

## Changes and Challenges of puberty in Adolescents with Autism Spectrum Disorder

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### Abstract

**Objectives:** The current study investigated the changes and challenges of puberty in adolescents with Autism spectrum disorder.

**Methods:** The qualitative research methodology was used by conducting semi-structured in-depth interviews. The sample consisted of 12 parents (8 men and 4 women) whose adolescents have been diagnosed with Autism spectrum disorder from government or private clinics, and they (adolescents) were between 13-18 years old.

**Results:** The findings indicate that most parents note that pubertal timing appears early in their children with Autism spectrum disorder, especially among female adolescents. Several parents indicate that some behaviors, such as stereotypical and repetitive behaviors decreased or stopped in their children during puberty. The findings of parents' responses analysis also show that their children experience several behavioral challenges during puberty, including anger, social withdrawal, sexual behaviors, daily life skills, menstruation, and eating.

**Conclusions:** Puberty leads to significant unique challenges for individuals with Autism spectrum disorder. The impairment in communication skills and other behaviors associated with the disorder can lead to negative risks during this period. Different developmental challenges begin to appear in the behavioral, health, physical, and psychological aspects during puberty. The study recommends the need for counseling and training programs for children with Autism spectrum disorder and their parents to deal with the changes and challenges of puberty.

**Keywords:** Changes, challenges, puberty, adolescents, autism spectrum disorder (ASD).

### تغيرات وتحديات البلوغ لدى البالغين ذوي اضطراب طيف التوحد

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#### ملخص

**الأهداف:** تهدف الدراسة إلى الكشف عن التغيرات والتحديات التي تواجه البلوغ لدى المراهقين من ذوي اضطراب طيف التوحد.

**المنهجية:** تم استخدام منهجية البحث النوعي من خلال إجراء مقابلات معمقة وشبه منظمة. تكونت العينة من 12 ولي أمر (8 رجال و4 نساء) ممن تم تشخيص أطفالهم المراهقين في عيادات حكومية أو خاصة بأن لديهم اضطراب طيف التوحد، وتراوح أعمارهم (المراهقون) بين 13-18 عامًا.

**النتائج:** تشير النتائج إلى أن معظم الآباء قد لاحظوا أن توقيت البلوغ قد ظهر في وقت مبكر لدى أطفالهم المراهقين ذوي اضطراب طيف التوحد، وخاصة بين المراهقات. ويشير عدد من الآباء إلى أن بعض السلوكيات مثل السلوكيات النمطية والمتكررة انخفضت أو توقفت لدى أطفالهم خلال فترة البلوغ. وتظهر نتائج تحليل استجابات الوالدين أيضًا أن أطفالهم يواجهون عددًا من التحديات السلوكية خلال فترة البلوغ تمثلت في الغضب، والانسحاب الاجتماعي، والسلوكيات الجنسية، والحيض، والمهارات الحياتية اليومية، والأكل.

**الخلاصة:** يقود البلوغ إلى تحديات ملحوظة لدى الأفراد ذوي اضطراب طيف التوحد، ويمكن أن يؤدي ذلك إلى ضعف مهارات التواصل الاجتماعي والمشكلات السلوكية المرتبطة باضطراب طيف التوحد إلى أحداث سلبية ومخاطر كبيرة خلال هذه الفترة. تبدأ التحديات النمائية المختلفة بالظهور في الجوانب السلوكية، والصحية، والجسدية، والنفسية خلال فترة البلوغ، أوصت الدراسة بضرورة توفير برامج إرشادية وتدريبية للأطفال البالغين ذوي اضطراب طيف التوحد وأبائهم للتعامل مع تغيرات وتحديات البلوغ.

**الكلمات الدالة:** التغيرات، التحديات، البلوغ، المراهقون، اضطراب طيف التوحد.



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## Introduction

Autism spectrum disorder (ASD) is a developmental neurological condition that leads to impairment in reciprocal social interaction, communication, and restricted repetitive activities or interests (Hamdan & Al-Balawi, 2018, Mohammad 2021). Recent estimates issued by the World Health Organization (WHO) indicate that the prevalence of ASD is 1 per 160 children in the world (World Health Organization [WHO], 2013; Smadi, & Abu Abeeleh, 2022). The Center for Disease Control and Prevention (CDC) and Autism and Developmental Disabilities Monitoring (ADDM) Network also estimated 1 in 88 individuals. In March 2013, CDC's published new estimates are roughly 1 in 50 children in the school community (Kira, 2014). ASD usually has significant long-term impacts and multiple aspects of individuals' life that occur through multiple contexts and different periods of life (The National Autistic Society [NAS], 2012; Aljaddou, 2019). Although many of the affected individuals may show an improvement in the underlying symptoms of the disorder using effective interventions, these symptoms may persist into adulthood and may lead to challenges and high risks during puberty (Eriksen, 2014).

## Statement of Study:

It is noticeable that ASD leads to many challenges during life cycle public, especially during the stage of puberty. Puberty is a difficult stage for many affected individuals, because it leaves many consequential problems in many aspects of social, emotional, sexual, behavioral and other. The author finds that these individuals show clear challenges and changes during puberty. On the other hand, he finds that they have a clear lack of skills to dealing with this stage and the related challenges. Whatever, despite the importance of studying puberty in adolescents with ASD, there is a paucity of literature on this issue. By reviewing previous literature, the author finds a number of studies that examined single and separate issues in puberty, such as sexual, psychological, or physical behaviors. Studies investigating various mixed issues associated with puberty, such as behavioral, emotional, physical, sexual, and health-related issues. However, this study is an attempt to address this gap in the literature investigating the Changes and challenges of puberty in adolescents with ASD. The study's main question is: What are the changes and challenges of puberty in adolescents with ASD?

## Study aim:

The study aims to explore the changes and challenges of puberty in adolescents with ASD.

## Study importance:

### Theoretical importance:

- It is a critical addition to the previous literature related to puberty in individuals with ASD.
- It provides a theoretical framework about changes and challenges of puberty in ASD for parents, professionals, and researchers in the field of ASD.

### Practical importance:

The study helps to understand the changes and challenges of puberty in the psychological, social, physical, sexual, and other aspects of individuals with ASD. It also helps to develop recommendations for parents, caregivers, professionals working with adolescents with ASD that may be helpful in the improvement of services provided for these individuals and their parents.

## Study terminology (procedural terminology):

**Puberty changes:** Are physical, social, psychological, and sexual events and behaviors that occur during the maturity stage for adolescents with ASD. These changes are identified by the responses of the parents during the interviews.

**Challenges:** Are the difficulties and problems that may result from changes in puberty, and that may disrupt the adolescents with ASD, their parents, or persons surrounded them. These problems are identified by the responses of the parents during the interviews.

**Adolescents with ASD:** Are individuals aged between 13-18 years old. They face difficulties in social skills and they

display specific, repetitive, and ritual stereotypical behaviors. Also, they show signs of physical and sexual maturity.

#### **Limitations of study:**

This study does have limitations. It recruited a small size of sample from parents of adolescents with ASD aged 13-18 years old who are residing in the Tabuk city. The parents were recruited and interviewed without their adolescent children with ASD. The study was limited to a qualitative research methodology using semi-structured in-depth interviews without using quantitative methodology. The participants reported a variety of different responses and experiences which may be difficult to generalize the results.

#### **Literature Review:**

Puberty is a series of natural changes in social, emotional, cognitive, and physical development. It is the second unique and significant challenge for individuals with ASD (Corbett, Muscatello, Tanguturi, McGinn, & Ioannou., 2020). The impairment in social and communicative skills, as well as the behavioral problems experienced by many individuals with ASD can lead to negative risks during this stage (Eriksen, 2014). A number of studies have documented co-morbid psychological conditions such as anxiety and depression disorders that tend to peak during puberty in individuals with ASD (Magiati, Tay, & Howlin, 2014). A recent study has reported that 1 per 4 individuals with ASD develops accompanying neurological conditions during puberty, such as epilepsy that is thought to be caused by hormonal changes in the body (Barloso, 2020). Furthermore, other studies have shown that sensory abnormalities can occur intensely and frequently during puberty. Compulsive behaviors, self-injury, aggressive behavior, cognitive rigidity, and other disorders were also documented as associated disorders in ASD during this period (Cridland, Caputi, Jones, & Magee, 2015). On the other hand, other studies indicated that Menstruation disorders such as polycystic ovary syndrome are complex disorders that may occur in many females with ASD as a result of the emotional and behavioral problems resulting from ASD (Pohl, Cassidy, Auyeung, & Baron-Cohen, 2014).

In puberty, individuals with ASD need to express their sexual interests and intimate relationships as typically developing peers, but the lack of social and communicative skills can prevent them from expressing these needs and may lead to a lack of access to knowledge about appropriate social behaviors to deal with physical and sexual changes that may experience as a result of puberty (Mukkades, 2002). Previous literature on sexual behaviors in ASD stated that many adolescents with ASD may lack intimate and sexual experiences, such as sexual frustrations and abnormal sexual preoccupations (Perera, Gadambanathan, & Weerasiri, 2003). These individuals are more likely to be victimized due to the consequences of inappropriate sexual behaviors. For example, Konstantareas and Lunskey (1997) find that adolescents with ASD demonstrate deviant forms of masturbation, such as masturbation using unusual objects and excessive masturbation in the form of repeated and unsuccessful attempts which may be associated with the inability to reach orgasm. They may exhibit sexual habits in the presence of other people, such as masturbating in public places, touching others inappropriately, and displaying unwanted physical sexual contact that may potentially expose them to sexual abuse, stalking, and sexual coercion. As mentioned by Stokes and Kaur (2005) some adolescents with ASD may have paraphilia that appears in the form of sexual interests towards non-sexual stimuli, frequent sexual arousals and fantasies towards non-sexual things, and sexual rituals toward sensual objects and stimuli.

On the other hand, although puberty is a period of rapid social development, individuals with ASD may become more socially isolated during this period. Anderson, Maye, & Lord (2011) find that social withdrawal increased in old adults with ASD during puberty. Maladaptive behaviors were also documented as significant challenges in many adolescents and adults with ASD. These challenges include rejection, isolation, bullying, and different inappropriate behavioral issues, such as bathing, hygiene, and following fashion trends. For example, adolescents with ASD don't often care about clothing styles; they may keep the same haircut for years, also they may not take a bath for long times, and may not be interested in combing their hair (The Vantage Point Team, 2015).

Academic issues are one of the potential challenges that could occur during puberty for individuals with ASD in middle or high school. In this stage, the academic expectations will be increased, so they will receive complex subjects,

assignments, and tasks. They will have more educational opportunities and options and will interact with a large number of teachers who may be irresponsible or even hostile towards making special arrangements in the classroom (Cridland et al., 2015).

The changes of Puberty and the challenges faced by adolescents with ASD in this critical stage require the need for providing continuous support to deal with these changes and challenges. Parents and caregivers are responsible for noticing and understanding these issues, so they should be aware of all changes and all risk behaviors. They have to develop their knowledge about strategies, methods, and procedures used in dealing with these changes and challenges (Barloso, 2020). Parents of children with ASD can use some teaching, including visual supports, modeling, cognitive behavioral therapy, social stories, and videos, etc. (The Autism Society of America [ASA], 2017).

Whatever, the issues related to puberty facing adolescents with ASD should be at the forefront of any discussion (Autism Speaks, 2011). Understanding the changes and challenges of this period is an important matter for those adolescents themselves, their parents, caregivers, and professionals. This understanding contributes to directing programs focusing on these issues (Cridland et al., 2015).

Corbett, Muscatello, & Tanguturi (2020) emphasize the need to enhance understanding of pubertal development in individuals with ASD, Because of the significant psychological and developmental implications resulting from ASD. On the other hand, the author in this study also expects that the investigation of changes and challenges of puberty will contribute to implementing accurate planning for services and programs provided for adolescents with ASD at this stage, and developing solutions that will help parents and caregivers deal with these issues during puberty.

Some previous studies on puberty were conducted on puberty in ASD. Cridland et al. (2015) use personal construct psychology to investigating the experiences of adolescents with ASD. 26 males and their fathers and mothers were enrolled in a semi structured interviews. Analysis of interview data was structured according to the themes presented in a previous theoretical application of personal construct theory (PCT) for understanding adolescents with ASD. The results indicated that there is a complexity of the adolescent social realm, sense-making in multifaceted situations, identity development, development of flexible processing styles, and understanding and managing physical and emotional changes associated with puberty.

Corbett et al. (2020) measured pubertal timing in male and female with typical development and ASD. The sample consisted 239 in the study. The linear regression using main effects of sex and age interactions was used to investigate the pubertal onset. The results found that there were significant differences in the pubertal onset. On the other hand, there was significantly earlier in development of pubertal in females with ASD more than males with ASD. Analysis of menses indicated that females with ASD had earlier onset in pubertal development than TD.

By reviewing the previous study related to puberty for adolescents with ASD, it becomes clear that there are clear changes in puberty in this group of people, and it has clear effects on their lives, but these effects are inaccurate as Corbett et al. (2020) indicated. The current study attempts to identify the gap in those previous studies.

## **Method:**

### **Participants:**

The sample consisted of 12 parents (8 men and 4 women) whose adolescents have been diagnosed with ASD from government or private clinics, and they (adolescents) were under the ages of 13-18 years old. The parents have adolescents with different levels of ASD (6 with mild, 3 with moderate, and 3 with severe ASD). Seven of the adolescents have accompanying intellectual disability, but five of them don't have. Whereas six of the adolescents are receiving their education in special schools run by the ministry of social affairs in the Tabuk city, three are in general schools, two have received no education, and one is in the residential school. Table (1) shows the demographic characteristics of the study sample.

**Table 1. Demographic characteristics of the study sample.**

Participants	Gender of parent	Gender of Adolescent	Age of Adolescent	Level of ASD	Accompanying intellectual Disability (ID)	Place of Education
<i>P1</i>	Male	Male	15 Y	Mild	No	General school
<i>P2</i>	Male	Male	13 Y	Mild	No	General school
<i>P3</i>	Male	Male	16 Y	Severe	Yes	special school
<i>P4</i>	Male	Male	18 Y	Moderate	Yes	Home
<i>P5</i>	Male	Male	15 Y	Mild	No	General school
<i>P6</i>	Male	Male	18 Y	Moderate	Yes	special school
<i>P7</i>	Male	Male	14 Y	Severe	Yes	Residential school
<i>P8</i>	Female	Female	16 Y	Sever	Yes	special school
<i>P9</i>	Female	Female	17 Y	Mild	No	special school
<i>P10</i>	Female	Male	18 Y	Mild	No	Home
<i>P11</i>	Female	Female	17 Y	Mild	Yes	special school
<i>P12</i>	Female	Male	18 Y	Moderate	Yes	special school

#### **Instrument:**

Semi-structured in-depth interview using free conversations was used in this study. The author developed a tool in the form of the interview guide. The tool was built by revision the previous literature (articles, studies, and some books) related to puberty, specifically for individuals with ASD, such as Gridland et al., (2015), and Eriksen (2016). It includes two parts, the first part consists of demographic information asking the participants about their adolescent children such, as gender, age, birth order, level of ASD, presence of accompanying intellectual disability, and place of education. The second part of the interview guide consists of open-ended questions asking parents about puberty time and changing of ASD symptoms during puberty, physical, behavioral, psychological, social, sexual changes, and associated challenges for parents and their children during puberty.

#### **Procedures:**

The author contacted the parents before meeting them to arrange for the schedule of interviews upon on their own time. All interviews were scheduled to be in November 2020. Two MA students in special education (male and female) from university of Tabuk cooperated as an assistant in the study to conduct the interviews. They were trained about the management of interviews and recording the parent's responses. The author and male' student worked together to conduct the interview with male's parents, while the female' student conducted the interview herself with female's parents. This takes into account the privacy of the society' culture and traditions in KSA. The parents were given the choice to select their favorite model of the interview to ensure their comfort. Six of the parents were interviewed in the schools where their children are enrolled, while two of them were interviewed in a café store, three by telephone, and one during a home visit. Most interviews lasted between 60-90 minutes. During interviews, the author and students introduced themselves and explained the purpose of the interview for parents. The participants were encouraged to provide all necessary information and everything they feel about their adolescent children during puberty. The parents were asked to answer the demographic information then to answer the interview guide questions. During the interviews, the interview protocol was slightly changing based on the responses of parents and the information they provide. After parents' approval, nine interviews were audio-recorded using the easy voice

recorder-smart mobile tools application, while three were not recorded, it was just written in a notebook by the investigators. All recorded and written responses were transcribed and transferred into a Word Document, then they were copied and transferred into the statistical & qualitative data analysis software (QSR NVivo-V9) for data analysis.

### **Data Analysis:**

Data were analyzed by identifying pieces of data related to the research questions by the following steps: 1. Collecting and extracting the data to QSR NVivo-V9. 2. Reading to ensure that all data corrected and accurate. 3. Rereading, comparing, and examining the relationship with them several times by identifying main categories and coding them in the form of main themes. 4. Classifying and combining similar data in the form of tree nodes. Eventually, understanding, interpreting, and discussing the data.

### **Methodology:**

Qualitative research methodology was used by conducting semi-structured in-depth interviews with a sample of parents having children with ASD. The methodology depends on using a method of inductive coding techniques and constant comparisons of data analysis.

### **Results:**

Analysis of interviews with the parents revealed a range of main themes of changes and challenges of puberty in their children with ASD as follows:

#### **Pubertal Timing:**

Nine parents 75% discussed pubertal timing for their adolescent children. They found that puberty began in early time in their children with ASD. The parents of female adolescents stated that their daughters with ASD show earlier and faster rates of puberty than their typical daughter. The data analysis has shown that the average puberty age was 14.8 years for males, and 12 years for females. On the other hand, the parents who had children with a mild level of ASD and without accompanying intellectual disability indicated that puberty appeared clearly and early in their children. Conversely, the parents who had children with severe degrees of ASD and intellectual disability indicated that puberty began late or was in the normal range for their children.

#### **Decreasing the symptoms of ASD:**

Building on parent's responses, it was found that some behaviors decreased significantly or stopped during puberty. All parents except one 92% ( $n = 11$ ) stated that stereotypical and repetitive behaviors decreased significantly during the first two years of puberty for their adolescent children. The parents who had female adolescent children mentioned that stereotypical and repetitive behavior disappeared quickly then appeared significantly again in their daughters. Moreover, 58% of the participants ( $n = 7$ ), especially those who have adolescent children with mild ASD, reported that attention and eye contact behaviors improved significantly over time among their children especially with family members. Participant 12 says, "I thank my God that attention deficit behavior decreased for my son, and his eye contact became better with others, especially with his family members. This might be a result of his maturity". Conversely, the parents of adolescents with moderate and severe ASD, especially those with intellectual disability, noted that these behaviors are still poor, but are improving with promoting and supporting. Additionally, 42% of parents ( $n = 5$ ) whose adolescent children display self-harm behavior confirmed that this behavior stopped, except one said that his son displays this behavior when he gets angry with someone, or when he is exposed to loud noise.

#### **Behavioral Challenges:**

All participants felt that puberty affected their children, but their responses varied widely across the sample. In general, the findings of the qualitative analysis of the parents' responses showed there are a number of behavioral challenges during puberty, and they are classified in the form of the main themes as follows:

**Anger:** Anger was one of the behavioral challenges described by the majority of parents 83% ( $n = 9$ ), especially those who have adolescents with moderate and severe ASD and have an accompanying intellectual disability. The parents observed that their adolescent children with ASD become angrier and violent than before, and usually express anger in an

unacceptable social way even in public places, something which cannot be controlled and usually affects family members and confuses others. For example, participant 6 says that, "My son's behavior has become much worse than before, so he gets angry quickly, can't control himself, confuses the family members, and attacks any member of the family if someone provides help or approaches his own Properties", whereas participant 10 says that, "My son feels angry and many things make him angry, like when I don't buy something for him from the market, or when I ask him to wash his hands. When he gets angry, he attempts to attack others physically". By comparing parents' responses, it was found that male adolescents tend to commit severe and frequent behaviors of anger compared to female adolescents. In contrast, it was found that symptoms of anger and irritability tended to dramatically decrease in adolescents aged above 17 years.

**Social withdrawal:** All the parents except one indicated that social withdrawal was one of the most behavioral challenges that their adolescent children show in puberty. The Parents presented a number of behaviors associated with social withdrawal including an unwillingness to go out to public events and occasions, withdrawing from social situations, poor conversation with others, listening and observing others from far away. On the other hand, four parents of adolescents, especially with severe ASD and intellectual disability aged above 16, stated that social withdrawal got worse for their children over time. For example, participant 4 says, "When my son was 16 years old, I noticed a clear regression in his social behavior, my son is very shy; he withdraws from social situations and doesn't want to go to parties". Participant 5 also stated, "My son withdraws from direct relationships, but he prefers to look for friends through social media".

**Sexual problems:** All the parents who had male adolescents had stated that their sons show at least two sexual behaviors that appear in different contexts. These behaviors were clearly and repeatedly observed in adolescents with moderate and severe ASD having an intellectual disability. The parents found that these behaviors are the most stressful behaviors. The sexual behaviors mentioned by parents were classified into sub-themes as follows:

**Table 2. The sexual problems associated with puberty in adolescents with ASD.**

Main theme	Sub-theme	Number of parent responses	percentage
Sexual behaviors	Taking off your pants and clothes in public places	5	42%
	Touching others inappropriately	4	33%
	Playing with genitals	7	58%
	Trying to masturbate in front of others/public places	2	17%
	Masturbating for long periods of time in isolated places	4	33%
	Discussing sexual topics	5	42%
	Paying attention to sexual contents	6	50%
	Hugging others in an inappropriate way	3	25%
	Preoccupation of sexual clothes	3	25%
	Difficulty of Neural control of erection	2	17%
	Inappropriate sexual flirtation	3	25%
	Difficulty of reporting sexual abuse.	10	83%

The table (2) shows that the difficulty of reporting sexual abuse, playing with genitals, paying attention to sexual content, and taking off pants and clothing in public places were the most behaviors indicated by parents as sexual behaviors associated with their adolescent children during puberty.

**Problems of daily life skills related to personal hygiene:** All the parents in this study reported that problems of daily life skills related to personal hygiene are one of the noticeable challenges experienced in their adolescent children during puberty. It was noted that these problems increased in adolescents with ASD having an accompanying intellectual disability. Bathing problems were the most challenging that most parents observed in their children. The parents described a group of sub-problems related to bathing including an unwillingness to go to the shower, inability to control the water

temperature, inability to use the cleaning tools appropriately, undressing in front of family members as an expression to take a bath, and bathing for long periods.

Moreover, difficulty in dealing with a wet dream is one of the personal hygiene problems expressed by some parents ( $n = 4$ ) (33%). Participant 3 reported that "My son is not aware of the meaning of a wet dream, and he can't tell that his clothes are wet or wants to clean himself". In addition, more than half of the parents indicated that their children did not initiate to shave their beards, mustaches, pubic hair, and head hair. As participant 10 says, "My son tries to escape when his father takes him to the hairdresser. My husband and I are forced to cut his hair by ourselves, but we face great difficulty to deal with him in this regard". Some of the parents observed that their children don't initiate cleaning some parts of the body, such as mouth, feet, and armpit. On the other hand, the parents who had female adolescents indicated that their daughters experience difficulty in cleaning themselves from menstruation and dealing with related behaviors.

**Problems related to menstruation among females:** All the female parents who have female adolescents with ASD indicated that their daughters face additional problems with menstruation during puberty. In the beginning, when parents were asked about their daughters' menstruation duration, they gave different answers ranging between 21-33 days. Half of the parents noticed that their daughters' menstruation period had continued for a long time at beginning of the period, but it had stabilized at the end. However, the parents expressed their concerns about this issue, and these concerns were represented in poor menstrual hygiene, healthy menstrual problems, such as stomach pain, back pain, and vomiting.

On the other hand, the parents found that their daughters experience social withdrawal, continuous crying, and absenteeism from school during the menstruation period, for example, participant 8 says that "My daughter doesn't go to school during her menstrual period because she can't deal with the problems resulting from menstruation". Half of the female parents also reported that their daughters refuse wearing bars and pads. Some of the different responses related to menstruation that was reported by the female parents, included increased sleep disorders, eating disorders, changes in mood, anxiety, and different patterns of stereotypical and repetitive behaviors.

**Eating problems:** Most the parents indicated that many eating behaviors have improved during puberty in their children, but there were unique patterns of behaviors that appeared during this period. The main behavior in this type of problem as described by the parents is avoiding eating foods in noisy social settings. Participant 3 said that "My son tries to avoid eating food in noisy places, as he becomes confused, anxious, and embarrassed in front of others in public settings". On the other hand, these parents preferred to take their children to specific places away from places crowded with people. Two fathers stated that their children prefer eating in specific restaurants and they do not prefer others. Participant 6 says, "I prefer to take my son to a restaurant (PS) because it is not crowded with people, he does not want to eat in crowded places". Moreover, around one-third of parents indicated that their children frequently eat similar foods (foods selectivity). Two parents disclosed that their children are hypersensitive towards certain foods; they found that the sensitivity was so severe to the extent it caused pain and vomiting. One parent described that his son was bothered by the smells of some strange foods. This parent said, "My son gets upset and avoids the strange foods that his mother cooks; he is accustomed to the smells of specific foods". Moreover, some parents described rigid patterns of thinking towards certain foods in their children; they explained that as a result of their bad past experiences. As participant 9 states, "On the day, my son drinks sour milk, after that he doesn't drink milk". Obesity was one of the issues discussed by the parents. Five parents reported that their children were in the overweight range, four within the low weight range, and three were within the normal weight range. It was found that the adolescents with overweight were eating foods with high calories. Conversely, the adolescents with low weight were eating low calories and certain foods.

## Discussion:

This study aims to identify the changes and challenges of puberty in adolescents with ASD. It is clear that puberty leaves significant changes and challenges for those individuals. The parents in this study report different responses about these changes and challenges which are classified into main themes and sub-themes, including pubertal timing, decreasing the symptoms, and behavioral challenges in anger, social withdrawal, sexual behaviors, daily life skills, menstruation

(among females), and eating.

Regarding the pubertal timing, the majority of the parents note that puberty occurs earlier in their children with ASD than their typical children. On the other hand, the parent of female adolescents stated that their daughters with ASD show earlier and faster rates of puberty than their typical daughters. When we compared and analyzed the responses of parents about the average puberty age between male and female adolescents, we had found that 14.8 years old is the average age for the males, while 12 years old is the average age for the females. In fact, this result is probably due to some small differences in the physiological structure of the female body in general. As Rosenfield (2005) found that the maturation of hormones in females is more complex compared with males. Moreover, other studies suggest that early puberty in children with ASD is likely a result of a response to changing environmental conditions (Gluckman & Hanson, 2006). Previous studies in typically developing adolescents indicate that a variety of factors, including socioeconomic status, body mass index, ethnicity, and race, could contribute to earlier onset (Corbett, et al., 2020).

These results are in the line with the results of some studies which indicate that puberty occurs earlier in people with ASD compared to typical individuals (Baron-Cohen, 2002; Tordjman, Ferrari, Sulmont, Duyme, & Roubertoux, 1997). They are also in agreement with the findings of Pohl et al. study (2014) which show that there is a clear development in early puberty for females with ASD. This seems to be in opposition to some studies that find no differences in pubertal timing in children with ASD and typical children (Knickmeyer, Wheelwright, Hoekstra, & Baron-Cohen, 2006). The differences between results of these studies and the current study may be due to some factors. Firstly, the error in assessing maturity. Secondly, the discrepancy in the nature and severity of ASD among affected individuals. Thirdly, the different characteristics of the sample of the study. Finally, the difference in the methodology used to investigate puberty in those individuals, for example, the current study used qualitative approach using parents' reports, while other studies used the survey approach and clinical methods.

On the other hand, the parent's reports indicate that some of the behaviors decrease or stop in their children, such as stereotyped and repetitive behaviors, attention deficit, self-injury, and eye contact problems. Interestingly, they note that these behaviors disappear and appear again in their female adolescent children. This result is maybe explained to number of factors, including physical and mental development which usually affects the development of their skills and reduce some of their maladaptive behavior. Also, maybe a result of the intensive training, educational programs, and behavior modification programs they received, which may have improved their behavior. As for the appearance and disappearance of these behaviors in females, it may be due to some psychological and social changes that occur in females, which usually may lead to the appearance of such behaviors again.

Several studies document lower levels of severity of repetitive behaviors and stereotypical behaviors in addition to verbal and nonverbal communication skills in individuals with ASD (Esbensen, Seltzer, Lam, & Bodfish, 2009). For example, the results of Chowdhury, Benson, & Hillier (2010) show a decrease in the severity of stereotyped behaviors and an improvement in each of the basic symptoms in more than half of the sample.

In spite of the apparent improvement in some of the behaviors documented in the current study, the author finds that poor attention behavior and lack of eye contact do not improve in adolescents with moderate and severe ASD disorder, especially those who have an accompanying intellectual disability. This result is similar with CDC' reports (2014) which indicate that the severity of ASD leads to significant social communication deficits, such as eye contact, attention, and etc. The CDC also indicates that these challenges depend on Intelligence Quantit-IQ and the presence of an accompanying intellectual disability.

On the other hand, the author finds that female adolescents show fluctuating behaviors appearing and disappearing quickly especially in stereotypical and repetitive behaviors. Whatever, the changes in these behaviors in adolescents with ASD may be due to various factors related to puberty, including severity of ASD, presence of accompanying intellectual disability, and gender. For example, gender may be an important factor due to the nature of the physiological structure of females, especially as a result of the fluctuating hormonal changes that occur during puberty which may affect or increase some symptoms, especially stereotypical and repetitive behaviors.

Furthermore, behavioral challenges are one of the main topics that were researched in this study. They have been classified into five sub-themes, including anger, social withdrawal, sexual problems, personal hygiene problems, and menstruation problems among girls. Although anger is not considered a behavior associated with ASD, it appears as a secondary behavioral problem for many people with ASD especially male adolescents (Mazurek, Kanne, & Wodka, 2013). Although the causes of anger in persons with ASD are also unclear and specific, it may be due to feelings of frustration, isolation from others, communication difficulties, and sensory abnormalities (Simpson & Myles, 1998). In general, some results of the current study are similar to the findings of Mazurek et al. (2013) who find that more than half of individuals with ASD show symptoms of anger in the form of physical violence.

In addition to the anger problem, the parents discuss social withdrawal problems. the author finds that this behavior increases in old adolescents over time, especially in those with mild ASD. If the puberty combines with increased social expectations, it will be harmful (Anderson et al., 2011). The social demands may play a crucial role for adolescents with high functioning and mild ASD who may find themselves similar to their typical peers (Anderson, Oti, Lord, & Welch, 2009). The last findings on social withdrawal are in agreement with Anderson's et al. finding (2011) which indicates that withdrawal increased in old ages in people with ASD.

Sexual problems are also the common problems that could be founded among adolescents especially males. The parents describe sub-groups of these problems, including difficulty of reporting sexual abuse, playing with genital, paying attention to sexual contents, and taking off clothes in public places are some of the most common sexual behaviors indicated by the parents. These findings confirm the findings of previous studies which indicate that the adolescents with ASD appear interests in sexual behaviors (Konstantareas & Lunsy, 1997). Hellemans et al. (2007) find that male adolescents with high functioning ASD show sexual problems. One of the reasons that may lead individuals with ASD to display sexual behaviors is the presence of accompanying intellectual disability.

In addition to the previous problems, the majority of parents indicate that their adolescent children experience problems with daily life skills related to personal hygiene such as bathing problems, difficulty in dealing with a wet dream, and inability to pay attention to personal hygiene. One of the factors that may affect the ability of individuals with ASD to perform daily life skills maybe language deficits and low intelligence-IQ. The literature on ASD often indicates that many individuals with ASD have a significant impairment of daily living skills which are usually associated with their cognitive skills. For example, Kilincaslan, Kocas, Bozkourt, Kayal, Derin, & Aydin (2019) observe that the individuals with ASD show lower scores than the individuals with intellectual disability on the total score of daily living skills in personal hygiene, dressing, safety, and interpersonal skills. However, the results of this study confirm that daily living skills should be the core of treatment plans for adolescents with ASD especially when they transit to puberty.

As for the menstruation problems among females, all the female parents indicate that their daughters face these types of problems. The author observes that the menstrual period among their daughters seems long at the beginning and stabilizes in the end. On the other hand, the female parents report number of problems related to menstruation, including poor menstrual hygiene, stomach and back pain, vomiting, social withdrawal, continuous crying, absenteeism from school during the menstrual period, sleep and eating disorders, changes in mood, anxiety, and different patterns of stereotypical and repetitive behaviors. These results confirm previous studies' findings, for example, Eriksen (2016) finds that mothers of girls with ASD tell that menstruation increases behavioral problems in their daughters. Also, he finds that the female adolescents with ASD have high levels of anxiety, and they have difficulty in using hygiene products. Furthermore, Anderson et al. (2011) find that all female participants with ASD report that the symptoms of menstruation lead to missing school days. Despite the important results in this study about the issue related to menstruation problems among female adolescents, it cannot be generalized due to the small number of participants and this needs to be investigated in future studies.

Finally, though the parents express that the eating behaviors improve, they observe some unique behaviors in their adolescent children during puberty, such as avoiding eating foods in noisy social settings, eating in specific places, and foods selectivity, etc. Some of these findings are in agreement with the findings of Zimmer, Hart, Manning-Courtney,

Murray, Bing, & Summer (2012) who find that all participants in the study display selectivity towards food. There is evidence that individuals with ASD may be at the risk of having overweight or obesity for many factors, which include the restricted diet of foods rich in carbohydrates, the poor organized physical activities, and the nature of the medications that individuals with ASD children are taking (Egan, Dreyer, Odar, Beckwith, & Garrison, 2013).

### **Recommendations:**

This study emphasizes the need for developing counseling and training programs for adolescents' children with ASD and their parents in order to deal with pubertal changes and challenges. There is also need for an understanding of changes and challenges in puberty in adolescents with ASD. Future research should consider the potential effects of puberty on families of adolescents with ASD. Also, they should investigate the interventions that must be used by parents to interfere with the changes and challenges of puberty.

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