

The Relationship Between Social and Behavioral Problems with Socio-Demographic Variables Among Siblings of Children with Autism

العلاقة بين المشاكل الاجتماعية والسلوكية مع المتغيرات الاجتماعية والديموغرافية بين أشقاء الأطفال المصابين بالتوحد

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الخلفية: تظهر العديد من الدراسات أن الأشقاء الأصحاء للأطفال المصابين بالتوحد معرضون لخطر المشكلات الاجتماعية والسلوكية. قيمت هذه الأبحاث متغيرات الأشقاء المصابين بالتوحد. ستدرس هذه الدراسة العلاقة بين القضايا الاجتماعية والسلوكية والمتغيرات الاجتماعية والديموغرافية لأشقاء الطفل المصاب بالتوحد.

المنهج: تصميم تحليلي وصفي لسبعين شخصاً في مراكز رعاية وتأهيل ASD بمدينة الحلة. تم التحقق من صحة الاستبيان من قبل الخبراء. تكتشف الأداة علم النفس المرضي للطفولة، والقضايا الاجتماعية والسلوكية. كل عنصر لديه فقط خيارات "غير صحيح"، "صحيح إلى حد ما" أو "صحيح دائماً". يتم إنشاء خمسة موازين فرعية من 25 عنصرًا. تقوم هذه المقاييس الفرعية بتقييم السلوك وعدم الانتباه أو فرط النشاط والأعراض العاطفية ومشكلات الأقران والسلوك الاجتماعي المؤيد. جمع وتحليل البيانات الإحصائية الوصفية والاستنتاجية.

النتائج: أظهرت النتائج أن 45.7% من الأشقاء كانوا من "6-أقل من 9 سنوات"، 54.3% منهم "الأصغر". يُظهر 37.1% من الأشقاء مشاكل عاطفية غير طبيعية بناءً على درجة المقياس العاطفي. ($M \pm SD = 3.89 \pm 2.096$) يعاني 62.9% من أشقاء الأطفال المصابين بالتوحد من صعوبات اجتماعية وسلوكية غير طبيعية، و 37.1% لديهم مشاكل عاطفية غير طبيعية، و 64.3% لديهم سلوك غير طبيعي، و 24.3% لديهم نشاط مفرط غير طبيعي، و 85.8% لديهم مشاكل غير طبيعية مع أقران، و 45.8% لديهم سلوك اجتماعي غير طبيعي.

الاستنتاجات: لا يوجد فرق كبير في المشاكل الاجتماعية والسلوكية بشكل عام فيما يتعلق بجنس الأشقاء، ولكن هناك فرق كبير في الأعراض العاطفية فيما يتعلق بجنس الأشقاء. توجد علاقة ذات دلالة إحصائية بين المشكلات الاجتماعية وبنسب الأشقاء عند قيمة $p = 0.12$ بينما لا توجد علاقة ذات دلالة إحصائية مع المتغيرات المتبقية.

التوصيات: توجه وزارة التربية والتعليم المدارس الحكومية والخاصة إلى إجراء برنامج لتقييم المشكلات الاجتماعية والسلوكية المتضمنة المشكلات العاطفية لأشقاء الأطفال المصابين بالتوحد. استخدام أدوات أكثر حساسية في الدراسات المستقبلية مع الدراسات التجريبية ومقارنة نتائج إخوة الأطفال المصابين بالتوحد بأقرانهم من غير الأشقاء المصابين بالتوحد. النظر في سمات الطفل المصاب بالتوحد، مثل شدة الإعاقة أو علاقة الأشقاء، وكذلك سمات الأشقاء والآباء.

Abstract

Background: Numerous studies show that healthy siblings of autistic children are at risk for social and behavioural issues. These research evaluated autistic siblings' variables. This study will examine the association between social and behavioural issues and the socio-demographic variables of the siblings of the child with autism.

Method: A descriptive analytic design of 70 subjects at AL-Hilla City ASD care and rehabilitation centers. The questionnaire was verified by experts for validity. The tool detects childhood psychopathology, social, and behavioral issues. Each item had only "not true," "somewhat true or always true" options. Five subscales are created from the 25 items. These subscales assess conduct, inattentiveness or hyperactivity, emotional symptoms, peer issues, and pro-social behavior. Descriptive and inferential statistical analysis collected and analyzed data.

Results: The result revealed that 45.7% of the siblings was "6-less than 9 years", 54.3% of them are the "youngest". 37.1% of siblings show abnormal emotional problems based on score of emotional scale ($M \pm SD = 3.89 \pm 2.096$). 62.9% of siblings of children with autism have abnormal social and behavioural difficulties, 37.1% have abnormal emotional problems, 64.3% have abnormal conduct behaviour, 24.3% have abnormal hyperactivity, 85.8% have abnormal peer problems, and 45.8% have abnormal prosocial behaviour.

Conclusions: there is no significant difference in overall social and behavioral problems with regard to siblings' gender, but there is significant difference in emotional symptoms with regard to siblings'

gender. there is significant relationship between emotional problems and siblings' gender at p-value=.012. While there is no significant relationship has been found with remaining variables.

Recommendations: the Ministry of Education direct public and private schools to conduct a program to assess the social and behavioral problems included emotional problems of siblings of autistic children. Using more sensitive tools in future studies with experimental studies and comparing the outcomes of the child with autism's siblings to their peers without siblings with autism. Considering the autistic child's features, such as the severity of the disability or siblings' relationship, as well as siblings' and parents' traits.

Key-wards: Social Problems, Behavioral Problems, Autism, Siblings.

Introduction

Autism spectrum disorder is a neurological condition that affects how people perceive and relate to one another, which can cause problems with social interaction and communication. Another characteristic of the condition is its limited and recurrent behavioral patterns. The word "spectrum" is used to describe the wide range of signs and degrees of severity associated with autism spectrum disorder^(1,2). CDC's Autism and Developmental Disabilities Monitoring (ADDM) Network⁽³⁾ indicates that 1 in 44 kids have been diagnosed with autism spectrum disorder (ASD). The prevalence of ASD has risen across the United States, more than doubling in the 10 years ranging from 2000 to 2010. Children with ASD have restricted and repetitive behaviors in addition to social and communication issues, and reciprocal social engagement is typically difficult. Children with ASD may not react when people try to interact with them. While some children don't speak at all, others do but frequently use the same words or phrases or speak in a monotone. Children may engage in repetitive behavior or become fixated on certain interests or hobbies. Problematic behaviors like tantrums, elopement, and even self-harm are typically linked to weak social and communication abilities^(3,4,5). According to Cridland⁽⁷⁾, a persons with ASD need to daily support with self-care, mobility, communication, and cognitive or emotional activities; the majority of this care is given by family members. some families with ASD children report negative effects on family functioning, as seen by greater psychological issues, more emotional coping methods instead of problem-focused ones, and higher levels of family problems. It is crucial to closely examine the experiences of the families in order to completely comprehend how families modify their way of life to accommodate a family member who has been diagnosed with ASD⁽⁸⁾. Studies looking at how having a disabled child impacts the other siblings in the family have shown contradictory results. Siblings who are normally developing (TD) face a number of concerns, such as

feelings of isolation and annoyance at the other sibling's social, behavioral, attention impairments, a decline in sibling connection, and problems with peer relationships⁽⁹⁾. a Walton investigation^(10,11), the behavioral and emotional risk factors in 111 siblings of autistic children were assessed in this study (ASD). The severity of ASD symptoms, sibling male gender, lower household size, youngest brother with ASD, and lower family income are the six factors that have been connected to internalizing and externalizing issues in siblings. Siblings were less likely to struggle with behavioral and emotional problems when there were fewer risk factors. Yet, internalizing and externalizing disorders were more prevalent in siblings with a greater risk of issues. Our study emphasizes the value of risk assessment for particular siblings in order to quickly identify a group of siblings who could require further help⁽¹²⁾. Due to the moderate to substantial associations between a variety of risk variables and siblings' SDQ scores, researchers formed the premise that these hazards may act cumulatively, both for siblings of ASD sufferers and siblings of typically developing kids (sex variable, the siblings elder than the children with ASD, high degree of broader autism phenotype). These findings suggest that the total number of risk factors may be significant in predicting sibling results, in addition to the existence of any one risk factor^(12,13). According to a research that looked at major danger signs of behavioral and emotional disorders in siblings, elder siblings of Individuals with ASD were more likely to experience problems in general, and in the domains of hyperactivity and peer problems, in particular. Just 24% of the children in the siblings of autism spectrum disorder group had an overall Strengths and Difficulties Questionnaire (SDQ) score in the high range, compared to 60% of the group's older brothers. However only 33% of the elder brothers in the typical developmental siblings group achieved an overall SDQ score in the high category⁽¹²⁾. Yet, other studies showed that sisters were more prone than brothers to

develop anxiety and depressive symptoms. Perhaps older siblings of ASD children are more susceptible to worries than younger siblings (such as externalising issues, depression)⁽¹²⁾. This acknowledges the fact that individual siblings' results might vary greatly and that

Methods

A descriptive analytic design was used to achieve the purposes of the current study that are stated earlier to investigate the behavioral and social disorders among siblings of children with autism. This study started from November/2022 to May 2023. **Setting of the Study:** The study was conducted in the specialized centers that receive children with autism spectrum disorder in Al-Hilla city. After bringing a request to facilitate a task from the College of Nursing, University of Baghdad, to the specialized centers where samples were collected. **Sample of the Study:** A non-probability, purposive sample of (70) respondents was selected from targeted centers. The selected respondents are of ASD child who have at least one sibling without any diagnosed psychiatric and mental disorders was selected purposively according to the inclusion and exclusion criteria that the researcher has determined. **Instrument of the study:** The data was collected using sociodemographic, and the Strengths and Difficulties Questionnaire (SDQ). The questionnaire includes the followings: **Part I:** In this part of the tool, demographic data of the child with autism, siblings, and parents participating in the study were taken. It included ASD children and their sibling's age, birth order, gender, the number of children with ASD in the family, and educational level of the siblings. Parents who -participate in the study- age, gender, current marital status, educational level, occupation, address, The number of family members, and monthly income, **Part II:** The Strengths and Difficulties Questionnaire (SDQ)⁽¹⁶⁾ is a 25-item screening tool for children ages three to sixteen that looks for prosocial behavior strengths as well as weaknesses in four different areas: emotional symptoms, conduct issues, hyperactivity/inattention, and peer relationship issues.

research on siblings has only lately started to concentrate on these issues. For instance, several studies have shown that male siblings are more likely than female siblings to experience problems (such as depression)⁽¹⁴⁾.

Design

Based on a factor analysis of a longer version of the Rutter Parent Questionnaire, Goodman decided to include these measures⁽¹⁷⁾. **Validity of the study** using a panel of experts (12), face and content validity has established that they are: experts from the Universities of Baghdad, Babylon, and Karbala's College of Nursing. Psychiatrists with advanced degrees from psychiatric teaching hospitals (Murjan teaching hospital), after taking into account their comments and recommendations for improvement, their responses showed that they all agreed on the questionnaire's content, clarity, relevance, and adequacy. Hence, it is judged legitimate. **Reliability of the study:** Almost 10,000 youngsters from the general population in the UK participated in validation of the SDQ⁽¹⁵⁾. The Arabic version has been utilized in studies involving Palestinian children and is easily accessible and publicly available on the sdq.com website. It has been verified and has a Cronbach's alpha of .72, indicating reliability and internal consistency⁽¹⁸⁾. **Data Collection Method:** Data were collected for the period from January 1st to February 28th, 2022; data collection began after obtaining the approval of the directors of the specialized centers. The purpose of the study was conveyed to the participants prior to data collection in order to gain their consent to participate. Because of the difficulty of collecting the parents of the children and communicating with them, the questionnaire was sent to the parents by the management of the specialized centers. **Methods of Statistics:** The Statistical Package for Social Sciences was used to examine the data (SPSS, version 26). Data was evaluated using descriptive and inferential statistical approaches

Results

Table (1): Overall Assessment of Social and Behavioral Problems (Strength and Difficulties Questionnaire- SDQ) among Siblings of Children with Autism

Overall score	f	%	M	SD
Normal	12	17.1	18.13	5.183
Borderline	14	20		
Abnormal	44	62.9		
<i>Total</i>	<i>70</i>	<i>100</i>		

M: Mean for total score, SD: Standard Deviation for total score f: Frequency,

%: Percentage, Normal= 0 – 13, Borderline= 14 – 16, Abnormal= 17 – 40

This table indicates that siblings of children with autism associated with abnormal social and behavioral problems as reported among 62.9% of them ($M \pm SD = 18.13 \pm 5.183$). **Table (2): Significant Differences in Social and Behavioral Problems with regard to Sibling’s Age (N=70)**

Age problems	Source of variance	Sum of Squares	df	Mean Square	F	Sig.
Emotional	Between Groups	15.564	3	5.188	1.191	.320
	Within Groups	287.522	66	4.356		
	Total	303.086	69			
Conduct	Between Groups	6.538	3	2.179	.603	.615
	Within Groups	238.548	66	3.614		
	Total	245.086	69			
Hyperactivity	Between Groups	7.275	3	2.425	.790	.504
	Within Groups	202.497	66	3.068		
	Total	209.771	69			
Peer	Between Groups	4.784	3	1.595	.635	.595
	Within Groups	165.787	66	2.512		
	Total	170.571	69			
Prosocial	Between Groups	2.180	3	.727	.129	.943
	Within Groups	372.163	66	5.639		
	Total	374.343	69			
Overall	Between Groups	71.700	3	23.900	.908	.442
	Within Groups	1737.786	66	26.330		
	Total	1809.486	69			

df: Degree of freedom, F: F-statistic, Sig: Significance

This table indicates that there is no significant difference in social and behavioral problems with regard to siblings' age.

Table (3): Significant Differences in Social and Behavioral Problems with regard to Sibling's Birth Order (N=70)

Order		M	SD	t	df	p ≤ 0.05	Sig
Problems							
Emotional	Youngest	3.71	2.415	.760	68	.450	N.S
	Eldest	4.09	1.653				
Conduct	Youngest	4.05	2.013	.296	68	.768	N.S
	Eldest	4.19	1.749				
Hyperactivity	Youngest	5.26	1.811	.414	68	.680	N.S
	Eldest	5.44	1.684				
Peer	Youngest	4.87	1.528	1.610	68	.112	N.S
	Eldest	5.47	1.586				
Prosocial	Youngest	4.58	2.575	.193	68	.848	N.S
	Eldest	4.69	2.039				
Overall	Youngest	17.89	5.321	1.053	68	.296	N.S
	Eldest	19.19	4.862				

M: Mean, SD: Standard deviation, t: t-test, df: Degree of freedom,

Sig: Significance, p: Probability value, N.S: Not significant, S: Significant, H.S: High significant

This table depicts that there is no significant difference in social and behavioral problems with regard to siblings' birth order.

Table (4): Significant Differences in Social and Behavioral Problems with regard to Sibling's Gender (N=70)

Gender		M	SD	t	df	p ≤ 0.05	Sig
Problems							
Emotional	Male	3.35	1.837	2.840	68	.006	S
	Female	4.74	2.229				
Conduct	Male	4.00	1.718	.638	68	.526	N.S
	Female	4.30	2.145				
Hyperactivity	Male	5.30	1.698	.244	68	.808	N.S
	Female	5.41	1.845				
Peer	Male	5.14	1.552	.022	68	.982	N.S
	Female	5.15	1.634				
Prosocial	Male	4.47	2.443	.739	68	.463	N.S
	Female	4.89	2.154				

Overall	Male	17.79	4.324	1.444	68	.153	N.S
	Female	19.59	6.110				

M: Mean, SD: Standard deviation, t: t-test, df: Degree of freedom, Sig: Significance,

p: Probability value, N.S: Not significant, S: Significant, H.S: High significant.

This table indicates that there is no significant difference in overall social and behavioral problems with regard to siblings’ gender, but there is significant difference in emotional symptoms with regard to siblings’ gender at P-value= 0.006.

Table (5): Relationship among Social and Behavioral Problems with Socio-demographic Variables of Siblings (N=70)

Variables	Correlation Coefficient	Social and Behavioral Problems				
		Emotion	Conduct	Hyperact.	Peer	Prosocial
Age	<i>Spearman</i>	-.092	.157	.086	.015	.010
	<i>Sig. (2-tailed)</i>	.449	.194	.477	.903	.934
Birth order	<i>Point biserial</i>	.123	.041	.075	.207	.067
	<i>Sig. (2-tailed)</i>	.309	.739	.537	.085	.584
Gender	<i>Point biserial</i>	<u>.297*</u>	.027	.023	.015	.103
	<i>Sig. (2-tailed)</i>	<u>.012</u>	.822	.851	.903	.395
Level of education	<i>Point biserial</i>	-.163	.133	.078	.038	.080
	<i>Sig. (2-tailed)</i>	.178	.273	.523	.752	.509

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

This table reveals that there is significant relationship between emotional problems and siblings’ gender at p-value= .012. While there is no significant relationship has been found with remaining variables.

Discussion:

The **table (1)** indicated that siblings of children with autism associated with “Abnormal” social and behavioral problems as reported among 62.9% of them (M±SD= 18.13 ± 5.183), while the rest of the results indicated that 20% “Borderline” and 17.1% “Normal”. According to a study⁽¹⁹⁾, In terms of the overall SDQ questionnaire score, siblings of autistic children had significantly more issues than siblings of children with Down syndrome and unaffected groups. Pourbagheri, Mirzakhani, and Akbarzade reported that the mean of overall score of Strengths and Difficulties Questionnaire was reported as 17.98±6.19 in the autism group, the mean of overall score of Strengths and Difficulties Questionnaire in the current study similar where it refers to 18.13±5.183, but it was contrary to a previous study conducted by Walton and Ingersoll (2015), as the average in this study is equal

to 10.35±7.31. one study conducted by Gau et al., (2010) indicate that siblings of children with developmental disabilities had average 14 ± 6 of total SDQ score. Result of a study conducted by Hastings and Petalas came with a lower mean 11.06±6.08 than the current study, where the abnormal percentage of total SDQ score was only 10.0% among the siblings of autistic child compared to 62.9% in the current study^(20,21). Perhaps this difference is due to the difference of who filled out the questionnaire, where Hastings and Petals used a scale version that is filled in by siblings, while a scale version that is filled out by parents was used in the current study^(20,22). According to the current study's findings **table (2)**, there were no significant differences between the siblings' ages in terms of their social and behavioral issues. One of the research was carried out by

Orsmond and Seltzer, who looked at the connections and wellbeing of siblings of people with autism spectrum disorders (ASD) from infancy to adulthood. They set their analysis within the larger body of work that has been done over the course of a lifetime on siblings of people with developmental disabilities (DD). then look at siblings' ASD characteristics, siblings of children with ASD may exhibit unusual social and communication development in their infancy^(23,24). They came to the conclusion that siblings of children with ASD may be at risk for social and behavioral adjustment issues during childhood and adolescence. Siblings express both positive and negative aspects of their relationship during childhood and adolescence ⁽²³⁾. As there was no significant difference between the siblings of the autistic child in the current study, the findings were in direct opposition to the findings of the researchers' only other study, which looked at the relationship between the age variable and the social and behavioral issues between siblings. Another important aspect of the family structure that has been researched is the birth order. Younger siblings may be in a worse situation due to the diluting of family resources, according to Downey; this is especially true when the older child has special needs^(25,26,27,28). According to Petalas and S. Verté, H. Roeyers, and A. Buysse , TD children born after their siblings with ASD are more likely to experience maladjustment^(29,30). According to Tomeny, in particular, younger TD siblings are more likely to demonstrate externalizing issues when older siblings with ASD exhibit high levels of externalizing behavior⁽²⁷⁾. These findings are in line with research on sibling interactions among TD kids^(26,31) and with theories of social learning and role modeling. The diluting effect literature, however, lacks coherence. For instance, Lawson and Mace noted that younger siblings exhibited higher levels of prosocial conduct and cooperative skills. In view of the aforementioned previous studies, which acknowledged the effect of the birth order regardless of whether the sibling is older or younger than the affected child⁽³²⁾, the results of the current study **table (3)** came out in contrast with previous studies in the absence of a significant difference between the birth order of the brother and the social and behavioral problems of the siblings of the child with autism this is consistent with a previous study by Pilowsky^(33,34). **Table (4)** indicated that there is no significant difference in overall social and behavioral problems with regard to siblings' gender, but there is significant difference in emotional symptoms with regard to siblings' gender at P-value=0.006. The results of the current study acknowledge

the significance of the gender variable and the emotional problems of the siblings of the child with autism, but did not find a significant difference between the gender variable and conduct problems, hyperactivity problems, peer relationship, and prosocial behavior. Several possible determinants of siblings' adjustment have been identified and explored in the reviewed studies (e.g., gender, birth order, gender compatibility of siblings, and family size); nonetheless, inconsistent results have been found in each study. Gender was mentioned as a predictor in a few researches. Sisters of children with ASD were found to suffer less with prosocial behavior and to be more social than their brothers ^(35,36,37,38). In contrast, Pilowsky et al. discovered that the gender of siblings had no impact on socialization. In a few research ^(33,35,37), siblings' birth order was also discovered to be a predictive factor, but not in other studies. The results of this study are presented in **table (5)**, which shows that there is a significant association between emotional difficulties and the gender of siblings, with a p-value of .012. However it has been determined that there is no meaningful association between the remaining variables. The results of the current study are close to the results of a previous study conducted by Fullerton et al., where the sample was siblings of children with life-long conditions, including autistic children, using the scale of strengths and difficulties, where it was found that there is a positive relationship between emotional problems and the gender of the sibling of the child with autism^(39,40). Parents' general belief that their non-autistic children do not suffer from social and behavioral problems may have been reflected in the results of this study, as reported by Stampoltzis where it was reported that parents of children with autism generally believe that their children who are not diagnosed with autism do not suffer from social and behavioral problems^(41,42). The best solution to obtain accurate results may be to make a comparison between the parents' statement and the siblings' statement themselves to see if there is a discrepancy or differences in the results between what the parents report and what the siblings of the autistic child feel. **Conclusion:** there is no significant difference in overall social and behavioral problems with regard to siblings' gender, but there is significant difference in emotional symptoms with regard to siblings' gender. there is significant relationship between emotional problems and siblings' gender at p-value= .012. While there is no significant relationship has been found with remaining variables. **Recommendations:** the Ministry of Education direct public and private schools to conduct a program to

assess the social and behavioral problems included emotional problems of siblings of autistic children. Using more sensitive tools in future studies with experimental studies and comparing the outcomes of the child with autism's siblings to their peers without

siblings with autism. Considering the autistic child's features, such as the severity of the disability or siblings' relationship, as well as siblings' and parents' traits.

References

1. Mayo Clinic Staff (2018). Autism spectrum disorder - Symptoms and causes. [online] Mayo Clinic. Available at: <https://www.mayoclinic.org/diseases-conditions/autism-spectrum-disorder/symptoms-causes/syc-20352928>.
2. Ali, A. and Ghanim, E. (2020). Feeding Behaviors of Children with Autism Spectrum Disorder in Baghdad City. *Iraqi National Journal of Nursing Specialties*, [online] 33(2), pp.60–65. Available at: <https://injns.uobaghdad.edu.iq/index.php/INJNS/article/view/416> [Accessed 30 Jan. 2023].
3. CDC (2023). Data and Statistics on Autism Spectrum Disorder | CDC. [online] Centers for Disease Control and Prevention. Available at: <https://www.cdc.gov/ncbddd/autism/data.html#:~:text=About%201%20in%2054%20children%20has> [Accessed 10 Mar. 2023].
4. American Psychiatric Association (2013). DSM-5 TM guidebook the essential companion to the Diagnostic and statistical manual of mental disorders, fifth edition. 5th ed. Washington, Dc American Psychiatric Publishing.
5. CDC (2021). Autism Spectrum Disorder, Family Health History, and Genetics | CDC. [online] [www.cdc.gov](https://www.cdc.gov/genomics/disease/autism.htm). Available at: <https://www.cdc.gov/genomics/disease/autism.htm>.
6. Okab AA, Ahmed SA. Evaluation of Late Adulthood Knowledge about Social Frailty. *Iraqi National Journal of Nursing Specialties*. 2022;35(2).
7. Lauderdale-Littin, S. and Blacher, J. (2016). Young adults with severe intellectual disability: Culture, parent, and sibling impact. *Journal of Intellectual & Developmental Disability*, 42(3), pp.230–239. doi:[10.3109/13668250.2016.1230843](https://doi.org/10.3109/13668250.2016.1230843).
8. Kelly, C. (2022). Siblings of Autism Spectrum Disorder and Art Therapy. 5–21. https://digitalcommons.lesley.edu/expressive_theses/631/
9. Longobardi, C., Prino, L. E., Gastaldi, F. G. M., & Jungert, T. (2019). Sibling relationships, personality traits, emotional, and behavioral difficulties in autism spectrum disorders. *Child Development Research*, 2019. <https://doi.org/10.1155/2019/9576484>
10. Walton, K. M. (2016). Risk factors for behavioral and emotional difficulties in siblings of children with autism spectrum disorder. In *American Journal on Intellectual and Developmental Disabilities* (Vol. 121, Issue 6, pp. 533–549). <https://doi.org/10.1352/1944-7558-121.6.533>
11. Lazam, M. and Hemiary, N.A. - (2013). Assessment of Coping Strategies for Parents of Autistic Child and their relation to educational level. *Iraqi National Journal of Nursing Specialties*, [online] 2(26), pp.26–34. Available at: <https://injns.uobaghdad.edu.iq/index.php/INJNS/article/view/168> [Accessed 30 Jan. 2023].
12. Walton, K. M., & Ingersoll, B. R. (2015). Psychosocial Adjustment and Sibling Relationships in Siblings of Children with Autism Spectrum Disorder: Risk and Protective Factors. *Journal of Autism and Developmental Disorders*, 45(9), 2764–2778. <https://doi.org/10.1007/s10803-015-2440-7>
13. Mohammed, Q. (2015). Psychological Distress in Parents of Autistic Children in Baghdad City. *Iraqi National Journal of Nursing Specialties*, [online] 1(28), pp.55–64. Available at: <https://injns.uobaghdad.edu.iq/index.php/INJNS/article/view/218/206> [Accessed 30 Jan. 2023].
14. Saleh, M. (2022). تقييم تطبيق استراتيجيات اللغة البراغمية للمدرسين العاملين في مراكز التوحد في مدينة بغداد. *Iraqi National Journal of Nursing Specialties*, [online] 35(1), pp.94–101. Available at: <https://injns.uobaghdad.edu.iq/index.php/INJNS/article/view/491/384> [Accessed 30 Jan. 2023].

15. Goodman, R. (2001). Psychometric properties of the Strengths and Difficulties Questionnaire. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 1337 – 1345.
16. Goodman, R. (1999). The extended version of the Strengths and Difficulties Questionnaire as a guide to child psychiatric caseness and consequent burden. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 40(5), 791–799.
17. Elander, J., Psychiatric, M. R.-I. J. of M. in, & 1996, U. (1996). Use and development of the Rutter parents' and teachers' scales. *Psycnet.Apa.Org*. <https://psycnet.apa.org/record/1996-05321-001>
18. Khamis, V. (2013). Psychosocial adjustment in siblings of children with war related injuries. *International Journal of Special Education*, 28(1), 69-71. <http://eric.ed.gov/?id=EJ1013691>
19. POURBAGHERI, N., MIRZAKHANI, N. and AKBARZADEHBAGHBAN, A. (2018). A Comparison of Emotional-Behavioral Problems of Siblings at the Age Range of 3-9 Year Old Children with Autism and Down Syndrome. *Iranian Journal of Child Neurology*, [online] 12(2), pp.73–82. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5904741/>.
20. Hastings, R.P. and Petalas, M.A., 2014. Self-reported behaviour problems and sibling relationship quality by siblings of children with autism spectrum disorder. *Child: care, health and development*, 40(6), pp.833-839.
21. Ali Mohsin Al-Azawi, A., & Ghanim Ali, E. (2020). سلوك التغذية للأطفال المصابين باضطراب طيف التوحد في مدينة بغداد. *Iraqi National Journal of Nursing Specialties*, 33(2), 60–65. <https://injns.uobaghdad.edu.iq/index.php/INJNS/article/view/416>.
22. Salman Dawood, K., & Kareem Khudhair, A. (2016). تقييم جودة الحياة لوالدي الطفل التوحيدي. *Iraqi National Journal of Nursing Specialties*, 29(1), 105–118. <https://injns.uobaghdad.edu.iq/index.php/INJNS/article/view/247>
23. Orsmond, G.I. and Seltzer, M.M. (2007). Siblings of individuals with autism spectrum disorders across the life course. *Mental Retardation and Developmental Disabilities Research Reviews*, 13(4), pp.313–320.
24. Al – Rawi BAO. Behavior Management of Children with Autism. *Al-Kindy Col. Med. J [Internet]*. 2019 Oct. 31 [cited 2023 Mar. 26];13(1):27-31. Available from: <https://jkmc.uobaghdad.edu.iq/index.php/MEDICAL/article/view/119>
25. Downey, D.B., 2001. Number of siblings and intellectual development: The resource dilution explanation. *American psychologist*, 56(6-7), p.497.
26. M. Azmitia and J. Hesser, 1993. “Why siblings are important agents of cognitive development: a comparison of siblings and peers,” *Child Development*, vol. 64, no. 2, pp. 430–444.
27. T. S. Tomeny, T. D. Barry, and S. H. Bader , 2014. “Birth order rank as a moderator of the relation between behavior problems among children with an autism spectrum disorder and their siblings,” *Autism*, vol. 18, no. 2, pp. 199–202.
28. Tawfeeq WF, Mukhaiser MH, Al-Hemiary NJ. Risk factors for autism in Baghdad city. *Al-Kindy Col. Med. J [Internet]*. 2016 Jun. 30 [cited 2023 Mar. 26];12(1):95-102. Available from: <https://jkmc.uobaghdad.edu.iq/index.php/MEDICAL/article/view/351>
29. M. A. Petalas, R. P. Hastings, S. Nash, A. Dowey, and D. Reilly, 2009. ““I like that he always shows who he is”: the perceptions and experiences of siblings with a brother with autism spectrum disorder,” *International Journal of Disability, Development and Education*, vol. 56, no. 4, pp. 381–399.
30. Roeyers, H. and Buysse, A. (2003). Behavioural problems, social competence and self-concept in siblings of children with autism. *Child: Care, Health and Development*, 29(3), pp.193–205. doi:[10.1046/j.1365-2214.2003.00331.x](https://doi.org/10.1046/j.1365-2214.2003.00331.x).
31. Kadhum ZI. Biochemical alteration in some Iraqi children with autistic spectrum disorder (ASD). *JFacMedBagdad [Internet]*. 2016 Apr. 3 [cited 2023 Mar. 26];58(1):46-50. Available from: <https://iqjmc.uobaghdad.edu.iq/index.php/19JFacMedBaghdad36/article/view/195>
32. Valicenti-McDermott, M., Lawson, K., Hottinger, K., Seijo, R., Schechtman, M., Shulman, L. and Shinnar, S. (2015). Parental

- Stress in Families of Children With Autism and Other Developmental Disabilities. *Journal of Child Neurology*, 30(13), pp.1728–1735. doi:[10.1177/0883073815579705](https://doi.org/10.1177/0883073815579705).
33. Pilowsky, T., Yirmiya, N., Doppelt, O., Gross-Tsur, V. and Shalev, R.S. (2004). Social and emotional adjustment of siblings of children with autism. *Journal of Child Psychology and Psychiatry*, 45(4), pp.855–865.
34. Ismael BA, Jacoub SM. Determination of Parents' Resilience with Autistic child in Baghdad City. *JFacMedBagdad* [Internet]. 2013 Jan. 2 [cited 2023 Mar. 26];54(4):325-30. Available from: <https://iqjmc.uobaghdad.edu.iq/index.php/19JFacMedBaghdad36/article/view/695>
35. Hastings, R. P. (2003). Brief report: Behavioral adjustment of siblings of children with autism. *Journal of Autism and Developmental Disorders*, 33(1), 99–104. <https://doi.org/10.1023/A:1022290723442/METRICS>
36. Kaminsky, L. and Dewey, D. (2002). Psychosocial adjustment in siblings of children with autism. *Journal of Child Psychology and Psychiatry*, 43(2), pp.225–232. doi:[10.1111/1469-7610.00015](https://doi.org/10.1111/1469-7610.00015).
37. Montes, G. and Halterman, J.S. (2008). Association of childhood autism spectrum disorders and loss of family income. *Pediatrics*, [online] 121(4), pp.e821-826. doi:[10.1542/peds.2007-1594](https://doi.org/10.1542/peds.2007-1594).
38. S. Verté, H. Roeyers, and A. Buysse, 2003. "Behavioural problems, social competence, and self-concept in siblings of children with autism," *Child: Care Health, and Development*, vol. 29, pp. 193–205.
39. Fullerton, J.M., Totsika, V., Hain, R. and Hastings, R.P. (2016). Siblings of children with life-limiting conditions: psychological adjustment and sibling relationships. *Child: Care, Health and Development*, 43(3), pp.393–400.
40. Thyen, U., Kuhlthau, K. and Perrin, J.M. (1999). Employment, Child Care, and Mental Health of Mothers Caring for Children Assisted by Technology. *Pediatrics*, 103(6), pp.1235–1242. doi:[10.1542/peds.103.6.1235](https://doi.org/10.1542/peds.103.6.1235).
41. Stampoltzis, A., Defingou, G., Antonopoulou, K., Kouvava, S. and Polychronopoulou, S. (2014). Psycho-social characteristics of children and adolescents with siblings on the autistic spectrum. *European Journal of Special Needs Education*, 29(4), pp.474–490.