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## **Self-awareness of one's own difficulties and the severity of depression in adolescents with autism spectrum disorders**

### **Samoświadomość własnych trudności a nasilenie cech depresji u nastolatków z zaburzeniami ze spektrum autyzmu**

**Abstract:** Autism Spectrum Disorders (ASD) are marked by significant challenges in social interaction, communication, and by restricted, repetitive behaviors and interests. These disorders often coexist with emotional issues like depression. The present study investigates the hypothesis that discrepancies between self-assessments of symptoms by adolescents with ASD and their parents' assessments contribute significantly to the severity of depressive symptoms. This mismatch may cause adolescents to feel misunderstood and isolated, lacking necessary support. A sample of 223 adolescents and their parents or legal guardians participated, utilizing the Autism Spectrum Quotient (AQ) and the Autism Spectrum Rating Scale for ASD symptom assessment, along with the CDI-2 questionnaire to evaluate depressive symptoms from multiple perspectives. Correlational analyses between ASD symptoms and depressive symptoms reported by adolescents and their parents revealed significant positive correlations, underscoring a strong relationship between ASD-related difficulties, the severity of depressive symptoms, and self-awareness of these difficulties. Variance analysis highlighted differences in depressive symptom perception between adolescents

and their parents, as well as across different ASD symptom intensity levels. Post-hoc analyses indicated significant differences in depressive symptom intensity assessed through self-reports among groups with varying ASRS scores. These findings emphasize the complex interplay between ASD and depression, particularly highlighting the impact of self-awareness and parental perception of adolescents' difficulties on depressive symptomatology. This underscores the importance of accurate and early diagnosis of ASD to mitigate the risk of depression, suggesting that both self-report and parental assessments are critical in understanding and addressing the mental health needs of adolescents with ASD.

**Keywords:** autism spectrum disorders, depression, autism diagnosis, self-awareness, parental report.

## **Introduction**

Autism Spectrum Disorders (ASD) are characterized by a wide range of difficulties in social interaction, communication, and restricted, repetitive patterns of behavior and interests (WHO, 2022). They often coexist with emotional problems such as depression. Research indicates a high prevalence of depression in adolescents with autism spectrum disorder (ASD) (Pezziamenti et al., 2019; Aggarwal and Angus, 2015; DeFilippis, 2018; Ghaziuddin et al., 2005; Greenlee et al., 2016; Hollocks, 2018; Stewart et al., 2021; Gotham et al., 2015; Menezes et al., 2018). This comorbidity is associated with worse outcomes, including treatment resistance and increased risk for suicide (Aina and Susman, 2006). However, the identification of depression in this population is challenging due to the lack of reliable diagnostic tools (DeFilippis, 2018; Stewart et al., 2021; Gotham et al., 2015). This can lead to both misdiagnosis and missed diagnosis of ASD in adolescents (Aggarwal and Angus, 2015). The presence of depression in adolescents with ASD is associated with a history of medical and behavioral problems (Greenlee et al., 2016). In children with ASD, the ascertainment of depression can be complicated by phenotypic overlap and atypical manifestations (Magnuson and Constantino, 2011). Adolescents with ASD, especially those with higher functioning forms, are at a higher risk of comorbid depression (DeFilippis, 2018). Elevated rates of depression and anxiety symptoms are found in children and adolescents with ASD without intellectual disability, suggesting an increased risk regardless of cognitive ability (Strang et al., 2012). Interestingly, autistic youth show higher rates of depressive symptoms early on, but these symptoms tend to decrease as they approach middle adolescence and puberty,

in contrast to typically developing youth during this period. Despite these differing trajectories, both groups reach similar levels of depression in late adolescence (Corbett et al., 2024).

The occurrence of depression in adolescents with ASD may be particularly determined by their ability to self-knowledge and reflect on their own difficulties, which may influence the severity of depressive symptoms. The assessment of depression in ASD is challenging due to the lack of significant reliability and agreement between different raters, which affects screening and intervention approaches (Schwartzman and Corbett, 2020). Individuals with ASD may exhibit atypical depression symptoms, including changes in autistic behaviors, self-injury, and psychomotor alterations. Reviews show a bias toward observer-reports, with self-reports often underused or undervalued, and inconsistencies between self- and observer-reports (Angel et al., 2023).

Individuals with autism spectrum disorder (ASD) often experience difficulties in cognitive processing of emotions, leading to higher levels of depression (Hill Berthoz and Frith, 2004). This is further exacerbated by lower self-esteem and higher levels of depression and anxiety in youth with ASD (McCauley et al., 2019). However, the severity of mental health problems in adults with ASD varies, with some reporting no difficulties and others experiencing severe problems (Moss et al., 2015). The development of a positive social identity can be a protective factor for mental health in individuals with ASD (Cooper, Smith and Russel, 2017). The theory of mind, particularly the awareness of one's own mental states, is impaired in individuals with ASD (Williams, 2010). Self-reported social impairments are a significant predictor of depressive disorder in adults with ASD (Day et al., 2019). Also, social difficulties in childhood are linked to peer victimization and increase the risk of depression (Mamimoué and Gauld, 2024). Improved social-communication skills are linked to fewer depression symptoms in less stressful peer and family environments (Greenlee, Winter and Johnson, 2020). Neuroimaging studies have shown altered self-representation, particularly in psychological aspects, in individuals with ASD (Uddin, 2011). These findings suggest that individuals with ASD may have a complex relationship with their own mental health, influenced by their self-awareness and social identity.

Low awareness of their own difficulties in teenagers with autism spectrum disorder (ASD) may be one of the factors contributing to the development of depressive symptoms. A lack of self-awareness can make it difficult to understand the causes of one's own emotional and behavioral reactions, causing frustration and a feeling of powerlessness. This inability to identify and express internal emotional states can lead to their intensification,

which in turn increases the risk of developing depression. Moreover, these difficulties may be perceived by peers and teachers, which further deepens social isolation and feelings of rejection, intensifying depressive symptoms. Individuals with ASD can reliably report their own emotions, indicating the validity of self-reports in assessing emotion regulation abilities (Berthoz and Hill, 2005). Other research suggest that self-report measures for psychiatric comorbidities in ASD should be interpreted with caution due to potential false negatives and positives (Mazefsky, Kao and Oswald, 2011).

On the other hand, being aware of your own difficulties without understanding their sources may also increase your susceptibility to depression. Teens with ASD that are aware of their challenges but do not understand the causes may experience constant feelings of inadequacy and difference from their peers. This awareness of the discrepancy between one's own experiences and the experiences of others can lead to negative assessments of one's self-worth and self-knowledge, which is strongly associated with depressive symptoms. Without understanding that many of their difficulties are due to inevitable aspects of ASD, teens may fruitlessly strive to change these aspects of themselves, leading to additional stress, feelings of failure, and ultimately, worsening depression. Research shows, that later diagnosis of ASD is associated with increased risk of depression and self-harming behavior in adolescence, suggesting the importance of earlier diagnosis (Hosozawa, Sacker and Cable, 2020).

In the present study, the hypothesis was adopted that the discrepancy between the self-assessment of symptoms by teenagers with autism spectrum disorders (ASD) and the assessment of the same symptoms by their parents may be a significant factor contributing to the severity of depressive symptoms in the studied group of adolescents. This thesis assumes that such a discrepancy in perception may lead to a situation in which the difficulties and challenges experienced by a teenager are not adequately reflected and understood in his immediate life environment. Consequently, these young people may feel isolated with their problems, deprived of the necessary support, and therefore misunderstood. This state of affairs may not only hinder proper diagnosis and implementation of appropriate therapeutic interventions but also contribute to the intensification of negative self-perception by teenagers, thus deepening depressive symptoms.

### **Research methodology**

The study involved 223 adolescents (113 boys and 110 girls) along with their parents and legal guardians, aged 15 to 17. Recruitment was conducted using a purposeful sampling method because of the assumptions of the study. The individuals included in our study were those who had not been previously diagnosed with any chronic health conditions or disorders (such as autism spectrum disorders, depression, anxiety, and others). The intellectual functioning of the participants was also monitored, and all participants were within the intellectual norm.

Participants for the study were recruited through an established collaboration with local schools. Parents were initially invited via school communications to participate in the study with their adolescents. They were informed that participation was entirely voluntary and that all information provided during the study would be kept confidential. Both parents and adolescents were required to give their consent before participating. Once both parties agreed to participate, detailed information was provided. Parents were assured of the confidentiality of the data collected, emphasizing that they would not have access to their child's individual responses. Adolescents were also informed that the responses they provided were confidential and that their parents would not have access to them. They were also told that they could withdraw from the study at any point without needing to justify their decision. To further assure the participants of the ethical standards adhered to in the study, it was clarified that adolescents had the right to refuse participation at any time, although no such refusals were reported. For parents who consented to participate, the opportunity to receive results from screening tests such as the ASRS and the CDI-2 was offered, contingent upon their expressed interest. In addition, explicit consent was obtained from the parents to process personal data necessary for the study's conduct. This process was conducted in strict compliance with prevailing data protection regulations to ensure the security and confidentiality of all participant data.

To verify the developed hypotheses, the following instruments were used:

- The Autism Spectrum Quotient (AQ, Baron-Cohen et al, 2001) - a self-report instrument designed to identify characteristics associated with autism spectrum disorder. Research shows that people diagnosed with autism spectrum disorder score significantly higher on this questionnaire than the general population (Baron-Cohen et al, 2001). In the Polish adaptation of the tool, as many as 80% of people diagnosed with ASD achieve scores above 25

points (Pisula, et al., 2013). In the current study, the AQ questionnaire was used as a self-report tool with adolescents aged 15–17 years. It was decided to use this tool in a non-standard way because of the need to take a closer look at the teenager's perspective on his or her own behaviors related to the autism spectrum and to compare his or her perspective with that of the parent. The Cronbach's alpha reliability (internal consistency) index for the general scale was 0.803

- The Autism Spectrum Rating Scale, ASRS (Goldstein et al, 2010) is a set of questionnaires designed to identify ASD symptoms in children and adolescents aged 2–18 years. ASRS is used to measure behaviors related to autism spectrum disorders (ASD), such as attention deficits, communication difficulties, contacts with peers and adults, and rigid and stereotypical behaviors. The tool is based on the ASD diagnostic criteria from the DSM-IV-TR. The reliability of the questionnaire in the parent version is very high (above 0.8). The ASRS differentiates children and adolescents diagnosed with autism spectrum disorders from those with other clinical diagnoses (confirmed discriminant validity).
- The CDI-2 questionnaire (Kovacs, Wrocławska-Warchała, Wujcik, 2017) is a tool used to assess symptoms of depression in children and adolescents, encompassing various perspectives including self-report, parental assessment, and the teacher's perspective. It is designed for children aged 7 to 18 years.

## **Results**

In the initial phase of the study, correlational analyses were carried out to examine the relationship between symptoms of autism spectrum disorders (results of AQ and ASRS) and depressive symptoms reported by both teenagers and their parents. Additionally, the correlation between Difficulties self-awareness self-report was examined. The results indicate statistically significant positive correlations between all examined variables, suggesting a significant relationship between ASD-related difficulties and the severity of depressive symptoms and the level of self-awareness of difficulties. These correlational results provide significant evidence for the relationship between ASD and depression, highlighting the role of both self-awareness of one's own difficulties and the environment's perception of these difficulties in the context of the development of depressive symptoms in adolescents with ASD. It is essential to comprehend the combined burden experienced by adolescents with ASD, given that they not only have to deal with the obvious

issues of ASD but also face an elevated risk of depression that needs to be managed. The strong associations between indicators of ASD symptoms and both self-reported and parent-reported depressed symptoms underscore the extensive influence of ASD on the emotional welfare of teenagers. This highlights the need for a comprehensive approach to treatment and support, integrating interventions that target both ASD and related mental health difficulties. Detailed correlations are presented in Table 1.

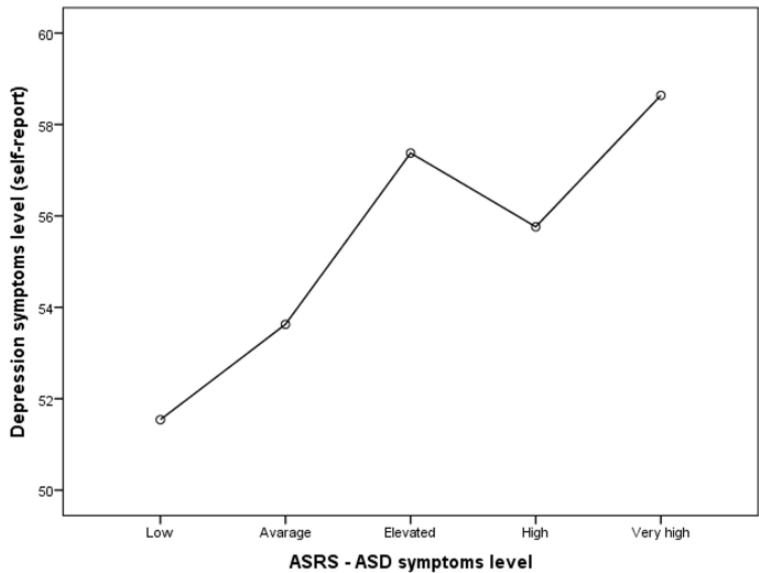
**Table 1.** Correlations between ASD symptoms measures and depression symptoms measures

	ASRS result (DSM scale)	ASRS (General result)	Depression symptoms (self-report)	Depression symptoms (parental report)
AQ result	$r = 0,425^{**}$ $p < 0,001$	$r = 0,408^{**}$ $p < 0,001$	$r = 0,519^{**}$ , $p < 0,001$	$r = 0,478^{**}$ , $p < 0,001$
ASRS result (DSM scale)	-	$r = 0,950^{**}$ , $p < 0,001$	$r = 0,391^{**}$ , $p < 0,001$	$r = 0,623^{**}$ , $p < 0,001$
ASRS (General result)	-	-	$r = 0,446$ , $p < 0,001$	$r = 0,616^{**}$ , $p < 0,001$
Depression symptoms (self- report)	-	-	-	$r = 0,719^{**}$ , $p < 0,001$

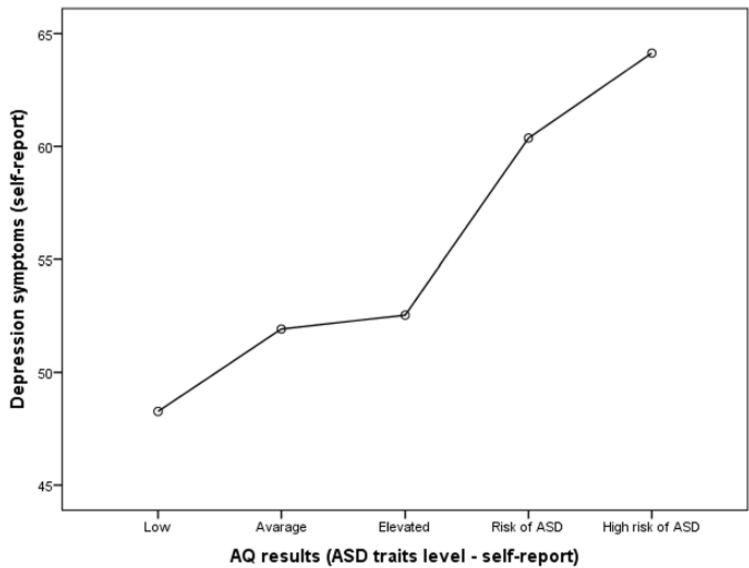
Notes: Significant correlations are marked with a  $^{**}$  symbol.

Conducted variance analysis presents significant results regarding depression, highlighting differences in the perception of depressive symptoms between teenagers themselves and their parents, as well as between different groups of respondents. The first set of data concerns the ASRS measurement group and shows that depressive symptoms reported by parents are significantly different between groups ( $F_4 = 13,079$ ,  $p < 0,001$ ), according to ASD symptoms intensity. In the case of AQ results for different ASD traits level, significant differences are also observed in reported depressive symptoms, both from the perspective of self-report ( $F_4 = 4,948$ ,  $p < 0,001$ ) and the perspective of parents ( $F_4 = 2,785$ ,  $p < 0,05$ ). The significant differences in parental reporting of depressive symptoms based on the intensity of ASD symptoms highlight the critical role that parental perception plays in the recognition and possibly the management of depression

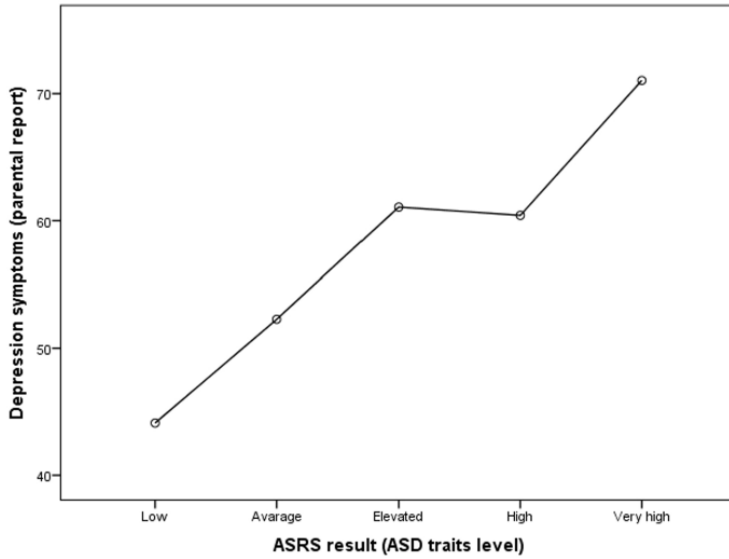
in adolescents with ASD. This suggests that parents may perceive and report depressive symptoms more acutely as the intensity of ASD symptoms increases.



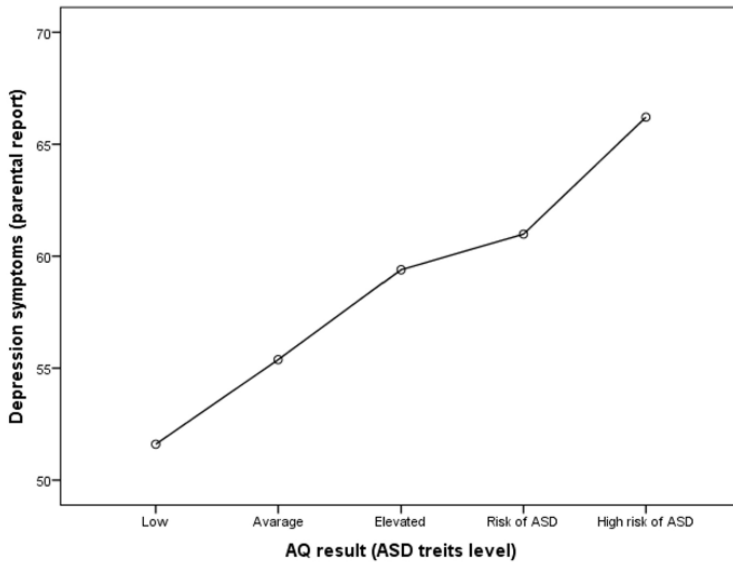
**Fig. 1.** Depression symptoms (self-report) in different ASD level groups (measured with ASRS)



**Fig. 2.** Depression symptoms (self-report) in different ASD level groups (measured with AQ)



**Fig. 3.** Depression symptoms (parental report) in different ASD level groups (measured with ASRS)



**Fig. 4.** Depression symptoms (parental report) in different ASD level groups (measured with AQ)

Post-hoc analyses revealed a significant difference in the level of depressive trait intensity assessed through self-report between groups with

low ASRS scores and those with elevated and very high scores. In the case of depression measurement via parental description, significant differences were found between all levels of symptom intensity, except for the comparison between elevated and high levels, where the difference was not significant. Regarding intensity levels according to the AQ assessment, significant differences were observed between all groups, except between moderate and elevated symptom intensity, where differences were not significant. The significant differences in self-reported depression between individuals with low and very high ASD symptoms could indicate that those with more pronounced ASD characteristics are either more susceptible to depressive symptoms or possibly more aware of their emotional states. This disparity in self-perception of depression could also suggest differences in cognitive processing related to self-awareness or emotional regulation among these groups. The results of these analyses are presented in Tables 2 and 3.

**Table 2.** Post-hoc analysis – depression symptoms intensity and ASRS levels

Depression symptoms (self-report)	Low	Average	p=1,000	Depression symptoms (parental report)	Low	Average	p=0,017
		Elevated	p=0,004			Elevated	p=0,000
		High	p=0,140			High	p=0,000
		Very high	p=0,000			Very high	p=0,000
	Average	Low	p=1,000		Average	Low	p=0,017
		Elevated	p=0,002			Elevated	p=0,000
		High	p=0,468			High	p=0,038
		Very high	p=0,000			Very high	p=0,000
	Elevated	Low	p=0,004		Elevated	Low	p=0,000
		Average	p=0,002			Average	p=0,000
		High	p=1,000			High	p=1,000
		Very high	p=1,000			Very high	p=0,000
	High	Low	p=0,140		High	Low	p=0,000
		Average	p=0,468			Average	p=0,038
		Elevated	p=1,000			Elevated	p=1,000
		Very high	p=1,000			Very high	p=0,006
	Very high	Low	p=0,000		Very high	Low	p=0,000
		Average	p=0,000			Average	p=0,000
		Elevated	p=1,000			Elevated	p=0,000
		High	p=1,000			High	p=0,006

**Table 3.** Post-hoc analysis – depression symptoms intensitt and AQ levels

Depression symptoms (self-report)	Low	Avarage	p=0,070	Depression symptoms (parental report)	Low	Avarage	p=0,067
		Elevated	p=0,001			Elevated	p=0,000
		High	p=0,000			High	p=0,000
		Very high	p=0,000			Very high	p=0,000
	Avarage	Low	p=0,070		Avarage	Low	p=0,067
		Elevated	p=0,930			Elevated	p=0,470
		High	p=0,000			High	p=0,000
		Very high	p=0,000			Very high	p=0,000
	Elevated	Low	p=0,001		Elevated	Low	p=0,000
		Avarage	p=0,930			Avarage	p=0,470
		High	p=0,090			High	p=0,055
		Very high	p=0,002			Very high	p=0,001
	High	Low	p=0,000		High	Low	p=0,000
		Avarage	p=0,000			Avarage	p=0,000
		Elevated	p=0,090			Elevated	p=0,055
		Very high	p=1,000			Very high	p=1,000
	Very high	Low	p=0,000		Very high	Low	p=0,000
		Avarage	p=0,000			Avarage	p=0,000
		Elevated	p=0,002			Elevated	p=0,001
		High	p=1,000			High	p=1,000

The most notable findings emerged from the interaction between ASRS groups and AQ levels regarding the self-report of depressive symptoms ( $F_4=1.764$ ,  $p<0.05$ ). The highest level of depressive symptoms was observed in adolescents who reported a high level of ASD traits but were assessed by their parents as low on the ASRS. Conversely, the second highest level of depressive symptoms was noted in adolescents who reported a low level of ASD traits, yet were assessed by their parents as high on the ASRS.

Adolescents who consider themselves as having high levels of Autism Spectrum Disorder (ASD) traits, but are perceived by their parents as having fewer ASD traits, exhibit the most pronounced levels of depressive symptoms. This disparity may suggest a notable divergence in the way teenagers and their parents perceive the obstacles faced by the teens. This discrepancy might exacerbate feelings of misunderstanding or invalidation among these teenagers, perhaps leading to their depressed symptoms. It highlights the importance of improved communication and deeper comprehension within

the family structure, which could alleviate these emotions of isolation or misinterpretation.

In contrast, teenagers who self-report low levels of Autism Spectrum Disorder (ASD) features but are evaluated by their parents as having high levels, display the second highest scores for depression. These findings indicate that these teenagers may be disregarding or not fully recognizing their challenges, either because they lack self-awareness, experience social embarrassment or seek to appear more competent or less affected. This misalignment can result in insufficient assistance for their genuine requirements, which can contribute to heightened depression symptoms as a result of unfulfilled expectations and unattended difficulties.

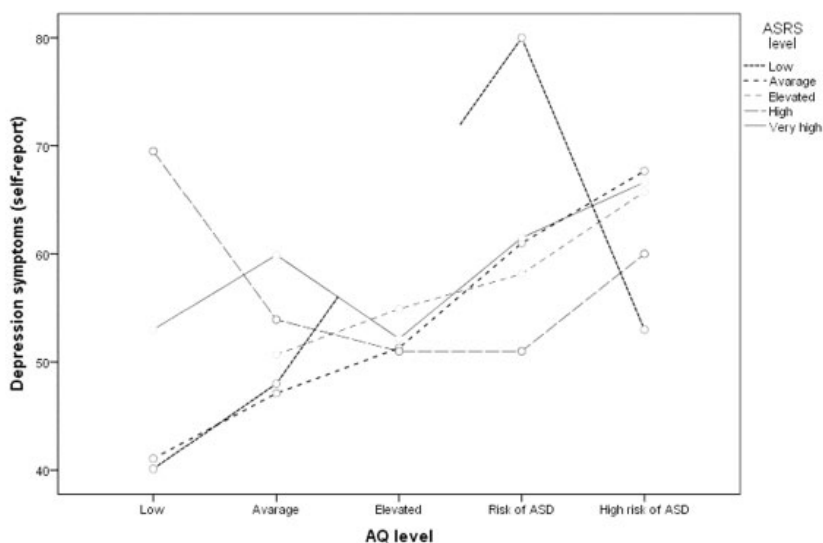


Fig. 5. Depression symptoms (self-report) - interaction analysis (ASRS and AQ level)

## Summary and Conclusions

The present study aimed to elucidate the complex interplay between autism spectrum disorders (ASD) and depressive symptoms in adolescents, drawing upon the theoretical framework that highlights ASD's characteristic difficulties in social interaction, communication, and restricted, repetitive patterns of behavior and interests. Echoing the array of research (Pezzimenti et al., 2019; Aggarwal and Angus, 2015), our investigation confirms the association of depression symptoms and ASD traits.

Previous research show, that positive association exists between the timing of ASD diagnosis and depression, with later diagnosis linked to increased symptoms and self-harming behavior, emphasizing the importance of early diagnosis (Hosozawa, Sacker and Cable, 2020). Many adults receive their first ASD diagnosis later in life, with a median age of 23 years, and often after receiving other psychiatric diagnoses such as intellectual disability, psychoses, personality disorders, and depression (Fusar-Poli et al., 2020). In the case of teenagers, an appropriate diagnosis is usually possible only if the teenager's behavior is adequately assessed by his or her parent, which may lead to the initiation of the diagnostic process. If the parent does not notice the difficulties, access to appropriate diagnostics may be difficult.

Our research contributes to the understanding of how self-awareness of difficulties and the ability to introspect may influence depressive symptom severity in adolescents with ASD. In analyzing the discrepancy between self-assessment of symptoms and parental assessments, we observed a significant factor contributing to depressive symptom severity among our adolescent participants with ASD. This divergence suggests that the adolescents' challenges may not be fully recognized or understood within their immediate environments, potentially leading to isolation, lack of support, and a profound impact on self-perception.

Within a pedagogic setting, our findings highlight the significance of creating educational environments that are supportive and acknowledge the distinct psychological requirements of students with ASD. Schools have a crucial role in this matter by adopting inclusive education policies that foster comprehension and offer suitable support services. It is crucial for educators to undergo training in order to precisely recognize signs of depression in young people with Autism Spectrum Disorder and implement efficient intervention strategies. Furthermore, the difference between the depressed symptoms reported by adolescents with ASD and those reported by their parents indicates possible communication and comprehension issues. This suggests that schools could play a crucial role in bridging this communication gap.

From a social perspective, the results call for increased public awareness and understanding of the complexities associated with ASD, particularly the heightened risk of depression. Community support structures, including counseling and mental health services, need to be accessible and tailored to meet the needs of those with ASD. There were big differences in depressive symptoms based on how severe ASD symptoms were reported by different people (self vs. parent). This shows how subjective it is to experience and

report these symptoms. This underscores the importance of considering multiple perspectives when assessing the psychological states of adolescents with ASD, ensuring that interventions are responsive to their reported experiences as well as observational data from caregivers and educators.

The study found a significant association between the severity of ASD symptoms and the way parents reported depressive symptoms. This emphasizes the important role that parental perception plays in identifying and perhaps addressing depression in adolescents with ASD. These findings indicate that when the severity of ASD symptoms increases, parents may be more aware of and accurately report depression symptoms. This trend emphasizes the importance of educators and school counselors actively including parents in conversations about their child's emotional well-being and taking their perspectives into account when creating assistance plans. Nevertheless, this also necessitates instructing parents in appropriately discerning and distinguishing depressed symptoms from the behaviors linked to ASD, as their understanding can greatly impact the care and interventions offered.

Furthermore, the variation in self-reported depressed symptoms among teens with varying levels of ASD symptoms, namely those with low and extremely high ASRS scores, implies that adolescents may possess an understanding of or be inclined to recognize their depression. Self-reports might exhibit inconsistency, posing challenges for educators and school psychologists in evaluating kids' mental well-being. The proposal suggests that educational institutions should employ a variety of assessment methods instead of relying just on self-report evaluations in order to gain a more comprehensive understanding of students' mental health.

To summarize, this study reveals the intricate relationship between how individuals view themselves and how their parents perceive the qualities associated with Autism Spectrum Disorder. These findings suggest the need for tailored mental health interventions that consider the cognitive and emotional processing capacities of individuals with ASD. Such tailored approaches could aid in more accurate identification of depressive symptoms, which may manifest differently based on the severity of the individual's ASD symptoms. The study also delves into the connection between these traits and the symptoms of depression in adolescents. A comprehensive strategy involving psychological support, educational modifications, and family education is necessary to address these problems. It is crucial to ensure that the interventions take into account the complexities of perception and self-awareness among adolescents with Autism Spectrum Disorder.

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