

**Assessing Neurodiversity Acceptance Among University Students:
A Survey Study at Nazarbayev University**

Student: Kamila Orazgali

Supervisor: Faye Foster, PhD, Valentina
Stolyarova, MD

Bachelor of Medical Sciences
Nazarbayev University School of Medicine

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Abstract

The prevalence of autism is rising worldwide, leading to different challenges faced by university students. It highlights the need for understanding and promoting autism acceptance in university context. However, there is limited research that addresses this issue in Kazakhstan's universities. Objectives of this research are to assess the current level of neurodiversity and autistic acceptance among university students and examine the impact of socio-demographic variables on attitudes towards neurodiverse people. A cross-sectional study was conducted in Nazarbayev University between February 2025 and March 2025 using the Autism Attitude Acceptance Scale (AAAS) developed by Kim (2020). The survey included 101 respondents and had 3 parts: socio-demographic data, AAAS subscale questions and questions for neurodiversity awareness. The data was analyzed using descriptive and inferential statistics. Nazarbayev University students showed moderately high General Acceptance (GA) level ($M=3.92$, $SD = 0.68$), while the mean score for Attitudes toward Treating Autistic Behavior (ATAB) was lower ($M=2.17$, $SD = 0.80$) showing limited acceptance of autism as a condition which should not be cured and accepted as it is. Significant differences were found between local and international students, with international students being more accepting of autism than local students ($p = 0.019$). Familiarity with neurodiversity concept found to be associated with higher level of General Acceptance score ($p = 0.002$). No significant difference was found in age, gender, major and previous contact level with autistic individuals.

Introduction

About a fifth of the human population is considered neurodiverse. Neurodiverse or neurodivergent (ND) are individuals whose neurocognitive functioning differs from what is considered neurologically typical (Zaneva, 2024). On the other hand, individuals, whose neurological development aligns with societal norms are called neurotypical (Rudy, 2024). Originally introduced in the context of autism, neurodiversity term now is used in relation with other conditions such as dyspraxia, dyslexia, attention deficit hyperactivity disorder (ADHD), dyscalculia, and Tourette syndrome (Clouder, 2020).

As autism was the initial focus of neurodiversity discussions, its prevalence has been widely studied. About 1 in 100 children worldwide is diagnosed with autism (WHO, 2023). Epidemiological studies show that the prevalence of autism has been rising rapidly over the past decade, and four to five times more boys are indicated to be affected than girls (Salari, 2022). Manifestation of autism varies from person to person, but it has common characteristics. They include social communication problems and restricted, repetitive sensory-motor behavior (Lord, 2018). With the increasing prevalence of neurodiverse individuals, more challenges related to academic settings have been identified.

The Importance of Neurodiversity Acceptance in High Education settings

According to Clouder (2020), most neurodiverse students face difficulties in their personal, social and academic life when transitioning to higher education, leading to anxiety, depression, bipolar disorder, etc. They are commonly subjected to stigmatization, bullying, rejection, and stonewalling. Autistic students in higher education settings often encounter problems with non-literal language, such as sarcasm and metaphors (Carr, 2024). It constrains their ability to participate in casual conversations, leading to feelings of isolation and non-belonging. There is a high prevalence of other mental conditions, which negatively influences academic performances and may lead to low rates of degree completion. According to several research works, there is high prevalence of anxiety disorder (48%) and depression (37%), and another study revealed 28% prevalence for ADHD; suicidal ideation is also high, about 30-50% (Chandrasekhar, 2024). Another research revealed a camouflaging problem, which is often found in autistic people, when they consciously or unconsciously hide their autistic traits to conform to social norms. Camouflaging could be considered as a response to stigmatization: to avoid bullying and retaliation. High camouflagers show higher anxiety and depression levels, while trying to fit into a formal environment like school, university or work (Cage, 2019). This tendency for camouflaging may make it difficult for university staff to identify autism signs and provide necessary support for them, highlighting the need for special training programs.

Further research explored how these challenges manifest in the first-year college experience of neurodiverse students: the study was conducted about students with Autism Spectrum Disorder (ASD) and Learning Disability (LD). Students with ASD largely interact with family and friends rather than with their faculty, and one of the challenges for these students is that faculty sometimes may not recognize the characteristics of ASD. Both students with ASD and LD reported to use disability offices' service rarely. In their first-year, students with disability face more difficulties in academic, social and cultural settings compared to their neurotypical peers (Petsu, 2021). Personal support networks, consisting of parents, family members, as well as friends play crucial roles in alleviating problems faced by neurodiversity students. These networks support students' interests and facilitate their self-advocacy, while also helping them to navigate the support systems in the university (Carr, 2024). These challenges clearly highlight that the problems with full inclusion and academic success among autistic students still exist. It also shows the

importance of promoting strategies, which could help to foster neurodiversity acceptance in university settings.

Promoting Neurodiversity in Higher Education

Research suggests that university plays an important role in encouraging acceptance. Here, institutional support and faculty awareness systems are the most important factors in promoting neurodiversity.

Faculty awareness and support is one of the important factors, which help neurodiverse students feel understood, included and better equipped. Some faculty members admitted having limited knowledge about the challenges faced by students with autism and expressed their willingness to learn about effective strategies to support them. However, despite positive situations where professors and students with ASD experienced connections resulting in academic success, reluctance of some professors to accommodate students in some unpredictable classroom situations, such as science lab courses, highlighted the importance of positive interactions (Zeedyk, 2019). Another research suggests that neurodiversity trainings could foster a more inclusive environment on campuses, as they have been shown to increase understanding and reduce stigma. Greater acceptance on campus could encourage students to disclose their conditions and seek support services. Another strategy is to implement Universal Design (UD) principles, which provides multiple ways to demonstrate learning material to students, ensuring that students use learning methods that work best for them (Dwyer, 2023).

Alternative teaching methods also may offer a more inclusive environment for neurodiverse students. According to Zeedyk (2019), for students with ASD, hands-on experiments, such as lab work, are more useful in developing interpersonal skills than traditional classroom settings. Along with faculty interactions and learning methods, institutional support also plays an important role in creating a more inclusive environment. Online survey conducted in Australia (Anderson, 2018) among university students with ASD revealed the level of satisfaction with academic and non-academic support and services. Despite the majority of students found accommodations somewhat to very helpful, some of them indicated common problems in delayed support services, lack of proactive assistance from faculty and poor quality of mentorship and self-advocacy training.

Neurodiversity Situation in Kazakhstan

According to the Republican Scientific and Practical Center for Mental Health of the Ministry of Health of the Republic of Kazakhstan the prevalence of autism has increased from 0.8/100000 to 12.7/100000 over the past 13 years (Nukeshtayeva, 2024). Another source suggests that the incidence of autism in Kazakhstan has almost doubled over the past 3 years: from five thousand to ten thousand. Along with the increasing number of children with autism, the main problem is the lack of data among adults: Kazakhstan's Ministry of Health reported only 145 adults with autism (Sabekov, 2024). With the increasing number of autistic people, the awareness and perception towards them becomes one of the important factors that should be learned to create a more inclusive environment in Kazakhstan. Cross-sectional study showed that the autism awareness level among young adults aged 18-25 was lower than those of older, highlighting the need for educating activities for university of college students (Kurmanalina, 2024). Another survey research was done among the general population about perceptions regarding ASD in Kazakhstan in 2024. This research shows that many respondents think that the behavior of children with autism may be dangerous. Despite the willingness of respondents to help parents of such children, some people are unsure how to do so. It again indicates the low awareness of Kazakhstan

people about ASD and the need for education (Kozhageldiyeva, 2024). Another study was conducted in Kazakhstan to investigate the knowledge and beliefs of healthcare professionals involved in autism diagnosis. It revealed that in Kazakhstan, although there is a general awareness of challenges faced by individuals with autism, there are still inaccurate and outdated beliefs even among specialists. The study also shed light on the fact that many psychiatrists have no specific training on tools for screening and diagnosing autism, other than general theoretical training (Somerton, 2022). This can explain why autism is widely misunderstood, not only among health professionals, but also among the general population.

Literature Review

Previously, numerous studies have examined neurodiversity acceptance, attitudes and awareness. Cross-sectional study was done in the Kingdom of Saudi Arabia to explore the knowledge of the general population about autism (Abualhommos, 2022). This study revealed that most participants had prior knowledge about autism (80.4%). They showed the highest knowledge about the abilities and needs of young people and children and characteristics of children with ASD. They also found that participants with Master's degrees and those who work in the healthcare area tended to have higher awareness about autism. However the level of knowledge about the causes of autism was low (32.2%). The study also mentioned some misconceptions, as some people still believe that autism can be cured, which leads to low acceptance levels of autism (Abualhommos, 2022). These results show that awareness does not always align with accurate knowledge. Using the same questionnaire about knowledge, a similar study was conducted among the general public in Jordan, but it explored not only awareness, but also attitudes towards autism and willingness to help (Abuhamdah, 2023). This study showed a weak level of awareness about the condition (36.5%), and the knowledge level showed significant difference based on different employment status ($p \leq 0.05$). Participants had a moderately positive attitude with an average agreement of 60.9%. Questions about their willingness and ability to help people with autism found that people showed moderate to high levels of agreement (59.9%). The study also mentions that high awareness is often linked to reduced stigma, higher acceptance and more favourable initial impression about people with autism.

Several Questionnaires about Autism knowledge and Acceptance were developed and tested in similar studies. Autism Stigma and Knowledge Questionnaire (ASK-Q) was developed as previous measuring tools did not have subscales, and could not examine stigma properly, even though they had both knowledge and stigma questions. Finally, the questionnaire consisted of 4 subscales: symptoms, diagnosis, etiology, and treatment (Harrison, 2017). Kitchin J and Karlin N (2022) used ASK-Q to investigate the relationship between ASD knowledge and stigma, while also looking at some socio-demographic characteristics and their effect to reduce stigma. The research found that out of four subscales, knowledge about ASD etiology was the most related to likelihood of reducing stigma. It concluded that misperceptions about ASD etiology and treatment can be the reason why there are still negative beliefs. The study also found the relationship between stigma and knowing someone with this condition: close contact with autistic individuals have a significant impact on ASD knowledge and stigma (Harrison, 2017).

Knowing that previous studies have measured mostly attitudes towards autistic individuals, So Yoon Kim developed another self-report instrument for measuring non autistic individuals' acceptance of autism (2020). Main research questions the author aimed to answer were how autism acceptance is related with autism and neurodiversity awareness, previous contact level with autistic individuals and different demographic factors such as age, gender, etc. Final version of Autism Attitude Acceptance Subscale consisted of 2 subscales: General Acceptance with 14

questions and Attitudes toward Treating Autistic Behaviors with 3 questions. All questions were scored in the likert scale from 1 to 5 (from definitely disagree to definitely agree), where higher GA score indicates better acceptance of autism, while higher ATAB score shows better understanding that treatments to reduce autistic characteristics will not benefit people with this condition (Kim, 2020). Using this tool, neurodiversity acceptance was measured in the college environment (Hotez, 2023). The study revealed higher General Acceptance subscale mean than it was reported in Kim (2020), 4.27 and 3.63 respectively. ATAB subscale showed a low level of acceptance with a mean of 2.51. It clearly shows that although students have a high level of self-reported autism acceptance, they do not fully understand the linkage between autism acceptance and initiatives for treating autistic individuals. The study also highlights the fact that the role of neurodiversity movement is to redefine autism and other neurodivergences as an aspect of identity rather than conditions that should be cured (Hotez, 2023). While previous studies explored great findings about neurodiversity/autism awareness and attitudes towards them, most of them focused on the general population, having a limited number of investigations among university students. Furthermore, there is a lack of research done in higher educational institutions in Kazakhstan. Addressing this gap is important to identify the neurodiversity situation in Kazakhstan's university settings and to develop a more inclusive environment.

Current Study

Students with neurodiversity, particularly with autism face many challenges in higher education in both academic and social context. Along with comorbid conditions, which can negatively affect a degree completion level, they also struggle with inadequate institutional support. In Kazakhstan, there is low awareness and acceptance level of ASD, leading to delayed and inaccurate diagnosis, stigma and insufficient support system. Taking into account the challenges faced by neurodiverse students there is a need for programs fostering an inclusive environment in higher education. The current study explores the awareness and acceptance of neurodiverse students in higher educational settings as no prior research was ever conducted in Kazakhstan. Given these gaps, this study aims to shed light on the current state of neurodiversity acceptance in Kazakhstan's higher educational settings, examine the influence of socio-demographic factors on acceptance levels and contribute to institutional changes that promote more supportive and inclusive academic environments.

The hypotheses are:

1. University students exhibit varying levels of neurodiversity acceptance based on familiarity with neurodiversity concept and previous contacts with neurodiverse individuals.
2. Students with different socio-demographic backgrounds demonstrate different acceptance levels and attitudes about neurodiverse individuals.

Methods

The study was cross-sectional which involved quantitative survey. It was conducted among Nazarbayev University students in Kazakhstan between February 2025 and April 2025. The survey was distributed via anonymous Google Forms. The study was approved by Nazarbayev University School of Medicine Institutional Research Ethics Committee (NUSOM-IREC).

Participants and Sampling

Students of Nazarbayev University, who are over 18 were invited to participate in this study. Participation was voluntary and the survey was conducted anonymously. Total of 101 respondents completed the survey. Socio-demographic and experiential characteristics are reported in Table 1. The majority of participants were 21-23 years old (44.6%), followed by 18-20 years (41.6%) and 24-26 years (9.9%). Only 3% of participants were aged 27-29 years old, with 1% answering the option “other”. 59.4% of participants were females, and the other 40.6% were males. Of the 101 participants, the majority identified as Kazakh (92.1%), followed by Tatar (5.9%), other Central Asian ethnicities such as Uzbek or Kyrgyz (5%), Russian (4%), and Korean (1%) and “other” 2%.

Survey Instrument

Survey had 3 parts with close-ended 26 questions. First part is socio-demographic, consisting of questions about age, ethnicity, gender, major, religion, student status (local, international) and experiential questions like contact level with autistic individuals. The second element of the survey was the Autism Attitude Acceptance Scale. AAAS is a special tool developed by So Yoon Kim (2020) which measures nonautistic adults' acceptance of autistic people. Most of the questions are about a hypothetical autistic individual named “Andy”. It consists of two subscales scored on a 5-point likert scale (“Definitely disagree” to “Definitely Agree”). The first subscale is General Acceptance (GA), which measures the person's acceptance of autism as a unique way of being, their willingness to interact and support autistic individuals (Cronbach's alpha = 0.92). The Attitudes toward Treating Autistic Behavior (ATAB) measures the person's belief that treatments to reduce or eliminate autistic traits are not beneficial (Cronbach's alpha = 0.69). Some questions are reverse coded and higher mean scores indicate higher acceptance of neurodiversity. The last part of the survey consists of questions for measuring the general self-reported knowledge about neurodiversity.

Statistical Analysis

In this study several statistical methods were used. Descriptive statistics such as frequency distribution was used for categorical, ex. socio-demographic data, while means and standard deviations were used for responses to AAAS Subscale. Comparative analyses were conducted using Mann-Whitney or Welch t-tests to compare acceptance level among binary groups (age, gender, student status), while Kruskal-Wallis H test was used for multiple groups (major, contact level with neurodiverse individuals). All analyses were conducted using Python, with statistical significance set at $p < 0.05$.

Table 1. Socio-demographic and experiential characteristics.

Characteristic	N (N = 101)	%
Age		
18-20	42	41.6%
21-23	45	44.6%
24-26	10	9.9%
27+	3	3.0%
Other	1	1.0%
Race/Ethnicity		
Kazakh	93	91.2%
Tatar	6	5.9%
Other Central Asian (Uzbek, Kyrgyz, etc.)	5	5.0%
Russian	4	4.0%
Korean	1	1.0%
Other	2	2.0%
Gender		
Female	60	59.4%
Male	41	40.6%
University Major		
SSH Sciences	32	31.7%
SSH Humanities	23	22.8%
SEDS Computer Sciences	17	16.8%
SEDS Engineering	13	12.9%
SEDS Robotics	1	1.0%
SOM Nursing	10	9.9%
SMG	2	2.0%
CPS	3	3.0%
Student Status		
Local	98	97.0%
International	3	3.0%
Religion		
Have a religion	39	38.6%
Do not have a religion	45	44.6%

Other	7	6.9%
Prefer not to answer	10	9.9%

Level of Personal Connection with Neurodiverse Individuals

Friend	20	19.8%
Family member	12	11.9%
Other	7	6.9%
No direct contact	56	55.4%
Prefer not to answer	6	5.9%

Results

The findings from the AAAS tool are represented in Table 2. Mean of acceptance for each question along with the number of individuals definitely agreeing and just agreeing with each question is shown. The mean for the first subscale of AAAS General Acceptance (GA) was 3.92 with standard deviation of 0.68. This finding is lower than in the research done by Hotez (2023) (M = 4.27 SD = 0.57). The highest agreement (91.09%) was for the item indicating to learn more about autism to support them better, while the lowest (14.85%) was for the item about not working on the same project with Andy. The results for the second subscale called Attitudes toward Treating Autistic Behavior (ATAB) were M=2.17, SD = 0.80. The mean was slightly lower than it was reported in Hotez (2023) (M = 2.51, SD = 1.05). In these questions more people (71.29%) agreed that autistic individuals should get interventions about how to pick up on social cues to make friends, while only 48.51% support the idea that autistic individuals' symptoms should be eliminated to support a better quality of life.

Table 2. AAAS descriptive statistics

Item	Mean ± SD	Definitely Agree / Agree (n)	Definitely Agree / Agree (%)
General Acceptance (GA) Subscale			
People need to learn more about autism to support individuals with autism better	4.62 ± 0.75	92	91.1%
Autism is a unique way of being that should be appreciated	4.15 ± 1.06	74	73.3%
When individuals with autism flap their hands, it's no different from people without autism tapping their feet in terms of their appropriateness	3.80 ± 1.01	59	58.5%
I would start a conversation with Andy	3.96 ± 1.09	71	70.3 %
I would try to get to know Andy on a personal level	3.70 ± 1.07	55	54.5%
I avoid Andy if I can *	3.79 ± 1.15	16	15.8 %
I would try to change the environment as much as possible to accommodate Andy's needs	3.74 ± 0.95	61	64.4 %
If I were Andy's colleague, I would work with management on ways to inform the employees of the department to be knowledgeable about autism	4.09 ± 0.90	78	77.2%
If I were Andy's colleague, I would personally work with Andy to help him/her find a work environment that works best for Andy	3.70 ± 1.06	61	60.4%
I would consciously try to include Andy in social events	3.73 ± 1.09	65	64.4%
I would feel comfortable sitting next to Andy	4.12 ± 0.94	77	76.2%
I would prefer not to work on the same project with Andy *	3.68 ± 1.06	15	14.8%
I would feel comfortable hanging out with Andy	3.78 ± 1.02	62	61.4%
I would enjoy having a coffee break with Andy	3.97 ± 0.96	73	72.3%

GA Mean	3.92 ± 0.68		
Attitudes toward Treating Autistic Behaviors (ATAB) Subscale			
It is important for researchers and doctors to devote resources to genetic and biological research to find a cure for autism *	1.92 ± 1.06	69	68.3%
Eliminating individuals' autistic symptoms can support a better quality of life for them *	2.48 ± 1.07	49	48.5%
It is important for an individual with autism to get interventions about how to pick up on social cues to make friends *	2.10 ± 0.91	72	71.3%
ATAB Mean	2.17 ± 0.80		
* Reverse coded			

Table 3. Participant Familiarity With and Understanding of the Term “Neurodiversity”

Familiarity with Neurodiversity	N (N =101)	%
Are you familiar with the term 'neurodiversity'?		
Yes	55	54.5%
No	17	16.8%
Not Sure	29	28.7%
What do you think “neurodiversity” refers to?		
A natural variation in how people’s brains work	85	84.2%
A medical condition that needs to be treated or cured	3	3.0%
A disability that limits people’s ability to contribute to society	5	5.0%
Not sure	8	7.9%

Influence of demographic variables on acceptance scores

Several statistical analyses were used to explore whether the acceptance scores were influenced by a number of socio-demographic factors. The Shapiro-Wilk test was used to check each subgroup for normal distribution, as this test is suitable for small sample size (<50). The Shapiro-Wilk test revealed that almost all data was distributed non-normally. For comparing factors like gender, religion, age, Mann-Whitney test was used for data distributed non-normally and Welch t-test was used when variances were unequal in normally distributed data. For comparing three or more groups, Kruskal–Wallis H test was applied for non-parametric data.

General Acceptance

Table 4 shows p-values for normally distributed variables with their mean (M) and standard deviations (SD). Table 5 shows p-values for non-normally distributed data, and their acceptance scores given as median (Mdn) and interquartile range (IQR, reported as Q1-Q3). There was a significant difference between the scores of international (n=3) and local (n=98) students.

International students showed significantly higher general acceptance ($M = 4.69$, $SD = 0.32$), compared to local students ($M = 3.89$, $SD = 0.68$), $p = 0.013$. Mann-Whitney U test revealed no statistically significant difference in General Acceptance levels between males and females ($p = 0.131$); Younger and older students ($p = 0.430$). The Welch t-test was used to compare students who have religion and those who do not, including participants who answered “other”, and it revealed no significant difference ($p = 0.162$). Different majors were also tested for acceptance level and divided into three: STEM (SSH Sciences, SEDS, SMG), Humanities (SSH Humanities, CPS), Health-related (SOM Nursing). GSB business major was excluded due to lack of participants. There was no significant difference between General Acceptance scores among majors ($p = 0.097$). Different contact levels with autistic individuals (family, friends, no contact and other) also revealed no statistical difference ($p = 0.694$).

Attitudes towards Treating Autistic Behaviors

There is statistical difference (p value = 0.019) in ATAB subscale between religious ($n=39$) and non-religious people ($n=52$), with the former one ($M=1.95$, $SD=0.74$) having less score than the latter one ($M=2.30$, $SD=0.85$). Participants with different previous contact with autistic people have almost statistical difference (p -value = 0.089), where friends ($n= 20$, $M = 2.58$, $SD = 0.94$) have higher than family members ($n = 12$, $M = 1.89$, $SD = 0.70$), followed by no direct contact ($n = 56$, $M = 2.05$, $SD = 0.75$) and other contact level ($n = 7$, $M = 2.00$, $SD = 0.77$). Other socio-demographic variables were analyzed using Mann-Whitney U test and Kruskal Wallis H test. They showed no difference in ATAB scores: females and males ($p = 0.231$), younger and older ($p = 0.326$), local and international students ($p = 0.511$), different majors ($p = 0.783$).

Table 4. GA Subscale: Mean Scores and p-value by Demographic Variable

Variables		Mean	SD	p-value
General Acceptance (GA) Subscale				
Religion	Have a religion	4.04	0.60	.162
	Do not have a religion	3.90	0.69	

Table 5. GA and ATAB Subscales: Median, IQR and p-values by Socio-demographic and Experiential Characteristics

Variables		Median	IQR	p-value
General Acceptance (GA) Subscale				
Gender	Male	3.86	3.63 – 4.50	.131
	Female	3.96	3.29 – 4.29	
Student Status	Local	3.89	3.43 – 4.43	.013
	International	4.71	4.54 – 4.86	
Age	Younger (18-20)	3.86	3.36 – 4.55	.430
	Older (21+)	3.93	3.57 – 4.36	

University Major	STEM	3.86	3.64 – 4.16	.097
	Humanities	4.00	3.59 – 4.54	
	Health-related	3.96	3.64 – 4.16	
Contact Level	Friend	4.11	3.63 – 4.64	.694
	Family	3.96	3.52 – 4.69	
	No Contact	3.86	3.41 – 4.29	
	Other	3.86	3.64 – 3.93	

Attitudes toward Treating Autistic Behaviors (ATAB) Subscale

Gender	Male	2.00	1.33 – 2.67	.231
	Female	2.00	1.67 – 2.75	
Student Status	Local	2.00	1.67 – 2.67	.511
	International	2.67	1.83 – 2.67	
Age	Younger (18-20)	2.00	1.67 – 2.58	.326
	Older (21+)	2.00	1.67 – 2.67	
Religion	Have a Religion	1.67	1.33 – 2.50	.019
	Do not have a religion	2.33	1.67 – 2.75	
University Major	STEM	2.00	1.67 – 2.67	.783
	Humanities	2.33	1.33 – 2.92	
	Health-related	2.17	1.67 – 2.83	
Contact Level	Friend	2.33	1.92 – 3.00	.089
	Family	1.67	1.33 – 2.08	
	No Contact	2.00	1.33 – 2.67	
	Other	1.67	1.50 – 2.67	

Influence of neurodiversity familiarity and knowledge on acceptance scores

Participants were asked whether they are familiar with the term neurodiversity and the distribution of their answers are shown in Table 3. Over half of participants know what neurodiversity is (n = 55, 54.5%), while a very small part answered “no” (n = 17, 16.8%), 28.7% (n = 29) chose the option “not sure”. The GA score of participants who are familiar with this term (M = 4.06 SD=0.73) was higher (p = 0.002) than those who are not (M= 3.75, SD=0.59). The ATAB scores however did not show any statistical differences (p = 0.325). In the second question, participants answered the question “What do you think “neurodiversity” refers to?”. Majority of the respondents identified the term neurodiversity as “a natural variation in how people’s brains work” which aligns with the original definition of this term (n = 85, 84.2%). Other options were common misconceptions and only a few students chose them: a medical condition to be cured (n = 3, 3.0%), disability, which limits people’s ability to contribute to society (n = 5, 5.0%), and other 7.9% of people chose the option “not sure”. GA score of people who chose the option with widely

accepted definition of neurodiversity ($M=4.03$ $SD = 0.66$) was significantly higher ($p < 0.05$) than those who chose answers with common misconceptions ($M = 3.30$; $SD = 0.43$). However, there were no significant differences in ATAB scores ($p = 0.502$). The data were non-normally distributed and their Median and Interquartile Range are shown in Table 6.

Table 6. GA and ATAB Subscale Scores and p-values by Neurodiversity Familiarity and Knowledge

Variables		Median	IQR	p-value
General Acceptance (GA) Subscale				
Familiar with the term neurodiversity	Yes	4.07	3.79–4.64	0.002
	No/Not Sure	3.68	3.30–4.25	
Accurate knowledge of neurodiversity	Yes	4.07	3.64–4.57	$p < 0.05$
	No	3.28	3.00–3.61	
Attitudes toward Treating Autistic Behaviors (ATAB) Subscale				
Familiar with the term neurodiversity	Yes	2.33	1.67–2.67	0.325
	No/Not Sure	2.00	1.67–2.67	
Accurate knowledge of neurodiversity	Yes	2.00	1.67–2.67	0.502
	No	2.33	1.33–2.75	

Discussion

Students of Nazarbayev University demonstrated moderately high acceptance towards autistic individuals, showing their willingness to support and help them. However, they showed lower scores in terms of using medical interventions to “cure” autistic people. The differences found between the scores for General Acceptance and Attitudes towards Treating Autistic Behaviors are similar to those found in previous research done by Kim (2020) and Hotez (2023). This can suggest that although people show empathy and openness towards neurodiverse individuals, they do not fully accept them as who they are, as they may still view people with neurodiverse conditions through a deficit-based lens, trying to “fix” them. Furthermore, people are willing to support autistic individuals more from distance than having close interaction. As it can be seen in Table 2, item-level analysis of General Acceptance, more respondents agreed on working with management to increase the knowledge about autism, than trying to get Andy on a personal level and directly work with Andy.

General Acceptance

Socio-demographic variables

Unlike previous studies (Kim, 2020; Hotez, 2023), where females had slightly higher acceptance scores than males, this research found no gender differences. Further research should be done with an equal number of both genders to clarify whether the absence of difference represents actual trends or was resulted by limited sampling.

Significant difference was observed between the acceptance scores of international and local students, with the former ones having more positive attitudes towards people with ASD.

However, the sample size is too small to solely rely on those findings. Other research about cross-cultural differences revealed no differences in cultural value orientations, which could affect the stigma towards individuals with ASD. They concluded that prior contact levels and knowledge were stronger factors than the countries participants lived in (Gillespie, 2019). Age and the presence of religion were not strong factors influencing the general acceptance levels of students. Age could not give any valuable information as sample size was too small for some subgroups, and the age ranges of participants were limited, as the study included only university students.

Experiential variables

Unlike our predictions, different previous contact levels with autistic individuals were not strong factors, which influenced acceptance levels. However, Kim (2020) concluded that quality and quantity of contact were correlated with both subscales of AAAS. In other research, having a first-degree relative with autism was shown to be one of the key factors in having higher openness towards autistic peers among college students (Nevill, 2011). According to another research, family members tend to have more awareness about ASD than the rest (Tipton, 2014). Taking into account differences found in previous and current studies, further research should be conducted with a broader sample size to find out if there really is correlation between contact level and acceptance.

Attitudes towards Treating Autistic Behaviors

The findings suggest that religious view is one of the factors affecting the attitudes towards treating autistic behaviors, indicating that non-religious people see autism as a condition to be treated or cured. This finding is consistent with other research, which suggests that cultural and religious frameworks can influence the way how autism is perceived, leading to stigma (Turnock, 2022). Other socio-demographic and experiential variables showed no difference in ATAB score, indicating that age, gender, major, etc do not affect their view of autism as a condition, which needs medical interventions.

Familiarity and Knowledge

As it was hypothesized, the familiarity with neurodiversity has positive effects on General Acceptance scores, with participants who are familiar with the concept of neurodiversity having more autistic accepting nature than those who are not or unsure. This shows that autism awareness and accurate understanding may play a crucial role in promoting more accepting attitudes towards people with neurodiversity. These findings support the core concept of the neurodiversity movement, which is aimed at promoting neurodiversity as a natural part of human variation rather than viewing it from a deficit-based lens. Neurodiversity movement puts autism as a human identity and not an impairment, which should be treated or cured (Turnock, 2022). From the findings, it can be seen that some students still hold outdated and misleading views about autism, highlighting the need for educational training on this topic and promotion of the neurodiversity movement in higher educational settings.

Recommendations for Promoting Neurodiversity

The results highlight a crucial need for promoting neurodiversity acceptance and more inclusive society in university context. Although having a moderately high autism acceptance, students show limited understanding of neurodiversity concept, where autism should be viewed as a part of human identity instead of the condition requiring medical interventions and limiting ability to contribute to society. It suggests the lack of foundational understanding, requiring the integration of neurodiversity education into students' academic curriculum. Here are some

recommendations consistent with previous research: creating a more autism-friendly environment and implementing Universal Design for Learning (UDL) to ensure an inclusive environment suitable for all students, including the ones requiring alternative learning methods (Dwyer, 2023). As the research showed the positive effect of awareness and knowledge on acceptance level, addition of student-led campaigns with neurodiverse speakers could effectively promote neurodiversity movement, as some research (Turnock, 2022) suggests the best way to promote acceptance is to involve autistic people themselves. Lastly, weekly and monthly training for students, staff and faculty on supporting the neurodiversity movement and promoting awareness and acceptance is one of the crucial steps, which could result in an inclusive cultural shift.

Limitations

The study has several limitations. First of all, sample size was limited as all reports were from a single university, which may not represent the general autism acceptance of university students in Kazakhstan. Secondly, the number of students from some socio-demographic groups were notably small, for example international students (N=3), students aged 27+ (N=3), potentially limiting the reliability of comparisons between different groups. Third, as the data were self-reported, some students might give socially acceptable answers, making the survey biased. Lastly, the survey contained only quantitative data, restricting the nature of answers, as open-ended questions could have provided deeper understanding and knowledge about students' perspectives and attitudes towards neurodiversity. Further research should include respondents from different universities and combine both qualitative and quantitative methods, reducing the number of self-reported questions.

Reference list

- Anderson, A. H., Carter, M., & Stephenson, J. (2018). Perspectives of university students with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 48(3), 651–665. <https://doi.org/10.1007/s10803-017-3257-3>
- Cage E, Troxell-Whitman Z. Understanding the Reasons, Contexts and Costs of Camouflaging for Autistic Adults. *J Autism Dev Disord*. 2019 May;49(5):1899-1911. doi: 10.1007/s10803-018-03878-x. PMID: 30627892; PMCID: PMC6483965.
- Carr J (2024). Autistic students' transition to university: Barriers to a positive experience (Master's thesis). Figshare. https://aru.figshare.com/articles/thesis/Autistic_students_transition_to_university_barriers_to_a_positive_experience/25610361?file=45676035
- Chandrasekhar, T., & Hu, Q. (2024). Meeting the mental health needs of autistic college students: A survey of university and college counseling center clinicians. *Journal of American College Health*, 72(1), 40–46. <https://doi.org/10.1080/07448481.2021.2013239>
- Clouder, L., Karakus, M., Cinotti, A. *et al*. Neurodiversity in higher education: a narrative synthesis. *High Educ* 80, 757–778 (2020). <https://doi.org/10.1007/s10734-020-00513-6>
- Gillespie-Lynch, K., Daou, N., Sanchez-Ruiz, M.-J., Kapp, S. K., Obeid, R., Brooks, P. J., Someki, F., Silton, N., & Abi-Habib, R. (2019). Factors underlying cross-cultural differences in stigma toward autism among college students in Lebanon and the United States. *Autism*, 23(8), 1993-2006. <https://doi.org/10.1177/1362361318823550> (Original work published 2019)
- Hotez, E., Rava, J., & Kuo, A. A. (2023). Brief research report: Investigating neurodiversity acceptance in the college classroom: An exploratory study. *Frontiers in Education*, 8, Article 1223175. <https://doi.org/10.3389/educ.2023.1223175>
- Kim, S. Y. (2020). The development and pilot-testing of the autism attitude acceptance scale: An instrument measuring autism acceptance. *Autism in Adulthood*, 2(3), 204-215. <https://doi.org/10.1089/aut.2019.0066>
- Kozhageldiyeva, L., Kosherbayeva, L., Sabyrdilda, Z., Kaukenova, A., & Kurmanalina, S. (2024). *Perceptions regarding autism spectrum disorders among the population of Kazakhstan*. *Journal of Clinical Medicine of Kazakhstan*, 21(1), 41-47. <https://doi.org/10.23950/jcmk/14264>
- Kurmanalina, S., Samambayeva, A., Akhtayeva, N. *et al*. Awareness of Autism Spectrum Disorder Among Population of Kazakhstan. *J Autism Dev Disord* (2024). <https://doi.org/10.1007/s10803-024-06350-1>
- Lord C, Elsabbagh M, Baird G, Veenstra-Vanderweele J. Autism spectrum disorder. *Lancet*. 2018 Aug 11;392(10146):508-520. doi: 10.1016/S0140-6736(18)31129-2. Epub 2018 Aug 2. PMID: 30078460; PMCID: PMC7398158.
- Nevill, Rose E. A, and Susan W White. "College Students' Openness Toward Autism Spectrum Disorders: Improving Peer Acceptance." *Journal of autism and developmental disorders* 41.12 (2011): 1619–1628. <https://doi.org/10.1007/s10803-011-1189-x>
- Nukeshtayeva K., Omarkulov B., Lyubchenko M., Delellis N., Zhamantayev O., Dauletkaliyeva Z., Zhanalina G., Shintayeva N., Karshalova G., Kenzhekeyeva M. Prevalence of Autism

risk among children undergoing regular Psychophysical Development Screening in Kazakhstan. *Clinical Epidemiology and Global Health*, Volume 28, 2024, 101703, ISSN 2213-3984, <https://doi.org/10.1016/j.cegh.2024.101703>

Rudy, L. J. (2024, November 27). *What does 'neurotypical' mean?* Verywell Health. <https://www.verywellhealth.com/what-does-it-mean-to-be-neurotypical-260047>

Sabekov S. (2024). *Adult autism is planned to be included in the disease classifier in Kazakhstan*. Inform.kz. <https://www.inform.kz/ru/vzrosliy-autizm-planiruyut-vnesti-v-klassifikator-bolezney-v-rk-6e58f7>

Salari, N., Rasoulpoor, S., Rasoulpoor, S. *et al.* The global prevalence of autism spectrum disorder: a comprehensive systematic review and meta-analysis. *Ital J Pediatr* 48, 112 (2022). <https://doi.org/10.1186/s13052-022-01310-w>

Somerton, M., Stolyarova, V. & Khanin, S. Autism and the Knowledge and Beliefs of Specialists in Kazakhstan. *J Autism Dev Disord* 52, 1156–1168 (2022). <https://doi.org/10.1007/s10803-021-05021-9>

Tipton, L. A., & Blacher, J. (2014). Brief report: Autism awareness: Views from a campus community. *Journal of Autism and Developmental Disorders*, 44(2), 477–483. <https://doi.org/10.1007/s10803-013-1893-9>

Turnock A, Langley K, Jones CRG. Understanding Stigma in Autism: A Narrative Review and Theoretical Model. *Autism Adulthood*. 2022 Mar 1;4(1):76-91. Doi: 10.1089/aut.2021.0005. Epub 2022 Mar 9. PMID: 36605561; PMCID: PMC8992913.

World Health Organization. (2024). *Autism spectrum disorders*. WHO. <https://www.who.int/news-room/fact-sheets/detail/autism-spectrum-disorders>

Zaneva, M., Coll-Martín, T., Héjja-Brichard, Y., Kalandadze, T., Kis, A., Koperska, A., Manalili, M. A. R., Mathy, A., Graham, C. J., Hollis, A., Ross, R. M., Yeung, S. K., Allen, V., Azevedo, F., Friedel, E., Fuller, S., Giannouli, V., Gjoneska, B., Hartmann, H., Zisk, A. H. (2024). Point of view: An annotated introductory reading list for neurodiversity. *eLife*, 13, e102467. <https://doi.org/10.7554/eLife.102467>

Zeedyk, S. M., Bolourian, Y., & Blacher, J. (2019). University life with ASD: Faculty knowledge and student needs. *Autism*, 23(3), 726-736. <https://doi.org/10.1177/1362361318774148>