Socio-economic Status in Egyptian Patients with Autism Spectrum Disorder. Does it affect Autism Severity?

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ABSTRACT

Background: Socioeconomic status (SES) exerts a crucial impact on the prevalence of chronic non-communicable diseases worldwide. The objective of the current study is to assess the SES in children with autism spectrum disorder (ASD) and its relation to clinical characteristics and disease severity.
Patients and methods: This was a cohort including 200 children diagnosed with ASD, using the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5) criteria. Severity was assessed using the Childhood Autism Rating Scale (CARS). SES was determined using the scoring system for measurement of socioeconomic status (SES) in health research in Egypt which was originally developed by Fahmy and El Sherbini in 1983 and then updated by El -Gilany in 2012. **Results**: In the studied patients, 57% of the children with ASD belonged to the middle SES group, compared to 21% and 22% in the low and high SES groups, respectively. Children with lower SES scores were more likely to experience a delayed diagnosis (p = 0.016). Those with higher SES scores fared better, with lower CARS scores and higher non-verbal IQ scores (P values 0.034 and 0.003, respectively). The SES and ASD severity groups differed in a few ways, but the values did not reach statistical significance level. **Conclusion**: Targeting certain socioeconomic and demographic factors involved in autism could help to implement tailored preventive and management strategies.
Keywords: ASD, Children, Socioeconomic status, Childhood Autism Rating Scale, DSM-5.

INTRODUCTION

Autism spectrum disorder (ASD) places an increasingly emotional and financial strain on the family and the community, particularly in low-income nations. It has a complex etiology with risk factors that can be changed and those that cannot. For a better prognosis, efforts should be focused on prevention, rapid case detection, and treatment [1]. There is growing evidence that health symptoms and outcomes may be influenced by socioeconomic status (SES). SES classification is based on resources available for education, employment, finance, culture, and healthcare [2]. It has been demonstrated that prenatal and developmental variables that may alter the susceptibility to neuro-developmental diseases are influenced by parental SES [3]. Additionally, it was discovered that SES had a significant impact on disparities in health care services, problem perception, age at diagnosis and intervention, ASD severity, and clinical presentation [4].

Results on SES's effect on autistic spectrum diseases are contradictory. The underlying mechanisms are intricate and probably have something to do with the health system. There is a trend for the frequency of ASD to be higher in homes with higher SES, as determined by the parental educational level or ecological measures of household income, according to numerous studies, primarily American and Australian studies. These correlations may mostly be explained by a case detection bias, with artificially elevated prevalence in backgrounds with more favorable demographics [5].

Contrarily, the bulk of research that discovered an elevated risk of ASD in individuals from underprivileged families was conducted in European nations [6-7]. Studies revealed an increase in prevalence linked to lower parental occupational class, lower mother education level, or lower household income [8].

These findings occasionally became less significant after controlling for additional risk variables, such as perinatal factors [7], or they were limited to a small number of categories, such as ASD with low genetic predisposition [9]. Even after accounting for all contributing factors and for all cases with ASD investigated, i.e. with or without accompanying intellectual disability (ID), a Swedish study found a definite increase in prevalence in the most impoverished homes [8].

The Arab communities have gone through fundamental societal changes during the past ten years on a variety of fronts, including parental ages, female employment, economic, political, and lifestyle changes. The incidence of ASD may change due to any of this causes [10]. Egypt is a developing nation with a low income. The Ministry of Health, which oversees a comprehensive network of healthcare services, is the main supplier of care. All citizens have access to subsidized and generally free MOH services. Twenty university hospitals are supported by the budget of the Ministry of Education. Compared to MOH institutions, these offer higher-quality care. Egyptians heavily rely on private healthcare, even though state provision dominates inpatient care services. Most of the doctors working in private clinics and hospitals are employed by the government. All of these private services are paid for out of pocket by individuals [11].

Along with academic hospitals, private clinics and hospitals primarily provide services for kids with autism. **Mendoza and his colleagues** [12] compared the costs of ASD in Egypt to those in wealthy nations in an effort to determine the economic impact of ASD there. They discovered that care and support for ASD are frequently based on a household-provider paradigm, in contrast to western, institution-centered paradigms. Costs associated with ASD in Egypt are mostly the

result of family caregivers making much greater time, effort, and behavioral adjustments [13].

The aim of the present study was to assess the SES in children with autism ASD and its relation to clinical characteristics and disease severity.

PATIENTS AND METHODS

200 Children with ASD were recruited from the Child and Adolescent Psychiatry Clinic, Ain Shams University, Cairo, Egypt; over a period of one year. Both sexes from different socioeconomic strata were included, with an age range of 3 to 15 years. The diagnosis was based on clinical assessment and confirmed by the Diagnostic and Statistical Manual of Mental Disorder, 5th edition (DSM-5). Patients were excluded if they suffered from congenital malformations, dysmorphic features and chronic physical illness.

Study procedure

Files were reviewed to check patients' compliance and follow-up. Only compliant patients were included. After taking written informed consent; a full history was taken with special emphasis on perinatal, developmental and family history. Detailed therapeutic interventions were documented (pharmacological and non-pharmacological modalities). A complete physical and psychiatric examination was done to ensure the selection criteria for an expert pediatric psychiatrist. All enrolled children were referred to a blinded qualified, skillful clinical psychologist for the following procedures:

1. *The Updated scoring system for the measurement of SES in health research in Egypt*. It includes seven domain-structured scales with a total score of 84, with a higher score indicating better SES [14].

a. **Education and cultural domain (score=30)**; including 1. Highest level of education for both husband and wife (Illiterate: 0, Read & write: 2, Primary: 4, Preparatory: 6, Secondary: 8, Intermediate institutes: 10 University graduate or Postgraduate degree: 12) 2. Access to health information (1 each for the following Printed materials, e.g. books, posters, booklets, etc.; Audiovisual message on television and/or radio).

b. **Occupation domain for both husband and wife (score = 10);** Non-working/housewife: 0, Unskilled manual worker: 1, Skilled manual worker/farmer: 2, Trades/business: 3, Semi-professional/clerk: 4, Professional: 5).

c. **Family domain (score = 10):** Residence: Urban slum = 0; Rural = 1; Urban = 2.Number of family members (parents, children & all dependents): < 5 members = 2; ≥ 5 members = 1.Number of earning family members: 1 member = 1; 2 members = 2; ≥ 3 members = 3.Education of children (aged ≥ 5 years, whether free or private education): All children going or ever gone to school/university = 3; ≥ 50% going or ever gone to school/university = 2; < 50% going or ever gone to school/university =

1; None go/gone to school/university/not applicable = 0.

d. **Family possessions domain (score = 12: 1 each for the presence of items given below):** Refrigerator – Radio – Television – Washing machine – Telephone/ mobile phone – Car – Agricultural land – Non-agricultural land for housing – Shop or animal shed – Other houses beside the house in which the family is living) – Animals/poultry – Computer/Internet.

e. **Economic domain (score = 5):** Income from all sources: In debt = 0; Just meet routine expenses =1; Meet routine expenses and emergencies =2; Able to save/invest money =3; Family receives governmental support: Yes = 1; No = 0; Family pays the tax: Yes = 1; No = 0.

f. **Home sanitation domain (score = 12)**, including **A.** Services (1 each for the presence of the following items): Pure water supply – Electricity – Natural gas – Sewerage system – Municipal collection of solid wastes – Flush latrine – Air conditioning. **B.** Type of house: Owned, ≥ 4 rooms = 4; Owned, < 4 rooms = 3; Rented, ≥ 4 rooms = 2; Rented, < 4 rooms = 1; No place to reside= 0. **C.** Crowing index: (the number of family members divided by the number of rooms): ≤ 1 person per room = 1 = 1; > 1 person per room = 0.

g. **Health care domain (score = 5):** Usual source of health care: Private health facilities = 5; Health insurance = 4; Free governmental health service = 3; More than one of the above sources = 2; Traditional healer/self-care = 1.

2. *Childhood Autism Rating Scale (CARS)* to determine the severity of autism using a validated Arabic version[16].The CARS is a 15-item behavioral rating scale developed to identify autism as well as to quantitatively describe the severity of the disorder. It yields a total score ranging from 15 to 60 [15].

3. *Stanford-Binet fifth edition*: to assess the intelligence quotient (IQ). It is a cognitive ability test that includes both verbal and nonverbal subtests [16].

Ethical Considerations:

The study was approved by the local Ethics Committee of Ain Shams University, Egypt (IRB review number 00017585). Written consent was obtained from both cases and controls or the legal guardians of those below 11 years. This work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Statistical analysis

Data were collected, revised, coded and entered into the Statistical Package for Social Science (IBM SPSS) version 23. The parametric quantitative data were presented as mean and standard deviation while the non-parametric data as median and inter-quartile range (IQR). Qualitative data were presented as numbers and percentages. The comparison between two

independent groups with qualitative data was done by using the Chi-square test. The comparison between two independent groups with quantitative data and parametric distribution was done by using an independent t-test while non-parametric distribution was done by using the Mann-Whitney test. The Spearman correlation coefficient was used to assess the correlation between two quantitative parameters in the same group. P value ≤ 0.05 was considered significant.

RESULTS

Of the 200 patients studied there were 36 females and 164 males with a male-to-female ratio of 5:1.

The mean age of onset symptoms of all studied cases was 2.09 (SD 0.72) years (Ranged from 0.67 to 3.5 years), the mean age of diagnosis was 2.78 (SD 0.79) years (ranged from 1 to 6 years), the mean CARS score was 36.04 (SD 5.17) and ranged from 28 to 50.

The studied cases were further classified according to the severity of the disease into three groups as measured by CARS; those with minimal symptoms of ASD (8 patients), those with mild to moderate symptoms of ASD (114 patients), and lastly those with severe symptoms of ASD (78 patients). Only 19 % of the parents were consanguineous. Regarding the order of birth, 24% were of 1st OOB, 37% were 2nd OOB, 21% were 3rd OOB, 16% were 4th OOB and 2% were 5th in OOB respectively. Regarding mode of delivery 47% experienced normal vaginal delivery while 53% caesarian section. Regarding perinatal problems, 86% of the ASD patients didn't suffer from any perinatal problems while 16% did. A total of 190 (95%) patients were of normal birth weight and 5% were of low birth weight. Regarding postnatal problems, 29% had postnatal problems while 71% didn't. Only 12% of the mothers were above 35 years at the time of conception while 28% of the fathers were above 35 years at the time of conception. 78% of ASD cases didn't have any family history of neurological or psychiatric diseases while 22% had. Regarding the type of feeding, 69% were breastfed, 16% were bottle fed and 15% had mixed feds **(Table 1)**.

Table (1): **Family demographics and perinatal history of the patients.**

Variable		Total no. = 200
Consanguinity	No	162 (81%)
	Yes	38 (19%)
Order of birth	1st	48 (24%)
	2nd	74 (37%)
	3rd	42 (21%)
	4th	32 (16%)
	5th	4 (2%)
Gestational age (weeks)	Mean ± SD	37.70 ± 2.05
	Range	28 – 40
	No. of preterm deliveries	18
Mode of delivery	Normal vaginal delivery	94 (47.0%)
	Caesarean section	106 (53.0%)
Prenatal problems	No	172 (86%)
	Yes	28 (14%)
Natal problems	No	174 (87%)
	Yes	26 (13%)
Weight at birth	Normal (2500-4000) gm	190 (95%)
	Low birth weight (<2500)	10 (5%)
Postnatal problems	No	142 (71%)
	Yes	58 (29%)
Age of mother at conception (years)	Mean ± SD	27.29 ± 5.64
	Range	19 – 43
	No. of mothers above 35 years at conception	24(12%)
Age of father at conception (years)	Mean ± SD	32.99 ± 7.06
	Range	22 – 55
	No. of fathers above 35 years at conception	56(28%)
Family history	No	156 (78.0%)
	Yes	44 (22.0%)
Type of Feeding	Breastfeeding	138 (69.0%)
	Bottle feeding	32 (16.0%)
	Mixed feeding	30 (15.0%)

SD: Standard deviation, gm: gram

Regarding SES groups, ASD cases were distributed as follows: 42 (21%) cases belonged to the low socioeconomic level, 114 (57%) belonged to the middle and 44 (22%) belonged to the high group respectively **(Table 2)**.

Table (2): **Socioeconomic status of the patients.**

Variable		Total no. = 200
Education and culture domain	Median (IQR)	20 (16.5 – 24)
	Mean ± SD	19.47 ± 5.34
	Range	3 – 30
Family domain	Median (IQR)	7 (6 – 7)
	Mean ± SD	6.76 ± 1.20
	Range	3 – 9
Economic domain	Median (IQR)	2 (1 – 3)
	Mean ± SD	2.15 ± 1.16
	Range	2 – 4
Occupation domain	Median (IQR)	2 (2 – 4)
	Mean ± SD	3.35 ± 2.68
	Range	2 – 10
Family possessions	Median (IQR)	5 (5 – 6)
	Mean ± SD	5.79 ± 1.30
	Range	4 – 10
Home sanitation domain	Median (IQR)	7 (6 – 9)
	Mean ± SD	7.81 ± 2.00
	Range	5 – 12
Health care domain	Median (IQR)	3 (3 – 3)
	Mean ± SD	3.25 ± 1.07
	Range	3 – 5
Total SES score (%)	Median (IQR)	55.95 (50 – 65.48)
	Mean ± SD	57.83 ± 13.12
	Range	27.38 – 70
SES groups	Low (21-41)	42 (21.0%)
	Middle (42-63)	114 (57.0%)
	High (64-84)	44 (22.0%)

SD: Standard deviation, IQR: Interquartile range, SES: socioeconomic status

Regarding SES domains, there was a non-significant difference between all domains of SES and the severity of the disease, the education and occupational domains were low in severe autism but did not reach significant values **(Table 3)**.

Table (3): Comparison between disease severity categories regarding the socioeconomic status domains

Variable		Severity of disease			Test value	*P*-value	Sig.
		Mild	**Moderate**	**Severe**			
		No. = 8	**No. =114**	**No. =78**			
Education and culture domain	Median (IQR)	21 (16 – 26)	22 (18 – 24)	18 (12 – 22)	5.469	0.065	NS
	Range	16 – 26	3 – 26	7 – 30			
Family domain	Median (IQR)	6 (5 – 7)	7 (7 – 7)	7 (6 – 7)	2.749	0.253	NS
	Range	5 – 7	5 – 9	3 – 9			
Economic domain	Median (IQR)	2.5 (2 – 3)	2 (1 – 3)	2 (1 – 3)	4.315	0.116	NS
	Range	2 – 3	1 – 4	2 – 4			
Occupation domain	Median (IQR)	2.5 (1 – 4)	4 (2 – 4)	2 (1 – 4)	5.736	0.057	NS
	Range	1 – 4	2 – 10	2– 10			
Family possessions	Median (IQR)	4 (4 – 7)	5 (5 – 6)	6 (5 – 7)	5.736	0.056	NS
	Range	4 –10	5 – 10	4 – 10			
Home sanitation domain	Median (IQR)	6.5 (6 – 7)	7 (6 – 9)	8 (6 – 9)	4.104	0.129	NS
	Range	6 – 7	5 – 12	5 – 12			
Health care domain	Median (IQR)	3 (3 – 3)	3 (2 – 5)	3 (3 – 3)	0.227	0.893	NS
	Range	3 – 3	2 – 5	2 – 5			
Total SES score (%)	Mean ± SD	54.17 (45.24 – 63.1)	58.33 (51.19 – 65.48)	52.38 (46.43 – 63.1)	5.346	0.069	NS
	Range	45.24 – 63.1	27.38 – 66.9	33.33 – 65.24			
SES groups	Low	4 (50.0%)	14 (12.3%)	24 (30.8%)	7.410	0.116	NS
	Medium	4 (50.0%)	72 (63.2%)	38 (48.7%)			
	High	0 (0.0%)	28 (24.6%)	16 (20.5%)			

SD: Standard division, IQR: Interquartile range, SES: socioeconomic status, P-value > 0.05: Non-significant; P-value ≤ 0.05: Significant

There was a statistically significant relation between SES groups and the order of birth of ASD cases, Also, a statistically significant relation between SES groups and family history. On the other hand, There were non-significant relations between SES groups and gestational age, mode of delivery, prenatal, natal and postnatal problems, weight at birth, age of the mother at conception, age of the father at conception (years) and type of feeding **(Table 4).**

Table (4): Comparison between socioeconomic classes and family demographics as well as the perinatal history of the patients

Variable		SES groups			Test value	P-value	Sig.
		Low	Middle	High			
		No. = 42	No. = 114	No. = 44			
Consanguinity	No	30 (71.4%)	94 (82.5%)	38 (86.4%)	1.740	0.419	NS
	Yes	12 (28.6%)	20 (17.5%)	6 (13.6%)			
Order of birth	1st	14 (33.3%)	20 (17.5%)	14 (31.8%)	18.406	0.018*	S
	2nd	2 (4.8%)	52 (45.6%)	20 (45.5%)			
	3rd	16 (38.1%)	24 (21.1%)	2 (4.5%)			
	4th	10 (23.8%)	14 (12.3%)	8 (18.2%)			
	5th	0 (0.0%)	4 (3.5%)	0 (0.0%)			
Gestational age (weeks)	Mean ± SD	38.52 ± 0.98	37.56 ± 2.13	37.27 ± 2.41	2.374•	0.099	NS
	Range	35 – 40	28 – 40	28 – 39			
Mode of delivery	Normal vaginal delivery	20 (47.6%)	52 (45.6%)	22 (50.0%)	0.127*	0.939	NS
	Caesarean section	22 (52.4%)	62 (54.4%)	22 (50.0%)			
Prenatal problems	No	38 (90.5%)	104 (91.2%)	30 (68.2%)	10.678*	0.221	NS
	Yes	2 (4.8%)	2 (1.8%)	6 (13.6%)			
	Threatened abortion	2 (4.8%)	6 (5.3%)	4 (9.1%)			
	Antenatal prophylaxis of Rh immunization	0 (0.0%)	2 (1.8%)	2 (4.5%)			
	Premature rupture of membranes	0 (0.0%)	0 (0.0%)	2 (4.5%)			
Natal problems	No	34 (81.0%)	100 (87.7%)	40 (90.9%)	5.211*	0.517	NS
	Obstructed labor	6 (14.3%)	4 (3.5%)	2 (4.5%)			
	Uterine bleeding	0 (0.0%)	6 (5.3%)	2 (4.5%)			
	Cord prolapse	2 (4.8%)	4 (3.5%)	0 (0.0%)			
Weight at birth	Normal (2500-4000) gm	40 (95.2%)	110 (96.5%)	40 (90.9%)	1.044	0.593	NS
	Low birth weight (<2500)	2 (4.8%)	4 (3.5%)	4 (9.1%)			
Postnatal problems	No	2 (4.8%)	24 (21.1%)	10 (22.7%)	12.425*	0.133	NS
	Jaundice	8 (19.0%)	2 (1.8%)	2 (4.5%)			
	Hypoxia	2 (4.8%)	2 (1.8%)	2 (4.5%)			
	Low birth weight	0 (0.0%)	2 (1.8%)	2 (4.5%)			
	Respiratory distress syndrome, low birth weight	30 (71.4%)	84 (73.7%)	28 (63.6%)			
Age of mother at conception (years)	Mean ± SD	28.48 ± 5.86	26.65 ± 5.43	27.82 ± 6.01	0.926•	0.400	NS
	Range	20 – 37	19 – 43	20 – 42			
Age of father at conception (years)	Mean ± SD	33.29 ± 5.51	32.49 ± 7.36	34.00 ± 7.72	0.381•	0.684	NS
	Range	24 – 43	22 – 55	23 – 52			
Family history	No	34 (81.0%)	80 (70.2%)	42 (95.5%)	6.046*	0.049	S
	Yes	8 (19.0%)	34 (29.8%)	2 (4.5%)			
Feeding	Breastfeeding	32 (76.2%)	72 (63.2%)	34 (77.3%)	4.846*	0.303	NS
	Bottle feeding	2 (4.8%)	22 (19.3%)	8 (18.2%)			
	Mixed feeding	8 (19.0%)	20 (17.5%)	2 (4.5%)			

SD: Standard deviation, P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant, *: Chi-square test; •: One Way ANOVA Test

There was a significant difference between the three SES groups regarding the order of birth (p=0.018), family history (p=0.049), age at diagnosis (p=0.016), CARS score (p=0.045), imitation problems (p=0.014), stereotypic behavior (p=0.034), and developmental regression (p=0.027). There was a significant correlation between SES and each of the CARS scores (r = -0.212, p = 0.034) **(Table 5).**

Table (5): Comparison between socioeconomic classes and clinical characteristics of the patients

Variable		SES groups			Test value	P-value	Sig.
		Low	**Middle**	**High**			
		No. = 42	No. = 114	No. = 44			
Age of onset symptoms (years)	Mean ± SD	2.39 ± 0.81	2.01 ± 0.69	1.99 ± 0.63	2.472•	0.090	NS
	Range	0.75 – 3.5	0.67 – 3.5	0.67 – 3			
Age at diagnosis	Mean ± SD	3.12 ± 1.08	2.59 ± 0.63	2.94 ± 0.68	4.336•	0.016	S
	Range	2 – 6	1 – 4	1.5 – 4			
Presenting symptom	Delayed speech	22 (52.4%)	52 (45.6%)	30 (68.2%)	5.132	0.743	NS
	Regression of speech	4 (9.5%)	10 (8.8%)	4 (9.1%)			
	Inattention to mother	8 (19.0%)	18 (15.8%)	2 (4.5%)			
	Tendency to play alone	6 (14.3%)	22 (19.3%)	4 (9.1%)			
	No eye-to-eye contact	2 (4.8%)	12 (10.5%)	4 (9.1%)			
CARS score		38.52 ± 6.60	35.40 ± 4.80	35.32 ± 3.90	38.52 ± 6.60	3.212•	0.045	S
		29 – 50	28 – 50	30 – 45	29 – 50			
Verbal language communication problems	No	0 (0.0%)	6 (5.3%)	2 (4.5%)	1.129*	0.569	NS
	Yes	42 (100.0%)	108 (94.7%)	42 (95.5%)			
Non-verbal language communication problems	No	4 (9.5%)	0 (0.0%)	4 (9.1%)	5.528*	0.063	NS
	Yes	38 (90.5%)	114 (100.0%)	40 (90.9%)			
Imitation problems	No	8 (19.0%)	2 (1.8%)	8 (18.2%)	8.507*	0.014	S
	Yes	34 (81.0%)	112 (98.2%)	36 (81.8%)			
Abnormal behaviour	No	2 (4.8%)	6 (5.3%)	0 (0.0%)	1.185*	0.553	NS
	Yes	40 (95.2%)	108 (94.7%)	44 (100.0%)			
Stereotypic	No	0 (0.0%)	28 (24.6%)	6 (13.6%)	6.787*	0.034	S
	Yes	42 (100.0%)	86 (75.4%)	38 (86.4%)			
Developmental regression	No	0 (0.0%)	0 (0.0%)	4 (9.1%)	7.236*	0.027	S
	Yes	42 (100.0%)	114 (100.0%)	40 (90.9%)			
Eye contact problems	No	8 (19.0%)	10 (8.8%)	10 (22.7%)	3.130*	0.209	NS
	Yes	34 (81.0%)	104 (91.2%)	34 (77.3%)			
Language delay	No	4 (9.5%)	0 (0.0%)	0 (0.0%)	7.677*	0.022	NS
	Yes	38 (90.5%)	114 (100.0%)	44 (100.0%)			

SD: Standard deviation, CARS: Childhood Autism Rating Scale, P-value > 0.05: Non-significant; P-value < 0.05: Significant; *: Chi-square test; •: One Way ANOVA Test.

DISCUSSION

Our research centered on characterizing the clinical traits of a sample of children with ASD while taking into account their socioeconomic status. In our study, there were five times as many males as females in the sample. There is a recognized male predominance in autism. Similar to how larger percentages were formerly attained [17].

Consanguinity made up 19% of the cases in our study sample, which was not particularly high. Given that the average consanguinity rate among Egyptians, especially in rural areas, is over 35%, it was even lower than expected [18].

The reason for the lower consanguinity rate seen in this study could be that most of our patients came from Cairo, the capital and the largest urban city in Egypt, which has a lower consanguinity rate. Also, overall rates of consanguinity are declining in Egypt over the years with better education. **Mamidala et al.** [19] discovered that parents who shared a child with an autism spectrum disorder (ASD) had significantly

higher rates of consanguinity, with a 3.22% total risk factor. In this study, consanguinity was not correlated to the severity of the disease. This contradicts stating that Parental consanguinity could predict ASD severity where the high levels of homozygous alleles might modulate ASD phenotypes [20]. Regarding the order of birth, more than 50% were first or second-born children. Study reported a potential association between increasing birth order and severity of ASD phenotype [21]. The order of birth was seen to be significantly associated with the SES of our patients. Patients of lower SES show increased order of birth. Egypt's considered a farming nation and more than 55% of employment agriculture-related. Farmers usually reside in rural and sub-urban areas where lower SES domains are usually more identified and families tend to be large as all family members tend to help with farming.

According to the current study, parental age at conception (years) significantly affected the severity of autism. In agreement with **Wu et al.** [22], who reported that a higher incidence of autism was linked to mother

or paternal ageing (35 years)**.** Additionally, neurodevelopmental abnormalities on the autism spectrum are the bad diseases that are most frequently linked to getting older fathers [23]. In our study, most of the patients were breastfed, where breastfeeding was found not to affect the severity of autism. Contradicting the finding that exclusive breastfeeding may confer protection in vulnerable children from ASD [24]. A cross-sectional research of 6049 toddlers aged 16 to 30 months in seven Chinese cities found that those who were not breastfed during the first six months of life had a greater risk of developing ASD[25].

There was a remarkably high incidence of positive family history for neuro-developmental disorders seen in nearly a quarter of the studied population. In concordance with our data**,** there may be a link between the elevated risk of ASD and a family history of neurological and mental illnesses [26]. Hereditary or psychological variables may be responsible for this [27]. However, in this study, there was little to no correlation between having a good family history and any of the socioeconomic strata.

The presenting symptoms in our study were in the form of speech delay, inattention to the mother, tendency to play alone and loss of eye contact in 52%, 14%, 16% and 9% of our cases respectively, compared to72%, 9%, 11% and 8% reported by **El-Baz et al.** [28]**.**

This discrepancy could be explained by the fact that more efforts were directed towards ASD awareness as well as the implementation of screening in the primary health care centers and increased orientation about all ASD presenting symptoms rather than speech delay solely. Furthermore, over the previous ten years, parental awareness may have improved along with SES and educational status. This is further shown by the finding that delayed speech was more frequently the presenting symptom in low and medium SES groups than in higher SES groups [29]. When we compared the age of diagnosis between the different SES we found that ASD patients of higher SES received a statistically significant earlier diagnosis than those of middle SES and especially those of low SES. This is due to better parental awareness and education as well as better access to medical services among the higher SES as confirmed by many other studies. Similar results attributed this finding to either a lack of knowledge among families with lower SES or to patients in the high socioeconomic group having ASDs that were more severe and required earlier medical treatment [30].

We found statistically significant differences regarding the severity of autism and stereotypic behavior. Matching the DSM-5; autism severity is based on social communication impairments and restricted, repetitive patterns of behavior [31]**.**

The main focus of this study; is the association between the SES of the patients and their different clinical characteristics. In our study, 57% of the children with ASD belonged to the middle SES group, compared to 21% and 22% in the low and high SES groups,

respectively. This contradicts an assumption that the majority of children in Egypt who have been diagnosed with ASD are of poor socioeconomic status, have inappropriate incomes, and have paternal education levels that are lower than average [32].

Increased ASD prevalence with higher socioeconomic status is seen in the USA, the positive link between SES and income might be the result of selective case selection in the context of access to healthcare and educational opportunities. They also discovered that children with ASD who did not also have co-occurring intellectual difficulties showed a similar association [33]. In the United Kingdom, children of mothers with an education level of at least an A-level had a diagnosis of autism twice as frequently as children of mothers with lower educational status and children of mothers with lower educational status had a significant under-diagnosis rate [35].

Unexpectedly, our study showed that family possessions were significantly higher in severe cases. Egypt is regarded as a farming country, and more than 55% of jobs are tied to agriculture. Owning agricultural property is seen to be a sign of dignity in Egyptian society, particularly in rural and suburban locations where lower SES domains are typically associated with a lack of professional therapy facilities.

SES and non-verbal IQ showed a statistically significant positive correlation in our study. Our findings concur with those who reported that children from lower SES performed worse than those from higher SES in terms of IQ, verbal episodic and semantic memory, working memory, written language, visual-verbal memory, and inhibitory control tests [35]. This could be explained by the fact that the SES is a significant factor that could affect the environmental stimulants, access to materials and activities that improve cognition, and caregiver enthusiasm for child engagement activities throughout the formative years of development.

In conclusion illustrated socio-demographic alterations in children with ASD could have an impact on morbidity and mortality. Despite the increased prevalence of ASD, there are concerns that socioeconomic disparity could hinder equality in diagnosis and management among different strata in our population. Further studies are needed to direct the government towards serious steps of awareness, screening programs, implementation of reachable medical service and establishment of ASD specialized units.

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