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# The Efficacy of the Modified Checklist in Early Screening for Autistic Sudanese Toddlers

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## ABSTRACT

**Background:** Early recognition of autism is vital for effective intervention and management. Timely diagnosis ensures families and caregivers access to necessary services and professional support.

**Aim:** This study aimed to evaluate the efficacy of the M-CHAT as a screening tool for autism in Sudanese toddlers aged 18-36 months.

**Methods**: This replication research compares data collected by the researcher with data from an earlier study on a different ethnic group, Sudanese. The sample consisted of 200 mothers of toddlers, split evenly between those with autism and those without. None had other developmental problems. The sample was purposively chosen. Mothers answered checklist items translated into Arabic.

**Results**: Analysis revealed that the M-CHAT version performed well as a screening tool for autism in toddlers. M-CHAT proved its ability to differentiate between autistic and non-autistic toddlers; its significance was 0.05. Its reliability was found to be through Cronbach's Alpha 0.976. It was found through applying T-Test that there were differences between the two tested groups of toddlers. The inferential statistics showed that there was a difference between both sexes (males and females), with significance 0.05. Difference due to age did not exist between the 2 groups, or within the same group, with sig. = 0.05. Putting in mind that parents are usually the first to notice a problem their toddler encounters, the M-CHAT offers a potential simple and inexpensive method of screening at risk populations of toddlers for autism; that all parents could easily apply, this facilitates early referral to a multi-disciplinary evaluation team for diagnosis.

**Conclusion:** Early screening leads to early intervention and efforts to encourage social adjustment and speech development and make the child able to respond appropriately. These findings reinforce the importance of integrating M-CHAT into routine paediatric care and public health strategies

Keywords: toddlers, autism, M-CHAT

## INTRODUCTION

The topic in hand comes to be important because it is a disorder, which is not well fully known in Sudan. Even health-care providers and professionals in the Sudan have limited means and instruments of screening assessment and evaluation to rule-in or rule-out a child as being autistic or not [1, 2].

Autism spectrum disorder is one of the most common childhood developmental disabilities. It is found in every country and region of the world, and in families of all racial, ethnic, religious, and economic backgrounds [3]. The male-to-female prevalence ratio was 3.4, with ASD prevalence of 49.2 per 1,000 among boys and 14.3 per 1,000 among girls [4].



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Autism diagnosis is often delayed by 2-3 years after symptoms appear due to concerns about labelling or misdiagnosis [1]. Early identification of autism in children and timely intervention during preschool years lead to better outcomes. It also ensures families access necessary services and support [5].

To the best of the researcher's knowledge, it is the first study in a Sudanese population that examines the possibility of devising a new screening instrument to detect autism and identify toddlers who are at risk for developing autism. Consequently, it is an attempt to adapt a checklist that enables psychologists, health care workers and parents at the first place, to pinpoint the problem(s) the toddler faces since his/her early years of life.

Over the past decade, there has been a significant increase in the prevalence of autism [4]. Various theories have been proposed to explain this trend, but no conclusive evidence has been found to support any specific theory. Increased awareness and funding for autism research have contributed to the rise in autism prevalence. In recent years, public awareness campaigns, educational initiatives, and advocacy efforts regarding autism have increased. This has resulted in more identification of individuals with autism and a better understanding of the disorder [6]. One of the most troubling aspects of having a child with autism is the confusion among professionals concerning diagnostic issues [7]. Autism has often been misdiagnosed as other disabilities, including mental retardation, schizophrenia, language development issues, hearing impairment, and pervasive developmental disorder [8].

It is recommended that screening tests should be regularly administered at the 9, 18, and 30 months well child visit. For example, at 9 months, a targeted screening may reveal early communication, motor, and language skill delays. At 18 and/or 24 months, indications of autism may become more evident. The 30-month well child visit (when most children can speak in 2-word phrases) can be a key opportunity to detect language delays, as well as motor, social-emotional, and cognitive delays [9]. Many children miss the recommended neurodevelopmental screenings and monitoring despite its importance [10]. Developmental screening tests for young children face limitations and controversies due to their limited ability to predict future functioning. However, they remain a valid and reliable method for assessing skills in various domains. A limited number of culturally sensitive developmental screening tools have been validated for children under the age of 5 in low- and middle-income countries. [11].

In the Sudan autism is not well known, paediatricians, family physicians, care providers, teachers, and parents may initially dismiss signs of autism, optimistically thinking the child is just a little slow and will "catch up" [12].

## **Checklist for Autism in Toddlers (CHAT)**

British researchers created a behavior checklist in 1992 to identify toddlers (18-24 months) at risk for autism, enabling earlier treatment. CHAT is a quick screening tool used to identify toddlers at risk for autism and other developmental disorders. It takes about five to ten minutes to administer and score and doesn't require special training. Parents and healthcare workers can use it effectively [13].

Children who lack joint attention, including the ability to follow an adult's gaze, engage in protodeclarative pointing, gaze monitoring, and pretend play at 18 months, are at a high risk of autism. Section A of the CHAT is a self-administered questionnaire for parents, with 9 yes/no questions addressing the following areas of child development: rough and tumble play, social interest, motor development, social play, pretend play, proto imperative pointing (pointing to ask for something), proto-declarative pointing, functional play, and showing. Section B of the CHAT consists of 5 items, which are recorded with observation of the children by general practitioners or health visitors. The 5 items address the child's eye



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contact, ability to follow a point (gaze monitoring), pretend (pretend play), produce a point (proto declarative pointing), and make a tower of blocks [14]. If screening using the CHAT suggests possible autism, or any other disorder, further assessment is needed to determine a diagnosis. If autism was unlikely, it is still important to: (a) assess the child for other developmental or medical problems that may have caused the initial concern. (b) continue regular periodic surveillance for problems that may be related to the cause of the initial concern. The CHAT is not a diagnostic tool but can flag potential autism spectrum disorder cases for further assessment [15].

## Modified Checklist for Autism in Toddlers (M-CHAT)

Originally introduced in 2001. The M-CHAT is an expanded American version of the original CHAT from the U.K. It consists of 23 questions, with 9 questions from the original CHAT and an additional 14 questions addressing core symptoms present among young autistic children. The original observational part (i.e. section B) is omitted. The M-CHAT is a straightforward, self-administered questionnaire for parents to use during regular paediatric visits. The number of questions children do not pass can indicate their risk of autism. The M-CHAT has better sensitivity than the original CHAT by screening children up to 36 months, targeting those who might regress between 18 and 36 months. In contrast, the CHAT tests children only at 18 and 24 months.

The 6 best questions of the M-CHAT address areas of social relatedness (interest in other children and imitation), joint attention (proto-declarative pointing and gaze monitoring), bringing objects to show parents, and responses to calling. Joint attention is addressed in the original CHAT, whereas the other areas were addressed only in the M-CHAT [16].

## M-CHAT Scoring

A child fails the checklist when 2 or more critical items (key questions) are failed or when any 3 items are failed. The six critical items are Q2, Q7, Q9, Q13, Q14, and Q15. Yes/no answers convert to pass/fail responses. Not all toddlers who fail the checklist will meet the criteria for a diagnosis on the autism spectrum. However, toddlers who fail the checklist should be evaluated in more depth by physician or referred for developmental evaluation with a specialist [16].

## MATERIALS AND METHODS

## **Research Sample**

The research was conducted with some already diagnosed autistic toddlers and non-autistic toddlers at Khartoum state (Khartoum, Khartoum North, and Omdurman) Ethiopia, Emirates, and Saudi Arabia. The researcher used purposive sampling method as it enable a sample selection that is believed to be representative of the population and can lead to very good samples. Proper purposive sampling depends on two assumptions: (1) the researcher can identify in advance the characteristic that collectively capture all variation, and (2) the chosen sample will correctly reflect the distributions of these characteristics [18]. A sample of 200 Sudanese mothers was interviewed using the Modified Checklist for Autism in Toddlers. The sample included autistic and non-autistic toddlers from Khartoum State, Ethiopia, Saudi Arabia, and the United Arab Emirates. Each study group consisted of 65 males and 35 females aged 18 to 36 months. As the sample was purposively selected, bearing in mind mostly age and the disorder, the sex was not considered (table 1, 2, & 3).



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#### Characteristics of sample

Table (1) Location of autistic and non-autistic toddiers								
Country	Number of autistics	Number of non-autistics						
Sudan	40	40						
Ethiopia	17	17						
Saudi Arabia	22	22						
United Arab Emirates	21	21						
Total	100	100						

Table (1) Location of autistic and non-autistic toddlers

The number of autistic toddlers was determined through purposive sampling, which involved a complex process for the researcher. Consequently, the number of non-autistic toddlers was selected to match that of the autistic toddlers and from similar environments.

Sex	Frequency	Percent
Males Female	130 70	65.0 35.0
Total	200	100.0

#### Table (2) Sex of toddlers (autistic and non-autistic)

Table (2) shows that the majority (65%) of the selected sample in each group (i.e., autistic and non-autistic) were males, while 35% were females. This outcome was primarily due to the purposive selection of toddlers, considering the difficulty in finding diagnosed autistic toddlers. Additionally, the researcher aimed to select an equal number of male and female non-autistic participants to avoid statistical issues and facilitate the comparison between sexes. The lower number of females can be explained by the male-to-female ratio of 4:1.

 Table (3) Age of toddlers (autistic and non-autistic)

Age range	Frequency	Percent
18-24 months	41	20.5
25-30 months	74	37.0
31-36 months	85	42.5
Total	200	100.0

Table (3) indicates that children aged from 18-24 months represented 20.5% of each sample; 25-30 months 37% and 42.5% fell in the age range 31-36 months.

Non-autistics falling in each age group were purposively selected to match those autistics in the same age group in order to keep away from any statistical hindrance and to allow more space for comparison.



# Procedures

## **Research tool**

The researcher planned to adapt M-CHAT and test its effectiveness, considering that cultural differences might lead parents to respond differently.

The key stages the researcher followed were three. Stage one involved the translation of M-CHAT from English to Arabic. An English/Arabic committee of specialists conducted a back-translation process, whereby the checklist was translated back into English. This procedure aimed to ensure equivalence between the original and translated versions, allowing for accurate comparison of results.

The second stage was evaluated by a committee of experts in psychology and psychiatry for its efficacy. Subsequent rewording and reforming were performed, resulting in the validation of its effectiveness.

In stage three, 30 toddlers who had been diagnosed with autism participated in the norming of the M-CHAT. Their parents were involved in the pilot study. The screening device did not require any further modifications or reforms. The questions were clear and straightforward.

Inter-item correlation was used to measure reliability. Cronbach's Alpha indicates reliability based on true score variation. Alpha coefficient ranges in value from 0 to 1 and may be used to describe the reliability of factor extract from dichotomous (i.e. questions with two possible answers) and/or a multiple formatted questionnaires or scales (i.e. ranging scale: 1= poor, 5= excellent). The higher the score, the more reliable the generated scale is.

The adapted M-CHAT proved to be accurately translated and detects symptoms the original version does. It satisfied the criteria of validity and reliability.

The researcher aimed at splitting the checklist into 2 parts when running the process of reliability, to ensure that the key best questions are really reliable and detect signs of autism. Part 1 was made up of the 10 keyquestions: Q2, Q7, Q9, Q11, Q13, Q14, Q15, Q18, Q20, and Q22. Part 2 was composed of all questions of the checklist.

Reliability statistics based on the inter-term correlation to each part alone was performed to make sure that each part, separately, is reliable and has a stable response. Question 16 (Can your child walk?) was found to be unreliable and negative so it was withdrawn. Once more inter-item correlation was administered to the 22 questions, (i.e. the adapted M-CHAT) and was found to be high.

Checklist	Number of items	Cronbach's Alpha							
key questions	10	0.920							
Total of questions	22	0.976							

Table (4)

Using the reliable and valid adapted M-CHAT, the researcher collected data by interviewing the selected sample. Those abroad were interviewed online, while others were interviewed in person. The adopted MCHAT was emailed to families abroad as a soft copy. The interview was scheduled at a convenient time for both parents and researcher. For families overseas, questions were answered through chat.

Data collected was statistically analyzed through SPSS. The t-test was used to assess whether the means of the two groups under study statistically differ from each other. Descriptive statistics was used to describe the basic features of the data in study. It provided a simple summary about the sample and the



measure, which included the minimum (the smallest number in the set of scores), the maximum (the biggest number in the set of scores), the mean or the arithmetic average of the group of scores, and the standard deviation which provides a reference of a group of scores to the normal curve or, describes the variability in a group of scores. Moreover, Analysis of variance - (ANOVA) to assess whether there is difference in the M-CHAT was also applied.

While some families were very much preservative, and refused to cooperate, others were very brave and allowed the researcher to enter their lives and find out problems and obstacles they faced throughout their journey with autism. They asked to keep their names as well as their residents as 'off the record' and confidential. Accordingly, and as part of the research ethics, the researcher respected their request and did not reveal any piece of information, which could lead to them, and the checklists were filled behind closed doors.

## **RESULTS AND DISCUSSION**

 Table (5): T-Test for two independent samples to assess whether the 2 groups of toddlers (autistic and non-autistic) differ in their means

Groups compared	Sample size	Mean	Standard deviation	df	t	Sig. (2- tailed)	Inference
Autistic	100	39.32	3.83	198	32.11 0.000 Difference exists the 2 groups, si CHAT could rule-out a todd		Difference exists between the 2 groups, sig.=0.05 (M- CHAT could rule-in or
Non- autistic	100	26.09	1.51				autistic or not)

Difference existed between the 2 groups (autistic and non-autistic). It is clearly seen that M-CHAT has the efficacy and ability to differentiate between toddlers who are autistic and those not. The T-test was highly significant at p=0.05, the value of the t test was 32.11.

Referral becomes a necessity if the respondent ticked 2 or more "no" answers to the critical items (key questions) 2, 7, 9, 13, 14, and 15, in addition, ticked a "yes" answer to items 11, 17, 19, or 21 (see appendix 4 and 6).

Many indicators and signs of autism matched and met the criteria in the Diagnostic and Statistical Manual of Mental Disorders, 4<sup>th</sup> edition. The sample revealed the following:

Social-emotional skills (Q1, Q2, Q4, Q18, and Q22)

By age 3 months, the toddler should be able to smile socially, laugh in playful situations at age 6-8 months, and show the ability to be consoled by 1 year. By age 2 he/she should demonstrate consistent eye contact, and show engagement with other children or other adults [19].

In autistic toddlers, there may be a failure to cuddle, an indifference or aversion to affection or physical contact. Toddlers with this disorder may treat adults as interchangeable (identical) or may cling mechanically to a specific person. The child tends to treat other people in unusual way e.g. expecting other people to answer ritualized question in specific ways, having little sense of other people's boundaries, and



being inappropriately intrusive (disturbing) in social interaction. They suffer difficulty relating to people. No spontaneous sharing of enjoyment, interests, or achievements with others was seen in the sample. Gross impairment in ability to make peer friendship, lack of social or emotional reciprocity, and failure to develop peer relationships appropriate to developmental level was evident.

Communication/Language skills (Q6, Q7, Q10, Q12, Q19, and Q20)

Speech sound development 0-3 years

In the first year, children develop the ability to hear and recognize the sounds of their parents' language. They experiment with sounds through babbling (e.g., "baba", "babamada"), and gradually, their babbling begins to resemble real words.

- 0-3 months: Babies communicate by crying, cooing, smiling, and making eye contact.
- 3-6 months: Add pointing, blowing raspberries, and laughing.
- 6-9 months: Babble using lip sounds like "baba" or "bamada".
- 9-12 months: Babble with more sounds such as d, m, n, h, w, t.
- Around 12 months: Begin using words.

Toddlers significantly expand their speech sounds and vocabulary between ages 1 and 2. By age 2, half of their speech is understandable, and by age 3, most of it can be understood by family and friends.

At the age of two years, toddlers are typically able to articulate various speech sounds such as p, b, m, t, d, n, h, and w. By the age of three years, their ability to produce speech sounds expands to include k, g, f, s, and ng. Toddlers often experience challenges in consistently pronouncing sounds correctly. Certain words may pose greater difficulty, resulting in errors such as saying "tat" for cat and "pam" for pram. Additionally, longer sentences can sometimes make children harder to understand [17].

By one month of age, non-autistic can discriminate the faces of their mothers from the faces of strangers. By 7 months of age, they can discriminate between fearful and happy facial expressions. Facial expression is significantly important to the communication [17].

The sample revealed to have qualitative impairment in communication being verbal or non-verbal. Toddlers with autism vary widely in abilities and behaviors. Communication impairments include deficits in use of proto-declarative gestures and ability to communicate emotion. In autism, one of the earliest signs detected by mothers is a lack of eye contact. Gaze avoidance, facial expression, and severe deficits in language comprehension were present in most cases. Pointing refers to proto declarative pointing that is the use of the index finger to indicate an item of interest to another person. Toddlers typically learn to utilize proto declarative pointing to communicate their concern for an object to others. As a screening question "Does your child ever use his/her index finger to point, to indicate interest in something?", Baron-Cohen and colleagues (1996, 1992) have demonstrated that the absence of a positive response to an inquiry about proto declarative pointing is predictive of the later diagnosis of autism. The absence of a positive response to this question suggests the need for a specialized assessment for possible pervasive developmental disorder. Expressive gestures are used to get others to do things for them but not to convey feelings. A person with autism often has problems understanding the meaning and purpose of body language. They find social interaction difficult, confusing, and scary [20, 21].

Cognitive skills (Q14, Q19, and Q22)

By age 2-3 months the toddler should be alert to mother, with special interest, search for dropped objects at 6-7 months, show interest in peek-and-boo when reaches 8-9 months, and search for hidden objects at age 1 year. Face recognition and what is known as "theory of mind" are impaired [21]. During the first



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two years of life, the way the non-autistics perceive the form of objects changes. Toddlers prefer to look at human faces rather than into objects. This preference is characteristic of infants only 5 days old [21]. It has been suggested that the problem underlying social impairment is lack of the in-built ability to recognize that other people have thoughts and feelings. Failure to respond to their parents' voices and to respond to their name is obvious. As a result, parents may be concerned initially that the child is deaf. An early diagnostic behavior is failure to engage in joint attention based on the ability to look where you are pointing (ibid).

Awareness and thinking abilities (Q5, Q8, Q9, Q11, Q13, Q15, Q16, and Q21)

Baron-Cohen and colleagues (1996, 1992) have established that the absence of symbolic play in toddlers is highly predictive of the later diagnosis of autism. Therefore, screening for the presence of symbolic play is a key component of the routine assessment of well toddlers. Impairment in abstract and symbolic thinking is apparent. Inability to play imaginatively with objects or toys or with other children or adults is an outward manifestation of autism. Lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level was the feature of those autistics. The absence of normal pretend play indicates the need for referral of specialized developmental assessment for autism and other developmental disabilities. Odd play may take the form of interest in parts of objects instead of functional uses of the whole object. For example, an autistic may enjoy repeatedly spinning a wheel of a car instead of moving the entire car on the ground in a functional manner. A tendency to select for attention minor or trivial aspects of things in the environment instead of an imaginative understanding of the meaning of the whole scene was also often found [20], [21].

Bizarre responses to auditory stimuli are present as either a lack of responsiveness or an exaggerated reaction to auditory stimuli, possibly due to sound sensitivity. Unusual responses to sensory information such as loud noises, and lights are also common. Many researchers suspect that these sensory processing difficulties are the cause of some of the more detrimental or harmful autistic behaviors, such as self-abuse, and tantrums. Sensory-motor problems are a defining characteristic of autism excessive mouthing of objects, and delayed responses to name [22].

Movement abilities (Q1, Q3, Q8, and Q17)

Another psycho behavioral diagnostic characteristic of autism is the presence of repetitive, stereotyped activities and the need for sameness. Arm flapping, abnormal posture, jumping, hand-finger mannerisms, circling or spinning, rocking, toe walking, and other preservative, repetitive or stereotyped movements are among the diagnostic criteria. The toddlers may insist on the performance of routines, as climbing stairs or being swung by parents repeatedly.

Complex stereotyped activities involving objects include intense attachment to objects for no apparent purpose. Some routines include repetition of a sequence of odd bodily movements. Repetitive play skills are generally evident.

Sample size	Minimum	Maximum	Mean	Standard deviation	High risk	Medium risk	Low risk
100	26	42	39.42	3.83	More than	36.83-43.46	Less than 36.82

<b>Fable (6):</b>	Descriptive	statistics	of M-CHAT
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The minimum score was found to be 26, the maximum score 42, the mean or the arithmetic average of the group of scores 39.42, and the standard deviation 3.83. The tool scoring levels were as follows: High risk = more than 43.47, Medium risk = 36.83-43.46, and Low risk = less than 36.82.

#### **Tool Scoring**

The tool's scoring was changed into 3 scales or levels from that of the original M-CHAT. Each level represents the probability of developing autism or suspecting to be autistic. Level (1) named as High Risk and Level (2) as Medium Risk which indicates that the toddler encounters signs of autism and needs to be referred to a diagnostic multidisciplinary team. Level (3) named as Low Risk illustrates that the toddler needs to be screened once more after a period of time.

Yes, question was given the value of 2, whereas no question was given the value 1, which means that if the toddler answered all questions "yes" he/she will gain a score value 44 (which indicates the likelihood and possibility of being autistic), and if answered all questions "no" he/she will gain 22, which indicates no existence of autism but. for more assurance toddlers should be retested again after a period of time.

Table (7): T-Test for two independent samples to assess whether the sex in the 2 groups of toddlers(autistic and non-autistic) differ in their means

Groups compared	Sample size	Mean	Standard deviation	df	t	Sig. (2- tailed)	Inference
Males	65	38.68	4.65	98	2.23	0.02	Difference exist between the 2 groups, sig.=0.05
Females	35	40.45	0.70				

The table above shows that the mean of males was 38.68 and of females was 40.45. The standard deviation of males and females was 4.65 and 0.70 respectively. Degree of freedom was found to be 98, while the t value was 2.23. Thus, the inferential statistics shows that there is difference between both sexes (males & females), with sig. = 0.05. This would suggest that, while females are less likely to develop autism, when they do they are more severely impaired. The symptoms may appear in any combination at any severity, so two toddlers with the same diagnosis may differ greatly in skills and behavior. Wing (1981:pp. 129-137) has set a theory that is based on evidence that, in the general population, females have better verbal skills, while male excel in visio-spatial tasks. There may be a neurological basis for this, so that autism can be interpreted as exaggeration of "normal" sex differences. But environmental and social factors may



also play a part in sex differences in ability, which means that no direct correlation can be drawn between the poorer verbal skills of males and the higher incidence of autism in males.

Sample size	Minimum	Maximum	Mean	Standard deviation	High risk	Medium risk	Low risk
65	26	42	38.8	4.62	More than 43.14	34.13-43.13	Less than 34.12

#### Table (8): Descriptive statistics of M-CHAT for males

When comparing males and females' responses it was found that differences exist. Thus, the descriptive statistics of M-CHAT for males clearly shows that the males whom were 65 had a minimum value of 26, maximum value of 42, mean of 38.8, and standard deviation 4.62. Accordingly the scales of scoring were as follows: Level (1) = More than 43.14, Level (2) = 34.13-43.13, and Level (3) = Less than 34.12. This result may be due to the fact that males are usually less severely impaired.

#### Table (9): Descriptive statistics of M-CHAT for females

Sample size	Minimum	Maximum	Mean	Standard deviation	High risk	Medium risk	Low risk
35	39	42	40.45	0.70	More than 41.16	39.23-41.15	Less than 39.22

Descriptive statistics of M-CHAT for 35 females revealed that their minimum value was 39, maximum value 42, mean 40.45, and standard deviation 0.70. Accordingly, the scales of scoring were as follows: Level (1) = More than 41.16, Level (2) = 39.23-41.15, and Level (3) = Less than 39.22. This result may be due to the fact that females are usually severely impaired when they develop autism.

# Table (10): Analysis of variance - (ANOVA) to assess whether there is difference in the M-CHAT due to age

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Source of variance	Sum of squares	Mean squares	Degree of freedom	f	Sig.	Inference				
Between groups	35.68	17.84	2	0.33	0.71					



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Within groups	10342.42	52.76	196		Difference due to age do not exist between the 2 groups, sig.=0.05
Total	10378.11		198		

Differences due to age factor between males and females (between and within groups) did not exist. This may be due to the fact that sexes do not differ in their developmental phases during their first 3 years of life.

Through intense study of the results obtained, a conclusion and several recommendations were reached, and discussed in the next chapter.

#### Conclusion

The adapted Modified Checklist for Autism in Toddlers proved to be valid and reliable in detecting autistic sign in Sudanese toddlers with age ranging between 18 - 36 months. In addition, it showed its easiness in administration and scoring out. Moreover, it is never considered to be expensive or time consuming.

Heading the list of universal goals of parents is the survival and health of their children. To go about their everyday lives they do not, of course, have to have scientific knowledge about autism, but they do need what is called a folk psychology, a set of beliefs that they can use to understand, interpret, and predict their own and other, people's thoughts, beliefs and actions. Usually parents, caregivers, and guardians are the first to note symptoms as early as infancy. Many parents misunderstand their child's delays or behavioral changes. They often report that their child had normal social and language development but later lost these skills and withdrew socially. Although they may link this change to a significant event, such as a sibling's birth, a grandparent's death, or an illness, it is unclear if the child was truly unaffected before the event [23]. Autistic infants might lie quietly in their cribs or on floor mats for hours without crying, making them seem easy to care for. Others may be irritable and cry frequently [24].

Thus, it is important to make sure children have attained developmental milestones. If a child misses, the milestones, it might be the first indication of possible autism or any other disability. This enables to identify and recognize if there is a problem somewhere.

The central dilemma for the paediatrician who screens patients is that identification must precede the provision of services, and the act of identifying a child as one who needs a comprehensive evaluation for developmental disabilities provokes anxiety in parents. This concern may create a tendency to identify only markedly delayed children, denying other children potential access to needed care.

Problems encountered

The research process was full of complexity and difficulties, due to being carried out with human beings. There was a great difficulty in finding and reaching more than 100 autistic toddlers mothers in Sudan; probably because they were not located in a certain special education centers or institute due to conflict in Sudan, plus stigma and not willing to show up.

#### Recommendations

1. Increase parents' awareness about childhood development, early warning signs of autism and other developmental disorders through educational seminars, awareness meetings, and distribution of enlightening sheets and materials in maternity hospitals, vaccination centers, and clinics. T.V. and radio programs must be more effectual and focus on autism.



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- 2. It is advisable to conduct periodic screenings at various age levels when concerns for autism persist. Routine developmental surveillance during health examinations is essential for young children. The M-CHAT assessments should be administered at 9, 18, 24, and 30 months, as they provide valuable information on potential autism, particularly since its characteristics often become apparent during the second year of life. Additionally, it is important to note that not all individuals with autism can be identified early, due to variability in the onset and severity of symptoms.
- 3. Seek medical care if an infant or toddler exhibits unusual behaviors for a day or two after being normal, as this may indicate minor illness, discomfort, or stress. Should these behaviors persist or be continuous, it is advisable to consult a paediatrician. During these examinations, reports from parents regarding their child's behaviors should be considered, as they may provide valuable information in identifying potential developmental issues, including autism. Medical professionals should listen attentively to parental concerns and observations about the child's development.
- 4. An expert diagnostic team should have the responsibility of thoroughly evaluating the child, assessing the child's unique strengths and weaknesses, and determining a formal diagnosis. The team should then meet with the parents to explain the results of the evaluation, in order to join forces with them to refer toddlers to early intervention services. Early intervention services would be much more effective when the family works closely with service providers and their toddler.
- 5. It is very important to carry out well-child visits, which are medical evaluation of a child who is not sick. These visits monitor the child's growth, development, and screen for any childhood conditions that may not be noticeable yet. Use of a combination of clinical judgment, standardized screening tools, and listening to the parents concerns to identify those with developmental delays would be very effectual and with great value. For there is no 'medical test' that can give a clear diagnosis.
- 6. Special education centers should never diagnose a child as autistic unless referred to a multidisciplinary team of experts. For this evokes many risks and hinders the child's as well as his/her family life.

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