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RECOGNIZING DEVELOPMENTAL DELAY OF CHILDREN UNDER 42 MONTHS IN AZERBAIJAN

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ABSTRACT

According to the U.S. Centers for Disease Control and Prevention (CDC), 15% of children under the age of 17 experience one or more developmental disorders. In the context of Azerbaijan, the limited knowledge among parents regarding the stages of child development and the signs of developmental delays suggests that these numbers may be even higher. Parents typically observe developmental delays at later ages and often turn to local polyclinics or physicians, which prolongs the process. Delayed detection and the need for specialist referrals are among the main reasons for prolonging process. The purpose of this study, which we carried out in order to obtain more objective information about this issue, is to investigate the risk of developmental delay in children who are considered to show typical development between 1-42 months, and whose developmental delay is not noticed by parents and others, and in which areas of development this delay is more common. The research used the adapted version of the Guide to Monitoring Child Development (GMCD) tool to track and assess a child's growth, milestones, and developmental progress to ensure they are meeting age-appropriate standards and to identify any potential issues early on. Early intervention specialists from 11 regions of Azerbaijan determined developmental difficulties of 138 children aged birth to 42 months. The fact that this tool is currently a recognized and accepted test by the Ministry of Health of Azerbaijan and at the same time many specialists from different regions have been trained to perform this test, as well as the fact that the test itself is simple to use has played an important role in the selection of this screening tool.

KEYWORDS

Developmental Delay, GMCD, Delay Risks, Delayed Skills, Child Development

CITATION

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Introduction.

A thousand years ago, Ibn-Sina, the father of modern medicine (*IJEPC, 2023),* wrote that childhood experiences significantly influence an individual's psychological, moral, and ethical development in later life. He divided child development into four main age-related stages: 0-2 years, 3-5 years, 6-14 years, and above 14 years. In describing each stage, he listed the factors that influence development, particularly emphasizing the critical role that environmental factors and the fulfillment of basic needs (such as food, water, hygiene, love, attention, etc.) play in the development of a child during the first two stages, that is, up to the age of five *(IJEPC, 2023).* The period from 1-3 years, is when development is most rapid from birth through 3 years of age *(Likhar A, et. Al., 2022)*. The rapid formation of brain synapses during this period is the main factor that ensures swift development. Therefore, the foundation for the skills that an individual will carry throughout their life is laid during this period. The presence of many negative factors during this time increases the likelihood of developmental delays *(Salomone E, et. al., 2019).* To promote development and mitigate the effects of negative experiences it is critical to monitor the development of young children, identify developmental delays as early as possible, and intervene appropriately *(Khan I, et. al., 2023).* According to the statistics of 2016, there are 52.9 million children with developmental delay worldwide. 95% of these statistics fall on low-income and middle-income countries, which increases the risk of problems such as

developmental delays and developmental disabilities *(Khan I, et. al., 2023).* A lot of evidence shows that the child's exposure to biological and psychosocial negative experiences in the first 3 years, has a negative impact on the child's development trajectory and affects his physical and psychological health. It also affects various systems - metabolic, immune, brain. These effects begin in childhood and sometimes persist throughout a person's entire life (*Nelson C.A, et. al., 2020).* According to the result of the study "Negative childhood experiences related to the family as risk factors for psychiatric disorders" conducted in Nigeria in 2010 by Bibilola D.Oladeji, Victor A. Makanjuola, Oye Gureje, negative childhood experiences, such as parental crime, mental illness of parents, and drug addiction of parents, reflecting domestic violence, are more likely to cause mental health problems in adulthood in those children. Almost half of the respondents had negative childhood experiences in the family context before the age of 16 *(Pubmed, 2010)*

In addition, wars and poverty experienced by children are also considered as factors contributing to the negative development of the ACE children mentioned above. Based on existing evidence, 43% of children under 5 years of age living in low and middle-income countries face a risk of inability to realize their maximum development capacity *(Black, et. al., 2016).* Given that Azerbaijan has been a conflict-ridden country for over 30 years, with many of today's parents have lived through or participated in the war, held refugee or internally displaced status, faced poverty, and other ACEs, the impact on child development cannot be overlooked. Additionally, the lack of awareness among parents regarding child development, developmental milestones, and disabilities as well as child-serving health system that does not promote developmental monitoring and screening, and early childhood intervention children with disabilities usually identified very late. Developmental assessment is a comprehensive approach that involves using tools to clearly determine whether a child possesses age-appropriate skills, along with gathering information from the family and using observation methods. In most countries, the basic principles of early childhood assessment are accepted as "Family-Centered Developmental Assessment".

A Family Centered Development Assessment is carried out together with the child's family or a person who cares for the child *(Ertem, 2005).* The purpose of the current study was to identify children demonstrating developmental delays and to determine whether delays in certain developmental areas occurred more prominently at specific ages. The probability of developmental delays in a random sample of children aged 1 to 42 months, who were assumed by their families to have typical development, was assessed.

Methods. The respondents involved in the study voluntarily participated in the study. However, as the test was grounded on results from parent responses in some cases, because of different reasons such as incomplete answers by respondents, parents' embarrassment, participation of grandmother or another person in the survey instead of mothers, this caused some difficulties. Another limitation could be related to the subjective nature of the test which depends on individuals filling in the sheets according to their understanding and experience, which could have lead to inconsistencies. However, this method was most convenient for the purposes of this survey because it is simple and cost-effective.

Examples from scoping and survey. The survey was encompassed in 11 districts of Azerbaijan:

Table. 1. Distribution of children by district

	Frequency	**Percent**
Aghstafa	11	9.9
Aghsu	8	7.2
Baku	10	9.0
Ganja	7	6.3
Goranboy	8	7.2
Samukh	11	9.9
Shirvan	7	6.3
Tovuz	9	8.1
Ujar	10	9.0
Xachmaz	19	17.1
Yevlakh	11	9.9
Total	**111**	**100.0**

An assessment of respondents was held in kindergartens and early intervention centres. Early intervention centers are community-based centers established for the purpose of early detection and early intervention. The children involved in the study were siblings of the children who used the services of these centers, as well as children in the appropriate age group who used the services of the kindergartens where these early intervention centers were located. A sample of 138 children was randomly selected and evaluated for the targeted age group to be screened. However, 27 of these children were excluded from the final results due to either detected developmental delays in one or more areas or incorrect age categorization. As a result, the study's sample consisted of 111 children, including 53 girls and 58 boys.

Detailed information about the children in the study sample is as follows. The age distribution of the children is depicted in Figure 1.

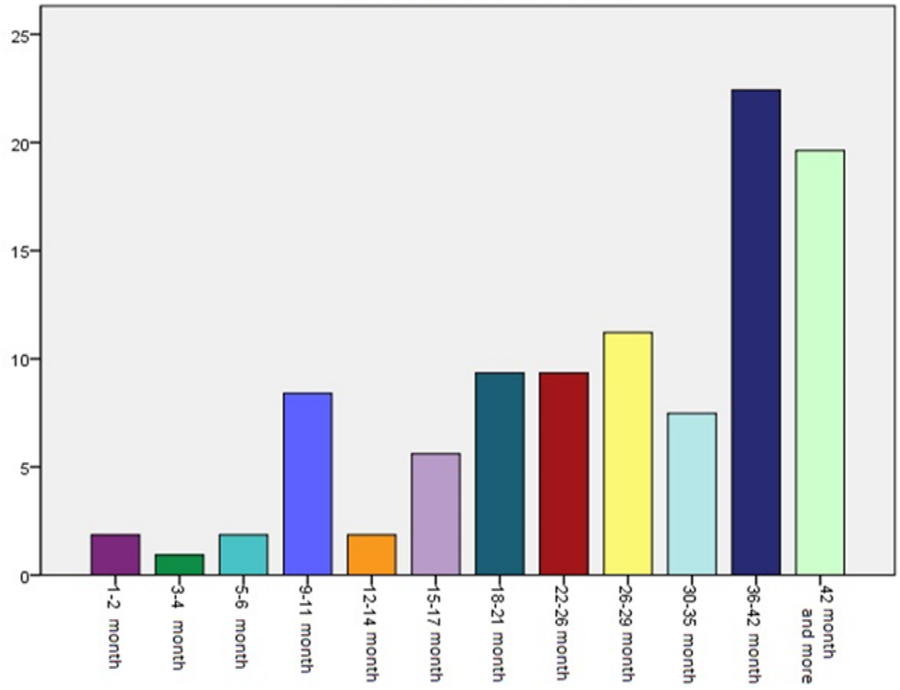

Fig. 1. *Age range of children*

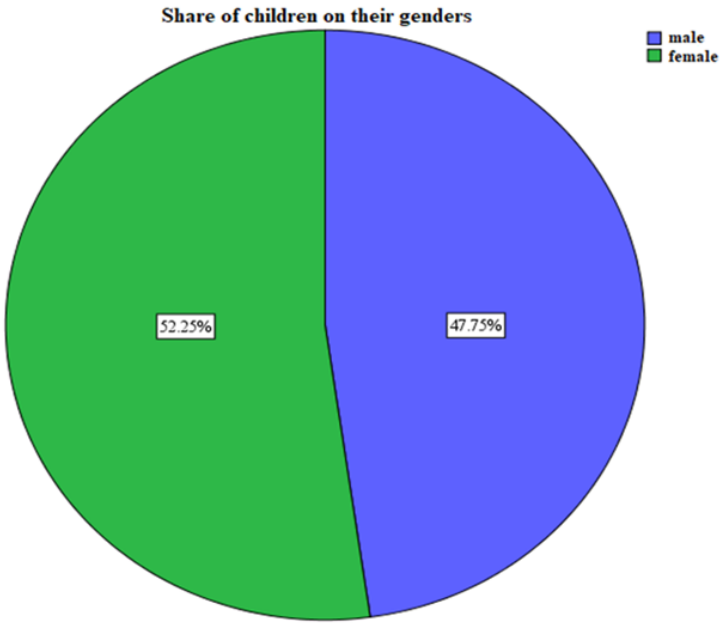

Fig.2. *Share of children in their genders*

Parents were informed about the screening process in advance. Considering that parents are more familiar with their children than other people, this evaluation was carried out as a series of questions & answers completed by the parents.

Survey tool.

The International Guide for Monitoring Child Development (GMCD) was chosen as a tool for this survey. The Guide for Monitoring Child Development (GMCD) *(Ertem et al, 2006, 2008, 2009, 2017)* originally developed in Türkiye is a comprehensive package of assessments based on the bio-ecological theory *(Bronfenbrenner and Ceci, 1994)* and family-centered care *(Brewer et al, 1989*).

The GMCD was used to screen the children primarily because it is approved by the Ministry of Healthcare of the Republic of Azerbaijan, and a variety of specialists throughout Azerbaijan have bee trained in the administration and interpretation of the tool. The GMCD screens children aged 1 to 42 months, dividing them into 12 age-based groups: 1-2 months, 3-4 months, 5-6 months, 7-8 months, 9-11 months, 12-14 months, 15-17 months, 18-21 months, 22-25 months, 26-29 months, 30-35 months, and 36-42 months.

Separate questions are gathered in the following fields:

- Parental concern
- Expressive language
- Receptive language
- Gross motor skills
- Fine motor skills
- Establishment of social interaction
- Play activities
- Self-help skills
- Existing opportunities for development support
- Existing risk factors
- Existing plans for approach to risk factors

A blank test sheet was filled in for all participating children; there were no circumstances that interfered in the process of assessment of children. Assessments were completed by specialists from Early Intervention and Community Based Rehabilitation centers in the 11 regions. The specialists were trained by Ministry of Health specialists in April 2018 on how to use the GMCD tool and gained the necessary certification to administer this test. Assessment sheets were collected and inputted using the SPSS computer program and results were analyzed using this program.

Results/outcomes:

Results are introduced in the following categories in the report. In which skill domain is developmental delay more prevalent: Per skills on ability groups

- ***Parental concerns***- In our study the questions related to parental concerns about their child's brain development in relation to learning, understanding, speech, movement, and use of hands. 42.5% (31 persons) of parents answered "Yes", while 57.5 % (42 persons) answered "No". This question was not completed by 38 parents.
- **Language skills.** In the study, questions associated with language skills were divided into two parts – expressive and receptive language, and each of them contained particular questions.

➢ **Expressive Speech (Expressive Language)** – To draw a clear conclusion, the presence of the following skills is examined through questions such as: "How does your child express their needs to you? What gestures, facial expressions, or words do they use?

A question about whether babies become quiet when holding them on your lap was answered "Yes" by 97.3% parents (108 respondents), while the response was "No" from 2.7 % (3 respondents) of parents.

The study showed that 90.1% children (110 respondents) possess skills in making different sounds to express joy, feeling discomfort and hunger, while 0.9 % (1 respondent) lack this skill development.

92.8 % (103 respondents) of infants aged 3-4 months can produce "aa" vowels, while 6.3% (7 respondents) of infants were not successful at this skill. 0.9% did not respond to this question.

91 % (101 respondents) of infants demonstrated improvement in giggling skills, while 6.3 percent (7 respondents) demonstrated negative results. 2.7 % (3 respondents) did not respond to this question.

93.3 % (98 respondents) of babies can use gestures (protests by nodding head, stretches out arms to ask to be picked up). 6.7 % (7 respondents) did not possess such gestures.

87.6 % of infants repeat the syllables ("da-da"), 12.4 % (13 respondents) have not yet progressed in this sphere.

88.1 % (89 respondents) are able to utter comprehensive words, while 1.9 % responded "No" to this question. The skill of pointing with hands to draw attention to things of their interest is well developed in 93 % respondents; 7% showed delay in this skill.

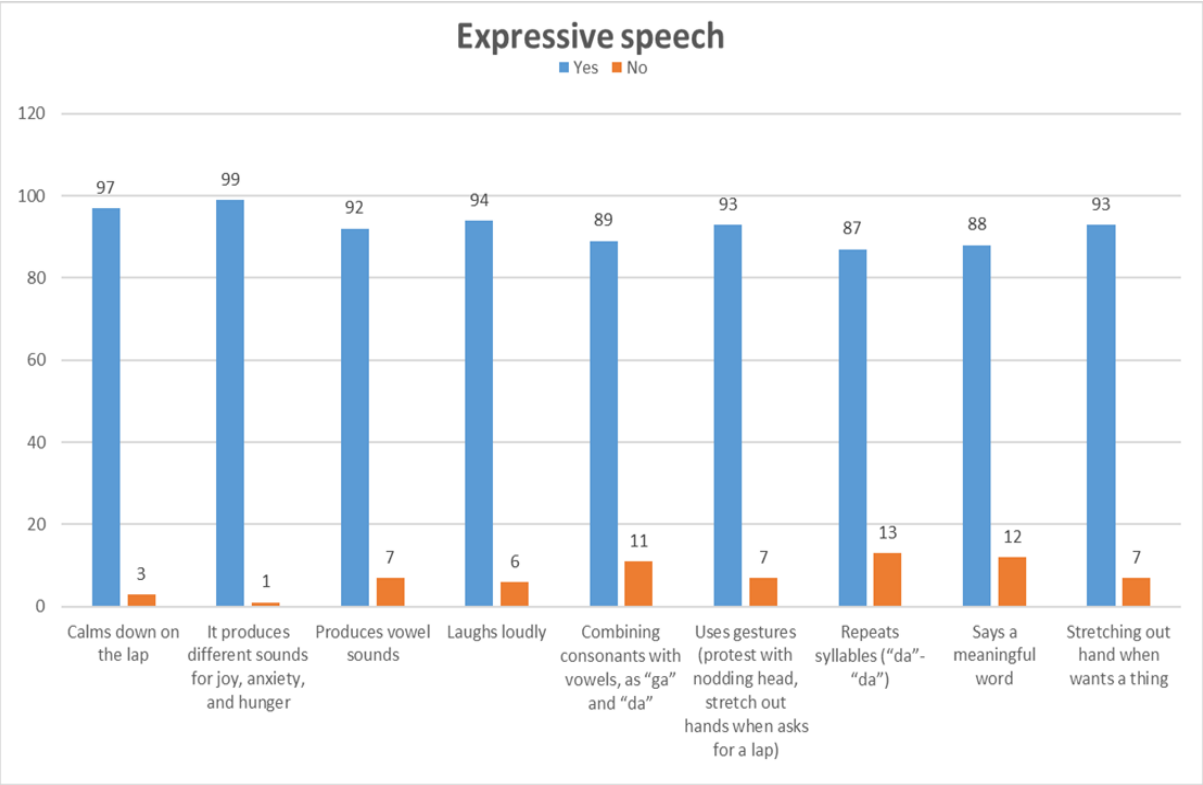

Fig. 3. *Expressive language (1-15 months old)*

The following table illustrates expressive speech development in the children aged 15-42 months:

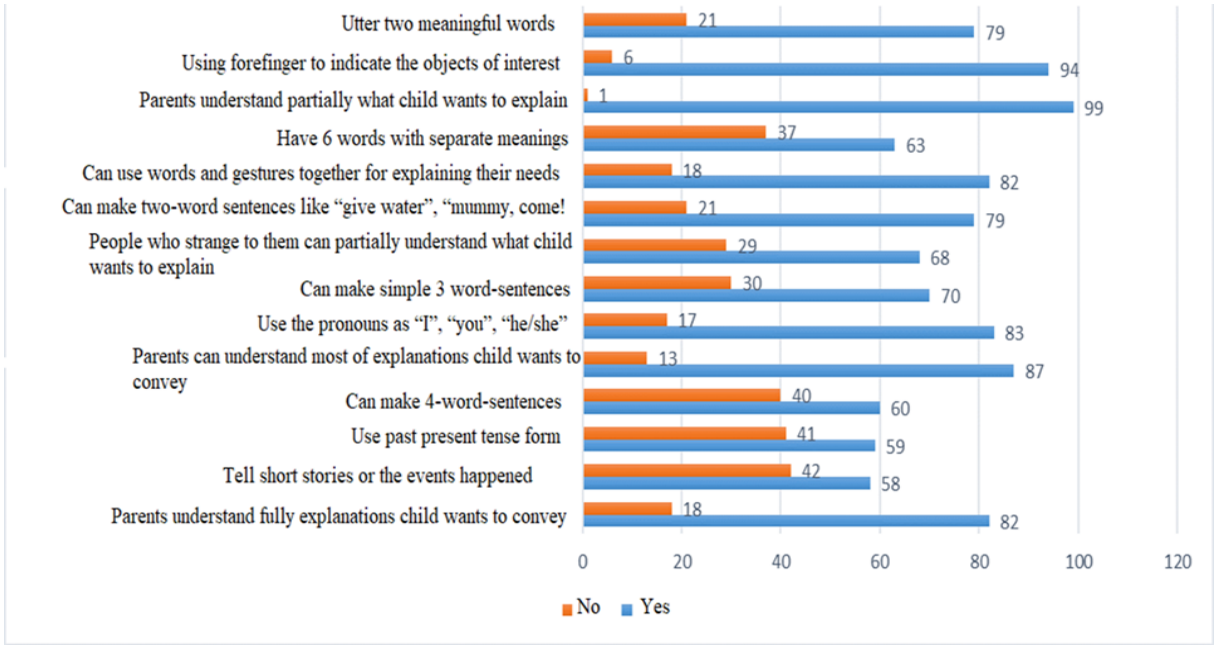

Fig. 4. *Expressive language (15-42 months old)*

21 % of children among this age group have difficulties in articulating two words with different meaning, 6% with using their forefinger to indicate objects of interest, 37 % in articulating 6 words with separate meaning. 18% of children are not able to use words and gestures to explain their needs. However, 21% cannot make a two-word sentence like “give water”, “mummy, come!”. 29% lack skills to describe their needs to strangers. 30% of the children have problems in making three-word sentences, 17% in utilizing the pronouns as “I”, “you”, “he/she”.

13% of infants have difficulties in expressing their needs to their parents. 40% of children are not able to make a sentence with 4 words, while 41% cannot make use of past-present form in their speech. 42% of children cannot tell short stories about events which have happened. 18% of infants cannot give explanations that are fully understood by their parents.

- **Receptive speech (Comprehension language)** - “How well does your child understand your speech? How do you know?” There are several questions which may clarify this:

1–15-month infants:

To the question – “While interacting with your child, does he/she pay attention or react by slowing down his/her movement?” – 95.5% of respondents answered “Yes”, while 4.5 % answered “No”. Results show that 95.5% of children demonstrated their ability to hear by looking at the face of the person speaking; however, 4.5% lacked this skill. 92.6% of infants are able to communicate by making sounds, while 7.4% of infants are not. 95.2% of infants understand the names of the people they know, while 4.8% of infants do not demonstrate this behavior. The ability to understand the words that indicate movement (e.g. come, throw, stop) was present in 95% of infants, and not present in 5%.

91% of infants had developed the ability to recognize the names of objects (ball, toy), with 9% having difficulties.

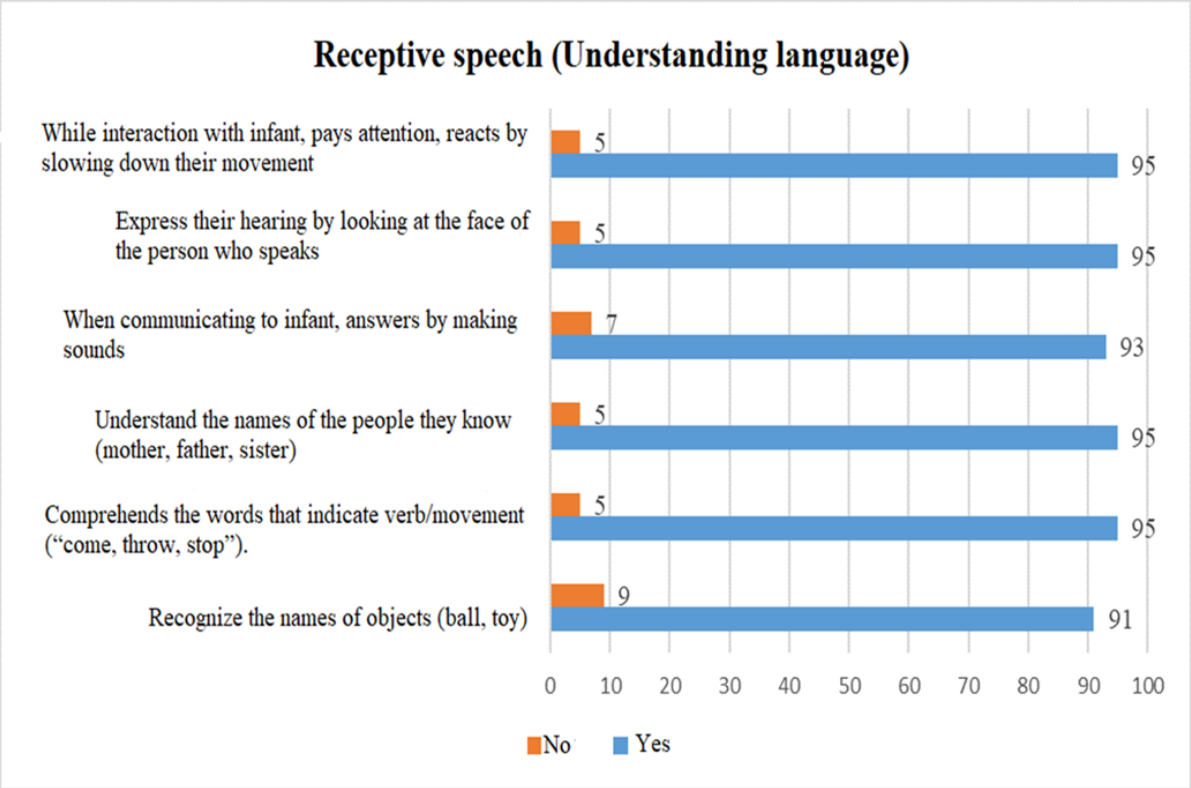

Fig. 5. *Receptive language (1-15 months old)*

The chart on receptive speech development at age 15–42-month toddlers:

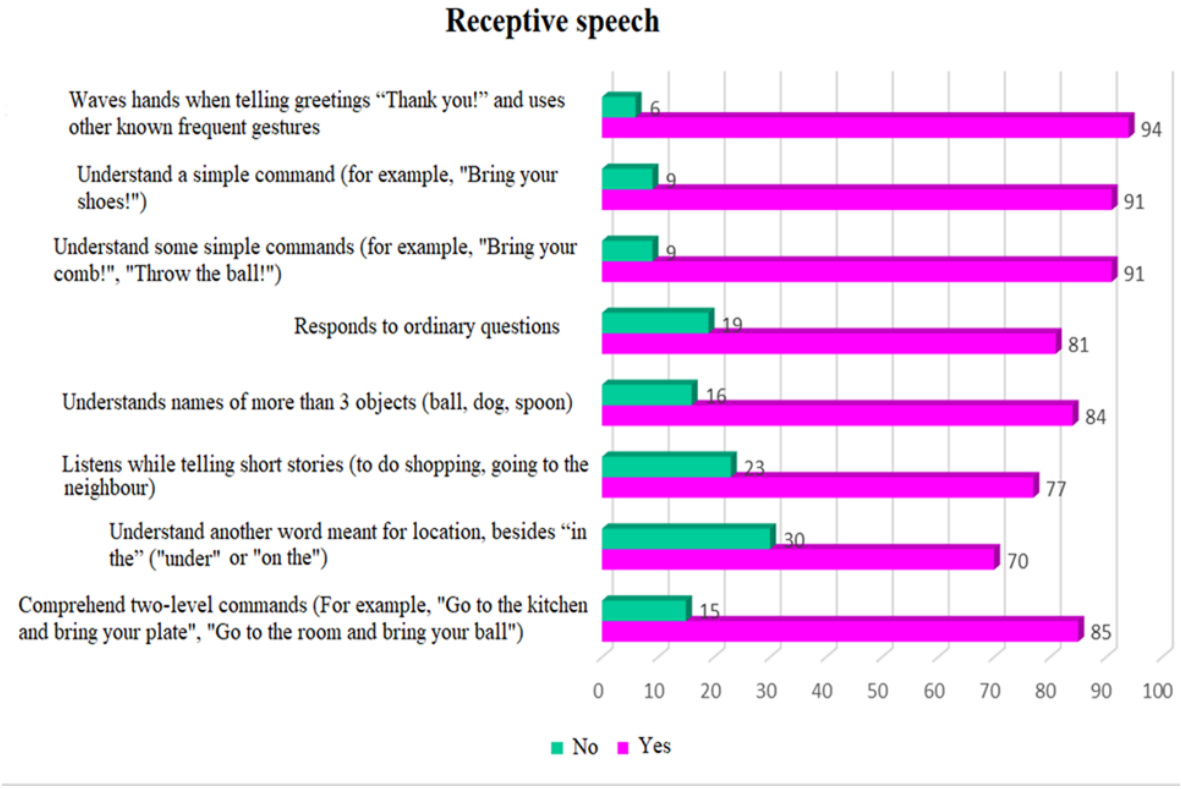

Fig. 6. *Receptive language (15-42 months old)*

In this age group, 6% of children wave their hands when greeting, saying "thank you", or using other common gestures. 9% of toddlers do not understand simple commands, while 19% have difficulty responding to ordinary questions. 16% do not recognize the names of more than three objects, and 23% do not listen to short sentences. 30% do not understand words related to location. Additionally, 1% of toddlers do not comprehend two-part commands.

- ***Gross motor skills***

1–15-month infants:

98.2% of infants can raise their head when lying on their stomach, 1.8% cannot do this.

When lying on their stomach, 97.2% of infants are able to turn their head, 2.8% showed delays respectively. 96.3% of infants are able to move their hands and legs at the same time, 3.7% have difficulties. 98.1% infants demonstrated their skill well on holding their head upright and steady, 1.9% did not improve this ability. 97.2% of infants can raise their head 90 degree upright when lying on their stomach, 2.8% did not possess such movement. 95.3% infant can sit with support, 4.7% cannot. 93.5% of children press their weight on legs when holding them under their arms, 6.5% lack this skill. 95,3% children possess skills to roll over front to back and opposite in a position of lying on stomach, 4.7% do not have such ability. 94.3% can sit without support, while 5.7% are not able to do it. 93,1% of children can stand up by grasping a pillar, 6.9% of infants are unable to do this. 92.1% can stand alone for a short time on their feet without support, while 7.9% of kids lack this skill. Stepping forward while holding objects - 92.1% answered Yes, 7.9% No.

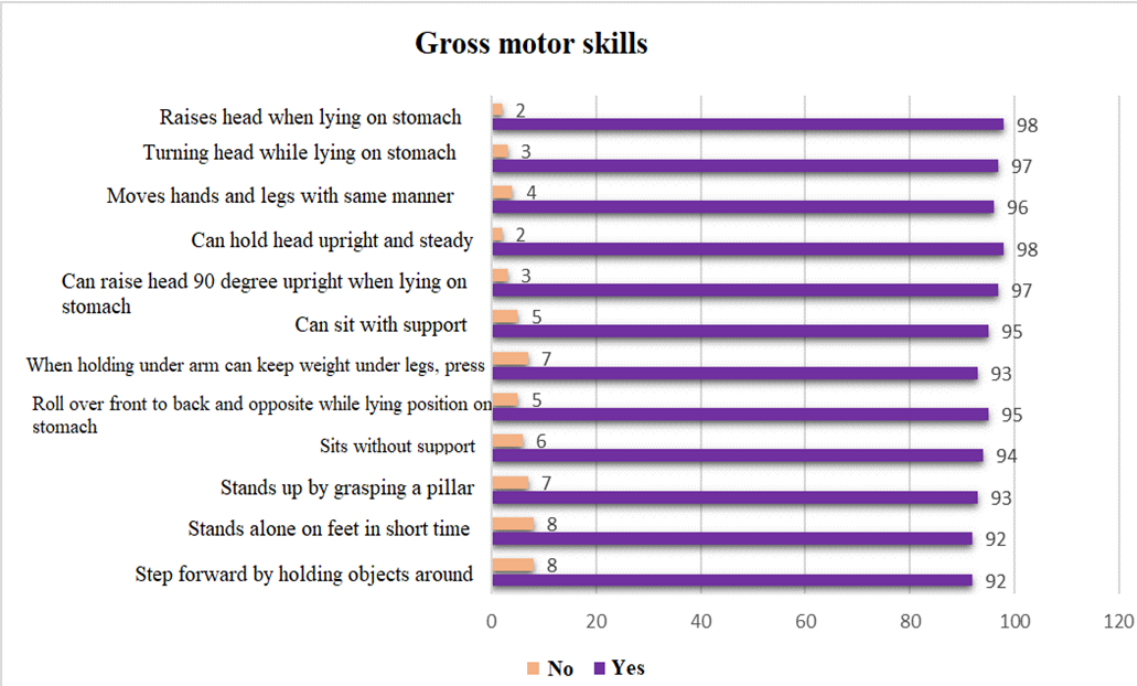

Fig.7. *Gross motor skills (1-15 years old)*

Development of gross motor skills in 15–42-month age group:

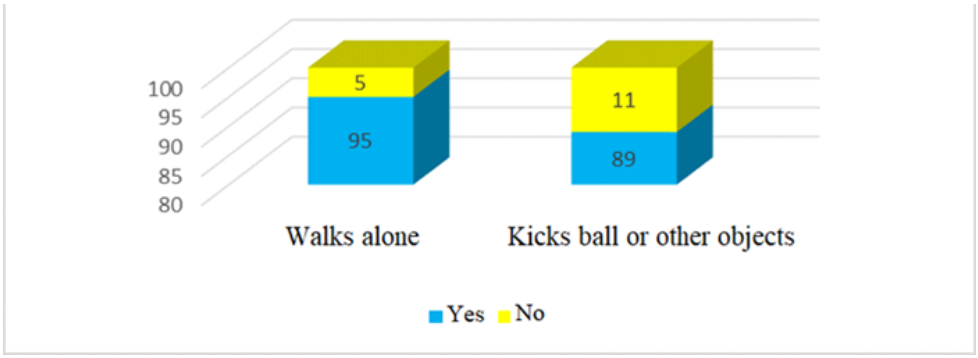

Fig.8. *Gross motor skills (15-42 months old)*

In this age group, 5% of children have difficulties stepping without support. However, 11% of toddlers could not demonstrate the skill of kicking a ball and other objects.

- Fine motor skills

1-15 months aged children:

Skills of holding hands open for a while was developed by 97,3% infants, in contrary 2.7% did not progress in this skill. 95.4% children can unite both hands in midline, 4.6 % cannot do this. 97.2% of infants can hold their hands open frequently, hence, 2.8% cannot. 94.4% infant can reach their hands towards an object, 5.6% cannot. 94.4% of infants can grasp toys and objects purposefully, while 5.6% do not demonstrate this skill. 94.3% of children can transfer objects from one hand to another by using their fingers and palms, while 5.7% were not able.

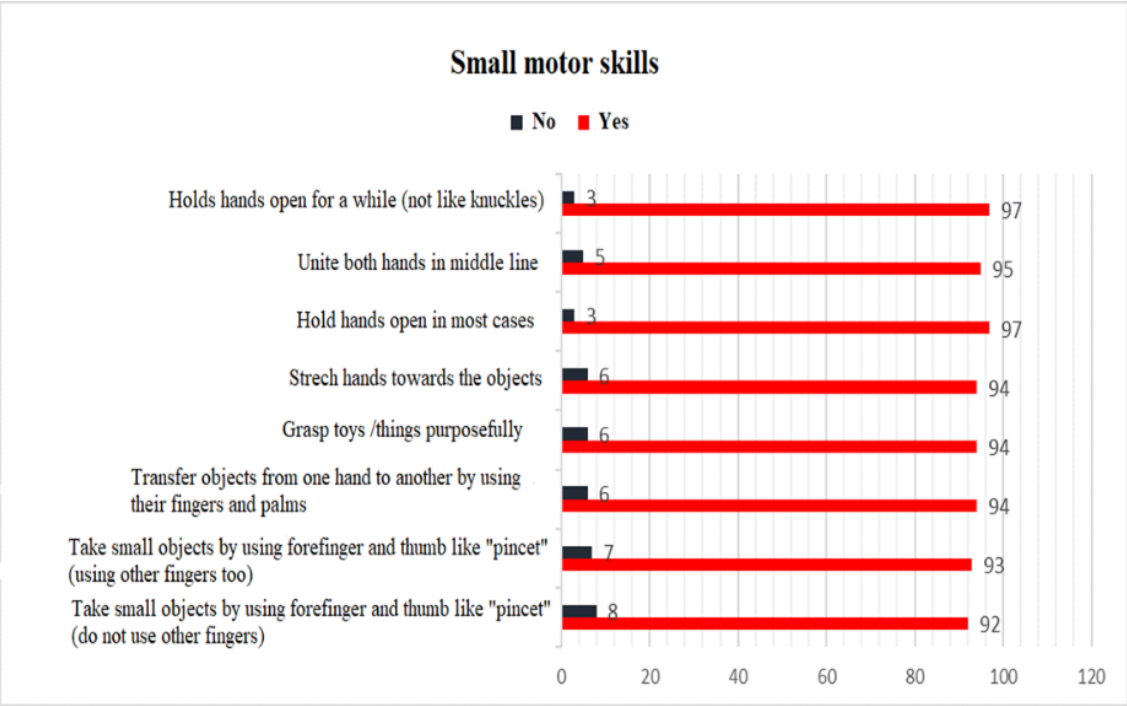

Fig.9. *Fine motor skills (1-15 months old)*

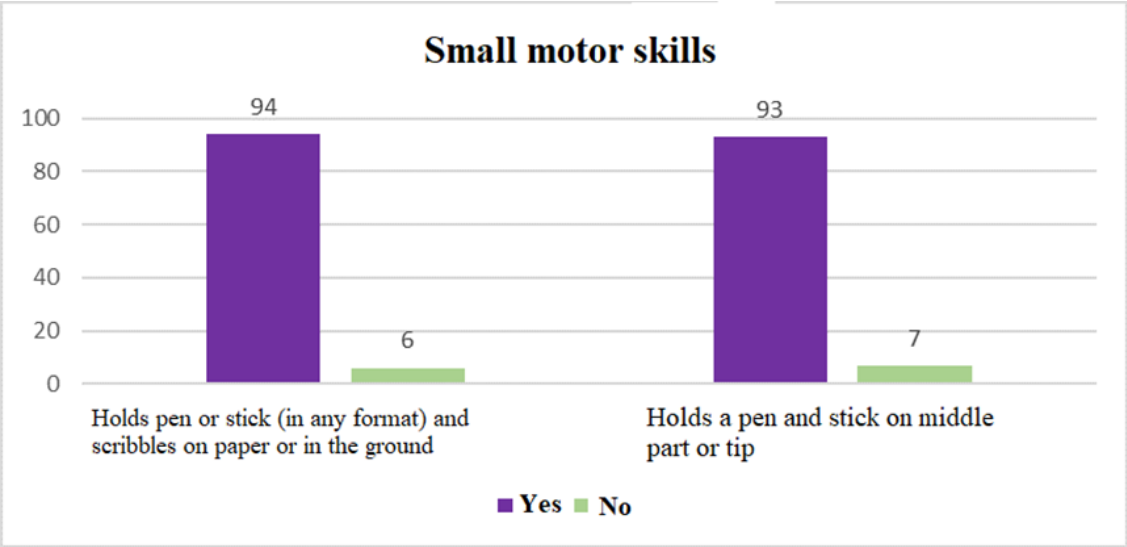

Fig.10. *Fine motor skills development in the children in 15-42 month-age interval*

90% of children cannot grasp a pen or pencil to scribble (in any format). Hence, 7% of children from this age group do not possess the skill to hold a pen or pencil effectively.

- ***Establishing communication :***

"How does your child communicate with the people they know? How do they express knowing and loving others? How is their eye-contact?" Subsequently, information is collected on how they interact with the people unknown to them.

1–15-month infants:

It was observed that 3% of children do not follow faces, 4% do not express reciprocal smile to games shown by their parents, 6% cannot make long-lasting meaningful eye contact, 6% cannot interact by their gaze, laugh and voice to express their communication needs. 8% of infants do not smile to their mothers and do not raise their hands towards them, 5% of infants did not express their discontent when separated from their mother and calm down when united.

6% of children do not become embarrassed near strangers (definition of stranger and native), while 8% of infants cannot share their joy and interests with people around them (do not embrace, kiss mother, cannot look at the toy with her)

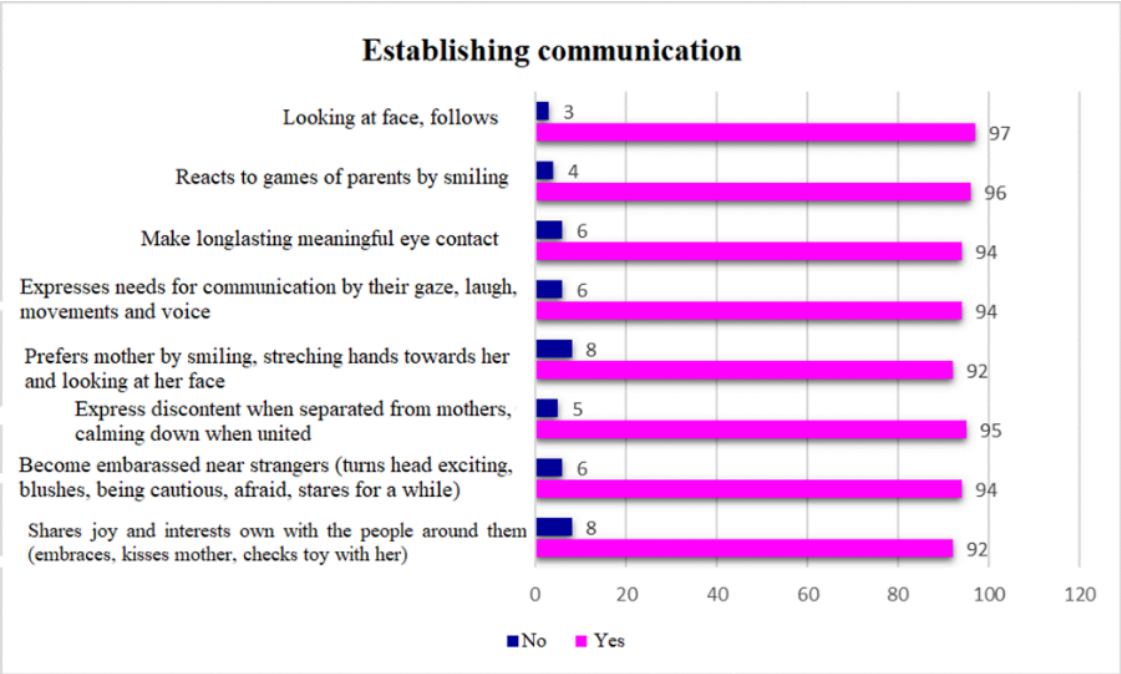

Fig. 11. *Establishing communication/interaction at 1-15 months*

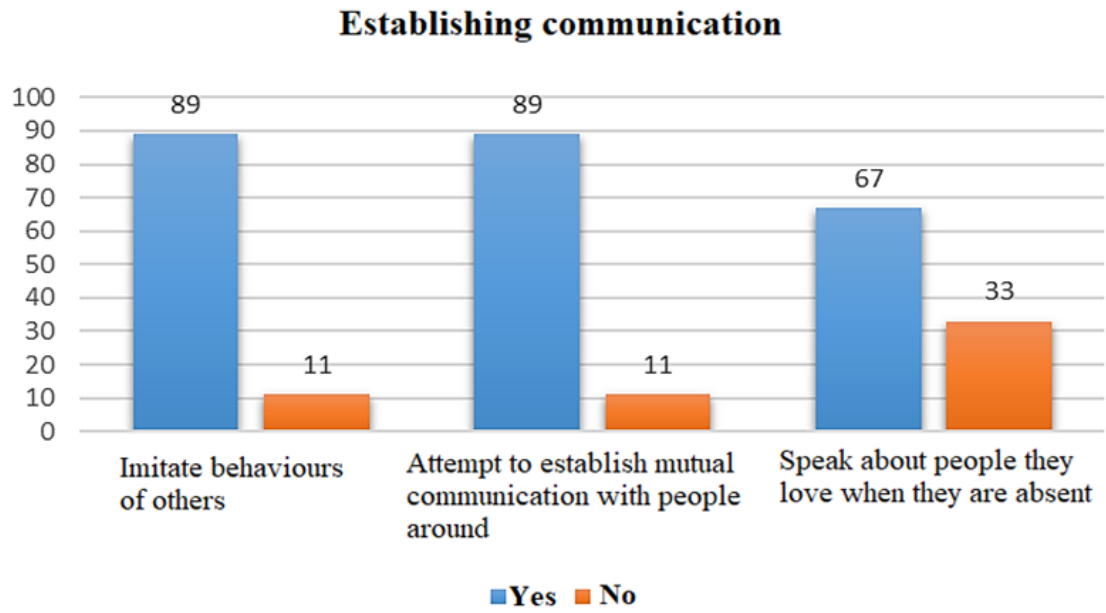

Fig. 12. *Establishing communication at 15-42 months*

11% of toddlers are unable to imitate the behavior of others, and 11% do not attempt to establish reciprocal communication with others. Additionally, 33% of toddlers cannot talk about people they love when those individuals are absent.

• Game activities

What kind of games does the child play and how they play with parents, peers, objects and toys is explored.

1–15-month aged infants:

It was found that 7% of the infants cannot demonstrate being responsive while playing with family members. Hence, 7% cannot react by making sounds while playing with them. 6 % do not take toys/objects (it is not a holding reflex), 5% do not bring toys/objects to the mouth, 5% cannot play looking at their hands. 7% of infants cannot react “peek-a-boo” type games. 7% of infants can not grasp and throw toys/objects. 6% of infants do not possess the skills to shake the toys while playing. 13% of children look for hidden toys and items. 11% do not have the skills to imitate gestures and facial expressions when playing. 14% of infants try to explore the way objects and toys work.

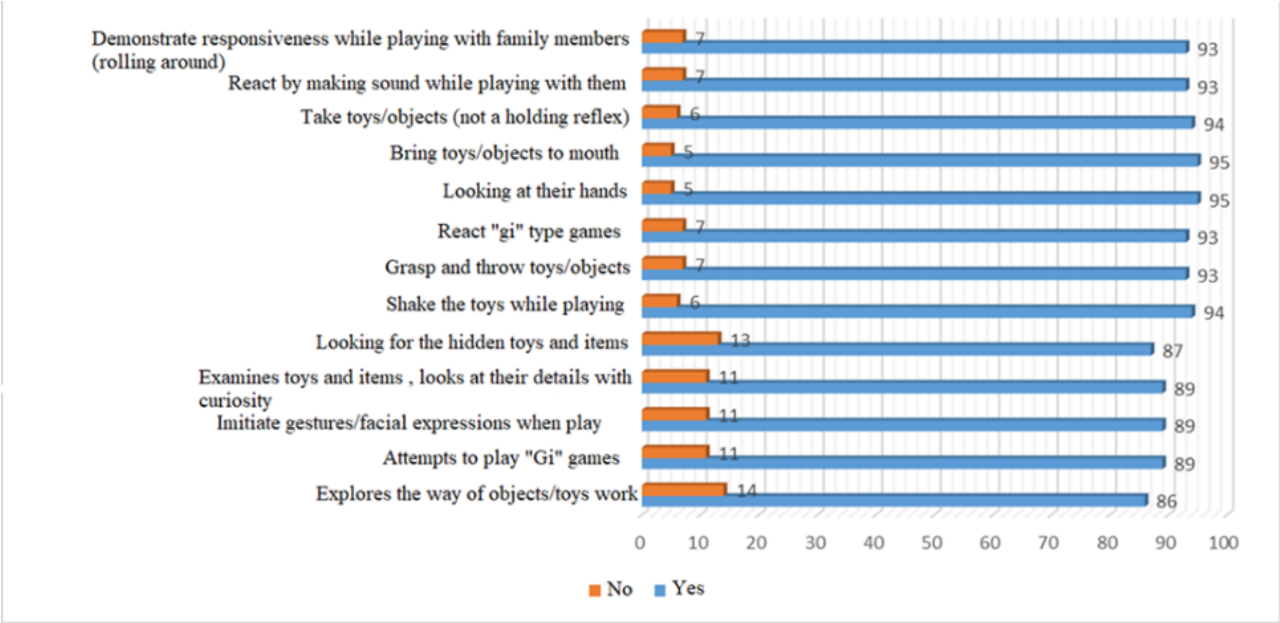

Fig. 13. *Game activities (1-15 months old)*

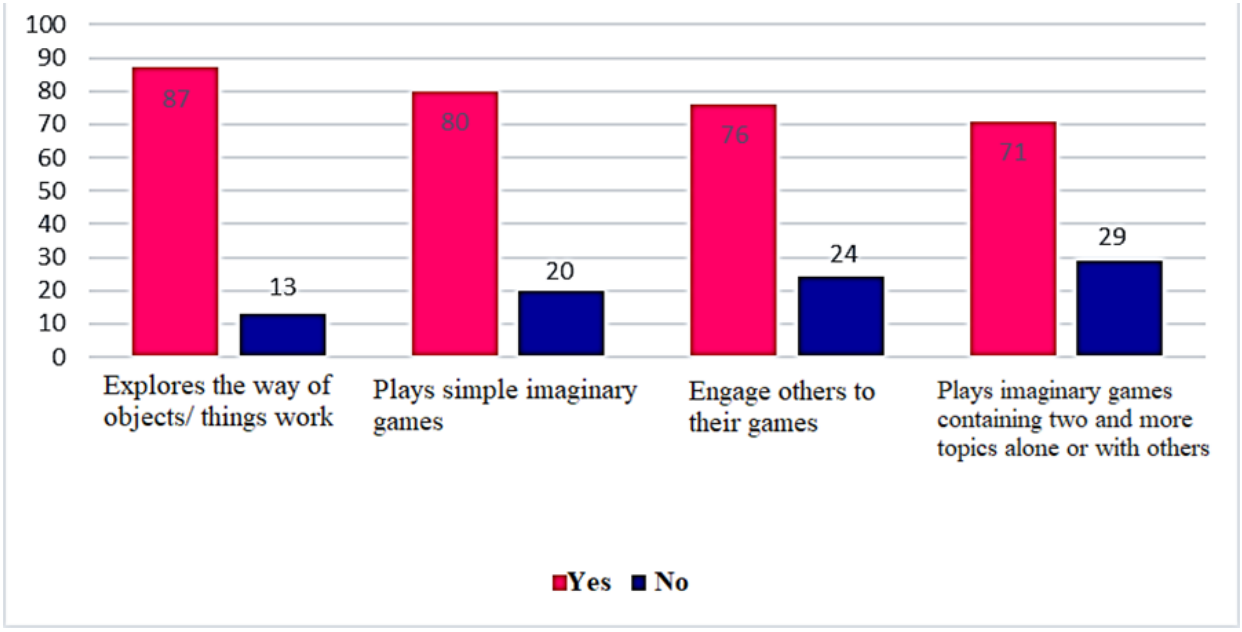

Fig.14. *Table on development of game activities at 15-42 months*

13% of toddlers do not explore the way objects and things work, 20% can’t play simple imaginary games. 24% cannot engage others in their games. 29% of infants did not demonstrate the ability to play imaginary games containing two or more topics alone or with others.

• Self-care skill

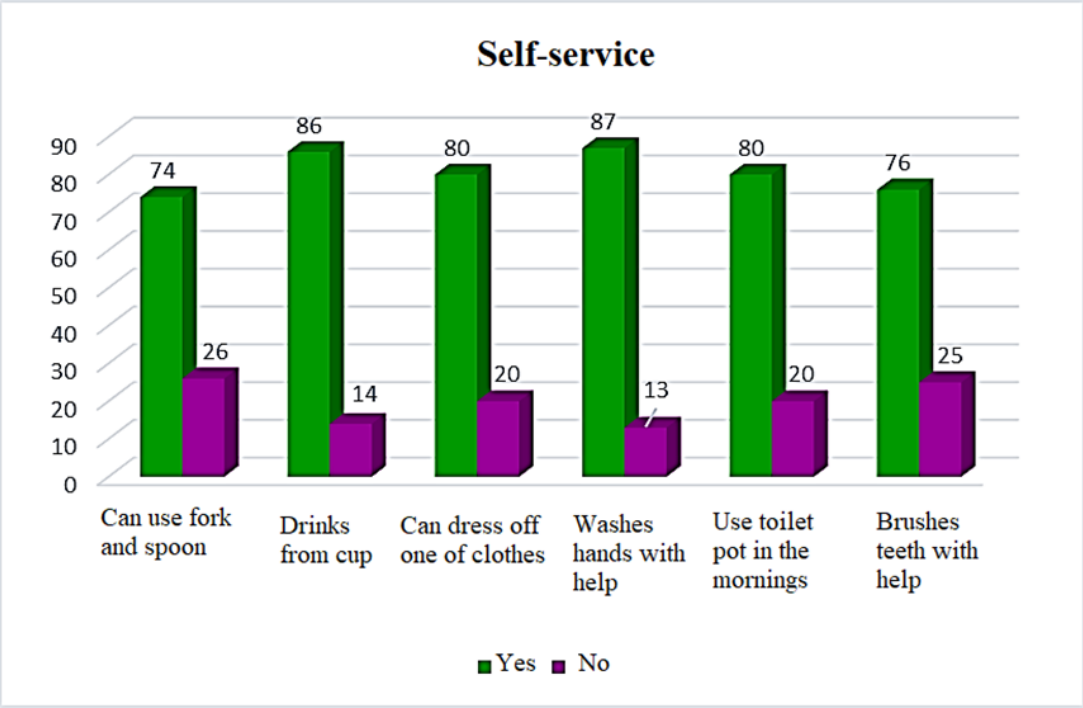

***Fig. 15**. Self-care skills (1-42 months old)*

26% of toddlers cannot use a fork or spoon, 4% cannot drink from a cup, 20% have difficulties to put on one piece of clothing, 3% cannot wash their hands with support, 20% of children cannot use a child sized toilet, 25% cannot brush their teeth with support.

Conclusions.

As a result, a child who may actually have a developmental delay requiring intervention is considered typical, and the situation is left unattended. When the child reaches school age and the parents realize that the problem has not been resolved, they begin to sound the alarm. However, by this time, the crucial golden period for intervention has already been lost. The child's developmental delay may have worsened, and the number of skills lost for their age may have increased. What might have initially involved delays in just one developmental area could now affect all skill areas. Since this is the first study conducted in this field in Azerbaijan, we compared our findings with those from other countries where similar research has been conducted.

Since implementing Early Intervention services in 10 regions of Azerbaijan, United Aid for Azerbaijan (UAFA) has identified numerous cases of developmental delays since 2015.

Our research study aimed to explore the frequency of developmental delays among children who are assumed to have typical development. The survey concluded that 34.2% of the children (38 out of 138) considered typical, showed significant developmental delays in one or more monitored areas.

As this is the first study of its kind conducted in Azerbaijan, we compared our findings with those from other countries with similar research. We found that results varied across different studies. For instance, a 2005 survey conducted in Thailand by Isanurug using the Denver II test kit reported a 36.4% frequency of developmental delays among children under 6 years old *(Isanurug, 2005)*.

In 2016, research carried out on development delays among 520 children aged under 5 in Northen Delhi, showed that 10,6% of children experience delays and these delays are related mainly to receptive speech (understanding language).

In Türkiye, research carried out by Kahraman and others among the 0-3 age group of children (2016) and in which Denver II test kit was applied, demonstrated typical development in 79,1% of children, while 20,9% were considered to be under suspicion or lacking development.

At Ankara University, in a survey realized by Dr. Nilufer Galip utilizing the GMCD test method, the frequency of development delays was 30% in a group of 102 children aged 1-5 years (*Galip, et. al., 2011*).

Our study found that developmental delays are more frequent among girls than boys. However, research on children aged 1-36 months living in Istanbul suggests that developmental delays do not show any gender-based differences.

Research on the development of children at age interval 1-36 months living in Istanbul suggest infants with development delays do not show any difference by gender *(Savci, et. al., 2011)*.

A survey conducted by Baykoch and Doghan in 2015 found a relation between frequency of development delays is linked to gender *(Dogan, et. al., 2015)*.

From our experience of the survey conducted with parents and rehabilitation work with children with learning difficulties in the community, we can say that it occurs due to various reasons.

In Azerbaijan, several factors contribute to these issues, including parental illiteracy, a lack of awareness about child development and developmental stages, and the presence of inexperienced parents due to early marriages. Additionally, young parents often lack decision-making autonomy and must defer to older family members, even when they have concerns about potential disabilities or developmental delays. This can lead to a passive approach to seeking medical advice. Furthermore, the predominance of a medical model in addressing disability and the shortage of specialized professionals, such as child development workers, child neurologists, rehabilitators, and psychologists, also contribute to these challenges.

Also, it was identified that a high percentage of development delays are associated with speech difficulties, especially in the expressive language area.

Nowadays, late speech development is frequently observed among typically developing children. In addition, many families lack the necessary knowledge and skills to support their child's development and are unaware of the role of play and toys in this process. As a result, regardless of age, children in these families are often limited to mobile phone games, television, and other digital devices. Frequent use of such devices has been confirmed as a contributing factor to speech delays. Additionally, the socio-economic well-being of families plays a significant role in this issue.

The latest analysis conducted by Stanford University focused specifically on this area. Psychologists at Stanford found that children under 2 years old from low-income families experience delays of about 6 months in the speech and communication domain. The 5-year investigation revealed that children from low-income families enter school with underdeveloped speech skills and a limited vocabulary.

In several social experiments, 5-year-old children entering school exhibited speech development delays of 2 or more years. This delay was particularly noticeable in the early months of development. Additionally, 18-month-old children from families with low socio-economic backgrounds showed delays of several months compared to their peers from families with average socio-economic status.

In addition, in our survey, it was observed that children in the 1–14-month age interval are delayed in game activities and the 15-42 age group experienced delays in self-care skills.

When analyzing delays by age range, it was observed that the proportion of delays was higher in the 36–42-month age range.

The results of our research confirms that the absence of early childhood services is leading to developmental delays in children that could be mitigated with better awareness, screening and community-based activities that engage the child and parents in developmental play and other interventions.

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