

A SYSTEMATIC REVIEW OF ASSOCIATIONS BETWEEN AUTISTIC TRAITS AND
THE MENTAL HEALTH OF STUDENTS

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ABSTRACT

Background: There is growing interest in the association between autistic traits and the well-being of students. A systematic review of this topic was carried out. **Methods:** The following search engines were used for studies conducted between 2014 and 2024: Google Scholar, SCOPUS, PubMed and PschInfo. The search terms were: autism spectrum quotient, AQ, autistic traits, mental health, students, university students, and school students. **Results:** Nine studies were selected for full review. The results showed associations between autistic traits, ADHD, anxiety and depression. High levels of autistic traits were associated with difficulty switching behaviour, reduced social skills and sticking to routine. Autistic traits were also associated with reduced quality of social life. The relationships between autistic traits and well-being outcomes were mediated by factors such as social competence. **Conclusions:** There are complex relationships between autistic traits and well-being, and further robust research and targeted interventions are required.

KEYWORDS: Autistic traits; Well-being; Students; ADHD; Anxiety; Depression; Quality of life; Loneliness.

INTRODUCTION

Autism spectrum disorders (ASD) are neurodevelopmental disorders that have been known to impact children and are typically diagnosed in early childhood, around the age of 2 or 3 years, when developmental differences in social communication and behaviour become evident. ASD is a lifelong neurodevelopmental condition, and individuals continue to experience challenges and problems throughout their lives. There are various reasons which are purported to contribute to individuals going undiagnosed or receiving a diagnosis later in life. Research^[1] conducted in recent years has found the presence of autistic traits in the general population. It was believed that autism lies on a continuum, and while keeping this in mind, a scale was designed. The AQ, also known as the autism spectrum quotient, was created by Simon Baron-Cohen et al. in 2001. The scale was designed to see if there is a broader autism phenotype or autistic traits in the non-clinical population. The scale was created as a self-report measure, as the existing scales were either time-consuming or were not self-administered. The AQ was developed for scientific and applied reasons.^[2] The scale is used with both clinical and non-clinical populations. Initially, the scale was designed for adults and had 50 items. Individuals rated the items on a 4-point Likert scale ranging from agree, slightly agree, slightly disagree, to disagree—the 50 items covered five key

domains.

1. Social skills – Difficulty in social interactions.
2. Attention switching – Preference for routines and difficulty shifting focus.
3. Attention to detail – Strong focus on small details.
4. Communication – Challenges in verbal and non-verbal communication.
5. Imagination – Limited flexibility in thinking and creativity.

Higher scores on the AQ are indicators of higher autistic traits. Over time, shorter versions of the scale have been designed, and the scale has also been adapted for use with students and for rapid screening. A short version of the autism spectrum quotient, the AQ-10, has been developed from the AQ and is consistently used in research and diagnosis. The 10 items correspond with behavioural, social and cognitive characteristics associated with autism spectrum disorders. The AQ-10 is widely used in research studies measuring autistic traits and in different populations of students, professionals, and clinical groups.

Well-being is a widely studied and researched topic today. There is a lot of emphasis on understanding the well-being of students. AQ as a scale helps understand how autistic traits correlate to student well-being, academic performance, academic achievement, and

mental health. Research studies have also reported the presence of commonalities between autism spectrum disorders and ADHD^[3], and clinical studies have found overlap between autism spectrum disorders and anxiety^[4] depression,^[5] and conduct disorders.^[6] These can be challenging for individuals, especially students, and thus impact academic performance, outcomes, and well-being. The last 15 years saw an exponential increase in the need to understand the university experiences of students with a diagnosis of autism spectrum disorders. This has been the case due to a variety of factors, including the increased enrollment of students with autism diagnoses in higher education institutions. Recent research has tried to understand the impact that the presence of autistic traits has on university life and outcomes. Studies have also found a broad variety of autistic traits in the general population.^[7,8] The AQ is a valuable tool for identifying the presence of autistic traits, and this, when used with student populations, can lead to better insights into students' well-being. This can help assess the impact of autistic traits on well-being and further lead to the development of targeted interventions for students. This, in turn, can lead to improved mental health and well-being for students of all age groups. This can also help formulate and implement support strategies for students.

This review aimed to analyse the existing literature on autistic traits and mental health and understand the association between autistic traits and mental health outcomes for students. This review will help identify common mental health challenges students face, risk factors impacting mental health outcomes, and gaps in the literature.

METHODS

The systematic review started with a search of research databases to find 'Autistic traits and mental health in students.' The search was conducted on Google Scholar, SCOPUS, PubMed, and PsychInfo databases for studies conducted between 2014 and 2025. The following

keywords were used in the search: autism spectrum quotient, AQ or autistic traits, mental health, students, university students or school students. The language of publication had to be English.

Inclusion criteria

- Studies examining the relationship and association of autistic traits with mental health outcomes were considered.
- Participants were students either in school or at a university.
- Peer-reviewed studies
- AQ measures
- Well-being measures

Exclusion criteria

- Case reports, reviews and abstracts from conferences.
- Studies focusing only on clinically diagnosed autism spectrum disorders.
- Studies not examining autistic traits.
- Studies not conducted on student populations.

Titles and abstracts were independently screened. The full-text articles for each study were then screened and assessed based on the inclusion and exclusion criteria. A total of 40 studies were identified. After title and abstract screening, 10 studies were eligible for a full-text review. Following a detailed evaluation, nine studies met the inclusion criteria and were included in the review and final synthesis. This selection process is explained in the PRISMA table below.

Stage	Number of Studies
Identified from databases	40
After removing duplicates	40
After title & abstract screening	10
After full-text review	9

Data Extraction

The studies were organised to summarise the key details of the studies.

Study	Population	AQ Measure	Well-being Measure	Key Findings	Quality
Garcha & Smith, 2023 ^[9]	University students (N=430)	Autism spectrum quotient	Well-being Process Questionnaire	<ol style="list-style-type: none"> 1. Autistic and ADHD traits were associated with well-being and SDQ outcomes. 2. Autistic and ADHD traits were significantly correlated. 3. Autistic and ADHD traits were significantly correlated with anxiety and depression. 4. AQ and ADHD were significantly correlated with various outcome 	Moderate-High

				variables.	
Low et al, 2024 ^[10]	University students (N=2732)	Autism spectrum quotient - 28	Satisfaction with life scale and Autism specific Qol.	<ol style="list-style-type: none"> 1. The group with diagnosed or suspected ASC had higher social skills, routine and switching difficulties than the non-ASC group. 2. Students in university with high autistic traits experience adverse psychosocial outcomes. 3. All psychosocial outcomes were negatively predicted by difficulty in social skills. 	High
Galvin, Howes & Richard, 2020 ^[11]	Undergraduate university students (N=164)	Autism spectrum quotient (AQ)	Hospital anxiety and depression scale	<ol style="list-style-type: none"> 1. There was a negative correlation between autistic traits and self-compassion. 2. The relationship between autistic traits and depressive/anxiety symptoms is partially mediated by self-compassion. 	Moderate to high
Liu et al, 2017 ^[12]	1 st year College students (N=2469)	Autism spectrum quotient (AQ)	Zung self-rating depression scale	<ol style="list-style-type: none"> 1. Autistic personality traits and schizophrenic personality traits are independent predictors of depressive symptoms. 2. The relationship between autistic personality traits and depression remained significant after controlling for neglect. 	Moderate
Liu et al, 2024 ^[13]	College students (N=1050)	Autism spectrum quotient (AQ)	Centre for epidemiologic studies depression scale (CES-D)	<ol style="list-style-type: none"> 1. There was a significant positive correlation between autistic traits and depressive mood. 2. Interpersonal emotional regulation and self-efficacy work as mediators between autistic traits and depression 	Moderate to high
Kurtz et al, 2023 ^[14]	College students (N=2976)	Broad autism phenotype	Patient Health Questionnaire and General Anxiety Disorder-7 (GAD-7)	<ol style="list-style-type: none"> 1. The relationship between anxiety, mood symptoms and broader autism phenotype had significant differences. 2. There was an interaction between race and broader autism phenotype. 	Moderate to high
Dell'Osso et al, 2019 ^[15]	University students (N=178)	Autism spectrum quotient (AQ) and ADAS	Trauma and loss spectrum report	<ol style="list-style-type: none"> 1. Higher scores were reported for both Adas and AQ for the students with problematic internet use (PIU). 	Moderate

		spectrum		2. In students with putative PIU, the suicide risk was related to the domain of social skills on the AQ.	
Shao et al, 2024 ^[16]	University students (N=1683)	Autism spectrum quotient (AQ) – Mandarin version	Coronavirus stress measure and Acceptance and Action questionnaire II (AAQ-II)	1. Positive correlation between autistic traits and social isolation. 2. The relationship between autistic traits and stress of social isolation was mediated by psychological inflexibility.	Moderate to high
Whillan, McGillivray & Rinehart, 2024 ^[17]	School students (N=51)		Strengths and difficulties questionnaire (SDQ), and Spence children's anxiety scale.	1. Autistic traits were associated with improved quality of life, mental health and school belonging.	Moderate to high

DISCUSSION

This systematic review examined the association between autistic traits and mental health in students. The research on university students has been growing. Although the research on autism and autistic traits in university students is still limited, it has started to establish links. The analysis of various studies saw the emergence of common themes. The research showed an association between autistic and ADHD traits, which aligns with previous research indicating the co-occurrence of ADHD and autistic traits.^[18] Autistic traits were associated with both anxiety and depression as common mental health problems, and this aligns with previous research that showed that children with autism and students with high scores on autistic trait measures had more depressive symptoms than the general population.^[19] The analysis also saw the impact of autistic traits on quality of life and mental health. The review shows that high autistic traits in university students were associated with negative psychosocial outcomes such as difficulty with switching, social skills and routine. Research has found that the variation in the presence of autistic traits is associated with various social challenges.^[20] Studies on university students found significant associations between autistic traits, social connectedness, and loneliness.^[21] The research found that autistic traits directly influence the social quality of life. People with higher autistic traits also reported less satisfaction with their psychological needs.^[22] Previous systematic reviews have found that a lower quality of life is reported by adults with autism.^[23] It has also been seen that there are greater reports of loneliness in individuals with autistic traits.^[24] It is also important to remember the transitions and routine challenges experienced by students, especially university students, as these challenges can contribute to feeling more stress and anxiety in everyday life. The systematic review found a negative correlation between autistic traits and self-compassion. This aligns with previous research that found the same results, where the total AQ score was

negatively correlated with self-compassion.^[25] Studies have also found that autistic individuals reported having lower self-compassion as compared to non-autistic individuals. Research also indicates that low self-compassion can lead to various mental health issues.^[26] The systematic review also found research where autistic traits independently predicted depression. The relationship between autistic traits and depression remains even after controlling for variables like neglect. Studies have found a higher prevalence of undiagnosed autism in adults with depression.^[27] Research has also found that depression is more common in high-functioning autism.^[28] However, some research has also found a risk of depression in those with lower-functioning autism.^[28] Studies have found a significant positive relationship between autistic traits and depression, with higher levels of depression reported with reports of higher levels of autistic traits.^[29] The systematic review also found that the relationship between autistic traits and mental health problems like depression and anxiety is mediated. The relationship between autistic traits and anxiety was mediated by social mediators, namely social problem-solving, social competence and teasing experiences. Research has also reported the presence of more autistic traits in people with anxiety disorders.^[30]

The systematic review found considerable differences between anxiety and mood symptoms between students with broad autism phenotypes and neurotypical students. There were also interactions between race and broader autism phenotype. Research conducted in recent years has found the existence of cross-cultural differences in the way autism is perceived in different countries.^[31] The systematic review also found that higher autism was linked with problematic internet use (PIU). It was also found that students with PIU also had a risk of suicide associated with social skills deficits. Research studies have shown that there is a link between autistic traits and compulsive internet use, as it works to deal with their

offline social challenges.^[32] A study on the general population also found a positive correlation between autistic traits and compulsive internet use.^[33] A cross-sectional study on European students found a strong association between suicidal behaviours and problematic internet use.^[34] The systematic review found a positive correlation between autistic traits and social isolation. This relationship was mediated by psychological inflexibility. Studies have found a positive correlation between autism spectrum disorder traits and loneliness in college students.^[35] Research shows strong associations between loneliness, depression, self-harm and ASD traits, thus confirming that the associations between loneliness and ASD traits can lead to mental health problems.^[36] The systematic review also helped discover an unexpected finding: autistic traits are associated with improved quality of life, mental health, and belongingness in school. This is particularly surprising as previous literature has shown strong associations of autistic traits with mental health problems like anxiety and depression, as well as social difficulties. This is a contradictory finding and could be due to various reasons. No literature has replicated these findings. Future research might focus on the outcome of autistic experiences and why some outcomes are better.

This systematic review provides valuable insights into the relationship between autistic traits and mental health; however, the methodological limitations must be considered. There was variability in the study design and measures. Each study had a different number of participants and varied widely regarding sample size, methodology, and assessment tools. The studies in this review were primarily cross-sectional and only looked at data at one particular time. While these studies are essential, they could not detect causal relationships and track changes over time. Longitudinal studies are needed to better understand causality.

CONCLUSION

This review demonstrates the complex relationship between autistic traits and mental health in students, emphasising the role of various factors. The evidence highlights the need for more robust research and targeted interventions to enhance well-being and mental health. The unexpected findings that autistic traits can be associated with improved quality of life open new avenues to research and better understand and explore individual differences and protective factors.

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