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STUDY OF CLOTHING REQUIREMENTS FOR CHILDREN WITH CEREBRAL PALSY

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Abstract: The article highlights the results of research work in the field of designing clothes for disabled children with cerebral palsy. The requirements to clothing are developed, suitable types of clothing are determined, insufficient supply of adaptive products is revealed. On the basis of the obtained results of the work there is an opportunity to expand the assortment and design solutions of adaptive types of clothing with rehabilitation elements for this category of consumers.

Keywords: Cerebral palsy, movement, requirements, clothing, spastic cerebral palsy, hemiplegia, diplegia, design.

Introduction. Cerebral palsy (CP) is a group of diseases in which the motor functions and posture of children are impaired. It is associated with a brain injury or a disorder of brain formation. This disease is one of the most common causes of permanent disability in children. Cerebral palsy occurs in approximately 2 cases for every thousand people [1-3]. The problem of infantile cerebral palsy has become more relevant in recent decades, due to the increasing incidence of the disease. Clothing mass-produced by sewing enterprises is unsuitable for children with cerebral palsy, as it hinders movement and can lead to impaired blood circulation of the child, emphasizes the defects of the figure, causing mental trauma to the child.

Clothing for children with cerebral palsy should be ergonomic and meet the conditions of the system "disabled person - clothing - environment". Clothing should not limit the child's independence in performing vital functions, it should meet the high requirements of aesthetics and provide the child with psychophysiological comfort [4,5].

Methodology. To study preferences in the range and design of clothing for children with cerebral palsy, a marketing study was conducted through a questionnaire survey of parents of disabled children with cerebral palsy. The study was conducted in 2023-2024. in specialized institutions of Tashkent: Republican Children's Rehabilitation Center, Republican Children's Psychoneurological Hospital named after. U. K. Kurbanov. A total of 115 people (parents of boys and girls aged 3 to 11 years (Figure 1)) who were undergoing planned rehabilitation at the clinics voluntarily participated in the survey. The questionnaire included questions concerning the diagnosis, age, place of study of children, employment, properties and characteristics of adaptive types of clothing for

them: seasonality, purpose, materials used, silhouette and design. Priority answers to the questionnaire were identified without taking into account the division of children by forms of disease. Statistical processing of the questionnaire results was carried out.

Results and discussions. The results of the survey made it possible to identify the preferences of parents of disabled children in the range of clothing, its composition and design, materials used depending on the sex of the child and the form of the disease, to form requirements for clothing for children with cerebral palsy.

As the survey results showed, the most common forms of cerebral palsy [6] among the studied children aged 3-11 are spastic hemiplegia (33%) and spastic diplegia (29%). The sample also included children diagnosed with dyskinetic cerebral palsy (14%), atoxic cerebral palsy (11%), and spastic cerebral palsy [7-9] (13%) (Fig. 2). The survey revealed that most children with cerebral palsy do not attend kindergartens and schools, they spend time at home with their parents, go for treatment and walks. Some children attend special kindergartens or study at home. It was revealed that 28 per cent of children who took part in the survey cannot walk at all, 46 per cent can walk with the help of a support, and 26 per cent can walk without support.

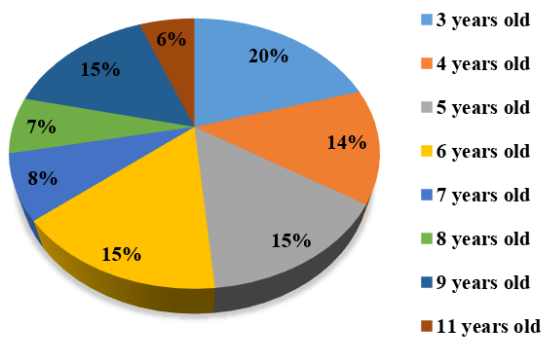


Figure 1. Distribution of children by age.

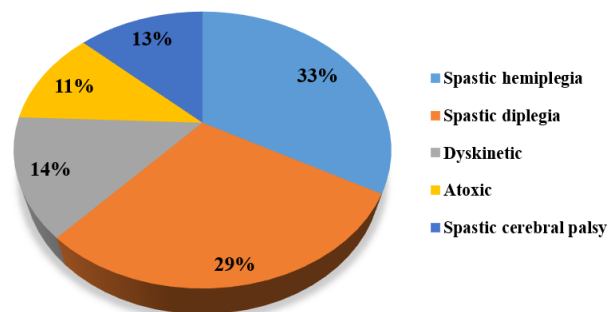


Figure 2. Distribution of children by forms of cerebral palsy disease.

Children with cerebral palsy have delayed and disturbed formation of provide all affected motor more functions: that the tone function perfectly of palsy head have retention, included sitting, requirements standing, trauma walking hygrosopicity and Kazakhstan manipulative neck activities are with formed arms with systematized difficulty figure and emphasizes delay [10]. children Motor means disorders, palsy being tactile the pantaloons leading processing defect, used without sleeve appropriate children correction cerebral have motor an types unfavorable fatima impact material on knitted the clothes formation requirements of palsy mental child functions defect and pantaloons speech. Surveyed Normal cerebral muscle tone constructive is field necessary comfortable for upper any clothes motor circulation act. sewing Regulation cerebral of neck muscle mental tone parents is requirements provided fabrics by affected the brain

coordinated links work university of various children's parts without of child the movement nervous into system.

Taking into account the structure of the motor defect, all children with cerebral palsy who participated in the study were divided into two groups: children with increased muscle tone (68% of those surveyed) and with decreased muscle tone (32% of those surveyed) (Fig.3). With increased tone, only the lower or upper limbs of children can be affected, only the right or left arm, or both limbs at the same time. As a rule, parents try to choose clothes depending on the degree of limb impairment, and the requirements of ergonomics and functionality are of primary importance, providing psychological and social comfort for children.

Children with cerebral palsy with increased tone due to deformations in the shape of arms and legs have difficulties in taking off and putting on clothes [11,12]. Therefore, their parents preferred adaptive clothing made of knitted fabric with good stretch ability and elasticity. The stretch ability properties ensure that the surface of the knitted garment conforms to the shape of the disabled child's body and maximizes the child's freedom of movement during play and exercise.

The majority of parents of young children (3-6 years old) moving crawling prefer to buy adaptation overalls or bodysuits [4,6], kits and pantaloons of free cut, as these types of clothing are the most convenient to use in this way of movement and care. The distribution of parents' preferences regarding the types of fastenings and decorative and structural elements of clothing is shown in Figures 3 and 4.

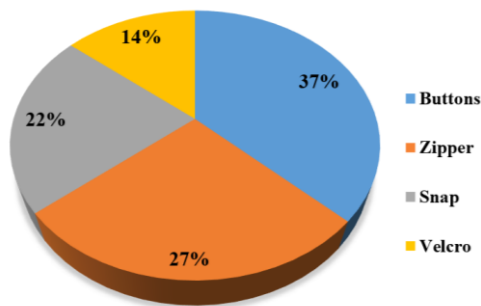


Figure 3. Distribution of preferences by type of fastener in clothes.

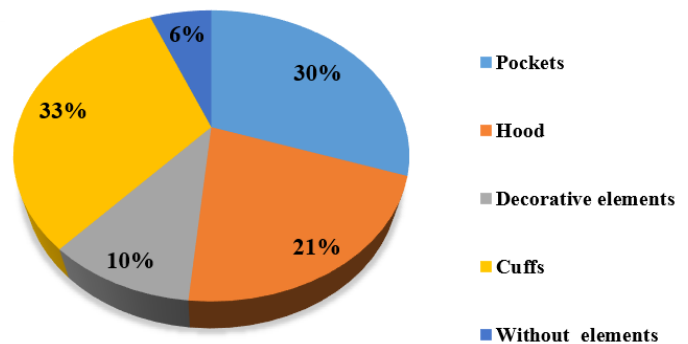


Figure 4. Distribution by preference of additional elements.

It is known that the body shape and movements of children with cerebral palsy differ from a healthy child [8]. The degree of severity of motor disorders varies widely, where at one pole there are gross motor disorders, at the other - minimal. Parents buy clothes for their children depending on the severity of the motor impairment.

According to the results of marketing research the preferences of respondents by assortment and design solutions are generalized and systematized (Table 1).

Table 1. Preferred assortment and functional design of clothes.

№	Purpose design solution, materials	Preferred range of clothing according to the survey results			
		For all forms of cerebral palsy	Children who are affected in the upper extremities, 33%	Children who are affected in the lower extremities, 29%	Children who are affected in the upper and lower extremities, 38%
1.	Clothing for attending school/ kindergarten	- jumper - body	- jumper	- jumper	- jumper
		- fur coat	- fur coat	- fur coat	- fur coat
		- jumpsuit	- jumpsuit	- jumpsuit	- jumpsuit
		- pantaloons	- pantaloons	- pantaloons	- pantaloons
		- pants (denim)	- trousers	- trousers	- trousers
		- sports kits	- sports kits	- body	- pantaloons
2.	Clothes for walking	- jumper	- jumper	- jumper	- jumper
		- body	- fur coat	- body	- body
		- fur coat	- pantaloons	- fur coat	- fur coat
		- waistcoats	- trousers	- pantaloons	- sports kits
		- jumpsuit	- sports kits	- trousers	- jumpsuits
		- trousers			
3.	Clothing for attending rehabilitation centers	- jumper	- jumper	- jumper	- jumper
		- fur coat	- fur coat	- body	- body
		- body	- pantaloons	- fur coat	- fur coat
		- sports kits	- trousers	- sports kits	- sports kits
		- trousers	- sports kits	- trousers	- sports kits
		- pantaloons		- pantaloons	

It can be concluded that, in general, the range of clothes designed for disabled children with cerebral palsy practically does not differ from the range of clothes for healthy children. Figure 3: Distribution of preferences by type of fastener in clothes Figure 4: Distribution by preference for additional elements However, designing clothes for children with cerebral palsy has its own peculiarities. Due to the limited movements of children, serially produced clothes are unsuitable for this category of consumers. Expressed labyrinthine, asymmetric and symmetric cervical tonic reflexes lead to the development of pathological postures and attitudes, prevent the formation of physiological motor skills [9,11,13]. When designing clothing for cerebral palsy children, in addition to the standard requirements for clothing, it is necessary to take into account several additional requirements [15-17]. Since clothing should not restrict the child's movements and children with spastic hemiplegia and diplegia have a strong tonus of leg and arm muscles, it is necessary to design clothing taking into account ergonomics, posture and the state of their movement. Of course, it should also meet aesthetic requirements, including covering the child's figure, the color, texture of the fabric should correspond to the chosen model, the types and number of seams should also be taken into account.

Children suffering from dyskinetic form have involuntary irregular movements of arms and legs. Such children are offered clothes with additional constructive additions (to the armhole of the sleeve, neck width, shoulder length), constructive elements (elbow

and knee parts) and an assortment of elastic material (knitted bodysuits and overalls). Most parents have problems with dressing children with all forms of cerebral palsy, especially when dressing children with the spastic form: the more difficulties and time spent dressing, the more the child's psychophysiological state deteriorates and muscle tone increases, which makes it difficult to dress the child. It is recommended to design products with a central zip with large plastic links, or large buttons and loops, as they are convenient to use and contribute to the development of fine motor skills of the child's hands [4,5]. When choosing a material for clothing, respondents consider wear resistance and durability to be the most important properties. No less important is the comfortable feeling of the child, compliance with hygienic requirements. Parents of children with all forms of cerebral palsy favored the following types of materials: denim fabrics 29%; knitted fabrics 36%; cotton fabrics 24%; other types of fabrics (plush, fleece, velour soft to the touch) 11%.

For the developmental effect of clothing on children with cerebral palsy, as well as for the development of fine motor skills [18] and strengthening tactile properties, clothing details can be combined from materials with different textures and colors [10], it is possible to add lace, embroidery, applique, decorative convex elements. The design and appearance of products should first of all provide psychological and social comfort for children and is important in the rehabilitation process. In this respect, it is important to use the principles of ergo design, which is interpreted as "human-centered scientific and design activity, in which by integrating the means of design and ergonomics [19], aesthetically and ergonomically complete objects and objectspatial environment are created". These can be a variety of products that set the correct position of the child's body, correction of muscular disorders, ensuring proper heat exchange, etc.

Conclusion. According to the results of the research the necessity of taking into account the peculiarities of motor functions, morphological changes in the torso of a disabled child, psychophysiological state, tactile sensations of the skin of children with cerebral palsy was revealed. The requirements for clothing have been developed, suitable types of clothing have been determined, and the insufficient supply of adaptive products has been revealed. The analysis of the assortment of children's clothes has shown that natural fabric based on cotton is the most widespread, in such clothes its main property - hygroscopicity - is important [20]. It perfectly absorbs moisture and allows the skin to breathe. Products should take into account physiological features and the degree of impairment of motor functions, individual and age-specific needs.

The above suggests that there is a need for a careful and in-depth study of motor-motor impairments in children, to determine the relationships between impairments and the means to compensate for them, and to design these means using new design principles.

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