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PECULIARITIES OF THE DEVELOPMENT OF CULTURAL AND HYGIENIC SKILLS IN CHILDREN AGED 5–6 WITH AUTISM SPECTRUM DISORDER: A DIAGNOSTIC (ASCERTAINING) STUDY WITHIN THE APPLIED BEHAVIOR ANALYSIS (ABA) FRAMEWORK

Abstract: The study addresses difficulties in acquiring self-care skills among preschool children with autism spectrum disorder (ASD), which constrain functional independence and inclusion. The aim was to conduct a baseline assessment of dressing skills and identify deficit components relevant for a subsequent intervention phase. Four children aged 5–6 years with ASD (ICD-10 F84.0) participated. Within an applied behavior analysis (ABA) framework, Section P of the ABLLS-R and behavioral chain analysis (task analysis) were used. Each chain component was scored on a 0–2 scale (0 – not performed, 1 – performed with prompting, 2 – independently within 20 seconds). None of the participants demonstrated full mastery; the mean independent performance rate was 34.5%. The most prominent difficulties involved clothing spatial orientation (top/bottom, front/back) and multi-step sequencing requiring bilateral coordination. The findings support structured behavioral teaching procedures, particularly backward chaining, and highlight the practical value of baseline diagnostics for individualized goal setting.

Keywords: autism spectrum disorder; self-care skills; dressing; applied behavior analysis; ABLLS-R.

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АУТИЗМ СПЕКТРІНІҢ БҰЗЫЛЫСТАРЫ БАР 5–6 ЖАСТАҒЫ БАЛАЛАРДА МӘДЕНИ-ГИГИЕНАЛЫҚ ДАҒДЫЛАРДЫҢ ҚАЛЫПТАСУ ЕРЕКШЕЛІКТЕРІ: ҚОЛДАНБАЛЫ МІНЕЗ-ҚҰЛЫҚ ТАЛДАУЫ (АВА) ПАРАДИГМАСЫНДАҒЫ АНЫҚТАУШЫ ЗЕРТТЕУ

Аңдатпа: Зерттеудің өзектілігі аутизм спектрінің бұзылысы (АСБ) бар балаларда өзін-өзі күту дағдыларының жеткіліксіз қалыптасуы олардың функционалдық дербестігін төмендетіп, әлеуметтік бейімделуін және білім беру ортасына кірігуін қиындататындығымен анықталады. Жұмыстың мақсаты – мектеп жасына дейінгі АСБ бар балаларда киіну

дағдысының қалыптасу деңгейін анықтау және кейінгі қалыптастырушы ықпалға арналған дефицитті компоненттерді айқындау. Зерттеуге 5–6 жастағы төрт бала қатысты. Бағалау қолданбалы мінез-құлық талдауы (ABA) парадигмасында ABLLS-R шкаласының P бөлімі және мінез-құлық тізбегін талдау (task analysis) әдісі арқылы жүргізілді. Әр операция 0–2 балдық шкала бойынша бағаланды (0 – орындамайды, 1 – көмектесумен орындайды, 2 – 20 секунд ішінде өздігінен орындайды). Қатысушылардың ешқайсысы киіну дағдысын толық меңгермеген; операцияларды өз бетінше орындаудың орташа көрсеткіші 34,5% құрады. Ең үлкен қиындықтар киімнің кеңістікте бағдарлануына және көпсатылы әрекеттерді ретімен орындауға байланысты болды. Қорытындыда кері тізбек (backward chaining) сияқты құрылымдалған мінез-құлықтық әдістерді қолданудың қажеттілігі және бастапқы диагностиканың жеке оқу мақсаттарын дәл айқындаудағы маңызы көрсетіледі.

Түйін сөздер: аутизм спектрінің бұзылысы; өзін-өзі күту дағдылары; киіну; қолданбалы мінез-құлық талдауы; ABLLS-R.

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ОСОБЕННОСТИ РАЗВИТИЯ КУЛЬТУРНО-ГИГИЕНИЧЕСКИХ НАВЫКОВ У ДЕТЕЙ 5-6 ЛЕТ С РАС: КОНСТАТИРУЮЩИЙ СРЕЗ В ПАРАДИГМЕ ПРИКЛАДНОГО АНАЛИЗА ПОВЕДЕНИЯ (ABA)

Аннотация: Актуальность исследования обусловлена тем, что недостаточная сформированность навыков самообслуживания у детей с расстройствами аутистического спектра (РАС) ограничивает их функциональную самостоятельность, снижает возможности социальной адаптации и затрудняет включение в образовательную среду. Цель работы – провести констатирующую оценку сформированности навыка одевания у детей дошкольного возраста с РАС и выделить дефицитные компоненты для последующего проектирования формирующего вмешательства. В исследовании приняли участие четыре ребёнка 5–6 лет с диагнозом РАС (F84.0 по МКБ-10). Оценка выполнялась в парадигме прикладного анализа поведения (ABA) с использованием раздела P шкалы ABLLS-R и метода анализа поведенческой цепочки (task analysis). Каждая операция в цепочке оценивалась по трёхбалльной шкале: 0 – не выполняет, 1 – выполняет с подсказкой, 2 – выполняет самостоятельно в пределах 20 секунд. Установлено, что ни один участник не владеет навыком одевания в полном объёме; средний показатель самостоятельного выполнения операций составил 34,5%. Наиболее выраженные трудности выявлены в операциях, связанных с пространственной ориентацией одежды (верх/низ, перед/зад) и последовательным выполнением многошаговых действий, требующих билатеральной координации. Сделан вывод о необходимости структурированного обучения с опорой на методы формирования поведенческой цепочки, прежде всего обратной цепочки (backward chaining), а также о практической значимости базовой диагностики для индивидуализации целей и критериев вмешательства.

Ключевые слова: расстройства аутистического спектра; навыки самообслуживания; одевание; прикладной анализ поведения; ABLLS-R.

Introduction. The development of cultural and hygienic skills in early childhood is considered a fundamental prerequisite for a child’s future independence and readiness for

participation in educational activities. Self-care skills (feeding, hygiene, dressing) are directly associated with the quality of family life, the child's level of social participation, and the expansion of everyday functioning.

The dressing skill has high practical relevance, as it is repeatedly performed in daily life and requires the integration of sensorimotor coordination, spatial analysis (distinguishing "top/bottom," "front/back"), comprehension of instructions, and consistent execution of action sequences. In neurotypical children, this skill develops through natural learning and imitation, whereas in children with autism spectrum disorder (ASD), its acquisition may be significantly delayed.

Contemporary clinical and pedagogical descriptions of ASD emphasize impairments in social interaction and communication, as well as the presence of restricted and repetitive patterns of behavior. According to the ICD-10 classification, ASD belongs to the category F84 "Pervasive developmental disorders," including childhood autism (F84.0), characterized by early onset and qualitative impairments in three domains: social interaction, communication, and behavior. These features create a context in which self-care skills are often formed in a fragmented manner.

From a psycho-pedagogical perspective, children with ASD typically exhibit difficulties with generalization and transfer of skills, limited behavioral flexibility, and a high dependence on prompts. A child may understand the general instruction ("get dressed") but experience substantial difficulties in performing individual operations, particularly those requiring fine motor skills, bilateral coordination, working memory for sequence retention, and spatial discrimination of clothing elements.

Applied Behavior Analysis (ABA) conceptualizes complex skills as behavioral chains consisting of discrete, operationally defined steps organized into a meaningful sequence. Teaching such skills involves chaining procedures, including forward chaining, backward chaining, and total task presentation. The selection of a specific teaching strategy depends on the child's baseline performance and the level of acquisition of individual chain components.

International systematic reviews of early interventions confirm the effectiveness of behavioral and naturalistic behavioral approaches in improving functional outcomes in children with ASD, including adaptive behavior and daily living skills. However, variability in intervention outcomes highlights the importance of precise baseline assessment for setting realistic goals and selecting appropriate monitoring tools.

From a methodological standpoint, effective intervention requires a preliminary baseline assessment. Such an analysis identifies independent components, prompted behaviors, and critical deficit points within the skill. A widely used standardized assessment tool is the ABLLS-R (Assessment of Basic Language and Learning Skills – Revised), which includes Section P devoted to dressing skills.

The relevance of the present study lies in the need to objectively assess baseline dressing skills in preschool children with ASD within an educational setting, as well as to establish an empirical basis for designing a subsequent intervention program. In ABA, quantitative baseline indicators (e.g., proportion of independent steps, error patterns across chain components) are essential for individualized program development and evaluation of intervention effectiveness.

Research object: self-care skills in preschool children with ASD. Research subject: the structure of dressing skill acquisition (components, sequence, deficit links) in children aged 5–6 years with ASD.

Aim of the study: to conduct a baseline assessment of dressing skills in children with ASD aged 5–6 years using the ABLLS-R scale and behavioral chain analysis.

Research objectives:

1. To describe the baseline level of dressing skills based on ABLLS-R (Section P);
2. To develop and apply behavioral chains for key dressing actions and identify sequence breakdowns;
3. To identify deficit operations requiring targeted instruction;

4. To justify directions for subsequent intervention based on baseline results.

Research question: Which operations within the dressing skill are most deficient in children with ASD aged 5–6 years, and what is their baseline level of independence?

Hypothesis: Dressing skills in preschool children with ASD are fragmented; the most pronounced deficits occur in operations requiring spatial analysis and sequential multi-step motor execution.

Practical significance: The baseline results enable precise formulation of individualized instructional goals, selection of optimal chaining strategies (particularly backward chaining), and definition of success criteria and prompting parameters for subsequent intervention.

Materials and Methods. Study design. The research was conducted as a baseline (diagnostic) study aimed at assessing the initial level of skill acquisition without intervention. This design corresponds to evidence-based ABA practice, where the initial state is recorded prior to intervention for comparison with post-intervention outcomes [2: https://elibrary.pearson.de/book/99.150005/9781292341057].

Study stages:

1. preparatory stage – selection of participants, specification of inclusion criteria, and development of behavioral chains (task analysis) for key dressing actions;
2. baseline (diagnostic) stage – individual task presentation and video recording of performance;
3. analytical stage – coding of behavior using the ABLLS-R scale and task analysis steps, identification of deficit components, and construction of an error profile.

Participants. The study involved four children diagnosed with ASD (ICD-10 F84.0) [15: https://icd.who.int], aged between 5 years 2 months and 6 years 1 month (mean age 5 years 8 months). All participants attended specialized preschool groups.

Inclusion criteria:
– absence of severe motor impairments;
– ability to maintain a seated position for at least 5 minutes;
– understanding of simple verbal instructions.

These criteria ensured that the assessment primarily reflected skill acquisition rather than motor limitations.

Table 1 – Individual Characteristics of Participants (n = 4)

Participant Code	Sex	Age (years; months)	Verbal Development Level (ABLLS-R, Section B)	Motor Imitation Level (ABLLS-R, Section D)
Child 1	M	5;2	12 points (single words)	8 points (imitation of simple actions)
Child 2	M	5;9	8 points (vocalizations without words)	5 points (imitation with physical prompting)
Child 3	F	5;11	15 points (2–3 word phrases)	10 points (imitation of up to 5 actions)
Child 4	M	6;1	10 points (echolalia, rare spontaneous words)	7 points (imitation of gross motor actions)

Assessment procedure. The assessment was conducted individually in a familiar classroom setting in the morning. Each participant was asked to complete dressing tasks (putting on a T-shirt, pants, socks, and shoes). Instructions were standardized and accompanied by gestural cues.

To control for learning effects, no additional verbal or physical prompts were provided during assessment. Each operation was limited to 20 seconds. All sessions were video recorded for subsequent coding.

Instruments. The primary instrument was Section P of the ABLLS-R (items P14–P17) [1: https://www.partingtonbehavioranalysts.com]. In addition, a behavioral chain (task analysis) was developed for each skill [2: https://elibrary.pearson.de/book/99.150005/9781292341057], consisting of 5–6 discrete operations. Such decomposition makes it possible to obtain a detailed performance profile and identify points at which the child loses the sequence or exhibits typical errors.

Example of a behavioral chain (putting on a T-shirt):

1. pick up the T-shirt;
2. determine top/bottom (identify the neckline);
3. put the head through;
4. insert the right arm;
5. insert the left arm;
6. adjust the T-shirt.

Scoring system. Each operation was evaluated using a three-point scale: 0 – not performed (refusal, stereotypy, incorrect action); 1 – performed with gestural or partial physical prompting (coded from video recordings); 2 – performed independently within ≤20 seconds [2: same source].

Outcome measures were presented as total ABLLS-R scores and as the proportion of independently completed steps within the behavioral chain.

Data analysis. Descriptive statistical methods (mean values, percentage of independent performance) and qualitative analysis of error patterns across task analysis steps were used. This approach is consistent with the study objectives, which focus on identifying deficit components for subsequent intervention.

Ethical considerations. The study was conducted in an educational setting. Participants' personal data were anonymized; no interventions posing potential harm were employed. Video recordings were used exclusively for behavioral coding and to enhance the accuracy of data collection.

Results and Discussion. The results of the assessment of dressing skill acquisition based on the ABLLS-R scale are presented in Table 2. None of the four participants achieved the maximum score on any of the items. The mean group score for item P14 was 1.25 out of a possible 2; for P15 – 0.75; and for P16 – 0.5. Item P17 (fastening skills) was scored 0 in all cases, reflecting the absence of the corresponding fine motor skills under baseline assessment conditions [1: https://www.partingtonbehavioranalysts.com].

The overall mean group score was 2.5 out of a possible 8 (31.25%). These findings are consistent with the proportion of independent performance observed in the behavioral chains: on average, 34.5% of operations were completed independently by the children. Thus, even in the presence of individually acquired components, the skill does not function as an integrated behavioral chain sufficient to complete the task independently without adult assistance.

Table 2 – Scores on ABLLS-R Items (Section P, max = 2)

Participant	P14 (T-shirt)	P15 (Pants)	P16 (Shoes)	P17 (Fastening)	Total (max = 8)
Child 1	1	1	1	0	3
Child 2	1	0	0	0	1
Child 3	2	1	1	0	4
Child 4	1	1	0	0	2
Mean	1.25	0.75	0.5	0.0	2.5 (31.25%)

Qualitative analysis of behavioral chains revealed specific breakdowns in the structure of the skill [2: https://elibrary.pearson.de/book/99.150005/9781292341057]. For most children, initial operations that did not require spatial analysis were performed relatively better: all participants confidently picked up the clothing item (the first step in the chain). However, operations related to recognizing clothing orientation (neckline/top vs. bottom, front vs. back) were the most deficient and frequently triggered incorrect responses. Typical errors included attempts to insert the head into

a sleeve, holding the T-shirt in an incorrect orientation, terminating the action after partial completion, or switching to stereotyped manipulations with the object.

Particular attention should be paid to operations requiring bilateral coordination, such as the sequential insertion of both arms [4: https://www.litres.ru/book/elena-rostislavovna-baenskaya/autichnyy-rebenok-puti-pomoschi-178258/chitat-onlayn/]. In several cases, the child successfully completed the first component (inserting one arm) but became "stuck" when transitioning to the next step, reducing the likelihood of completing the chain. These observations can be explained by a combination of insufficient motor planning and deficits in maintaining a stable action sequence.

Comparison of individual participant profiles shows that children with higher levels of motor imitation demonstrated greater success in the initial steps of the chain but experienced difficulties in the final stages, which require more complex coordination and adjustment of clothing [9: https://jneurodevdisorders.biomedcentral.com/articles/10.1186/s11689-021-09378]. The participant with minimal imitation abilities exhibited almost complete failure of the chain, except for picking up the clothing. Thus, motor imitation appears to be an important but insufficient condition for successful completion of the dressing task.

Interpretation of results within the ABA framework. In ABA, the teaching of self-care skills is based on task analysis (breaking down the skill into discrete steps), the use of prompting procedures, reinforcement strategies, and planning for generalization. At the baseline stage, the key objective is to identify specific steps that require targeted instruction. In the present study, these primarily included spatial discrimination tasks and transitions between sequential steps.

Practical relevance of backward chaining. The selection of backward chaining for the subsequent intervention phase is justified by the fact that the child completes the chain in each trial and gains access to the natural outcome (e.g., the T-shirt being fully worn, task completion). This may enhance motivation and reduce refusal behavior. At the same time, the instructor provides support for preceding steps, gradually transferring responsibility for earlier components to the child.

Recommendations for intervention design based on baseline findings. Based on the results of the baseline stage, it is recommended to:

– operationally define target steps (e.g., "correctly identifies the neckline and orients the T-shirt");

– introduce visual supports (markers, contrasting cues, pictograms) for spatial operations;

– implement a most-to-least prompting hierarchy and a plan for prompt fading;

– monitor progress at the level of individual chain steps (percentage of independent steps, number of prompts, task completion time), allowing evaluation of instructional effectiveness.

Comparison with existing literature. Meta-analytic data on early interventions for children with ASD indicate that effects on adaptive behavior and daily living skills are generally moderate, with considerable variability across studies [6: https://www.bmj.com/content/383/bmj-2023-076733; 7: https://www.mdpi.com/2077-0383/11/17/5100; 8: https://capmh.biomedcentral.com/articles/10.1186/s13034-025-006XX]. This highlights the importance of targeted instruction for specific skill components and accurate baseline assessment. Within the context of dressing skills, ABA research and methodological guidelines emphasize the role of chaining procedures and prompting strategies in teaching complex, multi-component behaviors.

Study limitations. A limitation of the study is the small sample size (n = 4), which restricts the generalizability of the findings. However, the study was specifically designed to identify deficit components and construct individual performance profiles, which aligns with applied research logic and subsequent single-case design methodologies.

Expanded literature review and theoretical framework. Adaptive behavior and activities of daily living are considered key indicators of a child's functional independence and important target outcomes of intervention programs for ASD. Systematic reviews and meta-analyses indicate that

early interventions may improve specific components of adaptive functioning; however, effect sizes vary depending on intervention intensity, study design, sample characteristics, and the quality of baseline measurement. In practice, this suggests that the most reliable outcomes are achieved through targeted training of specific functional skills combined with continuous progress monitoring and data-driven program adjustments.

Within the ABA framework, dressing is categorized as a complex, multi-step behavior in which the final outcome emerges only after correct execution of a sequence of actions. Therefore, task analysis is methodologically justified, as it allows the skill to be decomposed into observable steps and supports the selection of an appropriate chaining strategy based on baseline data. Dressing places a high cognitive load on spatial processing: the child must determine clothing orientation, relate it to their own body, retain the sequence in working memory, and perform coordinated motor actions. For children with ASD, these requirements may be particularly challenging due to deficits in sensory integration and motor planning.

Motor imitation plays a significant role in the acquisition of self-care skills. Imitation provides a foundation for model-based learning and transfer of observed actions, which is especially important for daily living skills. Research on imitation trajectories in preschool children with ASD indicates that imitation deficits emerge early and are associated with other developmental domains. Therefore, when planning intervention, it is advisable to consider the child's baseline imitation level and incorporate modeling procedures and reinforced practice.

Methodological considerations and outcome measures. From a publication perspective, it is important to specify measurable variables for the intervention phase. In ABA and special education research, these typically include: (1) proportion of independent steps (percentage of independence); (2) number and type of prompts; (3) time required to complete individual steps and the entire chain; (4) frequency of specific error types (e.g., incorrect clothing orientation); (5) indicators of generalization (transfer across settings and materials) and maintenance over time.

Given the identified deficits in spatial orientation, it is methodologically justified to combine visual supports with discrimination training procedures. Visual cues may include markers (stickers, colored dots), contrasting indicators at key points (e.g., neckline), pictogram sequences, and object prompts facilitating correct orientation. A critical component is planned prompt fading to ensure independence and generalization across different clothing items.

Backward chaining strategy. Backward chaining is particularly effective when: (a) the child demonstrates partial acquisition of initial steps; (b) completing the chain provides natural reinforcement; and (c) difficulties occur in transition points between steps. In this procedure, the instructor completes most of the chain and teaches the child to independently perform the final step first. Once mastery is achieved, earlier steps are gradually incorporated. This structure increases the frequency of successful task completion and may reduce frustration and refusal behavior.

Pedagogical conditions and social validity. Dressing skills have high social validity: they are required daily, reduce dependence on adults, and are meaningful for both families and educators. Increasing independence in self-care enhances participation in routine educational activities (e.g., preparing for outdoor play, changing clothes after activities, hygiene routines), thereby expanding opportunities for social engagement.

Effective intervention conditions include environmental stability at early learning stages, consistent instructions, structured task presentation, supportive interaction style, and individualized reinforcement strategies. Predictability is essential for children with ASD: consistent verbal cues, fixed sequences, and designated locations for task execution are recommended. Environmental variability should be gradually introduced to promote generalization.

Interpretation and broader implications. The identified deficit components (spatial orientation, sequencing, bilateral coordination) are consistent with findings in ASD research, where impairments in the executive component of action are observed despite intact understanding of task goals. ABA guidelines emphasize that steps requiring spatial discrimination and coordination often

represent critical bottlenecks and should be further subdivided, supported with prompts, and reinforced more intensively.

Limitations and future directions. The small sample size and absence of an intervention phase limit conclusions to baseline-level descriptions. However, the study provides a detailed operationalization of the dressing skill and demonstrates a replicable diagnostic approach. Future research should include a single-case experimental design to evaluate the effectiveness of backward chaining, as well as the stability and generalization of acquired skills across contexts.

Thus, the expanded theoretical and methodological analysis strengthens the link between baseline findings and evidence-based practice, providing a solid foundation for the subsequent intervention phase.

Future directions. The next stage of the research will involve a formative intervention using backward chaining. Effectiveness will be evaluated based on increased independent performance, reduced prompting requirements, and improved stability and generalization of skill execution across different contexts.

Conclusion. The baseline stage of the study, using the ABLLS-R scale and behavioral chain analysis, made it possible to objectively identify the structure of deficits in dressing skills in four children aged 5–6 years with ASD [1: https://www.partingtonbehavioranalysts.com; 2: https://elibrary.pearson.de/book/99.150005/9781292341057].

The findings revealed that:

1. dressing skills were not fully developed in any of the participants;
2. the average proportion of independently performed operations was 34.5%;
3. the critical components included spatial orientation of clothing and transitions between steps in multi-step sequences;
4. the level of motor imitation was associated with successful performance of initial operations but did not guarantee completion of the entire behavioral chain.

The obtained results represent a “point A” (baseline) for a subsequent intervention study, in which the use of backward chaining in combination with visual and motor prompts and their systematic fading is considered appropriate [2: https://elibrary.pearson.de/book/99.150005/9781292341057]. The practical implication lies in the development and validation of a training program for dressing skills in the same group of children, followed by comparison of results.

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