taken to assure proper nutrition (Angle, et al., 2007).

Electroconvulsive Therapy

Studies indicate that 12–17% of adolescents and young adults with autism satisfy diagnostic criteria for catatonia which is loss of or hyperactive motor activity. Electroconvulsive therapy (ECT) has been used to treat cases of catatonia and related conditions in people with autism. However no controlled trials have been

performed of ECT in autism, and there are serious ethical and legal obstacles to its use (Dhossche, et al., 2009).

Hyperbaric Oxygen Therapy

One small 2009 study of autistic children found that 40 hourly treatments of 24% oxygen at 1.3 atmospheres provided significant improvement in the children's behavior immediately after treatment sessions but this study has not been independently confirmed (Rossignol, et al., 2009).

More recent, relatively large-scale controlled studies have also investigated HBOT using treatments of 24% oxygen at 1.3 atmospheres and have found less promising results. in 2010 double study compared HBOT to a placebo treatment in children with autistic disorder. Both direct observational measures of behavioral symptoms and standardized psychological assessments were used to evaluate the treatment. No differences were found between the HBOT group and the placebo group on any of the outcome measures (Granpeesheh, et al., 2010).

A second 2011 single-subject design study also investigated the effects of 40 HBOT treatments of 24% oxygen at 1.3 atmospheres on directly observed behaviors using multiple baselines across 16 participants. Again no consistent outcomes were observed across any group and further no significant improvements were observed within any individual participant. Together these studies suggest that HBOT at 24% oxygen at 1.3 atmospheric pressure does not result in a clinically significant improvement of the behavioral symptoms of autistic disorder. Nonetheless, news reports and related blogs indicate that HBOT is used for many cases of children with autism. HBOT can cost up to $150 per hour with individuals using anywhere from 40 to 120 hours as a part of their integrated treatment programs (Jepson, et al., 2011).

Prevalence

Most reviews tend to estimate a of 1–2 per 1,000 for autism and close to 6 per 1,000 for ASD (Newschaffer, et al., 2007).

The 11 per 1,000 children in the United States for ASD as of 2008. because of inadequate data, these numbers may underestimate ASD's true rate. (Caronna, et al., 2008).

The Centers for Disease Control and Prevention (CDC) recognizes that ASD is an urgent public health concern, as its prevalence rate has dramatically increased in the last several decades The prevalence study reported that autism now affects approximately 1 in 44 children in the United States (CDC, 2022).

In Baghdad the prevalence rate of Autism among all childhood psychiatric disorders has reached 15.8% (AL- Shimery, et al., 2011).

Co-morbidity

Autism spectrum disorders tend to be highly co-morbid with other disorders. Co-morbidity may be increase with age and may worsen the course of youth with ASD and make intervention or treatment more difficult. Distinguishing between ASD and other diagnoses can be challenging because the traits of ASDs often overlap with symptoms of other disorders, and the characteristics of ASD make traditional diagnostic procedures difficult .The most common medical condition occurring in individuals with autism spectrum disorders is seizure disorder or epilepsy, which occurs in 11-39% of individuals with ASD. Tuberous sclerosis, a medical condition in which non-malignant tumors grow in the brain and on other vital organs, occurs in 1-4% of individuals with ASD (Underwood, et al., 2010).

Intellectual disabilities are some of the most common co-morbid disorders with ASD. Recent estimates suggest that 40-69% of individuals with ASD have some degree of an intellectual disability, with females more likely to be in the severe range of an intellectual disability. A number of genetic syndromes causing intellectual disability may also be co-morbid with ASD including Fragile X syndrome, Down syndrome , Prader-Willi and Angelman syndromes and Williams syndrome (Zafeiriou, et al., 2007).

Anxiety disorders tend to occur with autism spectrum disorders, with overall comorbidity

rates of 7-84%. Rates of comorbid depression in individuals with an ASD range from 4–58%. The relationship between ASD and schizophrenia remains a controversial subject under continued investigation. Genetic, environmental, infectious, and immune risk factors that may be shared between the two conditions. Deficits in ASD are often linked to behavior problems, such as difficulties following directions, being cooperative. Symptoms similar to those of Attention Deficit Hyperactivity Disorder (ADHD) can be part of an ASD diagnosis (Chisholm, et al., 2015).

Strategies of Caregivers Education

Caregivers of children with Autism spectrum disorders (ASDs) face unique challenges. Families with children with developmental disabilities experience more negative psychological outcomes than families with typically developing children, after diagnosis, early intervention is the next step for a child who is suffering from autism improving forming relationships , communication , and poor adaptive behavior and development of independence . Judicial intervention expensive strategies, many strategies require long hours of interact with a trained therapist or use of expensive foods supplements. However, personal money or health insurance or medication schemes are far less autism can than these requirements are covered. Having a child with autism affect family finances (Sharpe& Baker , 2007).

Autistic child can obviously a difficult experience for parents and their families, that it is important to identify the development and use of coping strategies social support by families raising an autistic child , alike it was found to be associated with positive adjustment in the individual car Mothers can learn many things about the child signs, the development of autism treatment of autism differs from child to another is that early intensive behavioral therapy leads to improvement in the cognitive and linguistic (Karst, &Van Hecke , 2012).

Understanding parents' knowledge of ASD is important for understanding their decision-making regarding ASD services (Dardennes et al., 2011), but ASD knowledge is typically assessed among predominantly White, middle-class parents. For example, parents from a predominantly White sample who believe that early trauma (e.g., delivery complications) caused their child's ASD are less likely to use evidence based ASD services compared to parents who believe their child's ASD is genetically caused (Dardennes et al., 2011). Additionally, parents who endorse environmental causes of ASD (e.g., exposure to toxins) are more likely to engage in alternative ASD treatments, such as special diets. Despite calls for increasing ASD awareness and education among minority communities in order to address service-use disparities (Lopez, Magana, Xu, & Guzman, 2018), research has not examined parent ASD knowledge within the larger cultural context. Parent adjustment (i.e., how parents emotionally and cognitively process their children's ASD diagnoses) is another individual-level factor that affects subsequent ASD service-use. Latino and non-Latino White parents who deny or minimize the impact of ASD in their own children are more likely to underutilize ASD services, while parents more accepting of ASD and its potential consequences use more ASD services, Adjustment to a child's ASD diagnosis also affects parents' functioning. For example, greater parent avoidance or denial in response to their child's ASD relates to greater parental stress, depression, and anxiety which in turn may affect service-use (Reyes et al., 2018).

METHODOLOGY

Design of the Study

A quasi experimental study design was conducted on Caregivers knowledge in autistic center in Kirkuk city. The study is related to Impact of Educational Program regarding autistic child in Caregivers knowledge from (15th November 2021) to the (1st february 2023). One study group was used: pretest consider as a control group then became a study group for the Educational program.

Administrative Arrangements

After getting the approval of the Nursing Colleges Council University of Sulaimani upon the study (Appendix D-1) .

The researcher has submitted a detailed description including the objective and methods of the study to Kirkuk Health Directorate in order to obtain an official permission to carry out the study (Appendix D-2).

Later the permission was present to Pediatric Hospital, in Kirkuk to ensure their agreement and cooperation for collected data (Appendix D-3).

Ethical approval: ethical committee permission of School of Nursing/Faculty of Medicine Sciences/University of Sulaimani (Appendix B).

Setting of Study

The study was carried out in pediatric hospital (Autism Center) in Kirkuk city .

Pediatric Hospital

Pediatric Hospital also consider as one the old and major hospital in Kirkuk city, That is established in 1972, It is a special hospital for pediatric that includes 120 beds, which offers to services exclusively to children. However the Autism Center established in 2019, run by the Ministry of Health and selected to be the setting of the study to serve the purpose of the study. This center is specialist autistic center and located at Pediatric Hospital in Kirkuk-City.

The center receive all children with autism from age 3 to 16 year & consists of several sections for treatment of autistic children. A large number of nurses work at the center as well as a number of psychologists and social counselors to communicate with children and meet them & their families to teach some skills and treat their disorders.

The center consists of many rooms like the administration room, the pharmacy room and the administrative affairs room, which involve all the autistic children's data , as well as three rooms that specialist according to the type of autism cases, which included the rooms for low , middle and the severe condition in addition to a very large room for children playing when finishing the lesson.

The centers consultation session begins at 10:00 A.M to 12:00 mid noon .The consultation included pediatric specialist , psychologist specialist , and neurologist specialist to diagnosis the childs condition if her, his has autism disorder at any degree .

Sample of the Study

Non-probability "purposive sample " of Caregivers were selected and the total number of the Caregivers accompanied their autistic children in the center were (90) which are considered the sample of the study 90. They were selected randomly (10) Caregivers selected for pilot study and excluded than, the total number is 80 Caregivers for the study.

The sample of (80) Caregivers are randomly selected and divided to two groups; (40) Caregivers in each group one group (40) Caregivers are not exposed to the program and are considered as "a control group " and the other (40) Caregivers are exposed to the program and considered as the " experimental group ". Random allocation of Caregivers is done to avoid selection bias and to control for potential confounding.

Inclusion Criteria

- All Caregivers with their children are autistic in Autism Center.
- The Caregivers with different levels of education.
- Both genders (male and female).
- Those who were volunteer to participated.
- The Caregivers with different levels of education.

Exclusion Criteria

- Caregivers who are included in pre-test (Pilot Study).
- They are not continue to participate as a result of either move her child to another center or graduated from the center during the program.

- Nurses who do not participate in the study

Tools of Data Collection

Based on extensive review of studies and literatures related to the study topic, the researcher constructs the questionnaire form for purpose of the study (Appendix E).

The questionnaire Includes the following parts:

Part One :- Socio Demographic Characteristics of the Study Sample

Related to Autistic child (Age, Gender, When did the first symptoms of autism appear, When was the child diagnosed with autism spectrum disorder, What type of treatment is used for the autistic child, How long has the child been registered in a specialized center for the care of autistic children, Does the child have difficulty sleeping.

Related to caregivers (age, employment status, residency, ownership of housing, family types, level of education, and marital status, Socio-Economic Status.

Part Two

This part is concerned with questionnaire for the need of the Assessment of Caregivers knowledge related to autistic child & composed of (8) main sections and they composed of (56) items.

Educational Program

The work started with implementation of instructional program on (10 January 2022) until (24 January 2022). The Caregivers in the study met the study criteria and were informed to insure their agreement on the study, and discuss the plan of the instructional program.

The implementation of the program which was introduced includes the following:

Demographic data obtained from the study sample (Caregivers) and pre-test to assess their knowledge and Performance was conducted.

Implementation of instructional program designed and presented.

In five sessions throughout two-week period. Every session took approximately (2) hour from (9.00 am to 11.00 am) in autism center – Kirkuk city, the researcher represents the material through the posters and pictures, to clarified the subject.

Validity

The content validity for the early developed instrument and program were determined through the panel (15) experts (Appendix A) having experience in their field specialty. They have been asked to review the program and the instrument for content, clarity, relevancy, and adequacy. Most of the experts had agreed upon the clarity, relevancy and adequacy of the instruments' items and its components of educational program. Changes and modifications had been made in respect to the experts' suggestions and recommendations. Modification and changes were done depending on the experts' comments and suggestions.

Pilot Study

The pilot study was conducted in autism center – Pediatric Hospital, in order to determine the reliability of instructional program and the study instrument, It was carried out on (10) Caregivers that have the same criteria of original study sample, during the period of November 15 to December 5, 2021.The sample of pilot study is excluded from the original study sample.

The pilot study aimed to

1.Identify the barriers that may be encountered during the data collection process.

2. Determine the time required for the data collection. Each Caregivers needs approximately (15-20) minutes to complete knowledge and Performance questionnaire the method of data collected was self-administrative method.

3.Check the clarity and content adequacy of the questionnaire.

4.Determine the reliability and validity of the questionnaire.

The Results of the Pilot Study:

1. The items of the questionnaire were clear and understandable by the Caregivers

2. The time required to answer the questionnaire items ranged from (15- 20) minutes.

3. The barriers are not found with application of the items.

Reliability

Reliability is concerned with the consistency and dependability of the research instrument. Determination of reliability of the questionnaire is based on Cronbach's Alpha reliability, the result of Caregivers knowledge and Performance concerning the autism children at autism center in Kirkuk City is (76) items (r= 0.91). The results of the pilot study indicate that the instrument is adequately reliable for the present study.

TABLE 1: Reliability Coefficients "Alpha Cronbach" for the Studied Questionnaire's responding

Reliability Coefficient of the studied Questionnaire	Standard lower bound	Actual values	Assessment
Study Group	0.70	0.9157	Verified
Control Group	0.70	0.9808	Verified

(*) Alpha Cronbach (α) for the reliability of questionnaire (Internal consistency).

This table is statistically formed to show the reliability coefficient for the instrument of the present study. Its results show that there is an acceptance level of Alpha Cronbachs' value for the questionnaire, and then there is a high acceptance level of reliability for instrument. Through the calculated results that the questionnaire is passing, all those mean that designed questionnaire is valid to study the phenomenon on the same population at any time in the future.

Rating Scales and Scores

In order to measure the previous items accurately and statistically, the researcher has followed scale and scores rating in part two of the questionnaire as the following patterns;

Each items in part one (Knowledge)has been scaled by three level of Likert scales and scored respectively as follow:

Scales	Scores
I know	2
Uncertain	1
I don't know	0

- Low (0.00– 33.33)
-Moderate (33.34 – 66.66)
-High (66.67 – 100).

Method of Data Collection

The data collected from the Caregivers (pretest) at (2) weeks interval period, Implementation has been of the instructional program for Caregivers required (5) lectures that have been given in class at the center at (5) days. The (pre-test) data collected before application of the program when analyzed too. Then the (post-test) data Collected after the application of the program in (2) weeks interval period, after period 2 weeks of the (pre-test) data was collected in (post-test). The data collection process has been performed from (7 January 2022) to (24 January 2022).

Statistical Analysis

The following statistical data analysis approaches were used in order to analyze and assess the results of the study under application of the statistical package (SPSS) ver. (22.0):

Descriptive data analysis

Tables (Frequencies, and Percentages).

Arithmetic mean and Standard deviation.

Summary Statistics tables including: Observed Frequencies, Percents, Mean of score (MS), Percentile Global Mean of Score (PGMS), Standard Deviation (SD), and Relative Sufficiency (RS%).

Where relative sufficiency (RS%) are calculated by:

$$R.S.\% = \frac{Mean\ of\ Score}{no.\ of\ Scoring\ Scales} * 100\%$$

Transformed studied sub and main domains for screening estimators grand and global mean of score of an overall assessments through transforming the recorded responses of each period in quantitative measure scale using percentile transformation technique by applying:

$$Percentile\ value\ = \left[\frac{(Sum\ of\ actual\ scoring - Sum\ of\ Min.\ of\ scoring\ scale)}{Range\ of\ Sum\ scoring\ scale}\right] * 100\%$$

Reliability Coefficient for the Pilot study through using Al-Naqeeb Formula[Ref]:

$$Relibility\ value = (\ 1 - \frac{no.\ of\ non\ coincidences\ items}{no.of\ all\ items\ *\ sample\ size\ of\ pilot\ study})\ * 100\%$$

Alpha Cronbach (α) for the reliability of questionnaire (Internal consistency).

Where ;

$$\alpha = \frac{K}{K-1}[1 - \frac{\sum_{i=1}^{K} \sigma_{ii}}{\sum_{i=1}^{K} \sum_{j=1}^{K} \sigma_{ij}}]$$

Where; K is the number of items (questions) and σ_{ij} is the estimated covariance between items i and j. Note the σ_{ii} is the variance (not standard deviation) of item i.

Graphical presentation by using

Bar Charts.

Inferential data analysis

These were used to accept or reject the statistical hypotheses, which included the following:

Contingency Coefficients (C.C.) test: Estimating of the association table for finding cause's correlation ships.

$$C.C. = \sqrt{\frac{\chi^2}{\chi^2 + T..}}$$

Where χ^2 is the Chi Square statistic and $T..$ is the overall total of the contingency table.

$$\chi^2 = \frac{\sum_{all\ i} (O_i - E_i)^2}{E_i}$$

Where O_i is the observed frequency of group i and E_i is the expected frequency.

Binomial test for testing the different of distribution of the observed frequencies of two categories nominal/or ordinal scale and there is none restricted of an expected outcomes at 50%.

The binomial probability, b(x; n, p), is calculated using:

$b = n\ C\ x\ \ p^x q^{n-x}$.

One sample Chi-Square test. This test compares the observed and expected frequencies in each category to test either that all categories contain the same proportion of values or that each category contains a user-specified proportion of values.

Mann-Whitney test: A nonparametric equivalent to the t test. Tests whether two independent samples are from the same population. It is more powerful than the median test since it uses the

ranks of the cases. Requires an ordinal level of measurement. U is the number of times a value in the first group precedes a value in the second group, when values are sorted in ascending order.

Analysis of Covariance (ANCOVA) for explore relationships between patient's socio-demographic characteristics of (Gender, Age, Residency, Marital Status, Educational levels, Occupation, and Economic situation) and interchanging resulted after applying a proposed program according to an overall assessments.

For the abbreviations of the comparison significant (C.S.), we used the followings:

NS : Non significant at P>0.05

S : Significant at P<0.05

- HS : Highly significant at P<0.01

limitation of the Study

1- Time was critical for the researcher.

2- Shortage of the research studies on this topic.

RESULTS AND FINDINGS

Part One :- Socio Demographic Characteristics of the Study Sample

Distribution of Socio-Demographical Characteristics variables

TABLE 1: Distribution of the Study and Control Groups according to (ACIv.) with comparisons significant

Autistic Children Information	Groups	Study		Control		C.S. (*) P-value
	Classes	No.	%	No.	%	
Gender	Male	24	60	30	75	C.C.=0.158 P=0.152 (NS)
	Female	16	40	10	25	
Age Groups	< 4 yrs.	6	15	13	32.5	C.C.=0.205 P=0.321 (NS)
	4 _ 5	19	47.5	14	35	
	6 _ 7	10	25	9	22.5	
	8 _ 9	5	12.5	4	10	
	Forceps	2	5	2	5	
	Cesarean	23	57.5	13	32.5	
When did the first symptoms of autism appear?	1st yr. of Age	2	5	7	17.5	C.C.=0.331 P=0.020 (S)
	2nd yr. of Age	19	47.5	18	45	
	3rd yr. of Age	10	25	14	35	
	4th yr. of Age	9	22.5	1	2.5	
When was the child diagnosed with autism spectrum disorder?	1st yr. of Age	0	0.00	1	2.5	C.C.=0.132 P=0.701 (NS)
	2nd yr. of Age	9	22.5	7	17.5	
	3rd yr. of Age	13	32.5	15	37.5	
	4th yr. of Age	18	45	17	42.5	
What type of treatment is used for the autistic child?	Drug therapy	12	30	14	35	C.C.=0.086 P=0.898 (NS)
	Behavioral therapy	22	55	20	50	
	Nutrition therapy	4	10	3	7.5	
	Educational Therapy	2	5	3	7.5	
How long has the child been registered in a specialized center for the care of autistic children?	Less than 1 yr.	27	67.5	27	67.5	C.C.=0.000 P=1.000 (NS)
	More than 1 yr.	13	32.5	13	32.5	
Does the child have difficulty sleeping?	Yes	25	62.5	30	75	C.C.=0.134 P=0.228 (NS)
	No	15	37.5	10	25	

(*) S: Sig. at P<0.05; NS: Non Sig. at P>0.05; Testing based on a contingency coefficient (C.C.) test.

Table (1) shows distribution of the studied "Autistic Children Information variables (ACIv.)", as well as comparisons significant to be confident that two independent groups are thrown from the same population in light of that variables.

With respect to "Gender" variable, no significant different between the distribution of the observed frequencies at P>0.05 in the studied groups, which shows that about two third of male are accounted in the study group 24(60%), and three quarters are accounted in the controlled 30(75%).

Relative to "Age Groups", no significant different at P>0.05 are reported between the distribution of the observed frequencies in the studied groups, since most of autism children were focused at the early age groups, which shows that about two third of under six year are accounted in the study group 24(62.5%, and more than two third are accounted in the controlled 27(67.5%).

With reference to number of children in family, no significant different at P>0.05 are reported between the distribution of the observed frequencies in the studied groups, since most of studied families had two to four children, which shows that more than two third are accounted in the study group 29(67.5%, and more than three quarters are accounted in the controlled 31(77.5%).

Regarding of ordinal position of autistic child in the family, most of studied groups are assigned at the first child, and no significant different at P>0.05 are reported between the distribution of the observed frequencies in the studied groups, which shows that 34(85%) are assigned for the study group, and 33(82.5%) are assigned at the controlled.

And about asking for the mother's health during pregnancy, results shows that a similar status with who were assigned fair and poor health, and no significant different at P>0.05 are reported between the distribution of the observed frequencies in the studied groups, which shows that 14(35.0%) are assigned for the study group, and 12(30.0%) are assigned for the controlled.

And for asking about gestational age, results shows that a similar status with who were assigned premature and post mature gestational age, and no significant different at P>0.05 are reported between the distribution of the observed frequencies in the studied groups, which shows that 7(17.5%) are assigned for the study group, and 10(25.0%) are assigned for the controlled.

And for asking about mode of delivery, results shows that no significant different at P>0.05 are reported between the distribution of the observed frequencies in the studied groups, rather than who were assigned forceps and cesarean at the study group 25(62.5%), which were twice than who were assigned in controlled15(37.5%).

And about asking for "When did the first symptoms of autism appear?", results shows that significant different at P<0.05 are reported between the distribution of the observed frequencies in the studied groups, rather than about half of studied cases who were assigned at the second year of age, 19(47.5%) are assigned for the study group, and 18(45.0%) are assigned for the controlled.

And about asking for "When was the child diagnosed with autism spectrum disorder?", results shows that a similar status with who were assigned at the third and fourth of child age , and no significant different at P>0.05 are reported between the distribution of the observed frequencies in the studied groups, which shows that 31(77.5%) are assigned for the study group, and 32(80.0%) are assigned for the controlled.

And about asking for "What type of treatment is used for the autistic child?", results shows that no significant different at P>0.05 are reported between the distribution of the observed frequencies in the studied groups, which shows that half of studied cases had behavioral therapy treatment, since 22(55.0%) are assigned for the study group, and 20(50.0%) are assigned for the controlled, and about one third had drug treatment in the studied groups, since 12(30.0%) are assigned for the study group, and 14(35.0%) are assigned for the controlled.

And about asking for "How long has the child been registered in a specialized center for the care of autistic children?", results shows that no

significant different at P>0.05 are reported between the distribution of the observed frequencies in the studied groups, which shows that more than two third of studied cases had less than one year, since 27(67.5%) are assigned for each group, while leftover were assigned for who had more than one year, and are accounted 13(32.5%) in each group.

Finally, for asking "Does the child have difficulty sleeping?", results shows that no significant different at P>0.05 are reported between the distribution of the observed frequencies in the studied groups, which shows that about two third of studied cases had difficulty sleeping, since 25(62.5%) are assigned in the study group, and three quarters 30(75.0%) were assigned for control group.

For summarizes of preceding findings, results shows that studied groups concerning (ACIv.) has recorded no significant differences at P>0.05, between studied groups, and that is reflecting validity of selected subjects due to their similarity status in light of that variables, as well as preceding results indicating that the two studied groups are thrown from the same population in light of (ACIv.), and that are more reliable for this study, since any meaningful differences are obtaining in the study group should be interpreted due to effectiveness of applying the proposed program.

Distribution of Socio-Demographical Characteristics variables

Table (4-1-2) shows distribution of studied "Socio-Demographical Characteristics variables (SDCv.) of caregivers, concerning age, employment status, residency, ownership of housing, family types, level of education, and marital status for studying the effectiveness of an educational program toward autism spectrum disorder on their knowledge and performance at autism center in Kirkuk city in Iraq, including observed frequencies, and percentages for the studying groups, in addition to testing distribution of the observed frequencies between the studied groups.

TABLE 2: Distribution of the studied groups according to (SDCv.) with comparisons significant

Caregiver SDCv.	Groups	Study		Control		C.S. (*)
	Classes	No.	%	No.	%	P-value
Age of the Caregiver:	20 _ 24	5	12.5	18	45	C.C.=0.376
	25 _ 29	9	22.5	7	17.5	P=0.022
	30 _ 34	15	37.5	5	12.5	(S)
	35 _ 39	6	15	4	10	
	40 _ 44	3	7.5	4	10	
	45 _ 49	2	5	2	5	
Employment Status of Caregiver	Government employee	17	42.5	23	57.5	C.C.=0.352
	Retired	1	2.5	3	7.5	P=0.045
	Free career	3	7.5	6	15	(S)
	Other mentioned	2	5	2	5	
	Does not work	6	15	5	12.5	
	Privet sector employee	11	27.5	1	2.5	
Residency	Urban	28	70	31	77.5	C.C.=0.198
	Rural	5	12.5	7	17.5	P=0.196
	Sub-Urban	7	17.5	2	5	(NS)

Continue ….

Caregiver SDCv.	Groups	Study		Control		C.S. (*)
	Classes	No.	%	No.	%	P-value
Family Type(**)	Single	32	80	31	77.5	C.C.=0.031
	Extended	8	20	9	22.5	P=0.785 (NS)
	IIIeiterate	5	12.5	3	7.5	C.C.=0.221

Level of Education:	Elementary Graduate	3	7.5	5	12.5	P=0.662 (NS)
	A middle School Graduated	4	10	7	17.5	
	High School Graduate	3	7.5	2	5	
	Graduate Institute	11	27.5	12	30	
	College Graduate	12	30	11	27.5	
	Post Graduate	2	5	0	0	
Marital Status:	Married	34	85	31	77.5	C.C.=0.109 P=0.620 (NS)
	Widow	2	5	2	5	
	Divorced	4	10	7	17.5	
Socio-Economic Status	Low	11	27.5	11	27.5	C.C.=0.126 P=0.525 (NS)
	Moderate	18	45	22	55	
	High	11	27.5	7	17.5	

(*) S: Sig. at P<0.05; NS: Non Sig. at P>0.05;; Testing based on a contingency coefficient (C.C.) test.

(**) Single: (Consisting of parents and children); Extended (Consisting of parents, children, grandparents, grandmothers, cousins).

Relative to "Age Groups", significant different at P<0.05 are accounted between the distribution of the observed frequencies, since about half of the studied controlled caregivers are formed the first age group, while the ages of the study group were older. Significant different at P<0.05 are accounted between distribution of the observed frequencies concerning "Employment Status of Caregivers", since more than one quarter of the studied subjects at the study group had a privet sector employee. No significant different are obtained between the distribution of the observed frequencies concerning residency at P<0.05, since both groups are accounted about three quarters of the studied residents at urban. No significant different at P>0.05 are obtained between the distribution of the observed frequencies concerning "Family Type", since both groups are accounted a single family type mostly. No significant different at P>0.05 are obtained between the distribution of the observed frequencies concerning educational levels. No significant different at P>0.05 are obtained between the distribution of the observed frequencies concerning "Marital Status", since most of caregivers had married status.

Finally, No significant different at P>0.05 are obtained between the distribution of the observed frequencies concerning "Socio-Economic Status", since most of caregivers had a moderate status.

For summarizes of preceding findings, results shows that studied groups concerning SDCv. has recorded no significant differences at P>0.05 between studied groups mostly, with the exception of age variable and occupation, and generally, caregivers are reflecting validity of selected subjects due to their similarity status in light of their SDCv., as well as preceding results indicating that the two studied groups are thrown from the same population, and that are more reliable for this study, since any meaningful difference could be obtained between studied groups should be interpreted due to effectiveness of applying a proposed program.

Part Two:- Distribution of the Sample Regarding Caregivers Knowledge about Autism spectrum disorder:

In this section, analysis of responses was dealt with both groups, the controlled (Without intervention of proposed program) and the study group (With the presence of the interventional proposed program), and along two assess periods (Pre, and Post) toward measuring efficacy of educational program toward autism spectrum disorder on caregivers knowledge at autism center according to questionnaire's items in Kirkuk city, which contents eight main domains, which were included of 56 items respectively, with three scales, such as (I know, Uncertain, and I don’t know) of integer numbers (2, 1, and 0) for knowledge items

Caregiver's Knowledge Domain

This part of caregiver's knowledge domain consists eight sub domains, such that: "Information, Concepts and Facts about Autism Spectrum Disorders, The use of means of Communication, Emotional Stimulation, The nature of interaction and social relations, Perception and Sense, Behavioral Patterns, The Sensory Side, and Nutrition", which were contents of 8, 9, 9, 7, 8, 4, 10, 4, and 6 items respectively, and in order to give a comprehensible presentation for the results of respondents in the two groups, a summary statistics are presented, such as (Mean of Score-MS, Standard Deviation-SD, Relative Sufficiency-RS%, Assessment scored over the three intervals (Low, Moderate, and High) for assessing a positive knowledge ascending ordered scoring scales due to relative sufficiency's intervals: (0.00 – 33.33), (33.34 – 66.66), and (66.67 – 100) respectively, as well as comparisons significant between the studied groups at the pre period, and at the post period are offered independently.

Overall Assessment for studied Sub and Main Domains

Table (1) shows a summary statistics of caregiver's knowledge are illustrated, related to questionnaire's sub and main domains along studied pre, and post periods due to applying a proposed educational program toward autism spectrum disorder at autism center in Kirkuk city, and in order to give a comprehensible presentation for the results of respondents in the two groups, a summary statistics are presented, such as (Percentile grand Mean of Score - PGMS, Pooled Standard error – PSE, Pooled Standard Deviation - PSD, Pooled Relative Sufficiency - PRS%, Assess scored over the three intervals (Low, Moderate, and High) for assessing a positive knowledge, and performance ascending ordered scoring scales due to relative sufficiency's intervals: (0.00 – 33.33), (33.34 – 66.66), and (66.67 – 100) respectively,.

Results of testing significant with reference of studied sub and main domains has recorded a particular strong effects through applying a proposed program, since too highly significant differences are accounted at $P<0.01$, and accordance with that results, it could be enable to confirms the importance or success of applying the suggested program, and it could be concludes that applying proposed program has becomes a requirement in order to improve and monitoring caregiver's knowledge and performance toward autism spectrum disorder at autism center in Kirkuk city, and that had rating at a high level attack boarder to t achieving to the goal of this study generally.

TABLE 2: Distribution of the studied groups according to (Studied Sub and Main Domains) concerning Knowledge with comparisons significant

Main and Sub Domains	Period	No.	Control				Study				C.S. (*) P-value
			PGMS	PSE	PSD	Ass. (*)	PGMS	PSE	PSD	Ass. (*)	
First: Information, Concepts and Facts about Autism Spectrum Disorders	Pre	40	23.75	1.94	12.27	L	25.78	1.75	11.07	L	P=0.367 NS
	Post	40	37.66	3.24	20.49	M	76.72	1.73	10.96	H	P=0.000 HS
Second: the use of means of communication	Pre	40	28.19	1.40	8.84	L	28.89	1.32	8.36	L	P=0.622 NS
	Post	40	26.25	4.34	27.48	L	69.58	2.44	15.41	H	P=0.000 HS
Third: Emotional stimulation	Pre	40	28.75	2.21	13.96	L	29.46	2.10	13.26	L	P=0.001 HS
	Post	40	30.00	3.94	24.91	L	69.29	2.57	16.27	H	P=0.000 HS

Fourth: the nature of interaction and social relations	Pre	40	18.13	1.79	11.31	L	27.50	1.50	9.47	L	P=0.147 NS
	Post	40	27.34	4.43	28.01	L	72.34	2.84	17.95	H	P=0.000 HS
Fifth: Perception and Sense	Pre	40	19.69	2.53	15.98	L	24.69	2.67	16.86	L	P=0.911 NS
	Post	40	24.69	4.68	29.62	L	69.69	3.58	22.63	H	P=0.000 HS
Sixth: Behavioral patterns	Pre	40	26.00	1.99	12.57	L	26.25	1.47	9.32	L	P=0.862 NS
	Post	40	26.75	4.38	27.72	L	74.63	2.34	14.78	H	P=0.000 HS
Seventh: The sensory side	Pre	40	16.88	2.85	18.03	L	16.25	2.87	18.17	L	P=0.699 NS
	Post	40	25.00	4.00	25.32	L	72.81	3.92	24.82	H	P=0.000 HS
Eighth: Nutrition	Pre	40	24.38	1.67	10.57	L	25.42	1.81	11.47	L	P=0.136 NS
	Post	40	25.00	5.17	32.69	L	73.13	2.20	13.93	H	P=0.000 HS
Main Domain: Caregivers Knowledge about Autism spectrum disorder	Pre	40	23.22	1.10	6.98	L	25.53	1.05	6.64	L	P=0.010 S
	Post	40	27.84	3.88	24.56	L	72.27	2.10	13.27	H	P=0.000 HS

(*) HS: Highly Sig. at P<0.01; S: Sig. at P<0.05; NS: Non Sig. at P>0.05; Testing based on Mann-Whitney test.

Assessments Intervals Scoring Scales of Relative Sufficiency Coefficient (RS%): [L: Low (0.00–33.33)]; [M: Moderate (33.34 – 66.66)]; [H: High (66.67 – 100)].

Table (2) shows a summary statistics of studied caregiver's knowledge related to questionnaire's overall main domains along studied pre, and post periods due to applying a proposed educational program toward autism spectrum disorder at autism center in Kirkuk city, and in order to give a comprehensible presentation for the results of respondents in the two groups, a summary statistics are presented, such as (Percentile global Mean of Score - PGMS, Pooled Standard error – PSE, Pooled Standard Deviation - PSD, and Assess scored over the three intervals (Low, Moderate, and High) for assessing a positive overall knowledge, and overall performance ascending ordered scoring scales due to relative sufficiency's intervals: (0.00 – 33.33), (33.34 – 66.66), and (66.67 – 100) respectively

Results shows that an overall each of knowledge, performance in compact form illustrated too highly and meaningful changeable with high levels of assessments along pre to post period, since the observed outcomes was high level approved resulted by applying a proposed educational program.

The results of the control group has illustrated low level assessment over the pre to post periods

TABLE 2: Distribution of the studied groups according to an overall assessment for (Overall Assessments) with comparisons significant

Overall Main Domains	Period	No.	Groups		C.S. (*) P-value
			Control	Study	

			PGMS	PSE	PSD	Ass. (*)	PGMS	PSE	PSD	Ass. (*)	
Impact of Educational Program Toward Autism spectrum disorder on caregivers knowledge and Performance at Autism Center in Kirkuk City	Pre	40	23.38	1.15	7.24	L	26.26	1.10	6.93	L	P=0.072 NS
	Post	40	26.97	4.18	26.46	L	73.62	2.22	14.02	H	P=0.000 HS

(*) Assessments Intervals Scoring Scales of Relative Sufficiency Coefficient (RS%): [L: Low (0.00– 33.33)]; [M: Moderate (33.34 – 66.66)]; [H: High (66.67 – 100)].

Relationships among Overall Assessments and Caregiver's SDCv, Caregivers Knowledge Relationships

To find out relationships between caregiver's SDCv. regarding of (Age Groups, Educational levels, Occupation, Family Type, Residency, Marital Status, and Economic situation) and interchanging resulted due to applying a proposed educational program according to knowledge of caregivers assessed for all studied knowledge items scored, which are transformed to percentile grand means of score in compact form due to responding at pre and at post periods through using percentile transformation technique.

TABLE 3: Descriptive statistics of PGMS of score, and PPSD of Knowledge assessment at studied pre/post periods distributed for SDCv.

SDCv.	Groups	Period	No.	PGMS	PPSD	C.S. (*) P-value
Age of the Caregiver:	20 _ 24	Pre	5	30.67	3.65	ANCOVA Test F=1.498 P=0.245 NS
		Post	5	69.73	18.32	
	25 _ 29	Pre	9	21.31	3.63	
		Post	9	61.38	14.61	
	30 _ 34	Pre	15	27.50	8.20	
		Post	15	74.66	11.35	
	35 _ 39	Pre	6	24.00	6.06	
		Post	6	81.49	5.86	
	40 _ 44	Pre	3	23.62	3.13	
		Post	3	77.91	4.88	
	45 _ 49	Pre	2	24.29	6.30	
		Post	2	73.66	1.83	
Educational levels	IIiterate	Pre	5	27.91	6.03	ANCOVA Test F=3.132 P=0.032 S
		Post	5	69.57	18.05	
	Elementary Graduate	Pre	3	21.57	0.90	
		Post	3	50.44	1.54	
	A middle School Graduated	Pre	4	19.77	3.19	
		Post	4	60.02	8.42	
	High School Graduate	Pre	3	28.38	0.88	
		Post	3	62.16	3.75	
	Graduate Institute	Pre	11	27.47	9.12	
		Post	11	79.91	8.17	
	College Graduate	Pre	12	25.35	6.13	
		Post	12	78.98	8.27	
	Post Graduate	Pre	2	23.17	3.58	
		Post	2	69.20	18.15	
	Government employee	Pre	17	25.21	5.87	ANCOVA Test
		Post	17	65.44	14.88	

Employment status of caregiver	Retired	Pre	1	25.70	0.00	F=1.986 P=0.136 NS
		Post	1	56.37	0.00	
	Free career	Pre	3	30.91	3.62	
		Post	3	62.10	2.98	
	Other mentioned	Pre	2	19.58	5.82	
		Post	2	84.46	0.99	
	Does not work	Pre	6	30.68	10.06	
		Post	6	82.49	5.52	
	Privet sector employee	Pre	11	22.82	4.52	
		Post	11	79.27	5.82	
Family Type	Single (consisting of parents and children)	Pre	32	25.69	6.03	ANCOVA Test F=0.460 P=0.507 NS
		Post	32	71.01	13.77	
	Extended (Consisting of parents, children, grandparents, …	Pre	8	24.87	9.19	
		Post	8	77.34	10.23	

SDCv.	Groups	Period	No.	PGMS	PSD	C.S. (*) P-value
Residency	Urban	Pre	28	25.18	5.07	ANCOVA Test F=1.129 P=0.348 NS
		Post	28	68.46	13.93	
	Rural	Pre	5	29.20	9.94	
		Post	5	78.16	3.29	
	Suburban	Pre	7	24.31	9.59	
		Post	7	83.30	5.11	
Marital status:	Married	Pre	34	25.86	6.62	ANCOVA Test F=1.704 P=0.213 NS
		Post	34	72.14	13.11	
	Widow	Pre	2	29.71	4.44	
		Post	2	58.05	20.25	
	Divorced	Pre	4	20.66	6.39	
		Post	4	80.53	5.99	
Socio-Economic Status	Low	Pre	11	23.75	5.82	ANCOVA Test F=0.011 P=0.989 NS
		Post	11	62.67	14.40	
	Moderate	Pre	18	26.69	7.75	
		Post	18	73.41	12.17	
	High	Pre	11	25.41	5.49	
		Post	11	80.01	7.62	

(*) HS: Highly Sig. at P<0.01; Sig. at P<0.05; Non Sig. at P>0.05; Statistical hypothesis based on Analysis of Covariance (ANCOVA).

DISCUSSION OF THE RESULTS

The sample of the study including (80) caregivers selected randomly accompanied their autistic children in autism center in Kirkuk city.

Data analysis of the present study shows the demographic characteristics for the children & their caregivers (Table 1,2) and the study sample (80) caregivers are divided to control group (n=40) and in the study group (n=40).

Part One :- Socio Demographic Characteristics

Table (1) shows distribution of the studied "Autistic Children Information variables (ACIv.)", as well as comparisons significant to be confident that two independent groups are thrown from the same population in light of that variables.

With respect to "Gender" variable, which shows that about two third of male are accounted in the study group 24(60%), and three quarters are accounted in the controlled 30(75%).

Male at higher risk for autism than girls and approximately the same results reported in other studies which agree with Benjak et al., (2007) in study in titled" Comparative study on self-perceived health of parents of children with autism spectrum disorders and parents of non-disabled children in Croatia" mentioned that in their study result the samples included 16.3% girls and 83.7% males .

Their present study results agree with Sipos et al.,(2012) in study in title " The Evaluation of Family Quality of Life of Children with Autism Spectrum Disorder and Attention Deficit Hyperactivity Disorder" show that their sample included (29.3%) girls and (73.6%) boys.

Lazam, (2013) in his study revealed that the majority of the children in sample (82%) were males. Dawood ,(2014) in study in titled "Assessment of Quality of Life for Parents of Autistic Child in Baghdad" reported that in her study results 78.2% of children were male.

Relative to "Age Groups, which shows that about two third of under six year are accounted in the study group 24(62.5%, and more than two third are accounted in the controlled 27(67.5%).

The present of study results agree with Malow, (2006) in study in titled "Characterizing sleep in children with autism spectrum Disorders: A multidimensional approach" which his study results indicated that most of autistic children ages are preschool age.

And about asking for "When did the first symptoms of autism appear?", results shows that half of studied cases who were assigned at the second year of age, 19(47.5%) are assigned for the study group, and 18(45.0%) are assigned for the controlled. The present study results agree with Dawood, (2014) show that the highest percentage 44.9% of children were beginning symptom at second year of age in her study group. The American Psychiatric Association (APA), (2016) reported that autism appearing with in the first three years of age.

And about asking for "When was the child diagnosed with autism spectrum disorder?", results shows that a similar status with who were assigned at the third and fourth of child age , which shows that 31(77.5%) are assigned for the study group, and 32(80.0%) are assigned for the controlled. . The researcher emphasizes that child's diagnosis beginning in third year. The present study agree with Elbahnasawy & Girgis, (2011) in study in titled " Counseling for Mothers to cope with their Autistic Children in Egypt " reveals that in their study more than half of children with autism was discovered in age 2-5 years. Lazam ,(2013) indicated that highest percentage (78%) were diagnosed at the age of 2&3 years. These studies may reflect the changes in the diagnostic criteria like educational professionals, the increased awareness about ASD among parents and staff in the autism centers.

And about asking for "What type of treatment is used for the autistic child?", results shows half of studied cases had behavioral therapy treatment, since 22(55.0%) are assigned for the study group, and 20(50.0%) are assigned for the controlled, and about one third had drug treatment in the studied groups, since 12(30.0%) are assigned for the study group, and 14(35.0%) are assigned for the controlled.

And about asking for "How long has the child been registered in a specialized center for the care of autistic children which shows that more than two third of studied cases had less than one year, since 27(67.5%) are assigned for each group, while leftover were assigned for who had more than one year, and are accounted 13(32.5%) in each group. This results agree with Davis & Carter, (2008) who found in their study in "assess the parenting stress of toddlers with autism" that children began receiving specialized early intervention at age 24 months.

Finally, for asking "Does the child have difficulty sleeping?", results shows that two third of studied cases had difficulty sleeping, since 25(62.5%) are assigned in the study group, and three quarters 30(75.0%) were assigned for control group. The results of the present study agree with Dominick, (2007) in study in titled "Atypical Behaviors in Children with Autism and Children with A

History of Language Impairment" show that in his study over two -third of autistic children have sleep problem. This study agree with Richdale et al.,(2009) in study in titled

" Sleep problems in autism spectrum disorders, prevalence nature, possible Bio psychosocial, A etiologies" reported that in their study about two-thirds of individuals with autism are affected by sleep problems.

Table (4-1-2) shows distribution of the studied "Socio-Demographical Characteristics variables (SDCv.) of caregivers,

Relative to "Age Groups of Caregivers ", about half of the studied controlled caregivers are formed the first age group, while the ages of the study group were older. emphasizes that most of the participant in this age .

the researcher The study agree with Dawood, (2014) her study indicates that 41% of mothers were in aged between (31-40) years. Mthimunye, (2014) in study in tittle " The Knowledge and Experiences of Single Mothers Raising an Autistic Child in African" mentioned that in his study Participants were mothers aged between 30-45 years .

And about asking for "Employment Status of Caregivers", since more than one quarter of the studied subjects at the study group had a privet sector employee. This study agree with Kheir et al., (2012) in study in titled "Quality of Life of Caregivers of Children with Autism in Qatar" reported that the majority of the mothers in their study occupy professional jobs. Also, these come in constant with the study of Lazam,(2013)which show the majority of mothers in his study sample were employed Abbas,(2013) "Assessment of Sleep Disorder among Autistic Children in Baghdad" mentioned in his study that (60%) of mother work outside the home. No significant different are obtained between the distribution of the observed frequencies concerning residency at $P<0.05$,

since both groups are accounted about three quarters of the studied residents at urban. This study result was consistent with Dawood ,(2014) show that all mothers participated in her study were from urban area(100%). Moreover the result also supported by Malhotra and Shatia, (2012) in study in titled "Quality of Life of Parents having Children with Developmental Disabilities " reported that in their study all their participants were belonging to urban domicile.

With reference to "Family Type", since both groups are accounted a single family type mostly. This study may be due to these families consisting of both parents who lived together and have some what a steady life. The present study agree with Dawood, (2014) reported that in her study majority of families was a solitary family type (67.5%).

Regarding to the educational levels of caregivers (30%) of the study group were college graduate, while (30%) of the control group were institute graduate

This results agree with Montes ,(2008) in study in titled " Association of childhood autism spectrum disorders and loss of family income "mentioned that these finding more than half participants were highly educated people .Lazam,(2013) show that majority of mother in his study sample (54%) are college graduates.

"Marital Status", since most of caregivers had married status. The results of the present study indicated that majority of sample (85% ,775%) in study group and in control group were married. This study agree with Lazam,(2013) show that the majority of parents' sample (94%) were living to gather in the same household with their children .

In relation to the "Socio-Economic Status", since most of caregivers had a moderate status in both group (study group and control group) were (45%, 55%). The researcher emphasizes there are lack of social interaction with the community with specific autism and low awareness and getting information about autism due to moderate level.

The present study supported with National Autistic Society National Institute of Deafness and other Communications Disorder]NAS] ,(2010) mentioned that autism affects socioeconomic background of parent and they become in moderate level.

Part Two : Discussion of the Impact of Educational Program Toward Autism spectrum disorder on caregivers knowledge and Performance

The analysis of the data includes eight aspects for knowledge, the multiple choice Questionnaire divided into (56) sub items were used to assess caregivers knowledge toward autistic child.

Table (1, 2) In control group, the results in (knowledge) reveal that there are no significant differences between (pre and post-test) for caregivers knowledge regarding autistic child.The researcher emphasize low of awareness caregivers concerning autistic child cause no changes for better in both tests.

This study agree with Tadesse,(2014) in study in titled " Families Living with Child Diagnosed with Autism: Challenges and Coping Mechanisms" show that the level of awareness of all participants about autism in her study there is no significant different in their awareness of levels. The results shows that there are highly significant differences between pre and post- test at study group for caregivers ' knowledge and performance related to autism child .

The results indicate that Educational program influenced on knowledge of the caregivers and become better during the period of the application of the program and they become more aware of some knowledge items but some items indicated no change for better so they many need a longer period of the program. Elbahnasawy & Girgis,(2011) their results of the study supported the finding of the present study their study indicated an after program implementation for mothers regarding to social skills of their autistic children as they had good score in social and communication skills when comparing (pre- test &post- test) .

In Addison there is no significant differences between study and control groups of all aspects of caregivers 'knowledge related to autistic child at pre-test. The researcher confirmed that the majority of sample in the study and the control group before the application of the program they need an information and awareness about autism. This finding has been supported by to Ezaz ,(2015) in study in titled " The Understanding of Mothers in regards to their Child's Diagnosis of Autism Spectrum Disorder in Bangladesh " mentioned that in his study mother needs to be developed regarding sensory problems as most of the children with ASD generally experience sensory problems.

Also shows that there are highly significant differences between study and control groups for all items of Caregivers Knowledge related to autism child at post- test, except some items show that there are no significant differences. This may due to be the program successful in the study group and increase awareness of caregivers about autistic disorder.

This result comes with studies done by Elbahnasawy & Girgis, (2011) their results indicated an improvement after implementation of the counseling program which might be due to that the majority of studied sample are highly educated.

Table (3-1) and Table (3-2) revealed the differences in the mean & percentage of responses of pre & post-test and overall main domains. The researcher confirmed that the program has influenced the knowledge of the caregivers which improvement . The study supported by Mthimunye ,(2014) in his study " The Knowledge and Experiences of Single Mothers Raising an Autistic Child in The Western Cape" mentioned that both parents and the community has a lack of knowledge, they were not informed of ASD and never heard of it before . All participants have reached the stage where by they accepted that their child suffers from ASD. Participants had mixed feeling after hearing the diagnosis. The present study results supported by Dillenburger et al., (2012) in study in titled " Awareness and knowledge of autism and autism interventions in Ireland " show that local and international awareness campaigns have proved to be very successful, and the focus should shifted to disseminating accurate information concerning intervention responsibilities and service provide. Since p-value = 0.000 < 0.01 , the difference between the Pre-test and Post-test scores is highly significant at 1% level of significance this shows that the

Structured Educational Program on selected common behavioral problems of children is effective

Part Three: Association between Caregivers knowledge with Some of Socio Demographic Characteristics.

Table (4-3-1-2, 4-3-2-2) the results reveal that there are no statistical significant association between Caregivers (Age Groups, Occupation, Family Type, Marital Status, and Economic situation) and their knowledge concerning autistic child, while there is statistical significant association between Caregivers (level of education) and their knowledge at (pre-test& post-test)

results reveal that there are no statistical significant association between Caregivers age groups and their knowledge concerning autistic child. Caregivers are encourage to learn, understand and seek medical attention for their autistic child and all age groups, The present study disagree with Nadira et al., (2015) in study in titled " Knowledge on care of autistic child among the mothers in Dhaka " show that there are significant association between knowledge about autism and mother's age ,child's age and follow up ($p<0.05$).

About Occupation the result shows that there are no statistical significant association between Caregivers Occupation and their knowledge concerning autistic child.

Our result supported by Acebo ,(2006) in study in titled " Sleep/wake patterns derived from activity monitoring and maternal report for healthy 1-to 5- year- old children" mentioned that in his study no significant of relationship occupation of the mothers and their knowledge for children with autism.

About Family Type the result shows that there are no statistical significant association between Caregivers Family Type and their knowledge concerning autistic child Our result supported by The researcher emphasizes there are no differences between Caregivers Family Type and their knowledge concerning autistic child Although, no found other studies support the present study results.

results reveal that there are no statistical significant association between Caregivers Marital Status and their knowledge concerning autistic child, This means that the program not impact on marital status, this means that Caregivers knowledge is no association with the marital status. This study agree with Kiani et al ., (2014) show that belief mother concerning autism not significant with marital status.

There are no statistical significant association between Caregivers socio-economic and their knowledge and performance concerning autistic child, This study disagree with Abbas et al ., (2015)in study in titled " Spiritual Journey in Mothers' Lived Experiences of Caring for Children with Autism Spectrum Disorders" reported that the social and economic situation of mothers is impact up on their knowledge of autism. The poor living and social standard may be the reason for their lack of knowledge of autism. results reveal that there is statistical significant association between Caregivers (level of education) and their knowledge concerning autistic child, The researcher emphasizes improvements that occurred due to applying proposed educational program This study agree with Lazam ,(2013) study revealed there are significant differences in the mothers coping strategies concerning to their educational level.

CONCLUSION AND RECOMMENDATIONS

This chapter includes the most important finding and conclusions of the study. In addition to that, its involve the recommendations that should be taken in to consideration.

CONCLUSION

The main conclusions in this study are

Majority of the sample are female, most of them there age ranged between (30-34,and 20-24)years old ,and proportion of married record higher percentage.

More than half of the sample are Employed, and very few percentage of the sample Post Graduate, most of them graduated from bachelor and

institute, and Majority of the sample living in urban areas.

The Caregivers knowledge were low about autism Spectrum disorder of the beginning of an educational programs of autism.

The Caregivers knowledge concerning autistic of their children are increasing at post-test and become high at acceptable knowledge level after the beginning of an educational program.

The result shows that there is no significant association between Caregivers (Age Groups, Occupation, Family Type, Marital Status, and Economic situation) and their knowledge concerning autistic child, while there is statistical significant association between Caregivers (level of education) and their knowledge at (pre-test& post-test).

RECOMMENDATIONS

Recommendations According to the findings of the present study , the researcher recommends the following :

Education program to Caregivers might be his plan to be given in the center that offers caring to children and give them enough information to deal with their children .

Providing educational material like posters, guidelines & pamphlets, providing booklets, pamphlets, and pictures to awareness Caregivers about autistic childs.

Standard indicators should be adopted to assess the child development for early recognition and diagnosis of autism in all the primary care centers.

Mass media like television used for general population especially parents who suffer from their autistic children to let the know the effective methods of dealing with an autistic child.

Ministry of Health might be responsible for educate people of mental illness and encourage them to seek advice when they are observed their children have abnormal behavior.

Future studies aiming at providing baseline data to guide policies and planning on healthcare delivery system to children with childhood autism and other developmental disorders in Kirkuk should focus on these issues.

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