

# MUHANDISLIK & IQTISODIYOT

## №6

ijtimoiy-iqtisodiy, innovatsion texnik,  
fan va ta'limga oid ilmiy-amaliy jurnal

2025  
IYUN



Milliy nashrlar

OAK: <https://oak.uz/pages/4802>

05.00.00 – Texnika fanlari

08.00.00 – Iqtisodiyot fanlar



Google  
Scholar

OPEN ACCESS

ULRICHSWEB™  
GLOBAL SERIALS DIRECTORY

Academic  
Resource  
Index  
ResearchBib

ISSN  
INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INTERNATIONAL CENTRE

CYBERLENINKA

OpenAIRE

ROAD

INDEX  
COPERNICUS  
INTERNATIONAL

BASE

Crossref

НАУЧНАЯ ЭЛЕКТРОННАЯ  
БИБЛИОТЕКА  
LIBRARY.RU



РЭУ.РФ  
РОССИЙСКИЙ ЭКОНОМИЧЕСКИЙ УНИВЕРСИТЕТ  
ИМЕНИ Г.В. ПЛЕХАНОВА  
ТАШКЕНТСКИЙ ФИЛИАЛ



# muhandislik & iqtisodiyot

ijtimoiy-iqtisodiy, innovatsion texnik,  
fan va ta'limga oid ilmiy-amaliy jurnal

Elektron nashr,  
82 sahifa, iyun, 2025-yil.

## Bosh muharrir:

**Zokirova Nodira Kalandarovna**, iqtisodiyot fanlari doktori, DSc, professor

## Bosh muharrir o'rinbosari:

**Shakarov Zafar G'afarovich**, iqtisodiyot fanlari bo'yicha falsafa doktori, PhD, dotsent

## Tahrir hay'ati:

**Abduraxmanov Kalandar Xodjayevich**, O'z FA akademigi, iqtisodiyot fanlari doktori, professor

**Sharipov Kongratbay Avezimbetovich**, texnika fanlari doktori, professor

**Maxkamov Baxtiyor Shuxratovich**, iqtisodiyot fanlari doktori, professor

**Abduraxmanova Gulnora Kalandarovna**, iqtisodiyot fanlari doktori, professor

**Shaumarov Said Sanatovich**, texnika fanlari doktori, professor

**Turayev Bahodir Xatamovich**, iqtisodiyot fanlari doktori, professor

**Nasimov Dilmurod Abdulloevich**, iqtisodiyot fanlari doktori, professor

**Allayeva Gulchexra Jalgasovna**, iqtisodiyot fanlari doktori, professor

**Arabov Nurali Uralovich**, iqtisodiyot fanlari doktori, professor

**Maxmudov Odiljon Xolmirzayevich**, iqtisodiyot fanlari doktori, professor

**Xamrayeva Sayyora Nasimovna**, iqtisodiyot fanlari doktori, professor

**Bobonazarova Jamila Xolmurodovna**, iqtisodiyot fanlari doktori, professor

**Irmatova Aziza Baxromovna**, iqtisodiyot fanlari doktori, professor

**Bo'taboyev Mahammadjon To'ychiyevich**, iqtisodiyot fanlari doktori, professor

**Shamshiyeva Nargizaxon Nosirxuja kizi**, iqtisodiyot fanlari doktori, professor,

**Xolmuxamedov Muhsinjon Murodullayevich**, iqtisodiyot fanlari nomzodi, dotsent

**Xodjayeva Nodiraxon Abdurashidovna**, iqtisodiyot fanlari nomzodi, dotsent

**Amanov Otabek Amankulovich**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD), dotsent

**Toxirov Jaloliddin Ochil o'g'li**, texnika fanlari bo'yicha falsafa doktori (PhD)

**Qurbonov Samandar Pulatovich**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD)

**Zikriyoyev Aziz Sadulloyevich**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD)

**Tabayev Azamat Zaripbayevich**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD)

**Sxay Lana Aleksandrovna**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD), dotsent

**Ismoilova Gulnora Fayzullayevna**, iqtisodiyot fanlari nomzodi, dotsent

**Djumaniyazov Umrbek Ilxamovich**, iqtisodiyot fanlari nomzodi, dotsent

**Kasimova Nargiza Sabitdjanovna**, iqtisodiyot fanlari nomzodi, dotsent

**Kalanova Moxigul Baxritdinovna**, dotsent

**Ashurzoda Luiza Muxtarovna**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD)

**Sharipov Sardor Begmaxmat o'g'li**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD)

**Sharipov Botirali Roxataliyevich**, iqtisodiyot fanlari nomzodi, professor

**Tursunov Ulug'bek Sativoldiyevich**, iqtisodiyot fanlari doktori (DSc), dotsent

**Bauyetdinov Majit Janizaqovich**, Toshkent davlat iqtisodiyot universiteti dotsenti, PhD

**Botirov Bozorbek Musurmon o'g'li**, Texnika fanlari bo'yicha falsafa doktori (PhD)

**Sultonov Shavkatjon Abdullayevich**, Kimyo fanlari doktori, (DSc)

**Jo'raeva Malohat Muhammadovna**, filologiya fanlari doktori (DSc), professor.





# muhandislik & iqtisodiyot

ijtimoiy-iqtisodiy, innovatsion texnik,  
fan va ta'limga oid ilmiy-amaliy jurnal

- 05.01.00 – Axborot texnologiyalari, boshqaruv va kompyuter grafikasi
- 05.01.01 – Muhandislik geometriyasi va kompyuter grafikasi. Audio va video texnologiyalari
- 05.01.02 – Tizimli tahlil, boshqaruv va axborotni qayta ishlash
- 05.01.03 – Informatikaning nazariy asoslari
- 05.01.04 – Hisoblash mashinalari, majmualari va kompyuter tarmoqlarining matematik va dasturiy ta'minoti
- 05.01.05 – Axborotlarni himoyalash usullari va tizimlari. Axborot xavfsizligi
- 05.01.06 – Hisoblash texnikasi va boshqaruv tizimlarining elementlari va qurilmalari
- 05.01.07 – Matematik modellash
- 05.01.11 – Raqamli texnologiyalar va sun'iy intellekt
- 05.02.00 – Mashinasozlik va mashinashunoslik
- 05.02.08 – Yer usti majmualari va uchish apparatlari
- 05.03.02 – Metrologiya va metrologiya ta'minoti
- 05.04.01 – Telekommunikatsiya va kompyuter tizimlari, telekommunikatsiya tarmoqlari va qurilmalari. Axborotlarni taqsimlash
- 05.05.03 – Yorug'lik texnikasi. Maxsus yoritish texnologiyasi
- 05.05.05 – Issiqlik texnikasining nazariy asoslari
- 05.05.06 – Qayta tiklanadigan energiya turlari asosidagi energiya qurilmalari
- 05.06.01 – To'qimachilik va yengil sanoat ishlab chiqarishlari materialshunosligi

- 05.08.03 – Temir yo'l transportini ishlatish
- 05.09.01 – Qurilish konstruksiyalari, bino va inshootlar
- 05.09.04 – Suv ta'minoti. Kanalizatsiya. Suv havzalarini muhofazalovchi qurilish tizimlari
- 10.00.06 – Qiyosiy adabiyotshunoslik, chog'ishtirma tilshunoslik va tarjimashunoslik
- 10.00.04 – Yevropa, Amerika va Avstraliya xalqlari tili va adabiyoti
- 08.00.01 – Iqtisodiyot nazariyasi
- 08.00.02 – Makroiqtisodiyot
- 08.00.03 – Sanoat iqtisodiyoti
- 08.00.04 – Qishloq xo'jaligi iqtisodiyoti
- 08.00.05 – Xizmat ko'rsatish tarmoqlari iqtisodiyoti
- 08.00.06 – Ekonometrika va statistika
- 08.00.07 – Moliya, pul muomalasi va kredit
- 08.00.08 – Buxgalteriya hisobi, iqtisodiy tahlil va audit
- 08.00.09 – Jahon iqtisodiyoti
- 08.00.10 – Demografiya. Mehnat iqtisodiyoti
- 08.00.11 – Marketing
- 08.00.12 – Mintaqaviy iqtisodiyot
- 08.00.13 – Menejment
- 08.00.14 – Iqtisodiyotda axborot tizimlari va texnologiyalari
- 08.00.15 – Tadbirkorlik va kichik biznes iqtisodiyoti
- 08.00.16 – Raqamli iqtisodiyot va xalqaro raqamli integratsiya
- 08.00.17 – Turizm va mehmonxona faoliyati

Ma'lumot uchun, OAK  
Rayosatining 2024-yil 28-avgustdagi 360/5-son qarori bilan "Dissertatsiyalar asosiy ilmiy natijalarini chop etishga tavsiya etilgan milliy ilmiy nashrlar ro'yxati"ga texnika va iqtisodiyot fanlari bo'yicha "Muhandislik va iqtisodiyot" jurnali ro'yxatga kiritilgan.

**Muassis:** "Tadbirkor va ishbilarmon" MChJ

**Hamkorlarimiz:**

1. Toshkent shahridagi G.V.Plexanov nomidagi Rossiya iqtisodiyot universiteti
2. Toshkent davlat iqtisodiyot universiteti
3. Toshkent irrigatsiya va qishloq xo'jaligini mexanizatsiyalash muhandislari instituti" milliy tadqiqot universiteti
4. Islom Karimov nomidagi Toshkent davlat texnika universiteti
5. Muhammad al-Xorazmiy nomidagi Toshkent axborot texnologiyalari universiteti
6. Toshkent davlat transport universiteti
7. Toshkent arxitektura-qurilish universiteti
8. Toshkent kimyo-texnologiya universiteti
9. Jizzax politexnika instituti



# MUNDARIJA

Ways to Strengthen the Economy of Karakalpakstan .....	12
<b>Isakov Janabay Yakypbayevich</b>	
Sanoat korxonalarida ishlab chiqarish xavf-xatarlarini iqtisodiy baholash.....	18
<b>Raxmatova M.G., Saidjonova Z.B</b>	
Strategy For Attracting Investments By Expanding the Participation of Joint-Stock Companies in the Securities Market .....	23
<b>Aytmuratova Ulbiki Jalgasovna, Kutlymurat Zhalgasovich Aytmuratov, Raushan Nurlybay qizi Umirzakova</b>	
O'zbekistonda eksportni sug'urtalash mexanizmlari: mavjud holat va takomillashtirish yo'llari .....	29
<b>D.E.Qarshiev</b>	
Ta'lim, ekologiya va raqamlashtirish sohalarida bolalar va o'smirlar turizmini integratsiyalash: xalqaro tajribalar va O'zbekiston .....	35
<b>Islomova Dilrabo Salomovna</b>	
Oliy ta'lim muassasalarida xodimlarning mehnat samaradorligini oshirishda rahbarlarning roli .....	40
<b>Reyimberdiyev Baburbek Adilbek o'g'li, Yusupov Sherzodbek Baxtiyor o'gli, Xaitbayev Jasurbek Otaxanovich, Madraimov Xabibulla Madaminovich</b>	
Обзор по теме Современные системы управлением возбуждение синхронных машин и перспективы их развития .....	47
<b>Алиев Абдор Мураткулович</b>	
The Mechanism for Applying Tax Benefits and Preferences in Tax Administration .....	52
<b>Dilorom Mutalova</b>	
Innovatsiyalarning ahamiyati va ularning iqtisodiy samaradorligining o'zbekiston qishloq xo'jalik mahsulotlarini qayta ishlashdagi roli .....	57
<b>Raximov Baxromjon Ibroximovich, Solohiddinov Nuriddin Sirojiddin o'g'li</b>	
Bino va inshootlarni zilzilabardoshligiga oid nazariyalar.....	62
<b>Jalilov Ahmadbek Ikromjon o'g'li</b>	
Soliq to'lovchilarning majburiyatlari bajarilishini konseptual asoslari va shartlari asoslari xususida .....	66
<b>Abdusherozov Abdullo Baxtiyorovich</b>	
The Analysis of the Psychophysiological Condition of Children With Mental Disorders and the Creation of Comfort Through Designed Clothing .....	73
<b>Asatilaeva Lola Muratjon qizi, Muminova Umida Tokhtasinovna</b>	



# THE ANALYSIS OF THE PSYCHOPHYSIOLOGICAL CONDITION OF CHILDREN WITH MENTAL DISORDERS AND THE CREATION OF COMFORT THROUGH DESIGNED CLOTHING

**Asatilaeva Lola Muratjon qizi**

Doctarant Textile and Light Industry Institute

**Muminova Umida Tokhtasinovna**

DSc, professor. Textile and Light Industry Institute

**Abstract:** This article discusses the fact that there are many diseases and diagnoses in the world, one of which is the diagnosis of “mental disorder” in children. It highlights the importance of choosing clothes based on the child’s psychological state. The article describes the reasons why children with autism may dislike dressing: sensitivity to sensory stimuli, the need for certain movements or clothing routines, difficulties in communication, and motor skill challenges.

**Keywords:** autism, clothing, climate, fabric, sensory sensitivity, behavioral routine, communication difficulty

**Annotatsiya:** Ushbu maqolada dunyoda ko‘plab kasallik va tashxislar mavjudligi, ulardan biri bolalarda uchraydigan “ruhiy buzilish” tashxisi ekani muhokama qilinadi. Unda bolaning psixologik holatiga qarab kiyim tanlash muhimligi ta’kidlanadi. Maqolada autizm bilan yashovchi bolalarning kiyinishga nisbatan salbiy munosabatining sabablari yoritiladi: sezgi ta’sirlariga haddan tashqari sezuvchanlik, muayyan harakatlar yoki kiyinish odatlariga ehtiyoj, muloqotdagi qiyinchiliklar hamda harakat koordinatsiyasidagi muammolar.

**Kalit so‘zlar:** autizm, kiyim-kechak, iqlim, mato, sezuvchanlik, xatti-harakat odati, muloqotdagi qiyinchilik

**Аннотация:** В статье рассматривается тот факт, что в мире существует множество заболеваний и диагнозов, одним из которых является «психическое расстройство» у детей. Подчеркивается важность выбора одежды с учетом психологического состояния ребенка. Также описываются причины, по которым дети с аутизмом могут не любить одеваться: чувствительность к сенсорным раздражителям, потребность в определённых движениях или одежде, трудности в общении и моторные нарушения.

**Ключевые слова:** аутизм, одежда, климат, ткань, сенсорная чувствительность, поведенческая рутина, трудности общения

## INTRODUCTION

In recent decades, there has been growing awareness of the complex interplay between mental health and physiological well-being in children with mental disorders. These children often experience heightened sensitivity to external stimuli, including tactile discomfort, temperature regulation issues, and stress reactions to clothing materials and fit. The psychophysiological condition of children with mental disorders requires careful, multidisciplinary attention—not only from medical professionals and caregivers but also from designers and textile engineers who create their everyday environments.

The integration of comfort-enhancing features in clothing design can significantly impact the quality of life for children with mental disorders. By addressing both functional and emotional needs through thoughtful garment construction, it is possible to reduce irritability, anxiety, and behavioral disturbances caused by inappropriate clothing. In this context, the present study aims to analyze the psychophysiological characteristics of children with mental disorders and propose design-based clothing solutions that promote comfort, well-being, and inclusion.

## LITERATURE REVIEW

A considerable body of literature highlights the correlation between clothing comfort and psychological health in individuals with cognitive and sensory processing disorders. According to Dunn (2001), children with

sensory integration dysfunction often show adverse reactions to certain fabrics, seams, tags, and tightness, which can lead to behavioral outbursts or withdrawal. Researchers such as Reynolds and Lane (2008) emphasize that sensory-adaptive environments—including wearable textiles—can mitigate overstimulation and support emotional regulation.

Studies by Kinnealey et al. (2012) and Schaaf & Blanche (2011) further demonstrate how physiological markers such as heart rate variability, skin conductance, and muscle tension can fluctuate based on clothing-related stimuli in children with autism spectrum disorders (ASD) or ADHD. Consequently, researchers have called for interdisciplinary efforts to create clothing that aligns with the sensory and cognitive needs of this demographic.

On the design front, professionals have begun experimenting with flat seams, tagless labels, organic materials, and compressive features inspired by therapeutic garments (Grandin, 1992; Watling & Hauer, 2015). Smart textiles embedded with biometric sensors are also emerging as tools for real-time monitoring of children's stress responses and discomfort levels, opening new avenues for adaptive clothing solutions.

Despite this progress, there remains a gap in practical implementation and widespread availability of such specialized clothing. Much of the existing literature is concentrated in Western contexts, with limited research tailored to diverse cultural and climatic environments. This study addresses that gap by focusing on the design of comfort-enhancing clothing for children with mental disorders within specific sociocultural contexts, informed by psychophysiological insights.

## METHODOLOGY

This study employs a mixed-methods research approach, combining both qualitative and quantitative methodologies to analyze the psychophysiological conditions of children with mental disorders and to develop corresponding clothing design solutions that enhance comfort.

### Participants

The study sample included 30 children aged 6 to 12 years diagnosed with mental disorders such as autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), and intellectual disability. The participants were selected in collaboration with pediatric neuropsychology centers and special education schools. Informed consent was obtained from parents or legal guardians in accordance with ethical research guidelines.

### Data Collection Instruments

#### 1. Psychophysiological Assessments:

- Heart rate variability (HRV), skin conductance levels (SCL), and electromyography (EMG) were measured to assess physiological responses to various textile stimuli.
- Measurements were conducted using wearable biometric sensors while participants were exposed to a range of textile samples (cotton, wool, synthetic blends, etc.).

#### 2. Behavioral Observations:

- A structured behavioral checklist was used to record observable reactions (e.g., fidgeting, vocal outbursts, avoidance) during interaction with different garment types.
- Observations were conducted in controlled classroom-like environments over three 45-minute sessions.

#### 3. Parental and Teacher Interviews:

- Semi-structured interviews were conducted to gather subjective data on children's comfort preferences, clothing aversions, and behavioral patterns related to garment use.

#### 4. Clothing Prototype Testing:

- Based on collected data, a series of prototype garments were designed, incorporating features such as seamless construction, soft organic fabrics, tagless labels, and adjustable pressure zones.
- Children wore the garments during a two-week trial period, with daily comfort ratings recorded using a simplified Likert scale (assessed by caregivers).

### Data Analysis

- Quantitative data from biometric sensors were analyzed using SPSS software to detect correlations between physiological stress markers and textile types.
- Qualitative data from interviews and observations were coded thematically using NVivo to identify recurring comfort-related themes.
- A comparative analysis was conducted to evaluate behavioral and physiological differences before and after the introduction of prototype garments.

### Ethical Considerations

The study was approved by an institutional ethics committee. All procedures adhered to child protection guidelines, ensuring minimal stress exposure and full confidentiality of participants. Caregivers were informed about the voluntary nature of participation and were allowed to withdraw at any point.



## RESULTS AND DISCUSSION

Autism spectrum disorders in preschool and early school-age children are becoming an increasingly relevant issue in modern pediatrics and psychology. Since the introduction of the term “autism spectrum disorders” by Lorna Wing in 1995, there has been a steady increase in the number of children diagnosed with this condition. According to official data from the World Health Organization, the prevalence of autism spectrum disorders reaches approximately 1% of the child population, with boys being affected more frequently than girls. In Uzbekistan, as in other countries, there has been an increase in the number of identified cases of autism, although accurate statistics are difficult to obtain due to an underdeveloped system of early diagnosis and record-keeping. The issue of social adaptation and improving the quality of life for children with autism spectrum disorder is becoming particularly important. An important factor in ensuring a child's comfort is their clothing. Properly selected and designed clothing that takes into account the child's individual characteristics can reduce sensory stress, improve emotional well-being, and facilitate daily activities both at home and in group settings. This chapter presents an analysis of the psychophysiological characteristics of children aged 3 to 10 with autism spectrum disorders and explores ways to create comfortable conditions for them through specific clothing design requirements. Autism spectrum disorders represent a complex developmental condition that affects several areas simultaneously: social interaction, communication, behavior, and the sensory domain [2].

Figure 1: Child's dislike for new clothes



Children aged 3 to 10 with autism often experience difficulties in interacting with others: they may avoid eye contact, not respond to their name, and have trouble engaging in play with peers. Speech development is often atypical: some children have delayed speech, while others exhibit echolalia (repetition of phrases) or possess a formally developed vocabulary without meaningful communication. Their behavior is typically characterized by stereotypical (repetitive) actions and a narrow range of interests.

Children with mental disorders may spend hours engaged in repetitive activities, become attached to specific routines and daily schedules, and react painfully to any changes. The diagnosis of autism spectrum disorders usually becomes possible during the preschool years, when behavioral characteristics become more



apparent. The main diagnostic indicators include the child's social withdrawal and stereotypical behavior. Additionally, children often exhibit limited patterns of activity and interests, as well as a deficit in imagination. Unlike in earlier years, when sensory characteristics were not included among the criteria, unusual responses to sensory stimuli (either hypersensitivity or hyposensitivity) are now considered an important diagnostic feature of mental disorders. This is reflected in the current definition: according to the DSM-5 (2013), autism is characterized not only by communication and behavioral impairments but also by atypical responses to sensory input, ranging from heightened to reduced sensitivity [3]. Many children with autism exhibit hypersensitivity to sounds, light, touch, taste, and smell, or, conversely, reduced responsiveness to strong stimuli. Modern research shows that over 90% of children and adults with autism experience sensory impairments that affect their daily lives. A characteristic feature is so-called fragmented perception: the child "sees the leaves but does not notice the tree" — focusing on details while missing the overall picture. For example, their attention may be drawn to a rotating part of a toy (such as the propeller blades), while the toy as a whole does not interest them. This reflects impaired holistic processing of images, with difficulties in the analysis and synthesis of perception.

A child with a mental disorder often finds it difficult to navigate new environments; some children show poor orientation even in familiar settings, although in certain cases (especially with severe forms of autism), spatial orientation may be relatively preserved. Hypersensitivity manifests in the fact that ordinary stimuli can cause overload in such a child: bright lights, loud noises, crowds of people — all of these can lead to increased anxiety or panic. Tony Attwood noted the effect of sensory overload in children with verbal communication disorders, particularly those with Asperger's syndrome.

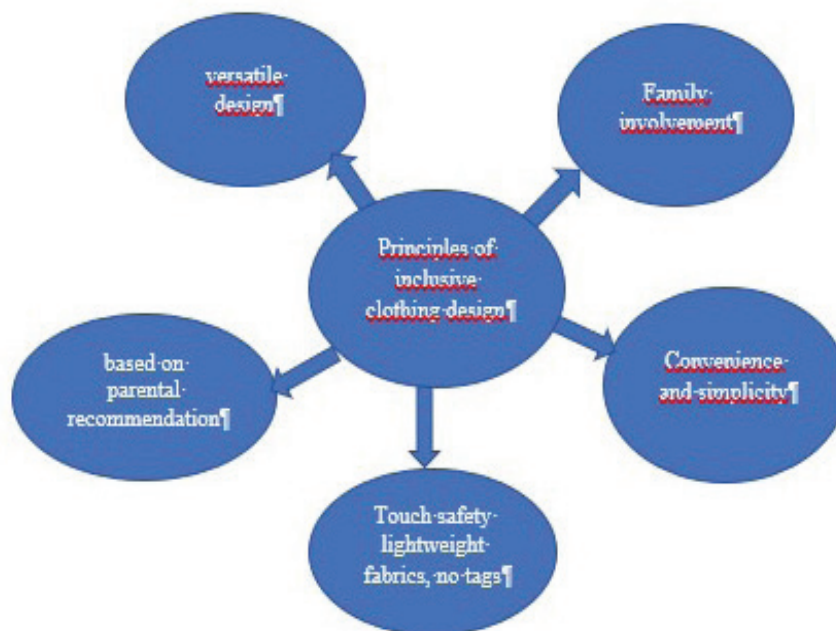
Sensory overload is often caused by the accumulation of multiple stimuli: flickering fluorescent lights, an abundance of bright colors, background noises — all of which can overwhelm a child's nervous system. At the same time, children with special needs may exhibit opposite reactions — sensory hyposensitivity: a lack of response to pain, cold, or loud sounds. In such cases, children seek additional stimulation — for example, by engaging in repetitive movements, vocalizing loudly, or even causing themselves pain just to feel a signal from their own body. Together, sensory characteristics make the world of a child with autism unpredictable and full of irritants; it is extremely important to create conditions for a controlled sensory environment where the amount and type of stimuli are carefully adjusted to the child's abilities. Sensory impairments in children with autism directly affect how they perceive their clothing. Many children with ASD are highly sensitive to tactile sensations, so details of garments that are usually considered insignificant can cause them significant discomfort. For example, an inner label on a collar or a rough seam on a sock can distract the child, irritate the skin, and trigger a negative reaction.

Parents often note that their child categorically refuses to wear clothing made from certain fabrics—such as wool or synthetic materials—that feel scratchy or "itchy" to them. Similarly, some children cannot tolerate tight or form-fitting clothes: narrow necklines, tight cuffs, and stiff waistbands may cause panic or tantrums when dressing is attempted. One sign of a sensory issue is when a child throws a fit trying to put on new clothing or insists on wearing the same "familiar" outfit every day. This behavior is also linked to a need for sameness: a favorite T-shirt or shorts become a kind of "comfort zone" for a child with autism, a predictable element in the sensory chaos of their surrounding world.

Some children, on the other hand, seek certain sensory sensations from their clothing. For example, some children feel calmer when their clothes fit snugly, almost like a gentle hug—they prefer wearing tight-fitting shirts, leggings, or even compression vests. The pressure on their body has an organizing effect, improves their body awareness in space, and reduces anxiety. Other children prefer layering—wearing several sweaters or two pairs of pants—because it makes them feel more secure. However, a significant number of children with autism cannot tolerate tight or restrictive clothing and prefer loose, baggy clothes. According to parent surveys, most of these children favor roomy garments they can literally "bury" themselves in. A wide hood pulled over the eyes, long sleeves covering the hands—these features give the child a way to shield themselves from excessive stimuli, reducing visual and tactile overload, especially in public places. Thus, clothing often serves as a form of self-regulation for a child with ASD: through it, they either seek missing sensations (such as pressure or warmth) or protect themselves from excessive ones (such as light, touch, or unwanted attention). It is important to note that clothing-related issues in children with autism can also manifest during the process of dressing and undressing. Thus, the perception of clothing by children with ASD is characterized by heightened demands for comfort and sensory consistency. Any element that causes physical discomfort (such as a scratchy tag or rough fabric) or disrupts familiarity can lead to the child refusing to wear the clothing or becoming tense and anxious. On the other hand, properly chosen clothing can become a "sensory refuge" for these children—a means to reduce stress and feel safe. For this reason, increasing attention is being given to creating sensory-friendly clothing adapted to the special needs of children with autism.

**Scheme 2: Principles of Inclusive Clothing Design**





Climatic Conditions. Uzbekistan has a sharply continental climate, characterized by hot, dry summers and cold winters. In many regions, summer temperatures regularly exceed  $+40^{\circ}\text{C}$ , with strong sunlight and little precipitation. In winter, especially in central and northern areas, temperatures can drop below  $0^{\circ}\text{C}$ , with frosts and cold winds. Such extremes require a thoughtful approach to clothing in general, and particularly for children with sensory sensitivities. In hot climates, overheating and heat stress pose a risk to any child, but a child with autism may not communicate in time that they are feeling uncomfortable or unwell, or may react inappropriately (for example, by removing all their clothes outdoors). Therefore, summer clothing should be as lightweight as possible and made from breathable fabrics to prevent overheating and skin irritation caused by sweat. Natural materials such as cotton, linen, and viscose are optimal, as they allow air circulation and wick moisture away effectively.

Fortunately, Uzbekistan is one of the largest producers of cotton, and cotton fabrics have traditionally been widely used in clothing. Cotton is considered one of the most comfortable materials: it is soft, hypoallergenic, and most children with ASD tolerate it well. Research on sensory preferences has shown that neutral-feeling fabrics like cotton evoke a sense of comfort and “neutrality” in individuals with autism—they neither distract nor irritate. At the same time, rough, scratchy materials (such as unlined woolen fabric) are almost universally rejected—up to 90% of participants with autism in one study found samples of coarse fabric completely unacceptable. Therefore, for the hot weather in Uzbekistan, it is recommended to wear light-colored, loose-fitting clothing made of thin cotton or linen, without unnecessary layers or decorations, to minimize heat and tactile irritation on the skin. It is also advisable to protect the child from direct sunlight with a lightweight cotton hat, but it should be soft (for example, a bucket hat without a stiff chin strap, especially if the child cannot tolerate pressure on the chin). In winter, the situation is reversed: it is important to prevent hypothermia. However, children with autism may resist wearing multiple layers and heavy winter clothing. Hats, scarves, and mittens often provoke protests due to sensations of tightness, itchiness (especially with woolen items), or simply unfamiliarity. A child may remove their hat or unzip their jacket in the cold without understanding the consequences. Therefore, it is the responsibility of parents and specialists to select a winter wardrobe that provides warmth while remaining comfortable to wear. It is recommended to use modern lightweight materials: instead of bulky wool sweaters, opt for fleece jackets (fleece is soft, elastic, and non-itchy); instead of heavy down coats, choose lighter jackets filled with synthetic insulation like thin holofiber or synthetic padding, which do not restrict movement. It is better to dress in several thin layers rather than one thick layer, as this allows easier regulation of temperature comfort and the ability to remove a layer if the child feels too warm. For example, you can dress the child in a cotton turtleneck (the first layer, comfortable against the skin), then add a fleece sweatshirt (the second, insulating layer), and finally a windproof jacket. If the child cannot tolerate scarves, a turtleneck with a high collar or a soft knitted neck gaiter (buff) can be used to protect the neck. For those who

dislike mittens, a compromise can be made with sweatshirts that have extended sleeves covering part of the hand, as mentioned earlier, or fingerless gloves. Winter footwear should also be comfortable: preferably with Velcro fasteners instead of laces, insulated but lightweight.

The entire winter outfit should be introduced gradually, possibly at home in small increments, so the child can get used to the sensations before going out into the cold. Based on the features discussed, recommendations can be formulated for the design and selection of clothing that ensures psychophysiological comfort for children with autism spectrum disorders. These recommendations are intended not only for children's clothing designers but also for parents, educators, and everyone involved in creating comfortable conditions for a child with ASD.

**Selection of soft and hypoallergenic fabrics.** Preference should be given to natural or high-tech sensory-friendly materials. Cotton and cotton-based knit fabrics lead in comfort—they are soft, “neutral” to the touch, and breathable. Thin merino wool (if the child tolerates wool) or cashmere can also be suitable in cold weather, as these materials are softer than regular wool. Rough, scratchy fabrics and textures with pronounced relief should be avoided. Any fabric that causes itching or irritation is unacceptable.

It is helpful to consider the tactile comfort coefficient of fabrics—scientific literature includes studies on how people with autism perceive different materials. For example, cotton received high comfort ratings, while spandex was rated very low due to its rubbery feel and constriction. Using soft fabrics can contribute to a more positive emotional experience and overall well-being. The thermal insulation properties of clothing primarily depend on the thermal conductivity of the fabrics. This, in turn, is influenced by factors such as porosity, fabric structure, fiber type, and the weave. Thick and soft fabrics contain numerous gaps between the fibers, where air is trapped air being a poor conductor of heat [4].

**Clothing construction without internal irritants.** Clothes should be designed with hypersensitive skin in mind: flat seams, no protruding threads, and no internal tags are essential requirements. Seams are better placed on the outside or covered with a soft tape on the inside. Size and care labels should be printed directly onto the fabric during manufacturing (thermal application) or made easily removable to avoid cutting them off with scissors, which can leave sharp edges. All buttons, rivets, zippers, and other hardware that come into contact with the body must have protective flaps or soft linings. For example, a jacket zipper should have an inner fabric strip to prevent chin scratches. Avoid any stiff lace or mesh that can irritate the skin. Even the choice of threads matters—sewing threads should be soft; special soft braided threads exist specifically for children's clothing.

**Comfortable fit that considers the need for either freedom or gentle pressure.** There is no one-size-fits-all solution: some children prefer loose clothing, while others like it snug. Therefore, adjustability is optimal. A good example is sports hoodies with a neutral cut but an adjustable drawstring at the hem: the child can slightly tighten the bottom to feel gentle pressure around the hips or wear it loose. Similarly, a hood with fasteners can allow the child to cover their head and part of their face, creating a sense of privacy.

In general, for most children with ASD, a looser, non-restrictive cut made from soft, stretchy materials is recommended. Such fabrics can gently fit the body without being tight or baggy (e.g., elastic knits). Clothing should avoid rough, tight cuffs and narrow necklines—better to use elastic ribbing or adjustable fasteners. A layered approach works well: instead of one thick, dense garment, use several thin, tactilely pleasant layers. This way, the child can remove an extra layer if they feel discomfort.

**Ease of putting on and taking off.** Considering motor difficulties, clothing should be designed to be as functional and simple to handle as possible. Fastenings should be limited to only the essentials and must be easy to fasten and unfasten.

The ideal options are Velcro, snaps, and elastic bands. Laces, complicated buckles, and numerous buttons are undesirable. If buttons are unavoidable (for example, on a shirt), it's best to choose large buttons with wide buttonholes or use decorative buttons while placing the actual fastening under a Velcro flap. Pants are better made with an elastic waistband rather than a zipper and button. Outerwear should use large plastic zippers with easy-to-grip pulls that a child can handle. Overall, clothing should be designed so that the child can at least partially dress independently without unnecessary stress. This increases their autonomy and reduces negative experiences during dressing.

**Special sensory elements.** A modern approach in adaptive clothing design includes features that help children with ASD self-regulate. For example, seams or special pockets can hold weights—thin bags filled with sand or removable plates. Weighted vests or shoulder capes like these are already used in sensory therapy: a small, even weight provides a sense of stability and reduces anxiety. Studies show that compression and weighted sensory vests can improve a child's concentration and engagement in activities.

It is important that these items are tailored to the specific child and used in moderation (some children do refuse to wear them—about 10% in one study did not accept sensory clothing). Additionally, tactile toys or stimulation elements can be incorporated into the clothing—for example, small soft “pompoms” or patches of various textures sewn onto the sleeve ends, which the child can play with to help soothe themselves.



Designer Anna Lychagina, in her project “Sensoria,” employed an interesting approach—voluminous soft padded cushions on the sleeves of hoodies that imitate the tactile sensation of water droplets. These elements not only decorate the clothing but also allow the child to squeeze and press them—essentially serving as built-in stress-relief toys. At the same time, the garment does not look like a medical device, remaining stylish and attractive, which is also important for social integration. Aesthetics and personalization. While comfort is the top priority, the appearance of the clothing also matters. A child with ASD should not feel “different” in a negative way because of their clothing. Therefore, adaptive clothing should look as normal and ordinary as possible, while still reflecting the child’s own style and fashion preferences.

For example, allow the child to try wearing different T-shirts and ask which one they like best. Even if the child is nonverbal, they will show their choice through their actions (taking off uncomfortable clothes, smiling, or being calm in comfortable ones). This approach not only ensures a better fit for their needs but also gives the child a sense of control, which reduces stress. Preschool and early school-aged children with autism spectrum disorders have pronounced psychophysiological characteristics that affect their behavior, perception, and interaction with the world around them. Sensory hyper- and hyposensitivity, stereotyped behaviors, difficulties in emotional contact, and motor impairments — all these traits must be taken into account when organizing living and learning conditions for such children. One of the important factors influencing the well-being of a child with ASD is their clothing and the comfort associated with it. Analysis shows that improperly selected clothing (in terms of material, cut, details) can become a strong stressor for an autistic child, whereas thoughtfully designed and adapted clothing, on the contrary, can serve as a source of calmness and confidence. Without appropriate support, these conditions often limit the ability of such children to access educational and social opportunities accepted by others. Their caregivers must remain constantly attentive and present. Nevertheless, most children with developmental mental disorders and their families are unable to receive the necessary care and support. Providing this care can significantly improve the well-being of both caregivers and children [5].

In the context of Uzbekistan, issues of sensory comfort in clothing are compounded by climatic and social factors. Extremely hot summers and cold winters require a special approach to fabric selection and layering of clothes, while cultural norms (such as wearing school uniforms) impose additional constraints. During the work on this chapter, recommendations were developed for designing and selecting clothing for children with autism, taking into account their psychophysiological needs and local conditions. Key recommendations include: using soft natural fabrics, eliminating irritating elements (such as seams and labels), providing a loose and comfortable fit with adjustability, simplified fastenings, and incorporating special sensory elements that enhance comfort and help the child self-regulate. Equally important is involving the child in the process of choosing and getting used to the clothing, as well as educating those around about the child’s needs (whether special clothing or allowances in dress code)

## CONCLUSION

Creating a comfortable sensory environment through properly selected clothing is an effective way to improve the psychophysiological state and daily functioning of children with ASD. According to research findings, even seemingly external factors such as the fabric of clothing can significantly impact the well-being of a person with autism. By understanding and taking this into account, society can take a step toward a more inclusive world—where children with developmental differences feel safe and comfortable, including thanks to clothing that does not constrain but supports them. A comprehensive approach that combines knowledge from psychology, special education, and clothing design will enable the development of solutions that enhance the quality of life for these special children and facilitate their integration into society.

### List of used literature

1. “Correction of Psychophysiological Characteristics in Children Aged 5–7 with Autism Spectrum Disorder” <https://cyberleninka.ru/article/n/korreksiya-psihofiziologicheskikh-osobennostey-detey-5-7-let-s-rasstroystvom-autisticheskogo-spektra/viewer>
2. The article by E. G. Ogoltsova and A. A. Panurovskaya titled “Psychological Features of Preschool Children with ASD” (published in *Young Scientist*, 2022, No. 4 (399), pp. 358–361) discusses the distinctive cognitive, emotional, and behavioral characteristics of preschool-aged children with Autism Spectrum Disorder. It emphasizes the importance of early diagnosis and individualized psychological and pedagogical support to foster communication, emotional understanding, and social development.
3. *Autism Dev Disord.* 2021 Jul 21;53(4):1495–1508. doi: 10.1007/s10803-021-05140-3 Clothes, Sensory Experiences and Autism: Is Wearing the Right Fabric Important Chrysovalanto Kyriacou 1, Rachel Forrester-Jones 2, Paraskevi Triantafyllou
4. Michael Ogundele “Behavioral and Emotional Disorders in Childhood” *pediatricians Brief for “* <https://scholar.google.com/scholar>
5. <https://www.who.int/teams/mental-health-and-substance->



# **muhandislik** **& iqtisodiyot**

ijtimoiy-iqtisodiy, innovatsion texnik,  
fan va ta'limga oid ilmiy-amaliy jurnal

**Ingliz tili muharriri:** Feruz Hakimov

**Musahhih:** Zokir Alibekov

**Sahifalovchi va dizayner:** Iskandar Islomov

---

**2025. № 6**

---

© Materiallar ko'chirib bosilganda "Muhandislik va iqtisodiyot" jurnali manba sifatida ko'rsatilishi shart. Jurnalda bosilgan material va reklamalardagi dalillarning aniqligiga mualliflar ma'sul. Tahririyat fikri har vaqt ham mualliflar fikriga mos kelamasligi mumkin. Tahririyatga yuborilgan materiallar qaytarilmaydi.

"Muhandislik va iqtisodiyot" jurnali 26.06.2023-yildan  
O'zbekiston Respublikasi Prezidenti Adminstratsiyasi huzuridagi  
Axborot va ommaviy kommunikatsiyalar agentligi tomonidan  
№S-5669245 reyestr raqami tartibi bo'yicha ro'yxatdan o'tkazilgan.  
**Litsenziya raqami: №095310.**

**Manzilimiz: Toshkent shahri Yunusobod  
tumani 15-mavze 19-uy**





+998 93 718 40 07



<https://muhandislik-iqtisodiyot.uz/index.php/journal>



[t.me/yait\\_2100](https://t.me/yait_2100)