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## Effects of creative drama-based diet-exercise on preschoolers' preferences for and consumption of healthful foods

تأثير تدخل النظام الغذائي والتمارين الرياضية القائم على الدراما الإبداعية على تطوير تفضيلات الأطفال في سن ما قبل المدرسة واستهلاكهم للأطعمة الصحية

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### Abstract

This study examines the effects of Creative Drama-based Diet-Exercise intervention on developing preschoolers' preferences for and consumption of healthful foods. A quasi-experimental experiment was designed and implemented. 40 children (66.6%) were girls and 20 (33.3 %) were boys. The sample was randomly divided into two groups: treatment (n=30 children), and control (n=30 children). To collect and analyze data, pictured questionnaires were used. A play-based nutrition program was developed. The program was based on social Cognitive Theory (SCT), as it involves concepts that have been established as crucial factors in children's healthy eating behaviour development. Results show that there is a significant difference between the two groups after provision of creative drama-based diet-exercise intervention. The difference is for the treatment group.

**Keywords:** creative drama, diet-exercise intervention, healthful foods, preferences, preschoolers.

### Introduction

#### *A description of the problem*

The integration of children's drama education into campus activities can give children a deeper understanding (Perez-Rodrigo et al., 2003). Australian research found that theater performances improved

### المخلص

تهدف هذه الدراسة الى البحث في تأثير تدخل النظام الغذائي والتمارين الرياضية القائم على الدراما الإبداعية على تطوير تفضيلات الأطفال في سن ما قبل المدرسة واستهلاكهم للأطعمة الصحية. تم تصميم وتنفيذ تجربة شبه تجريبية. تتكون عينة الدراسة من (60) طفلاً، تم تقسيمهم عشوائياً إلى مجموعتين: تجريبية (n = 30 طفلاً) وضابطة (n = 30 طفلاً). لجمع وتحليل البيانات، تم استخدام الاستبيانات المصورة. تم تطوير برنامج تغذية قائم على الدراما الإبداعية. تظهر النتائج أن هناك فروقا دالة بين المجموعتين بعد تقديم تدخل النظام الغذائي والتمارين الرياضية القائم على الدراما الإبداعية، وهذه الفروق في صالح المجموعة التجريبية.

**الكلمات المفتاحية:** الدراما الإبداعية، التدخل الغذائي والتمارين الرياضية، أطفال ما قبل المدرسة، التفضيلات، استهلاك الأطعمة الصحية.

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children's healthy eating attitudes and student nutrition activities (Bush et al., 2018). The study used creative drama to provide dietary training for overweight and obese adolescents and found that training courses designed with creative drama methods significantly changed the adolescents' knowledge, attitudes, meal order and weight and also significantly reduced (Demir Acar & Bayat, 2019). A study by Xu & Yun (2022) indicated that balanced drama intervention enhances children's nutritional knowledge and food cognition, and the study also found that the effect is more significant for girls than for boys.

Studies that dealt with nutrition problems are rare in our country. Asia faces a challenge of hunger in its population of under-five. The reported prevalence of overweight is less than 5.2 per cent lower than the worldwide average of 5.9 per cent. The prevalence of stunting in the under-five is 22.7%, higher than the global average of 21.9%. The prevalence of waste in Asia is also 9.4% higher than the global average of 7.3%. About 42.3 per cent of children under six months of age are breastfed in the Asian world, while the world's total low birth weight rate of 17.3 per cent is higher than the global average of 14.6 per cent (Okolo et al., 2021). Creative drama is a possible solution for this problem. Creative drama is among the most important kindergarten activities, as its characteristics and features are consistent with those of young child's age (Erbay & Ömeroğlu, 2013). Interactive and participatory learning through the creative drama technique effectively increased students' obesity awareness and promoted healthy nutrition-exercise behaviors (Eryiğit et al., 2024). To provide nutrition education by using creative drama-based diet-exercise in order to change children's nutrition, it is especially important to support programs and factors that enable positive behavior that are effective in students' habits in this regard.

## Literature Review

Creative drama positively affects the development of the child's individual and social skills. In addition, it strengthens the child's physical skills and the capacity to solve the problems he/she faces (Boal-Palheiros & Ilari, 2023). Through creative drama, events and situations and the connections between them can be easily learned. In creative drama, people create a world they imagine based on their knowledge and experiences. On the other hand, drama, which is a social process, requires communication. The meaning of creative drama is to develop the participation of individuals. With creative drama, the seeds of learning the values that strengthen the individual's social unity based on cooperation and rules are also laid. Accordingly, in the early stages of the lives of people living together within certain cultural and moral bonds, the restorative and constructive effect of play represents an important support point for the construction of sociality (Gezen, 2022).

Additionally, creative drama is a concrete, interpretable, creative and experience-based learning process instead of the abstract learning style that is based on memorization and remains at a theoretical level. This process, where knowledge and experience come together, enables the development of cognitive and psychological integrity in the student (Karaosmanoglu & Adiguzel, 2021). In addition, creative drama helps individuals gain characteristics such as self-expression, development of imagination and artistic awareness, social awareness, cognitive awareness, speech fluency, self-awareness, development of self-esteem, self-confidence and self-discipline (Karaosmanoglu & Adiguzel, 2021).

Moreover, creative drama applications are carried out using various theater techniques under the guidance of the teacher within the scope of a determined subject. Research conducted within the scope of creative drama reveals the effectiveness and necessity of creative drama applications in preschool education. Children both learn and have fun with creative drama applications. Creative drama applications are also effective on all psychological processes related to cognitive activities, thinking and knowing. Cognitive activities cover the processes of how information is obtained, processed and organized. Cognitive development studies how these mental processes work in children and young people. As children develop, their thoughts also change. Creative drama applications also contribute to children's cognitive development (Öz et al., 2022).

In a broad sense, children's drama can be divided into two concepts: one is children's stage drama with performance as the goal, and the other is children's educational drama activities with education as the goal. Children's educational drama activities are not to perform a drama on stage for children to watch or let children perform a drama, but a group drama activity with children as the center and education as the purpose, under the premise of using drama elements and strategies (Akyol, 2003). Children's educational drama, by bringing together children's thoughts, imagination, language and real experience, under the guidance and support of teachers, achieves the educational effect of increasing children's knowledge,

cultivating children's emotions, promoting children's aesthetics, and cultivating children's comprehensive abilities (Çilengir & Akar, 2016).

The main implementation place of educational drama is generally classrooms or other children's activity areas, rather than the stage of the theater. Its significance is to let children immerse themselves in a certain story framework and drama structure. In the process of cooperation between teachers and children, teachers and students spontaneously create situations and play roles together. Children get to know themselves, others, and the world in the process of exploring drama stories (Barakat, 2023; Cömertay, 2006).

As a diversified, inclusive and creative teaching method, educational drama meets the requirements of the development of the current era. Preschool teachers use comprehensive drama art forms and creative drama teaching methods to guide children to develop in an all-round way, taking "accompanying children who develop in all aspects in the new era" as the ultimate educational goal (Ulutaş, 2011). In the kindergarten stage, educational drama helps solve the problems of excessive intervention by kindergarten teachers and the separation of content in the five major areas. It uses educational drama methods to comprehensively integrate teaching work in various fields, so that children's various abilities can be fully developed in the immersive experience of drama, and drama elements can be fully integrated into kindergarten teaching, so that kindergarten teaching can reflect the educational goal of "taking children as the center" (Metwalli & Barakat, 2022; Yalçın & Akar, 2016).

Drama provides an opportunity for children to express themselves, as it is characterized by group participation in improvisational writing, spontaneous diagnosis, and natural, unconscious group production (Schwenke et al., 2020). The child's involvement in dramatic activities confirms his understanding of human behavior, himself, and the world in which he lives (Çilengir & Akar, 2016). This is evident through their enjoyment of transforming their experiences into improvisational drama (Erbay & Ömeroğlu, 2013). Creative drama is a purposeful educational method that can be used in the form of educational experiences in which the child feels pleasure, and it conveys many different knowledge, concepts and values, and behavioral modification (Genç, 2003). Through creative drama, the child is trained to assume roles to modify negative behaviors and replace them with positive ones. This increases the child's awareness of his behavior through these roles. It is through creative drama that the child feels what other people actually feel (Gürey & Adıgüzel, 2013).

Children are in the process of growth and development, especially their brain functions are developing rapidly, their nervous systems are maturing, and their mental and behavioral habits are beginning to form. They need to consume a lot of energy, have a huge demand for nutrients such as vitamins, minerals, and trace elements, and have a high requirement for dietary diversity (Artemova et al., 2023; Perkins et al., 2018). Other studies have shown that long-term bad eating behavior not only causes malnutrition or overnutrition in children, but also affects their intellectual development and the formation of perceptual functions, and even affects parent-child and social relationships (Faith, 2005). These experiences shape children's preferences for certain foods as well (Skinner et al., 2022). Children are said to learn dietary behaviours through experience, as they are at an age stage that is important in forming their food preferences (Liem & Menella, 2002).

One of the conditions for being mentally, physically and spiritually healthy is an adequate and balanced nutritional habit. A balanced diet is vital for children; because the basic developmental areas of children are directly linked to nutrition (Skinner et al., 2022). The mental potential of a child who is fed adequately and balancedly increases, his height and weight follow a normal development line, his joy of life increases and his resistance to difficulties increases (Brown & Ogden, 2004).

Nutrition is a term that includes the intake of nutrients necessary for the functioning of the body and their use in the body as a result of a series of processes such as digestion, absorption and transport (Merdol, 2008). For a healthy life, nutrients must be taken into the body in an adequate and balanced manner. Adequate and balanced nutrition is important to meet not only physiological needs but also psychological and sociological needs (Piziak, 2021; Saraç et al., 2023; Toussaint et al., 2021). Malnourished societies have a ten times higher death rate than adequately nourished societies (Brown & Ogden, 2004). The World Health Organization (WHO) stated that diet-related chronic diseases are the main cause of 60% of deaths and 46% of diseases (Merdol, 2008).

Countries need physically and mentally healthy individuals to reach the level of developed countries. In order for people to be physically and spiritually healthy, they need to have an adequate and balanced diet throughout their lives. Nutrition is the ability of the body to take and use all the nutrients required by the body in the amounts required to sustain life and protect health, according to the human structure, gender, working and special situation and genetic characteristics (Nakamura, 2022).

The aim of child nutrition is to ensure optimal growth and development of the child. The main differences that distinguish the nutritional needs of children from adults are that their basal metabolic rates are higher than adults due to growth and development, and their protein, vitamin and mineral needs are different from adults due to tissue formation (Merdol, 2008).

It is not that difficult to observe and measure food preferences in preschool children. Moreover, there are interventions that are known to be involving repeat exposure and helping to increase familiarity. Additionally, food preferences correlate positively and highly with food consumption. Thus, food familiarity, food preference, and food consumption are patterns that help in the development process of in taking healthful foods and this can be a preventive method against overweight and obesity (Jarvensivu, 2017).

Feeding behavior refers to the specific methods or behaviors that parents use to influence children's eating. This behavior itself includes a large number of factors, such as the behavior of the feeder when feeding, the behavior of the child when being fed, food, and environment. It is not only affected by the knowledge, attitude, socioeconomic culture and other factors of the feeder, but also by the physical constitution, personality and other factors of the child. (Røed et al., 2020; Shim et al., 2016).

In the literature, the studies on the effects of creative drama-based diet-exercise intervention are limited. Educational drama focuses on students' personal experience and emphasizes "student-centeredness" so that they can understand educational content through actual experience. Compared with traditional mental health education, students can learn knowledge more quickly and effectively, experience various emotions, and apply these knowledge and emotions to real life, which enables them to better adapt to the environment and achieve the purpose of quality education (Destriatania et al., 2019).

Preschool children's educational drama is a creative and interactive educational method that can stimulate, encourage and attract preschool children's interest in learning. It forms a systematic and experiential teaching model through games, pretending, experiencing stories, participating in role-playing and creating plots. Preschool children's educational drama is based on imagination. It can activate children's imagination and improvisational creativity and awaken their instinct to play. Through the actual use of some comprehensive artistic means, teachers and children jointly conceive and participate in the development process of a drama story. The drama story development process is tailored to the needs and developmental levels of young children and embeds drama methods and content into a progressive learning process centered on a collective creative process. (Destriatania et al., 2019; Perry et al., 2002; Tatlı et al., 2022).

Drama-based education is an efficient method to help children understand the concept of healthy eating behavior (Nicklas et al., 2017). Story-telling health videos can increase children's physical exercise self-efficacy and enhance intrinsic motivation for fruit and water intake. The literature also points out that the prolongation of maintenance effectiveness needs to be strengthened (Le Bigot Macaux, 2001; Wang et al., 2017; Wardle et al., 2001). A study on the impact of drama teaching on story understanding, recall and learning motivation of second grade children in elementary schools pointed out that drama teaching has a significant effect on improving children's story recall ability (Liao, 2001). The conclusion of this study is that the balanced diet drama model has a long-term memory effect on school children's nutritional education and can significantly improve school children's food cognition.

Shan Jing (2022) investigated the effect of balanced diet drama intervention in nutrition education on the dietary behavior of elementary school children. Using a pre-test and post- test design, the second graders of elementary school were given self-made questionnaires before, one month and six months after the intervention to evaluate the nutritional knowledge and food cognition. The sample number of schoolchildren was 1755, and the average recovery rate of valid questionnaires was 68%. After the intervention of balanced-diet dramatic performance, there was significant differences on eating habit, life habit, nutritional knowledge and food cognition in tested students ( $p < 0.05$ ), and the significant differences persisted to six months after the intervention.

## Aims

The aim was to investigate effects of Creative Drama-based Diet-Exercise intervention on developing preschoolers' preferences for and consumption of healthful foods.

## Hypotheses

**H1.** It is expected that scores in preferences for healthful foods will increase in the intervention group.

**H2.** It is expected that scores in consumption of healthful foods will increase in the intervention group.

## Methodology

### Design

The aim was to explore the effects of creative drama-based diet-exercise intervention on developing preschoolers' preferences for and consumption of healthful foods. A quasi-experimental experiment was designed and implemented.

### Sample

104 children were recruited. All of them were preschoolers. Inclusion criteria were as follows: a) Always attending school, b) Willing to participate in the study, and c) Willing to attend and collaborate in the training sessions. Exclusion criteria were as follows: a) Unwilling to participate in the study training, and b) Irregular in his attendance at school. 40 children (66.6%) were girls and 20 (33.3 %) were boys. The sample was randomly divided into two groups: treatment (n=30 children), and control (n=30 children). (See table 1. and fig.1).

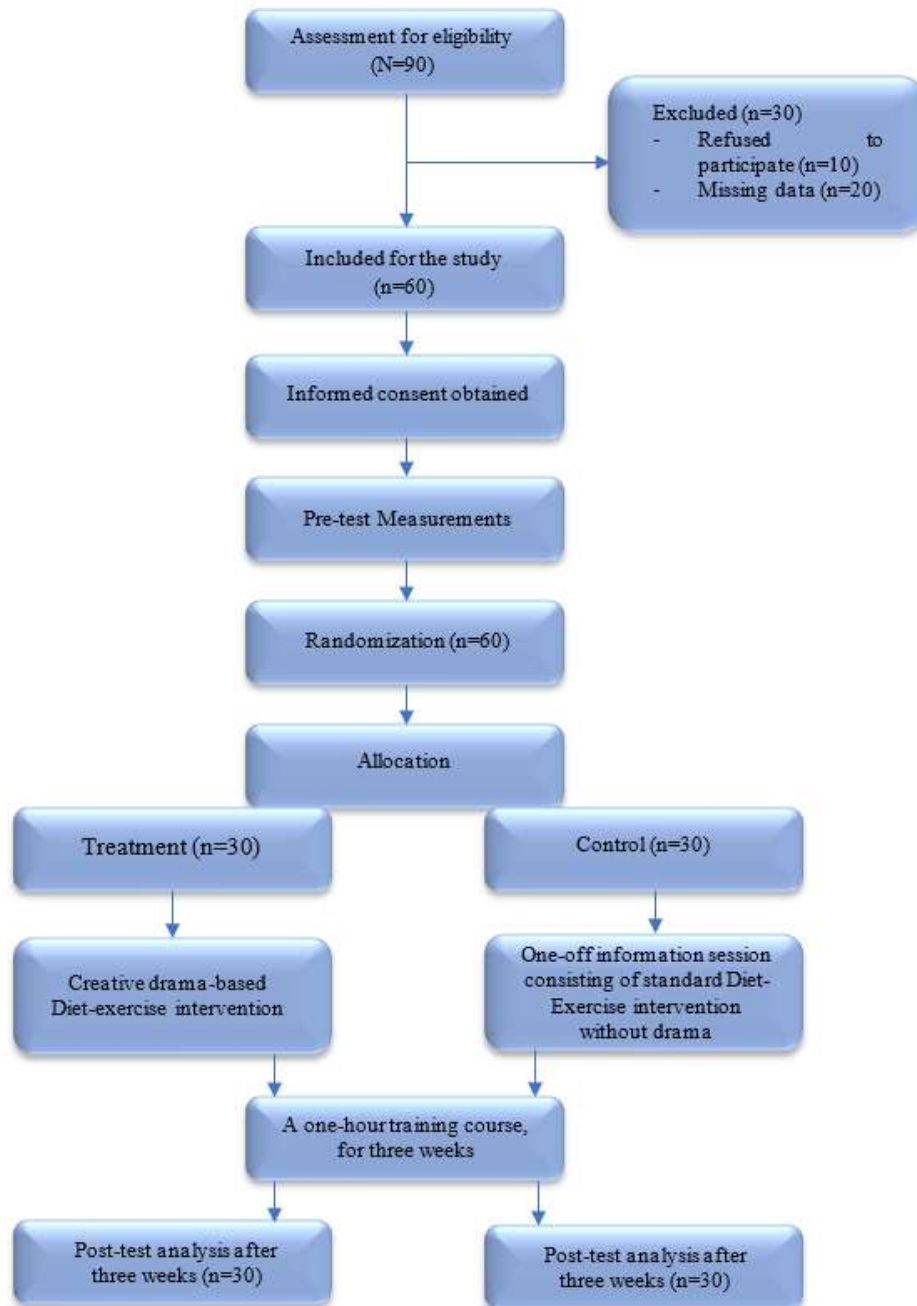
**Table 1.**

*Characteristics of the participants*

Variable	Treatment group		Control group		p
	n	%	n	%	
Gender					
Female	20	66.6	20	66.6	0.823
Male	10	33.3	10	33.3	
Socioeconomic level					
Low	2	6.6	3	10	0.774
Medium	18	60	16	53.3	
High	10	33.3	11	36.6	

(Prepared by the author)





**Figure 1.** Participants flow chart.

Source: The authors.

### Instruments

**Child Preferences:** Children are shown 15 cards with one type of food on each. They are asked to rate their likes and dislikes on a five point likert type scale. five cards with the facial pictures are put on the table. Child points to and chooses the appropriate face. Possible range for child preference was 15 to 75 with a score of fifteen reflecting total refusal of all test foods. Cronbach's alpha coefficient for this test is  $\alpha$  0.86.

**Child Consumption of healthful foods:** Children are shown 15 cards with one type of food on each. They are asked to say how often they would like to eat each on a four point likert type scale. Possible range for child consumption was 15 to 60 with a score of fifteen reflecting total not eating of all test foods. Cronbach's alpha coefficient for this test is  $\alpha$  0.89.

## Statistical Analyses

Descriptive statistics were used to provide a description of the study sample. T-tests analyses were performed to determine whether there were differences between pretest and posttest measures for both the intervention and control groups.

## Data Analysis

SPSS 21.0 package program was used for data analysis.  $P < 0.05$  was accepted as the significance level.

## Procedure

Control group received a one-off information session consisting of standard Diet-Exercise intervention, without drama, delivered by the second author. This group received no further contact.

## Intervention delivery

A play-based nutrition program was developed. The main focus of the nutrition program is on developing healthy eating behaviours. The program incorporated six learning areas— personal and social development, language, mathematics, science and technology, health and physical activity, and the arts. The program was based on social Cognitive Theory (SCT) (Stage et al., 2018), as it involves concepts that have been established as crucial factors in children's healthy eating behaviour development (21, see table 2). Three different dramatic play centres were employed. Each are explained in terms of the objectives, role-playing opportunities for children, materials needed, and discussion topics. (See figures from: Shopping at the Grocery Store - English Conversation shown to children. This can be reached at: <https://www.youtube.com/watch?app=desktop&v=GINbzAGZC2M>) (see Figure 2)

**Table 2.**

*Description of the three Dramatic Play Centres and Activities*

Creative Drama-based Diet-Exercise: Centre & Roles	Healthy eating behavior and activities performed	Learnt Language activities	Learnt Math activities	Learnt Social Skill, Art, Science, activities
Centre 1: Grocery Store	Children observe teacher modeling and discussing healthy grocery store purchasing options. They role play practicing healthy foods choice in a grocery store. With their teachers and peers, children discuss choosing, purchasing, and preparing a variety of foods	Children learn to create signs for the store, labels, and posters for different store sections.	Children explore the shapes of different foods, practice using money and sort and classify foods.	Discuss with their peers what to purchase, learn how different foods are grown, and develop dramatic arts through trying out a variety of roles
Centre 2: House (kitchen)	Children observe their parents making healthy food choices in home setting. They practice making healthy food choices at home. They learn about food allergies.	Children make a list of meal menus for the week.	Children count the number of different foods, the number of plates/bowls/spoons, etc needed at the table. They examine how numbers are used in food labels	Children develop dramatic arts through dramatizing different cultural celebrations involving food. They following the steps of a recipe.
Centre 3: Restaurant	Children observe their adults choosing healthy foods off menus. They discuss making healthy choices off menu	They practice creating menus. They learn to mention their orders.	Children examine how numbers are used in menus	They learn and practice hygiene and safety. They develop dramatic arts through dramatizing different practices

Source: The authors



**Figure 2.** Shopping at the Grocery Store - English Conversation

Source: Easy English (n/d)

## Results

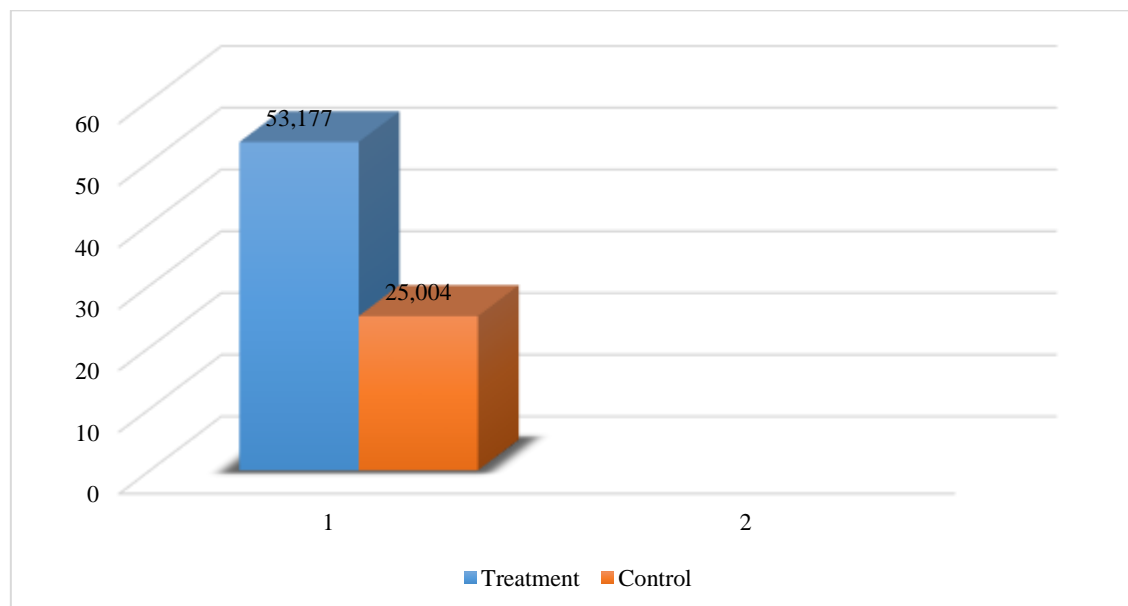
In order to verify the hypothesis, t-test was used to compare test mean scores between experimental and control group. Table 3 shows T-test results for the differences in post- test mean scores between the two groups in Preferences. As shown, T for Preferences=13.49,  $p < 0.01$ (see figure 3 for clarification).

**Table 3.**

*T-test results for the differences in Preferences*

Variables	Group	N	Mean	Std. deviation	T	Sig.
Preferences	Treat.	54	66.182	1.02	13.49	.000
	Cont.	50	35.228	1.40		

Source: The authors



**Figure 3.** The differences in post- test mean scores in Preferences

Source: The authors



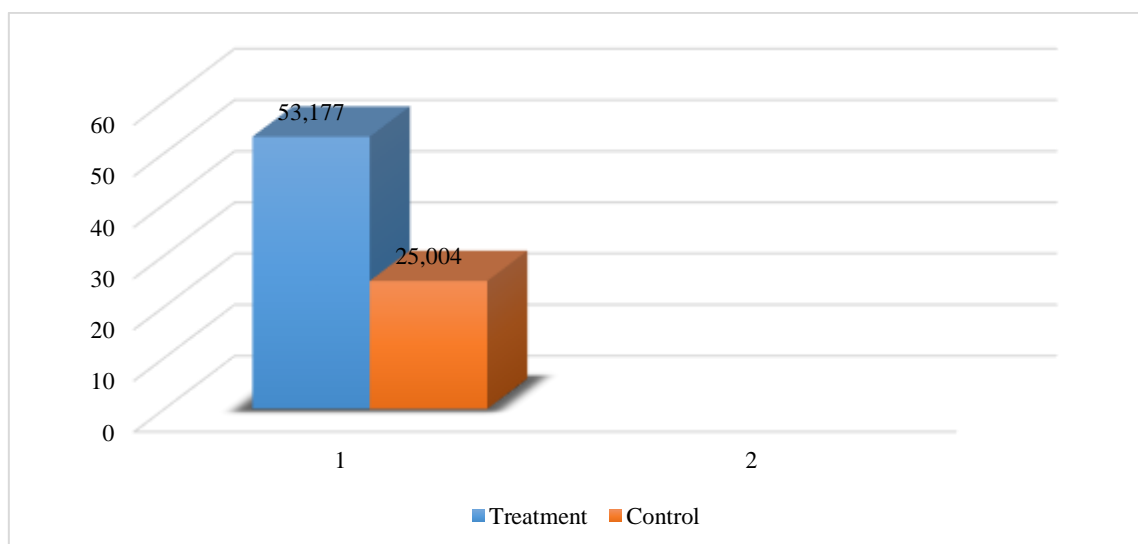
In order to verify the hypothesis, t-test was used to compare test mean scores between experimental and control group. Table 4. shows T-test results for the differences in post- test mean scores between the two groups in consumption. As shown, T for Preferences=14.22,  $p < 0.01$ (see figure 4 for clarification).

**Table 4.**

*T-test results for the differences in consumption*

Variables	Group	N	Mean	Std. deviation	T	Sig.
Consumption	Treat.	54	53.177	1.00	14.22	.000
	Cont.	50	25.004	1.12		

Source: The authors



**Figure 4.** The differences in post- test mean scores in consumption.

Source: The authors

## Discussion

This study mainly explores the impact of creative drama-based diet-exercise intervention on developing preschoolers' preferences for and consumption of healthful foods. Results show that there is a significant difference between the two groups after provision of creative drama-based diet-exercise intervention. The difference is for the treatment group.

The importance of healthy nutrition in children is emphasized for achieving ideal growth and development curves, developing cognitive functions appropriate to age, and preventing metabolic diseases. Acquiring healthy eating habits in childhood forms the basis of a healthy lifestyle that will be maintained throughout life (Suleiman-Martos et al., 2021).

Especially today, increasing childhood obesity is caused by unhealthy nutrition and lifestyle habits. This situation causes children to consume unhealthy food and drinks that they are constantly exposed to through school cafeterias, social circles and television advertisements. In this context, effective tools are needed to teach children healthy eating habits. In line with this need, gamified nutrition education has the potential to attract children's attention. Studies in the literature show that gamification positively affects children's and adolescents' knowledge and behaviors regarding nutrition. At this point, the game model developed within the scope of this study stands out as a tool to help children gain healthy eating habits and facilitate lifestyle changes (Çakmak & Simzari, 2024).

The literature points out that game intervention is an effective educational method for children's healthy eating education (Chow et al., 2020). Simultaneously with the experimental group, which was taught about food through creative drama applications, the researcher taught the subject of food to the control group using plain narration and question and answer techniques. At the end of the education given on the subject of food through creative drama applications, when the food drawings of the students in the experimental

group in the first part of the Preschool Food Teaching Test were examined, it was seen that the foods in the food groups were drawn.

Other studies in which creative drama was used as a method in nutrition education support the results in favor of the experimental group (Maghfiroh et al., 2021; Özensoy, 2010). Kara & Aslan, (2018) stated in their study that 40 creative drama activities prepared for nutrition education were effective in nutrition education. According to Tolluoğlu (2009), it was stated that creative drama, discussion, problem solving, question and answer, discussion methods were more effective than the plain narration method in determining the basic nutrition knowledge levels of third-grade students studying at the primary school level. It was stated that techniques such as games and rhymes that make the student active were more effective in increasing the knowledge levels of students studying at the preschool level (Nanney et al., 2017).

Sütçü (2006) stated in his study that creative drama education has a positive effect on children's eating habits. Obalı (2009) concluded that education given with a project approach provides positive developments in the level of knowledge about food groups. Koroglu (2009) stated in his study that families do not consume enough of the food groups they should consume daily. Gündoğdu (2009) concluded in his study with preschool teachers that preschool teachers stated that the most important meal is breakfast, but teachers consume simit and pastry at breakfast. It was reported that some teachers consume fruit and some drink tea during snacks. Oğuz (2011) classified children according to their weight rates in his study and concluded that they are of normal weight for their age, boys choose more food than girls, and children consume milk, cheese, yogurt, olives, eggs, soup and fruit every day.

Based on creative drama, play is a phenomenon that provides children with the opportunity to learn by doing and experiencing information, and supports their mental, emotional and social development. Such a creative process, where imagination, skills and interpretation are combined with play, opens the doors to multi-faceted development (Vaughn et al., 2018).

Activities helped children acquire knowledge, information, skills, behaviors, and positive attitudes through interactive activities that encourage children to be health-conscious in terms of personal and public hygiene, healthy food, disease prevention, and risk prevention. This is consistent with what Mayesky (2016) indicated that creative drama is a means of understanding and modifying the child's behavior, and also works to provide him with many different concepts, experiences, and values. In addition, it is considered a field for the child to express what is inside him, and it allows him to perform some roles automatically.

The children practiced the activities and involved them in preparing and designing its tools, dividing roles among themselves, and working in an educational environment as a single unit to achieve the goal of the activity (Fathonah et al., 2024; Joronen et al., 2012), which increased motivation to learn, increased social interaction and integration into activities, and contributed to developing health awareness that was clear in participation and selection of groups. This was confirmed by both the behavioral and social theory of Bandura (Linde et al., 2022), that the educational environment and the social environment surrounding the child when they feel an atmosphere of interaction and affection, they have thus acquired many concepts and values that help them control unhealthy behaviors, and move towards healthy behaviors related to hygiene, healthy food (Sundin et al., 2018), and prevention of various diseases and risks. This is consistent with what was confirmed by the study of both Erbay, & Doğru (2010), Lindberg (2015), and Brown (2017), who all emphasized the importance of creative drama activities for children, which help them play freely, how to deal with others, and support positive relationships in an atmosphere of fun and happiness.

Establishing a healthy diet younger children (in the kindergarten) is crucial for their health in the long run (Nasreddine et al., 2019; Tandon et al., 2016; Yıldırım Süt & Kutluca, 2021). In order for diet to be of a good quality, children should on one hand frequently consume different types of foods such as fruits, vegetables and whole grains and on the other hand infrequently consume foods high in sugar, salt and/or fat (Scaglioni et al., 2018).

Paying attention to food and healthy nutrition is especially important in early childhood. Because it is directly related to all aspects of the child's growth and development, healthy food rich in nutrients is necessary to build a healthy body, mind, and nervous system for the child (Destriatania et al., 2019; Jarman et al., 2022), and lack or malnutrition during this stage negatively affects physical growth, mental

abilities, ability to think, motor coordination, language skills, energy, activity, and behaviors (Perez-Rodrigo et al., 2003).

When children have a direct contact with foods through tasting, feeling, seeing, and smelling learn about their food likes and dislikes. They also can do this observing their food environment, for example, the eating behaviors of others (Nekitsing et al., 2018; Rosy, 2017). Preferences for and consumption of healthful foods across sex and gender groups are well-established in the literature (Deslippe et al., 2023; Ares et al., 2024).

We point out here the importance of education or nutritional education for all different age stages, and for everyone, male or female, from childhood, starting with those in kindergarten to adults, in order to avoid exposure to malnutrition and immunodeficiency diseases (Destriatania et al., 2019), and it is also necessary to prevent the occurrence of growth deficiencies mentally and physically, especially in the early stages of life.

### **Limitations and future research**

One limitation was that this study was conducted with preschoolers, and the results can only be generalized. This study shows that creative drama-based diet-exercise intervention can develop preschoolers' preferences for and consumption of healthful foods. Future studies should integrate gender, because it is responsible for many of the choices made throughout life. Also, it would be influential to use Pretest-posttest follow-up experimental design.

### **Conclusion**

Creative drama is very important in preschool education. In addition to children learning by doing and experiencing with the creative drama method, it provides an entertaining education and training environment by adding gestures, facial expressions and emotions to the learning process. For this reason, creative drama is one of the indispensable building blocks of preschool education. The basis of raising healthy and productive future generations is to teach children the foods that should be consumed for proper and balanced nutrition. While providing information and skills regarding nutrition education at the preschool education level, which forms the basis of adult knowledge and skills, it is important for children to feel comfortable, have fun, think of creative ideas and express these creative ideas. All of these can be provided with the creative drama method at the preschool education level. At the same time, it is recommended that creative drama be used as an effective tool in interventions to help children gain healthy eating habits and prevent problems such as obesity.

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### **ETHICS STATEMENT**

The studies involving human participants were reviewed and approved by department of Early Childhood Education, college of Education, Northern Border University, KSA. Participants provided their written informed consent to participate in this study. Written informed consent was obtained from the participants.

### **CONFLICT OF INTEREST STATEMENT**

The author declare that they have no conflict of interest.

Author Contribution Statements.

Afaf carried out the experiment. Rasmeya wrote the manuscript with support from Afaf. Afaf fabricated the sample. Rasmeya helped supervise the project. Afaf & Rasmeya conceived the original idea. Afaf supervised the project.

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