

## Children of an Early Age: Preferences with Regard to Different Types of Motor Contents and Multimedia during Their Realisation<sup>1</sup>

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### Abstract

The aim of the study is to determine whether children of an early age take equal part in all offered types of motor contents and various types of realisation accompanied by multimedia. The sample of examinees comprised 63 children who were on average 2.3 years old and who attended the regular integrated programme in Kindergarten Rijeka. The variables are formed by types of motor content which can be performed during kinesiological activities: biotic motor knowledge, kinesiological games, preparatory games, motor content accompanied by multimedia. The activities were recorded by a video camera; the observation method and the chi-square test were applied. Results show that there is a statistically significant difference in the children's involvement regarding the types of motor contents and the application of multimedia. The highest involvement was present in the following contents: mastering obstacles, handling objects, individual kinesiological games, general preparatory exercises in place, while regarding the multimedia, during the realisation of motor contents children mostly preferred music. The lowest involvement was in the following contents: mastering resistance and team kinesiological games.

When planning kinesiological activities with children of an early age, it is necessary to respect their interest which will then increase motivation and efficacy in organised physical exercising.

**Key words:** *preferences; motor contents; kinesiological activities; early age; multimedia*

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## 1. Introduction

Physical activity is usually defined as “each movement of the body linked to muscle contraction which increases energy consumption to a higher level than during inaction “(Heimer and Beri, 2013: 54). This definition is very wide and comprises all forms of physical activity, and THUS the kinesiological activity of early and preschool-aged children. A kinesiological activity is any controlled working process with a characteristic flow of information between the controlling system and the controlled system (Prskalo, 2004). Physical activity and health are closely related, so it is important to form the habit of daily physical exercise as early as possible (Petrić, 2016; Novak et al., 2014). A lack of adequate physical activity has an unfavourable influence on children’s growth and development and jeopardises the normal functioning of organs, organic systems and the overall health (Sindik, 2008). Every child who, as an individual, develops his genetic potential for various sports activities from the early age, has a greater chance that his potential will continue to develop in the future (Trajkovski Višić and Višić, 2004).

Early preschool childhood is a period in which physical exercise and sport represent joy and challenges to children (Petrić, Kostadin, and Peić, 2018). In this period children are fast to acquire new and different motor contents which they store as motor memory. The fast acquisition of new and varied contents and patterns is enabled by the susceptibility of the nervous system to learning (Živčić, Marković and Breslauer, 2011, according to Alić, Petrić and Badrić, 2016). Content-wise, before all, great importance is given to the acquisition of natural forms of movement like walking, jumping, carrying, crawling, rolling, bowling over, catching, shooting, crawling through, etc. The significance of the game is very high in childhood. Therefore, kinesiological activities in early and preschool age have to be enriched by a multiplicity of contents from this category. Implementation of the game in kinesiological activities with children of early and preschool age elicits positive emotions in children (satisfaction, happiness, laughter, joy), but also allows for the development of various types of knowledge, skills and habits used by children in everyday life (Findak, 2001, according to Alić, Petrić and Badrić, 2016). Because of that, preschool teachers can create a physical exercise habit for young children

through the game. Šagud (2000) states that games are the primary medium for developing some abilities by activating children's intellectual, physical, social and emotional resources. Children are mostly interested in and happy about all disciplines because through socialization, they primarily meet other children and can learn something new through playing and having fun. They learn basic forms of movement typical for certain sports; coordination is enhanced, speed, balance and flexibility, too. The National Curriculum for Early and Preschool Education (2014) stresses the importance of the aforementioned and its provisions are closely related to the integration of kinesiological activities at children's early and preschool age. One of the characteristics of the National Curriculum for Early and Preschool Education is integration. Children's activities are not structured according to separate methodological areas and are in no way separated by content or time period. This represents a departure from the positivistic concept of learning, i.e. using monitored teaching methods and transmitting of fractioned fragments of knowledge for the benefit of purposeful activities for children, ensuring the quality of their experience and achieving a dynamic approach to learning (National Curriculum for Early and Preschool Education, 2014. p. 14).

Considering the practice so far, physical activities are most often performed with children of preschool age rather than early age. However, physical activity is important because it reveals the inborn potentials of children with a view to their further development and enrichment (Findak, 1995).

Previous research on this topic (Fazio, 1981; Chen and Zhu, 2005) indicates that children can identify activities which attract them but are not capable of distinguishing their individual preference contents or estimate if a certain activity is part of their individual interest. Because of that, a preschool teacher's task is to monitor the free play, behaviour and activities of the child and to determine children's preferences. After that, the preschool teacher can design a plan and program that includes a variety of motor contents suitable for the child's age. However, children's preferences direct their attention toward a certain content, and so they filter information which will be acquired faster (Renninger and Wozniak, 1985). Kindergarten and home environment variables have a stronger impact than personal variables on children's intuitive interest in physical activity.

Future interventions should focus on strengthening kindergarten physical education and providing a safe home environment to help nurture children's intuitive interest in physical activity (Chen and Zhu, 2005).

There are not many studies about early and preschool-aged children's preferences for certain kinesiological contents. Some results show that polygons are a method which children show preferences for, and they often lead them to situations when they re-examine their competence and skill levels. Through polygons, children develop the sense of common responsibility, the feeling of belonging to the group and the feeling of organised conduction of the kinesiological activity course (Breslauer and Zegnal, 2011). Findak (1999) defines polygon as a form of work that is applicable in almost all conditions, with all age categories and levels of motor ability and skills. It can be used to develop and improve motor skills and children perform tasks in the polygon without pause. Authors Tijan, Tomac and Trajkovski (2018) point out that a polygon involves performing a number of different exercises in a series. Early aged children get extremely tired of some exercise and movements. Due to the rapid change of tasks in the polygon, there is no loss of children's interest in the task. This shows the advantage of polygons over, for example, frontal work.

Besides, research results indicate that the tendency to prefer certain games and kinesiological activity is partly linked to chronological age, but also to belonging to a certain group (Prskalo, Horvat and Hraski, 2014). As a conclusion, if these results are observed as a consequence of forming attitudes as early as at the preschool age, it can be concluded that grouping attitudes occur in primary education, at the same time not diminishing the influence at the preschool age, which should certainly be rich in various stimuli.

This study represents a kind of base for further development and breakthrough in the area of kinesiological activities with nursery, or early childhood, children. During the creation of programmes and the choice of activities the children's age, their abilities and developmental possibilities should be considered to ensure whatever is done with them is serving their health (Petrić, Kostadin and Peić, 2018; Petrić, Bartolucci and Novak, 2016). By thoroughly planning the contents, using different equipment and props, introducing multimedia, having satisfactory facilities (gym), and with the educators' professional approach, as well as a good combination

of all the aforementioned, children's motor achievements can be significantly influenced.

The aim of this study is to determine whether children of an early age are equally involved in all offered types of motor contents and their different types of realisation accompanied by multimedia.

## **1. Methods**

The sample of examinees consists of 63 children of an early age, ON average 2.3 years old, and attending the regular integrated programme in THE Kindergarten Rijeka. 33 children were in the experimental group, and 30 children were in the control group.

The sample of variables is formed by types of motor contents which can be conducted during kinesiological activities, namely: biotic motor knowledge (motor contents for mastering space, obstacles, resistance, handling objects); kinesiological games (individual, catching kinesiological games, team kinesiological games, preparatory exercises (in place, in movement); motor content accompanied by multimedia (music, video recording).

Preschool teachers in the chosen educational groups were introduced to the research details and have participated in the creation and conduction of the experimental programme. They informed parents about the aforesaid at a meeting and requested their written consent. The programme was conducted from November 2018 to May 2019. The physical education activity was especially monitored. In order to make the implementation of the plan possible, we paid attention to the spatial and material conditions in the kindergarten where the program is being implemented. After that, a plan and program was created, which anticipated the realisation of the mentioned activity three times a week and included motor contents from four domains (Table 1.).

All planned motor contents are shown in Table 1 and are sorted by domains. During one activity, two thematic units that had a different effect on the body were performed. In the main „A“ part of the activity the emphasis was on the education and learning some motor contents. During the activity, only one of the two motor contents can be new to the child.

**TABLE 1. A DISPLAY OF MOTOR CONTENTS ACCORDING TO DOMAINS**

<i>DOMAIN</i>	<i>MOTOR CONTENTS</i>
MASTERING SPACE	CRAWLING IN MANY WAYS, WALKING WITH MUSIC RUNNING ON DIFFERENT SURFACES, ROLLING ON MATS IN DIFFERENT DIRECTIONS, RUNNING WITH MUSIC, CRAWLING THROUGH DIFFERENT SPORT EQUIPMENT, WALKING BETWEEN DIFFERENT SPORT EQUIPMENT
MASTERING OBSTACLES	CRAWLING THROUGH THE FRAME OF THE SWEDISH BOX, JUMPING IN DIFFERENT WAYS, JUMPING ROPE ON THE FLOOR, CRAWLING THROUGH A TUNNEL, CRAWLING THROUGH A HOOP, DROP JUMPS, DEPTH JUMPS AND HOP JUMPS ON AND FROM DIFFERENT SURFACES, PASSING OVER OBSTACLES IN VARIOUS WAYS.
MASTERING RESISTANCE	LIFTING AND CARRYING VARIOUS OBJECTS, PUSHING THE BALL WITH ARMS, PUSHING THE BALL WITH LEGS, PUSHING A PLASTIC STICK WITH ARMS, PULLING A PLASTIC STICK, MOVING WITH ARMS FRONT, HANGING ON A ROPE
HANDLING OBJECTS	THROWING THE BALL TOWARD A WALL, THROWING THE BALL UPWARDS WITH TWO ARMS, THROWING THE BALL INTO THE MARKED SPACE, CATCHING THE BALL WITH TWO ARMS, THROWING THE BALL TO THE GROUND WITH AN ARM, THROWING THE BALL THROUGH A HOOP, DIRECTING THE BALL WITH THE LEG

During the planning and implementation of motor content, great attention is paid to the gradualism as one of the principles of educational work in the kinesiological methodology. It is planned to acquire new motor skills on already well-trained and knowledge-based activities. Additionally, physical exercise started with easier, or simpler, children's motor skills that later lead to adopting more difficult and complex ones. After designing the program, it was determined which contents can be used in a particular part of a kinesiological activity. For the introduction, kinesiological games and catching kinesiological games were chosen. In the preparatory part of the activity, general preparatory exercises in place, in movement and with music were used. The contents of the main "A" part were previously mentioned in the plan and program while the contents for the main "B" part of the activity included polygon, kinesiological team games and dance and music movements. The final part of the kinesiological activity included content such as reading a story, using video, health and hygienic procedures, etc.

During activities, various kinesiological games were created from these contents, while certain contents were realised accompanied with

music or a video recording which was displayed on a big screen (according to Vujičić, Petrić, and Pejić Papak, 2018).

Data were processed and analysed in the programme Statistica 12.5. Results are presented as absolute frequencies and percentages. Activities were recorded by a video camera, and to determine the participation of a child in the performance of motor contents, the observation method was used. Differences in the frequency of children participating or not participating in certain types of motor contents were determined by the chi-square test. Statistical significance was tested at the level of 0.01 %.

## 2. Results

Based on the involvement of children in the offered motor contents, or their active participation in a certain motor task, it can be concluded whether a child is interested or not in said contents. Table 2. presents the results of children's active participation in line with motor contents in frequencies, while the graph shows the same in percentages (%). In Graph 1. it can be noticed that among the motor contents divided into domains, children were the least interested in contents for mastering resistance, while there were 84 % (84 – 89 %) of children who actively participated in the remaining three domains.

Most of the children were actively involved in motor contents based on handling objects, such as: throwing balls into the wall, throwing balls through the rim, throwing balls into the marked area, pushing the ball with the foot or catching the ball with two hands. Also, a lot of children were involved in motor contents based on mastering obstacles, such as: jumping in different ways, jumping over the spit on the floor, pulling through the tunnel, rolling through the rim, overcoming obstacles in different ways, etc. 84% of the children were included in motor contents based on space mastering, such as: crawling in different ways, walking with music, running on different surfaces, rolling on the mattress in different directions, running with music, crawling through different sports equipment, walking between different sports equipment etc. Some of the contents which are based on mastering resistance, and which include the

smallest number of children, were: pushing mats, pulling mats, lifting and holding the ball.

**TABLE 2. RESULTS OF PARTICIPATION IN MOTOR CONTENTS  
PRESENTED IN FREQUENCIES**

<i>TYPES OF MOTOR CONTENTS</i>	<i>CHILDREN'S PARTICIPATION</i>
MASTERING SPACE	53 / 63
MASTERING OBSTACLES	55 / 63
MASTERING RESISTANCE	33 / 63
MASTERING THE HANDLING OF OBJECTS	56 / 63
INDIVIDUAL KINESIOLOGICAL GAMES	55 / 63
CATCHING KINESIOLOGICAL GAMES	45 / 63
TEAM KINESIOLOGICAL GAMES	30 / 63
PREPARATORY EXERCISES IN PLACE	54 / 63
PREPARATORY EXERCISES IN MOVEMENT	40 / 63
MOTOR CONTENTS WITH MUSIC	61 / 63
MOTOR CONTENTS WITH VIDEO RECORDINGS	58 / 63

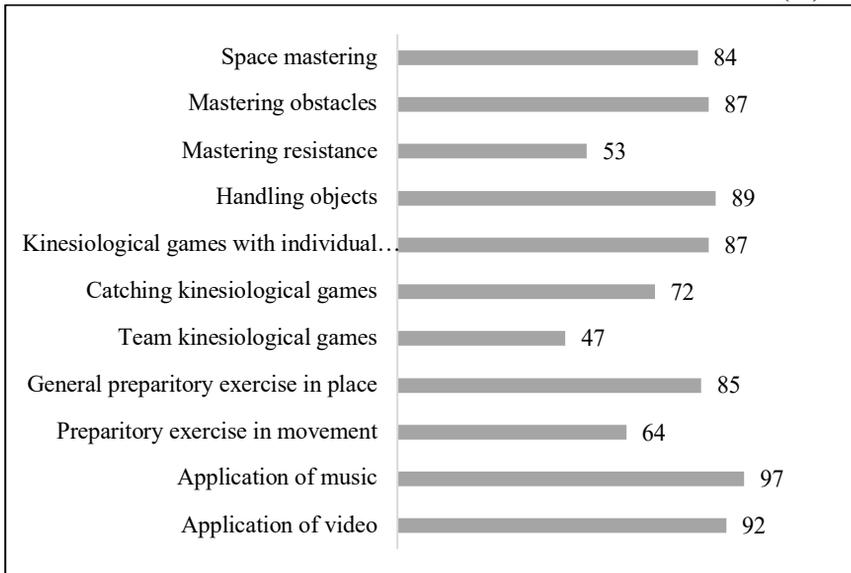
Early aged children found individual kinesiological games (87 % of involvement) especially interesting. These are games where children perform a certain motor task themselves, without direct cooperation of other children. Here is one example: Every child in the group stands in his place behind the line. The line represents the start. On the preschool teacher's sign, each child should kick the ball to the other side of the hall. There is no winner in the game; the goal is for every child to do the best they can.

Catching kinesiological games showed to be a somewhat weaker challenge for children and achieved only 72 % of active involvement. An example of this type of game is: Child needs to hold his friend's hand, and with the second hand he needs to keep a ball. A ball is a sign of a hunter in this game. They catch other children in pairs. When they touch someone, he or she "freezes" in his or her current position. The game is finished when everyone gets caught/frozen.

Kinesiological team games, where children need to cooperate with others, proved to be the least interesting for them, with only 47% of their involvement. Here is one example of team kinesiological games: Children need to hold their hands and make a circle. The preschool teacher needs to

stand in the middle of the circle and throw a balloon. Children need to keep the balloon in the air as long as possible using only their heads. If there are too many children, they can be placed into several groups.

**GRAPH 1. RESULTS OF PARTICIPATION IN MOTOR CONTENTS (%)**



Preparatory exercises in place (85 %) showed to be more interesting than their realisation in movement (64 %), and children were more eager to get involved for more than 20 %. The ways motor contents were realised accompanied by multimedia also proved to be especially interesting to early aged children. Their interest for contents with multimedia trespassed 92 %, and music, along which almost all children (97 %) happily participated in the physical exercising process, imposed itself greatly. Motor contents with music included songs that are already familiar to children and which the group has already encountered. Music is used in all parts of the kinesiological activity, for example games with music in the first part of the activity, dancing with music in the main "B" part of the activity or relaxing with music in the final part of the activity. Also, video materials, such as cartoons, have been used. Participation in that content was 92%.

**TABLE 3. RESULTS OF DIFFERENCES IN THE CHILDREN'S PARTICIPATION AND INVOLVEMENT IN CERTAIN TYPES OF MOTOR CONTENTS**

<i>Chi - square</i>	<i>Degrees of freedom (df)</i>	<i>p - value</i>
69.04	8	<b>0.00</b>

The number of actively involved children differs significantly ( $p=0.00$ ) in relation to the type of motor contents offered to them (Table 3). Although children participated in all motor contents, the results showed that their interest in the following contents was particularly the greatest: contents of mastering obstacles, mastering the handling of objects, individual kinesiological games, general preparatory exercises in place and the realisation of motor contents accompanied by multimedia (where interest was especially expressed). According to the developmental characteristics of children, their abilities and opportunities at an early age, the results were analysed.

### **3. Discussion**

The greatest children's involvement (>85 %) was present in mastering obstacles and handling objects. Research and practice showed that early-aged children have significant potential for learning and exploring space around them (Gopnik et. al. 2003, Bruner, 2000 et al., Vujičić, 2013). They learn through exploring the world around them, doing, watching, and participating in activities. It is important to create a supportive and challenging environment for learning and researching (Vujičić, 2013). Children of early age are curious and are interested in space around them and how they can handle some objects.

Children start exploring from the moment of their birth, and as they grow, their need for exploration also grows. It is known that early aged children are curious, brave, learn by doing and express a strong urge to explore their environment (Martinović, 2015). Also, children have an inborn sense of wonder and a strong desire to explore; they just need a supportive adult who can keep their spirit alive. They can often be seen touching various objects, throwing them, palpating, rolling them and listening to their movement. Besides, they often explore their bodies' possibilities and try what they can and are capable of. They do that by jumping, walking, running, furthermore they throw themselves, bowl over

and roll. That is why mastering obstacles and handling objects are two domains which are extremely interesting to children, and represent new challenges and stimulate their actions. Through the observations of children, we can see them moving around the hall during kinesiological activities. Also, it can be seen that activities initiated by children are related to the domains of handling objects and space mastering. Activities initiated by children positively affect all aspects of their development. To carry out such activities, well-equipped space is very important. Properly equipped spaces for physical activity in kindergarten contribute to everyday natural motion.

Children are biologically ready to learn about the world surrounding them, to walk, speak, etc. Due to this innate ability, they become interested in activities belonging to these two domains whenever they get the chance for it (Conezio and French, 2002; Vujičić, 2017). Early-aged children do not like kinesiological team games, and most of them get involved in individual kinesiological games. Such results can be corroborated by the fact that early aged children are not ready enough to cooperate with others. Later on, in the preschool period, from the fourth to the sixth year of age, there is a developmental task ahead of the child to be involved in the world around him/her to a greater extent, to form relationships with other children, to cooperate and be active. Social interactions include a number of social skills; thus socially competent children coordinate their behaviour with others' by finding a common language, exchanging information and cooperating (Brajša Žganec, 2003). Two-year-olds are still characterised by their egocentric phase. Egocentrism can be manifested in two forms: as an early form and as a late form. For early egocentrism, it is typical that a child does not have a clear sense of separation from the environment, and the environment becomes part of it. In the late egocentrism, children slowly start to distinguish themselves from the environment, but they cannot yet understand that they are different from others, they cannot understand common rules. They are also putting themselves into the centre of everything, and it is difficult for them to join team games. Due to egocentricity, the child is not completely ready to cooperate and does not know the limit between himself and the external world (Berk, 2008). Children aged 1 to 3 are not capable of reaching common agreements, of negotiating and maintaining self-control

during such games, so they often choose and prefer individual kinesiological games. Children need to know some rules to be able to participate in team kinesiological games. Games with the rules are games that are based on pre-established rules. These games can be cooperative so children can also learn about teamwork and collaboration with others, about helping and sharing. Moreover, children learn how to abide by rules and learn about the community. Games which require this are typical for school-aged children (Klarin, 2017). Egocentrism disappears between the ages of 6 and 7 (Starc et al., 2004). This fact is important for clarifying the involvement of children in team kinesiological games.

Results indicate that early aged children prefer general preparatory exercises in place. Early aged children can direct their thoughts toward a certain task, but their attention span (the amount of time a person can spend concentrating on a task without becoming distracted) is much shorter than that of older children or adults. Therefore, early aged children cannot remain concentrated for a longer time to perform movement exercises or exercises accompanied by music. Older children have longer concentration-time than children of an early age. There is also a close connection between concentration (being able to focus attention) and self-regulation. Children who are better at self-regulating display more positive social behaviour. As adults, we need to be patient and understanding with children. Music and movement can draw their attention from general preparatory exercises, which are then not performed in the right way. During early childhood, children develop the ability to imitate and are better in solving simple tasks (Berk, 2008). With regard to this, they mostly prefer general preparatory exercises in place when they follow movements and instructions given by educators and repeat what is assigned without additional stimuli and tasks which could deconcentrate them. Children's preference for general preparatory exercise in place can be increased by the implementation of stories about some topic that is very interesting to children. For example, a preschool teacher can create a story about animals who are going for a walk. The first in a row is a giraffe who may move its neck. It encourages children to try to practice as a giraffe. Also, the preschool teacher can implement stories including toys, nature, vehicles, etc.

The children's interest in content with multimedia was 92%. Children prefer music, and almost all children (97%) were happy to participate in the physical exercise process. Multimedia contents linked to movement are extremely stimulating for the realisation of motor contents with children of early or preschool age (Vujičić, Petrić and Pejić Papak, 2018). This fact was also confirmed by the results of this study. Multimedia is an indispensable part of everyday life, with music that activates, encourages, stimulates and strongly influences men from the earliest age (Šamanić, 2011). Motor contents accompanied with music were especially emphasized, which in the context of all pedagogic concepts of education are an unavoidable path toward children's holistic development. If children are stimulated with music from the earliest age, it is possible that they make experience patterns (Šamanić and Petrić, 2017). For early and preschool-aged children, music is primarily a feeling they express by movement. It is known today that the music intended for perfecting the children's motor contents should be of a tempo (speed) which adequately complements their abilities (Šamanić and Petrić, 2017). It can be chosen from all genres available to the educator but has to be rhythmically clear and dynamically moveable for the realisation of the planned goal. Music allows children to express their emotions freely, which they transfer from personal experience to movement and motor activity, which is especially important in this age at which they insufficiently express themselves verbally.

In the continuation of this research, it would be good to include a larger number of examinees for the results to be surely generalised. This study has shown that with early and preschool-aged children it is possible to conduct organised kinesiological activities like physical education, and it offers guidelines in the choice of motor contents for which children show significant preferences.

#### **4. Conclusion**

Organised kinesiological activities in early education institutions represent for many children in their developmental phase the only chance to engage in physical activities. This fact emphasizes the invaluable importance of physical activity in the contemporary world, where sedentary life predominates (Petrić, 2016). Besides, regular physical

activity from the earliest age is a crucial factor for a healthy life; therefore, physical exercise and kinesiological activities should play an important role in a child's overall activity set (Petrić et al., 2012). Motor knowledge and the abilities which a child acquires from the earliest age fulfil his/her biotic need for movement and contribute to the development of motor potentials.

The results obtained by this study indicate the possibility of working with children of an early age who can achieve significant results in adequate conditions, with qualified professionals and their support. Children showed special interest for activities of mastering obstacles, handling objects, individual kinesiological games, general preparatory exercises in place and the realisation of motor contents accompanied with multimedia. When planning kinesiological activities with children of an early age it is necessary to respect their interest because the efficacy of physical exercising is then more significant. They should be used to increase the motivation toward organised physical exercising, but attention should also be paid to not neglecting other adequate motor contents which allow for the overall development of children.

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### **Djeca rane dobi: uključenost s obzirom na različite vrste motoričkih sadržaja i multimedije tijekom njihove realizacije**

**Sažetak:** Cilj istraživanja je utvrditi sudjeluju li djeca rane dobi podjednako u svim ponuđenim vrstama motoričkih sadržaja i različitim vrstama njihove realizacije koje omogućuje i multimedija. Uzorak ispitanika činilo je 63 djece prosječne dobi od 2,3 godine koja su pohađala redoviti integrirani program u Dječjem vrtiću *Rijeka*. Varijable su formirane tipovima motoričkih sadržaja koji se mogu izvoditi tijekom kinezioloških aktivnosti: biotičko motoričko znanje, kineziološke igre, pripremne igre, motorički sadržaj uz multimediju. Aktivnosti su snimljene videokamerom, a primijenjene su metode uključivale promatranje i hi-kvadrat test. Rezultati pokazuju da postoji statistički značajna razlika u uključenosti djece u pogledu tipova motoričkih sadržaja i primjene multimedije. Najveća uključenost zabilježena je u sljedećim sadržajima: svladavanje prepreka, rukovanje objektima, individualne kineziološke igre te opće pripremne vježbe na mjestu, dok u kontekstu multimedije tijekom realizacije motoričkih sadržaja djeca uglavnom preferiraju glazbu. Najmanja uključenost zabilježena je u sljedećim sadržajima: svladavanje otpora i timske kineziološke igre. Kod planiranja kinezioloških aktivnosti u djece rane dobi potrebno je poštivati njihov interes, što će povećati motivaciju i učinkovitost pri organiziranoj tjelesnoj aktivnosti.

**Ključne riječi:** *preference, motorički sadržaj, kineziološke aktivnosti, rana dob, multimedija*