

Sensory Comfort of Autistic Students

Komfort sensoryczny autystycznych studentów

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Received: 3 Dec 2024
Reviewed: 16 Feb 2025
Accepted: 20 Feb 2025
Published: 30 Jun 2025

Abstract: Providing sensory comfort at a university is a challenge for the academic community, and understanding the experiences of young autistic people seems essential in this process. Individual experiences reveal what needs to be changed at the university so that the growing number of autistic students can study in a more welcoming environment. Using an interpretive approach in a qualitative research strategy, the experiences of 12 young autistic individuals were examined to gain insight into their interpretation and understanding of sensory comfort. Sensory comfort is interpreted as the absence of overwhelming sensory experiences and a condition whose absence significantly impairs social functioning, including academic performance. It depends not only on environmental and social factors but also on personal preferences. A university should be an environment that is welcoming and free of overwhelming sensory experiences, even if this is only the result of each university's strategy.

Keywords: sensory comfort, autism spectrum disorder, autistic students,

Abstrakt: Zapewnienie komfortu sensorycznego na uczelni wyższej jest wyzwaniem dla społeczności akademickiej, a zrozumienie doświadczeń młodych osób autystycznych wydaje się w tym procesie niezbędne. Indywidualne doświadczenia ujawniają, co należy zmienić na uniwersytecie, aby rosnąca liczba studentów i studentek autystycznych mogła studiować w bardziej przyjaznym środowisku. Stosując podejście interpretacyjne w jakościowej strategii badawczej, zbadano doświadczenia 12 młodych osób autystycznych, aby uzyskać wgląd w ich interpretację i zrozumienie komfortu sensorycznego. Komfort sensoryczny jest interpretowany jako brak przytłaczających doświadczeń sensorycznych i stan, którego brak znacząco utrudnia funkcjonowanie społeczne. Zależy on nie tylko od czynników środowiskowych i społecznych, ale także od osobistych preferencji. Uczelnia wyższa powinna być środowiskiem przyjaznym i wolnym od przeciążających doznań sensorycznych, nawet jeśli jest to jedynie wynikiem indywidualnej strategii każdej szkoły wyższej.

Słowa kluczowe: komfort sensoryczny, zaburzenia ze spektrum autyzmu, studenci autystyczni, integracja sensoryczna



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In the International Statistical Classification of Diseases and Related Health Problems ICD-11 (WHO 2022), autism spectrum disorders (ASD) are defined as deficits in the ability to initiate and maintain reciprocal social interactions and social communication. These are accompanied by a range of restricted, repetitive and rigid patterns of behavior, interests, and activities that are atypical compared to the cultural norms of the individual's environment and their chronological age. The onset of this disorder occurs in the developmental period, often in early childhood, although symptoms may become apparent later when social demands exceed the abilities of an autistic person. Social functioning difficulties in autistic individuals can be so severe that they lead to difficulties in personal, familial, social, educational, or professional. Individuals with autism spectrum disorder demonstrate a full range of intellectual and linguistic abilities, although ASD may be accompanied by coexisting illnesses, disorders, or disabilities. There are different perspectives on interpreting autism beyond clinical views. Many autistic people see autism as a neurodiversity, part of their personality, a social identity. There are different perspectives on interpreting autism beyond clinical views. Many autistic people see autism as a neurodiversity, part of their personality, a social identity (Amstrong 2010; Bailin 2019). They do not treat autism as a clinical disorder. In Poland, autism is most often treated as a clinical entity and another way of interpreting it is in the minority. This applies both to the provisions in Polish law and the public perception.

The term "sensory integration", as used by Ayres, refers to the ability to generate appropriate motor and behavioral responses to sensory stimuli. "Sensory integration is the ability to register information from the surrounding world through the sensory organs, process this information in the central nervous system and to use it in purposeful actions" (Mass 2007, 32). The process of sensory integration has its roots in the prenatal period. During the first year of life, sensory integration must occur smoothly, as it affects the child's ability to crawl and stand independently (Ayres 2015). The development of children's cognitive abilities is largely shaped by the development of their sensorimotor skills. A critical role in this process is played by the integration of signals from the vestibular and proprioceptive systems. However, "the brain, under normal circumstances, is a self-organizing system. When it is unsuccessful in accomplishing its integrative task, the behavior directed by the brain fails to fall within 'normal' expectations" (Ayres 1968, 41). The result of these abnormalities is inadequate responses to stimuli, i.e. behavior that deviates from the social norm. According to Ayres, ASD symptoms are the result of sensory integration disorders. This hypothesis is also reflected in the DSM-V criteria (American Psychiatric Association 2013; Kryteria diagnostyczne 2018). Ayres (1979) observed both hypersensitivity and hyposensitivity to sensory stimuli in autistic individuals. These persons face difficulty registering (detecting and interpreting) signals, modulating them, interacting with various objects, and/or motivation. Ayres's theories in relation about autism spectrum disorders also find support in contemporary research (Kilroy, Zadeh and Cermak 2019). According to Ayres (2015), sensory processing limitations in autistic children can

be classified and grouped into three types. First, there may be an abnormality in the registration of sensory information in the brain, which results in insufficient attention to these stimuli or, on the contrary, an overreaction. Second, there may be a disruption in the modulation of nerve impulses, especially in the context of vestibular and tactile stimulus processing, which leads to the experience of instability (especially in the context of gravity) and heightened sensitivity to tactile stimuli. Third, the area of the brain responsible for volition, particularly regarding new or unusual activities, may malfunction, manifesting as a lack of interest in performing activities generally considered purposeful or constructive.

The relationship between ASD and sensory processing disorders continues to be a matter of scientific interest (Geschwind 2009). These are two separate disorders that coexist symbiotically. “Basically, the relationship is as follows: most (perhaps all) children with autism spectrum disorders have sensory processing problems” (Miller 2016, 378). Different ways of sensory processing are a feature of autism (Marco et al., 2011). Ayres’ theory, also confirmed by other authors (Lane 2019), facilitates the understanding of the sensory comfort of persons with ASD.

1. SENSORY COMFORT OF YOUNG AUTISTIC ADULTS

Sensory processing disorders (Sensory Processing Disorder – SPD) are related to the presence of sensory integration process disorders (Borkowska and Wagh 2018). Sensory Processing Disorder (SPD) is the inability to effectively use information received through the senses to enable daily functioning. This term covers a variety of neurological abnormalities. These disorders are also referred to as sensory integration dysfunction (SI Dysfunction) or dysfunction in sensory integration (DSI) (Kranowitz 2012). If sensory processing does not work properly, it can lead to difficulties in motor development, motor coordination, and manual skills; development and improvement of speech and language; attention and memory; acquiring academic skills; social, emotional, and adaptive functioning; and achieving an appropriate level of school readiness. Their consequences include limitations in social life, difficulties in regulating emotions and lower self-esteem (Miller 2016). Sensory processing disorders are categorized into three types: sensory modulation disorders (SMD), sensory discrimination disorder (SDD), and sensory-based motor disorders (SBMD) (Odowska-Szlachcic 2018). “Altered neurological sensory integration results in Sensory Processing Disorder (SPD), also known as Sensory Regulation Dysfunction, Sensory Integration Dysfunction or Sensory Dysfunction Disorder. In this condition, the brain doesn’t process sensory inputs correctly, leading to inappropriate behavioral and motor responses that affect learning, coordination, behavior, and language. SPD may lead to stress, anxiety or even depression, and represents a risk of psychopathology” (Galiana-Simal et al. 2020, 1). Difficulty in processing sensory stimuli can make normal relationships and communication with the environment challenging. People in the immediate environment may struggle to understand the specific way of interacting with a person with sensory integration

disorders, which generates atypical behaviors in them, allowing them to avoid overwhelming, incomprehensible, and unpleasant sensory experiences.

Comfort is an individual reflection of the human body. A state of comfort can only be achieved when physiological, mental, and physical factors interact in a way to satisfy an individual. The physiological response of the human body is an objective reaction to external conditions, striving to achieve a state of balance. Human sensations cannot be measured and can only be assessed by observing related responses. Sensory comfort is intuitive (cf. Cheng et al. 2021). Individuals with atypical sensory processing often present atypical behaviors, especially characteristic of persons with autism spectrum disorders, for example, avoiding stimuli or self-harm. These behaviors result from difficulties in coping with intense discomfort that is difficult to describe verbally (Biel 2015). Autism spectrum disorders manifest themselves differentially in the form of reactions and traits in the spheres of communication and social interaction, repetitive and inflexible behavioral patterns, and interests. These manifestations are closely related to the perception of sensory comfort and thus to the individual's way of satisfying needs related to this comfort. "It is not just adverse sensory environments that create barriers to autistic inclusion, but also the stigmatisation of autistic people who are overwhelmed by sensory environments (MacLennan et al. 2022)" (Manning, Williams and MacLennan 2023, 1515).

Sensory comfort is a crucial aspect of the daily lives of young adults with autism spectrum disorders. For them, the process of processing sensory stimuli can be significantly more demanding and complex than for individuals without this type of disorder. Dysregulation of sensory experience may lead to problems in everyday interactions and communication with the environment.

2. METHODS

The study sought (according to the research questions posed) to learn about the sensory comfort of autistic students and their interpretation of it (including in the context of quality of life), as well as to learn about the stimuli that are related to this individual and subjective state.

1. How do autistic students describe their experiences of sensory comfort experienced in everyday life?
2. What strategies do they prefer to deal with uncomfortable sensory stimuli?
3. What sensory stimuli influence their sensory comfort?
4. What is the relationship between sensory comfort and the quality of life and the ability to fully participate in the social life of autistic students?
5. What factors (environmental, social, and personal) determine the sensory comfort of the subject group?

Project

The interpretive approach is used in research conducted in a qualitative strategy (Cohen, Manion and Morrison 2011). For interpretive researchers, the starting point is an individual and the aim of the study is to know and comprehend their interpretation of the surrounding world. In our research, we decided to focus on autistic individuals studying at higher education institutions because changes are necessary in the academic environment. This environment should ensure sensory comfort for autistic individuals, which can only be achieved by understanding the needs and expectations of autistic persons.

Participants

The research sample (twelve people) was selected in a purposeful manner (purposive sampling), which consists in “sampling elements from the population that meet the criterion included in the research question” (Rubacha, 2008, 124). The criteria used to select the research sample were as follows: the subject was a young adult (from 18 to 27 years old¹: subject 11 and subject 12 – 18 years old; subject 8 – 19 years old, subject 2 – 20 years old; subject 5 – 21 years old; subject 1 subject 10 – 22 years old; subject 4 – 23 years old; subject 3 – 24 years old; subject 6 – 25 years old; subject 9 – 26 years old; subject 7 – 27 years old)) who studied at a university had autism spectrum and sensory disorders. Gender differences in relation to sensory experience did not occur in this study. The group was ethnically homogeneous and had similar levels of sensory sensitivity. It was differentiated in terms of ability and level of social functioning, including academic functioning.

Autistic persons were recruited from Polish universities by sharing posts on the Facebook social networking site in groups related to ASD. Individuals interested in participating responded to the post.

Materials

The research employed the method of a semi-structured individual interview. The first version of the interview was assessed by autistic students who did not participate in the research. Their feedback formed the basis for developing the final version of the interview questionnaire with twelve open questions. Each respondent was informed about the voluntary nature of participation in the study, the right to withdraw from the study at each stage, the need to provide informed consent to participate in the study, and the fact that the researcher would anonymize the participant's identity.

Procedure

Each study participant gave informed consent via a private e-mail to the researcher, expressing their willingness to participate in the research. In the private message, they received an interview questionnaire which then they completed independently and returned as a filled-out file (cf. Ryen and Silverman 2000). Eleven interviews

¹ In Poland, this is overwhelmingly the age of those studying at universities.

were conducted through this procedure, and one interview was conducted face-to-face, as requested by one of the study participants. Participants did not receive compensation for participating in the study.

3. ANALYSIS

The stages of data analysis include data reduction, representation, and verification (Rubacha 2017). “Data reduction involves coding the data. Coding is finding and labeling indicators of variables (analytical categories) in the text and giving them meaning” (Rubacha 2017, 263). Analysis of the interviews can be done through various techniques. In this research, content analysis was chosen, which involves systematically searching the text to identify categories. In the research described here, categories were determined by letting the themes come out on their own (inductive analysis).

Data coding can be divided into: factual coding and theoretical coding. The data collected was coded factually line by line. The factual coding began with an open approach, in which the text was analyzed from multiple perspectives, allowing as many analytical categories to emerge as possible. The next step was selective coding, that is, selecting only those categories that best reflect the research problem, for further theoretical analysis. Once the open coding process was completed, there was a selection of codes that were directly related to the research topic. Table 2 presents an example of a question from the interview questionnaire and the analytical categories assigned to it, to illustrate below the sample statements of the respondents with the categories assigned to them. The selected codes formed the foundation of the representation of the collected data (Rubacha 2017; cf. Babbie 2003). Table 1 presents a summary of the research questions and their assigned questions from the interview questionnaire, as well as the selected codes that formed the foundation of the representation of the collected data.

4. RESULTS

Sensory comfort is the absence of unpleasant sensory experiences.

The answer to the first research question required an analysis of the data obtained from the responses to two questions from the interview questionnaire. Sensory comfort is the result of a balance between individual preferences and needs and the environmental conditions that promote a sense of calm, security, and satisfaction.

The obtained data demonstrate a correlation between the theoretical definition of sensory comfort and the way it is experienced by the respondents.

“For me, it’s a state where I am not overwhelmed by excessive stimuli. It’s the feeling when I feel free and calm, without an intense need for stimulation.” (The Person 1)

“As a sense of absence of unpleasant sensory experiences, or possibly also the absence of the risk of them occurring (which in itself can be stressful).” (The Person 2)

“I feel sensory comfort when nothing bothers me when I don’t feel discomfort, meaning nothing disturbs me, hurts, or causes overly intense sensory experiences – there are no stimuli that distract us.” (The Person 5)

“An experience of satisfaction, calm, and well-being about sensory stimuli, such as touch, sight, sound, smell, and taste.” (The Person 6)

“Sensory comfort, in my understanding, means how sensory perceptions affect an individual on a comfort scale. A high level of comfort would mean that none of the sensory perceptions cause discomfort or hinder a person’s functioning. A low level of comfort means that sensory perceptions cause enough discomfort to make functioning difficult.” (The Person 10)

The respondents interpret the feeling of comfort as a state free from excessive stimuli, avoidance of unpleasant sensory experiences, absence of discomfort and overwhelming stimuli, and experiencing satisfaction, calm, and well-being.

“I don’t like noise and unfortunately my department is a very old building with wooden floors that creak terribly when walked on, and dragging metal chair legs on them makes a terrible bang. I also can’t stand it when someone drops something or puts it down with a bang on the wooden benches in the classrooms. I also feel very uncomfortable when ambulances and cars with intentionally damaged mufflers drive by outside my window (the department is located by the road). Not only do they make noise but they also do it suddenly and this shock only intensifies my discomfort.” (The Person 2)

“The worst thing is when there’s a light and it just keeps flickering constantly. I can hear it, I can see it. It’s not that it’s directly above me, but I just have this feeling that there’s something in the room and it distracts me. The same goes, for example, when someone starts sniffing during class. It’s unbearable for me too. I can’t concentrate on what’s going on in the room, because the only thing I can focus on is these sounds.” (The Person 7)

“Sometimes, mostly in situations when there are many people in the building at once and it gets noisy. I also have trouble understanding the people I’m talking to.” (The Person 8)

“Every time I’m at the university there are situations that cause me sensory discomfort. Some of them are beyond anyone’s control, like bright/flickering lights, sounds made by students in an uncontrolled manner, and noises from the street. Other highly uncomfortable experiences for me include audio materials played during classes, which are always too loud for me, the large number of people in the corridors, but at the same time large empty spaces, and the inability to use certain ways to relieve stress due to the fear of drawing attention to myself.” (The Person 10)

The responses from autistic individuals indicate a profound sensitivity to environmental stimuli that may go unnoticed by most people but for them, they are factors that generate sensory discomfort: noise, bright and flickering lights, accidental touch, various smells, or empty spaces. Feelings of anxiety may also be linked to social situations. Crowded rooms and crowds of people in corridors can make autistic individuals feel overwhelmed and helpless. For them, sensory comfort

is not only limited to avoiding discomforting situations but also to seeking those that provide relief. Appropriate lighting or a quiet corner can serve as a haven of tranquility and self-stimulation can help release accumulated emotional tension.

We have various strategies for coping with sensory-motor discomfort.

The responses to the second research question were provided by the data obtained from asking two additional questions in the interview questionnaire. For autistic individuals, stimming (self-stimulation) can be a way to manage difficulties in processing sensory stimuli and regulating emotions as well as finding a sense of comfort and control over their environment. Despite the stigma associated with this practice, many autistic individuals perceive stimming as a natural and positive part of their life experience (Kapp et al. 2019). It is worth noting that one way to cope with stress and excessive arousal is by using sensory toys. These can take various forms, from popular gadgets (such as fidget spinners and “pop it”) to simple items available at home (Slater 2012).

“When I’m not feeling very overwhelmed, stronger stimming helps a bit. I often put on headphones or look for a quiet place without people. I wait for everyone to leave the room so I can be the last one out without having to push through.” (The Person 1)

“I have these magnetic balls that you can squeeze and turn. Generally, something that I need to have in my hands. I also draw in my notebook.” (The Person 4)

“I bought noise-canceling headphones (ANC) which help a lot. I also a small case with earplugs. I usually have stim toys with me. I try to wear clothes that are comfortable for me.” (The Person 8)

“I use headphones, earplugs, and noise-canceling devices. I have specific tactile needs, so I wear pressure clothing, fabrics that feel nice to the touch, and heavier weight. I also carry items that are purely sensory-pleasing for me like plush toys made of soft material. Whenever possible, I try to avoid situations and things that cause me sensory discomfort.” (The Person 10)

“My tactile needs require stimulation with a gel toy.” (The person 11)

Young autistic adults prefer different methods for managing sensory discomfort: wearing noise-canceling headphones, using sunglasses in crowded places or wearing clothing with special sensory properties (pressure garments or those made from pleasant materials). Avoiding crowded places, where the risk of sensory overload is high, is a proven strategy for coping with uncomfortable sensory stimuli (Rowe, Candler and Neville 2011).

“I try to avoid crowded places and situations where the risk of sensory overload is high, as much as possible. I regularly use noise-canceling headphones and sunglasses.” (The Person 3)

“I wear noise-canceling headphones, dress in clothes that suit me, and take my blanket with me to different places. When I don’t feel well, I simply leave the situation that is harmful to me.” (The Person 7)

Autistic students use individual methods to cope with uncomfortable sensory stimuli, including the very popular practice of stimming. Many respondents use sensory-reducing equipment and choose clothing with specific sensory properties.

An important strategy is seeking out calm places, which helps minimize the risk of sensory overload, and using sensory toys which aid in regulating sensory experiences and replace undesirable behaviors like scratching or clenching teeth.

Each sense can provide uncomfortable sensory experiences.

The data obtained from responses to one of the questions in the interview questionnaire were used to address the third research question. The data show that various sensory stimuli affect sensory comfort in adults with autism spectrum disorders. Analysis of the responses from the interview questionnaire highlights key areas that are sources of sensory discomfort: bright lighting, intense and bright colors, loud sounds, noise, and crowds in corridors, simultaneous voices of many people, the need to filter sounds, unexpected touch, cold objects, temperature changes, vomiting reactions to most types of food, restricting diet to a small number of acceptable foods or intense smells.

“Probably the most challenging for me is visual and auditory stimuli, like a lot of people in the corridor and the lighting in the rooms and corridors. It’s not super overwhelming; I think I’ve learned to manage it a bit.” (The Person 4)

“Sense of sight, taste, and touch. For visual stimuli, it’s very bothersome, for example, when you enter a store and it’s very bright with everything in white. These stimuli make it hard for me to process what’s happening. When it comes to tactile stimuli, I don’t like it when strangers or people I’m too close to touch me. It just makes me shudder. When I’m stressed and overwhelmed with emotions, I need to bite the inside of my cheeks. As for taste, I have been diagnosed with AFRID, which means I don’t eat most types of food. I have a few types that I eat, but I can’t eat most because I have a very strong gag reflex.” (The Person 5)

“Definitely in the area of hearing, probably touch, including temperature. I also have a pretty strong need for stimming.” (The Person 8)

“The sense of smell is the most sensitive, hypersensitive in me.” (The Person 12)

Each sense provides uncomfortable sensory experiences. It can be a source of sensory discomfort and a build-up of emotions that young autistic adults cannot cope with. They seek individual ways to relieve emotional tension, which often falls outside of accepted social norms, such as biting the inside of their cheeks or vomiting.

We are different, not neurotypical.

The answers to the fourth research question were provided by the data obtained from three questions in the interview questionnaire. Many studies indicate a lower quality of life for individuals with autism compared to neurotypical individuals. The perception of young autistic adults results from ignorance, misunderstanding of these disorders, and the effects of social stereotypes.

“I think there is a stereotype that every person on the spectrum is hypersensitive to sound, which is not true. Some people believe that every autistic person has the same sensory difficulties.” (The Persons 3)

“Many people perceive us as if we are somehow deficient, underdeveloped, or strange. Stimming is seen as abnormal and gadgets are considered mere inventions.

They do not understand our problems or trivialize and judge them. On the other hand, some people take excessive care, as if we were delicate. Ultimately, we still appear as different because we are held to the standards of ‘normal’ people.” (The Person 1)

The standards of ‘normal’ set for autistic individuals seem crucial for social selection

“Sort of, the stereotype is that of rocking back and forth and some people imagine that someone is mentally ill.” (The Person 4)

“People look at my sensory blanket oddly, but not at my headphones because they think they are wireless for listening to music, not noise-canceling ones.” (The Person 1)

“There is generally no reaction from the lecturers. I try to use them in classes with teachers I know are informed about neurodiversity. Reactions from other students are generally positive (e.g., that I have a cool fidget spinner) or they do not react in a way that is noticeable to me.” (The Person 8)

“The items I bring to the faculty do not cause problems, but there are some items that I like or that are very helpful to me but I do not bring them because I have encountered negative opinions. Some items make noises that are unpleasant to some people, but I can replace them with others. Unfortunately, I have problems with biting and clenching my teeth due to sensory problems, and orthodontic chew toys help me a lot. Unfortunately, they are considered disgusting in public and I am seen as ‘retarded’ when using them, and I do not have a substitute for them. Other methods are not only unsatisfactory but also less safe or have the opposite effect on my comfort.” (The Person 10)

The participants also described the reactions of others when informed that they are autistic and have sensory integration issues.

“Generally, people say I’m making it up, some just say that’s how I am and leave it at that.” (The Person 4)

“With ridicule, saying that I’m mentally ill.” (The Person 6)

“If they are neurotypical people, they often react with disbelief, sometimes completely dismissing my difficulties. I think this is because they cannot imagine my sensory experiences and/or have never heard of anything like it.” (The Person 9)

“I usually meet with understanding; rarely does anyone say that I’m exaggerating.” (The Person 3)

“I meet with a lot of understanding and acceptance.” (The Person 7)

Individuals with autism spectrum disorders often encounter negative opinions from society, which are also a result of stereotypical and false views in the media. Respondents point out the existing stereotypes and misconceptions, which often lead to misunderstandings and wrong judgments. For example, the perception of autistic persons as “deficient and underdeveloped” or the belief that every autistic person is sensory hypersensitive results in either the trivialization of their problems or excessive concern. Both reactions entail negative consequences.

Everything determines our sensory comfort.

The data obtained from three questions in the interview questionnaire provided the answers to the fifth research question. The factors determining the sensory comfort of autistic students include personal preferences, environmental conditions, and social perceptions of individuals with autism spectrum disorders. An overload of uncomfortable sensory stimuli can lead to social isolation in this group or a lack of relationships in the peer group.

“During my freshman year, there was a student integration event at a pub and I was overwhelmed by everything and ended up leaving as soon as I entered. I couldn’t handle the loud music, the shouting and squeals of people having fun, or the colorful lights and lasers.” (The Person 1)

“One uncomfortable event I experienced was during the test I was very stressed about. There was a person who kept sniffing their nose the whole time. I just couldn’t write the test. I failed because of it. Not only was I extremely stressed with my hands shaking, but because of that situation I couldn’t hear my thoughts.” (The Person 5)

“Once, after a long bus ride, I realized I was so upset that I wanted to cry and was actively angry. The discomfort was caused by the noise and experiences related to the crowd (it was too hot, and I couldn’t move without brushing against other people).” (The Person 8)

Persons with autism spectrum disorder have increased sensitivity to the behavior of others, which affects their sense of comfort in social interactions.

“When someone shouts near my ear, touches or hugs me without warning – it makes me feel very bad. My comfort improves when I’m left alone.” (The Person 1)

“It bothers me when more than one person is talking at the same time or when someone is passionately telling a story. It’s difficult for me to be around children because they often interact with each other and their voices are hard for me to bear.” (The Person 7)

“Loud conversations, shouting, not muting phones, listening to loud music, playing with lights, touching and getting close to me without asking, looking me in the eyes, describing tastes and smells in detail – all of that is discomfort.” (The Person 10)

Food selectivity, also known as ARFID (Avoidant/Restrictive Food Intake Disorder), is a significant factor in the comfort of individuals with autism spectrum disorder about eating (Kozak et al. 2023). Autistic individuals often experience sensory sensitivities, which can lead to avoiding or limiting the consumption of certain foods due to their taste, texture, or smell. This, in turn, can create an aversion to eating and cause stress related to the need to consume foods that are sensory and unpleasant for them.

“I eat very specifically and selectively. There are things I won’t eat because of their texture and form. I eat with small cutlery and can’t use larger ones. Fortunately, there’s no canteen at our university so I eat what I bring with me.” (The Person 1)

“I usually eat very bland things. Stronger flavors, different vinegars, and spices are very unpleasant for me. Carbonated drinks also sting too much. Of the food

offered by the university, I'm only familiar with what's in the vending machines and there's usually something I can choose." (The Person 2)

"I eat the same things repeatedly and my diet is quite limited. At university, there are restaurants/canteens where sometimes I can find dishes that I'm able to eat." (The Person 9)

"Due to sensory issues, I have problems with many types of meat. Sometimes I have problems with food in general, then I need meals that are easy and quick to eat. A year ago, I still had trouble finding food at university that had meat I could eat or vegetarian dishes. Now, there are more options (at least in my faculty), and there's usually something I can eat. Unfortunately, when I struggle to eat I have almost no options." (The Person 10)

Food selectivity is also a personal factor that prevents from establishing and maintaining peer relationships. Relationships are built during shared meals at university or in trendy restaurants frequented by young adults.

Table 3 shows the environmental, social and personal factors determining the sensory comfort of the surveyed adults with autism spectrum disorders. The respondents introduced their types and described them in detail based on these three main factors. Within the group of environmental factors, respondents most frequently highlighted strong stimuli that were unacceptable to them. Among the social factors, acceptance and understanding of the environment were singled out as a condition for social inclusion. Social interactions are important to them, as they can be both a source of comfort and sensory discomfort. In the group of personal factors, respondents emphasized the need for an individualized approach to each young autistic person. This individualization includes nutritional selectivity and routinized behavior.

5. DISCUSSION

Sensory comfort is closely related to a person's physical well-being and to achieve it, there must be harmony between physiological factors, psychological factors, and external conditions. The body's physiological reactions are objective and strive to achieve balance, but an individual's experiences are subjective and not directly correlated with physiology. Human feelings are difficult to measure, but they can be assessed by observing reactions such as the body's sensory comfort or responses to sensory discomfort (cf. Cheng et al. 2021). Sensory comfort is a state of subjective well-being, achieved when external stimuli affect a person's senses pleasantly and harmoniously.

Autistic students often encounter uncomfortable situations at universities (Jackson et al. 2018; Gelbar, Shefyk and Reichow 2015). These difficulties include challenges in information processing, time management, group work and responding to questions posed by lecturers. They also face issues with processing all the sensory stimuli present in the university environment (MacLeod and Green 2009; Van Hees, Moyson and Roeyers 2015), which directly impacts the academic functioning of autistic students (Jansen et al. 2017; White et al. 2016).

Individuals with autism spectrum disorder experience a variety of sensory stimuli. Sensory hyperreactivity is one of the characteristic symptoms of ASD and can manifest as sensitivity to external stimuli that others might perceive as normal or mild. For example, sounds that are tolerable to most people may be painful for those with sensory hyperreactivity. Feelings of being overwhelmed can also be triggered by blinding lights, intense smells or even a light touch (Chamak et al. 2008; Jones, Quigney and Huws 2003). On the other hand, sensory hyporeactivity, though less noticed in research and often overlooked, is also present in autistic individuals. Persons with hyporeactivity may not respond adequately to stimuli such as pain, hunger or temperature changes. They may also be less sensitive to certain sounds or smells (Chamak et al. 2008). Additionally, some autistic individuals may exhibit sensory-seeking behavior, actively searching for pleasurable sensory experiences. These can include favorite music, specific textures or other stimuli that evoke positive feelings (Jones, Quigney and Huws 2003). Sensory stimuli have a significant impact on the comfort, or discomfort of young autistic adults. For some, strong sensory stimuli (such as repetitive sounds, cold light or mixed smells) can be overwhelming and lead to discomfort. Conversely, other stimuli (such as a barely perceptible touch, subdued light, or soft sounds) can have a calming effect, and enhance sensory comfort.

The sensory comfort of adults with autism can be affected several factors such as noise levels or intense light exposure. These stimuli can be either stimulating or overwhelming (Tomchek, Huebner and Dunn 2014). Additionally, personal characteristics such as the degree of sensory sensitivity or preferences for certain stimuli also play a significant role in determining the level of sensory comfort (Dellapiazza et al. 2021). Sensory overloads affect the relationship between sensory comfort and quality of life, as well as the ability to fully and satisfactorily participate in the social life of this group of individuals (Øverland et al. 2022). The opinions of others in their environment exert a significant impact on the social functioning of autistic individuals. These opinions are often shaped by mass media, which portray autistic people in a false manner. Such representations can be harmful as the public tends to prefer stereotypical and fictional examples that do not reflect the true experiences of autistic individuals. These cases are often intriguing and serve to increase viewership and click rates (Belcher and Maich 2014). Information provided by people from one's environment (such as peers) is often regarded as authentic and has a strong influence on the decisions of autistic individuals. Relationships with others are crucial to the quality of life for individuals with high-functioning autism. However, the correlates of the quality of life for autistic individuals are not well understood due to a lack of standardized tools to study this conceptual category (McKenzie et al. 2024).

A lack of understanding of specific sensory difficulties by neurotypical individuals leads to the devaluation of the experiences of those with ASD. Reactions to the use of sensory gadgets by autistic individuals vary. There are instances where these gadgets are met with misunderstanding or negative

responses, which discourages their use in public places. Similar reactions are presented by the academic environment towards stimming, which refers to motor or sensory actions performed by individuals with autism spectrum disorder to self-regulate or modulate their sensory experiences. Stimming can include repetitive body movements, complex gestures, leg shaking, blinking, or specific sensory behaviors such as rocking or looking at lights. Stimming may occur in stress response, excessive sensory stimulation, uncertainty, or as a way to express emotions. Scientific research confirms that stimming can provide a stable and familiar experience that helps cope with unpredictable, overwhelming, and new situations. It can also provide relief from sensory and emotional overstimulation such as anxiety (Leekam, Prior and Uljarevic 2011). Autistic adults report that stimming provides them with a soothing rhythm that supports them in coping with distorted or overstimulating perceptions and the resulting stress (Davidson 2010). Stimming can assist in managing uncertainty and anxiety (Joyce et al. 2017).

Fortunately, some individuals experience neutral or positive reactions, particularly in environments that are aware of neurodiversity. Discussions about the sensory issues faced by young autistic adults provoke a range of reactions: negative (mockery, disbelief, or devaluation of sensory difficulties) and positive (understanding, acceptance). Negative reactions lead to a sense of isolation and lack of understanding, while positive responses improve well-being and enhance the ability to function socially. Introducing accommodations for autistic individuals in universities is a priority for improving their sensory comfort and, in turn, their quality of life. Research shows that autistic students face many challenges in building relationships and adapting to the university environment, often leading to decisions to discontinue their studies. Support from universities should include mentoring, special exam conditions, and quiet study rooms. Raising awareness and educating the academic community about autism can also improve understanding and support for autistic students (Gurbuz, Hanley and Riby 2019). In Table 4, we show the changes that could be made at the university suggested by the young autistic adults surveyed. In Table 4, the respondents suggested solutions that can create an environment at the university that is welcoming and free from overwhelming unwanted stimuli. Some solutions any university can implement immediately, while others require more time but are not costly. The university must want to create a sensory-friendly environment.

Sensory comfort plays a key role in the social life of young adults with autism spectrum disorders, especially at university. Improving communication and understanding of autistic students as well as creating environments adapted to their sensory needs are crucial for their comfort and social inclusion (Benevides et al. 2020). The data obtained in our research indicate that appropriate sensory conditions promote better focus and effective learning, which are essential for academic success. Sensory comfort is closely linked to building social relationships, both within and outside the university (Bagatell et al. 2022).

6. LIMITATIONS AND STRENGTHS

The sample for this qualitative study was small and described experiences within the specific context of Polish higher education institutions. Therefore, the ability to generalize the findings is limited. In this study, the experiences of autistic students were used to understand their sensory comfort. These experiences may differ from those of other young adults with autism spectrum disorders. Further research is needed to explore how the current findings may apply to other environments, such as the workplace. The findings from this research could be extended to a broader population (Maxwell and Chmiel 2014; Maxwell 2019) and may offer a new perspective for those shaping academic environments.

CONCLUSION

Autistic students interpret sensory comfort as the absence of overwhelming sensory stimuli. They employ various strategies to cope with these experiences including stimming, noise-canceling headphones, and sensory toys. Each sense can produce uncomfortable sensory experiences, and each sense is exposed to overwhelming stimuli at university. Autistic students encounter both positive and negative reactions from their academic environment. Negative reactions stem from people’s lack of knowledge, stereotypes and social prejudices. There is a whole range of personal, environmental, and social factors that determine sensory comfort, including individual preferences, many diverse stimuli in the surroundings, and personal responses that help relieve emotional tension.

Table 1. Summary of the research questions and the assigned questions from the interview questionnaire and the codes underpinning the collected data

What strategies do they prefer to deal with uncomfortable sensory stimuli?	What strategies do you use to maintain your sensory comfort	<ul style="list-style-type: none"> • Stimming • Noise-cancelling headphones • Leaving the room • Sensory toys • Earplugs
	Do you use sensory gadgets to increase your sense of sensory comfort? If so, how do they increase it?	<ul style="list-style-type: none"> • I use it/them • I don’t use it/them • Noise-cancelling headphones • Anti-stress toys • Sunglasses

<p>What types of sensory stimuli influence their sensory comfort?</p>	<p>In the sphere of which sense (visual, auditory, tactile, taste, smell) do you most often experience uncomfortable sensory experiences?</p>	<ul style="list-style-type: none"> • Sense of sight • Sense of hearing • Sense of touch • Sense of taste • Sense of smell
<p>What is the relationship between sensory comfort and the quality of life and the ability to fully participate in social life of autistic students</p>	<p>What kind of reaction did you experience at university regarding the use of sensory gadgets?</p>	<ul style="list-style-type: none"> • Strange looks • No reaction • Neutral reactions • Curious looks • I hide when using sensory gadgets.
	<p>What kind of reaction do you get when you talk about your sensory problems?</p>	<ul style="list-style-type: none"> • I don't talk about sensory issues. • Understanding • Negative reaction • Ridicule • Compassion
	<p>In your opinion, are there stereotypes or misconceptions about sensory comfort in persons with autism spectrum disorders? What are these misconceptions?</p>	<ul style="list-style-type: none"> • Disabled person • Mentally ill person • Lack of understanding of the diversity of sensory experiences
<p>What factors (environmental, social and personal) determine the sensory comfort of the subject group?</p>	<p>Is there a specific situation that particularly influenced your sensory experience? What is the situation and in which sense does discomfort occurred?</p>	<ul style="list-style-type: none"> • Auditory discomfort • Crowd • Tactile discomfort • Noise • Visual discomfort • Excessive lighting • No specific situation
	<p>What behaviors of other persons around you influence your sensory comfort or discomfort?</p>	<ul style="list-style-type: none"> • Screaming and loud talking • Unexpected touch • Playing with light • Strong smell
	<p>Does your diet deviate from the generally accepted norm for sensory reasons? Does the university offer solutions that would meet your dietary expectations?</p>	<ul style="list-style-type: none"> • Specific and selective food • Avoiding intense flavors • No dietary preferences • Repetitive food

Source: own study.

Table 2. Example of data coding²

Question from the interview questionnaire	Codes underpinning the representation of collected data
How do you understand the concept of sensory comfort?	No stimulus overload Sense of freedom Feeling calm No need for stimulation Lack of stress Absence of unpleasant experiences Overall well-being
Example of respondents' statements	Choice of an analytical category
"For me, it is a state in which I am not overloaded by excessive stimuli. The feeling of being at ease and calm when I don't have an intense need for stimulation."	No stimulus overload Sense of freedom No need for stimulation
Theoretical code 1	Sensory comfort is equated by young autistic people with the absence of overloading stimuli and the lack of need for stimulation, as well as a sense of freedom.
Example of respondents' statements	Choice of an analytical category
"As a sense of the absence of unpleasant sensory experiences, or the lack of risk of their occurrence (which in itself may be stressful)."	No unpleasant sensory experience Risk of unpleasant sensory experience
Theoretical code 2	Sensory comfort is equated by young autistic people with the absence of unpleasant sensory experiences.
Example of respondents' statements	Choice of an analytical category
"I understand sensory comfort as a state where I am not overwhelmed by the stimuli around me and my brain processes them without overload."	No stimuli overload
Theoretical code 3	Sensory comfort is equated by young autistic people with the absence of being overwhelmed by stimuli.

² Due to the limited volume of the article, the entire coding is not presented.

Example of respondents' statements	Choice of an analytical category
"An experience of contentment, peace and well-being in a relationship with sensory inputs such as touch, sight, sound, smell and taste."	A sense of calm A sense of well-being related to sensory stimuli.
Theoretical code 4	Sensory comfort is equated by young autistic people with a sense of calm and well-being associated with sensory stimuli.
Example of respondents' statements	Choice of an analytical category
"For me, sensory comfort is the lack of feeling stimuli that cause pain, anger, discomfort and internal opposition."	No stimuli overload
Theoretical code 5	Sensory comfort is equated by young autistic people with the absence of sensory stimulus overload.

Source: own study.

Table 3. Factors determining the sensory comfort of autistic young adults as perceived by them

Factor type	Factor subtype	Factor characteristics
Environmental	Strong stimuli	Loud noises and strong light levels are overwhelming and tiring for autistic people.
	Crowded places	Being in places such as pubs, shopping centres, large lecture theatres, and cramped corridors at university are difficult for autistic people to accept.
Social	Acceptance and understanding of the environment	Lack of acceptance from peers and lack of understanding from those around them lead to social exclusion of autistic people and feelings of discomfort.
	Human interaction	Sudden touches, unexpected hugs, and interactions with multiple people at the same time are unbearable for young autistic adults and negatively affect their sensory comfort.

Personal	Degree of sensory sensitivity	Individual differences in the degree of sensory sensitivity mean that what is pleasant for one person may be unpleasant for another. It is important to take these differences into account and adapt the environment to meet the individual needs of autistic people.
	Routine and predictability	Changes in routine and unpredictable situations can be particularly challenging for autistic people, leading to increased stress and discomfort.
	Dietary selectivity	Autistic people often have specific food preferences related to sensory hypersensitivity, which can lead to difficulties associated with eating foods that they find sensory unpleasant.

Source: own study.

Table 4. Changes at university positively influencing sensory wellbeing in autistic people

Sensory-Friendly Spaces at University	Examples of Sensory-Friendly Spaces
Infrastructure and space	Enlargement of corridors and entrance doors Installation of adjustable lighting Use of soundproof floor coverings More seating areas in corridors Creation of soundproof rooms
Sensory support	Availability of sensory toys and soundproofing headphones Quiet learning rooms Maintaining a temperature between 20-21°C
Organisational changes	Reducing the size of class groups Allowing people to choose the form of credit (p. written response instead of oral) Listening to the voice of autistic people about their sensory comfort needs Appointing self-advocates for autistic people
Educating the academic community about ASD	Educate the academic community about the needs of autistic people Promote tolerance of different sensory behaviors (e.g. stimulation toys)
Academic catering offer	Expansion of catering services to include meals for autistic people

Source: own study.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Conflicts of Interest: The author declares no conflict of interest.

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