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Effect of Developmental Stimulation Program on the Developmental Measures of Toddlers

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Abstract

Background: The variability in the developmental skills is reduced after the first three years of life; therefore, it is necessary to identify and manage early developmental delays.

Aim: The aim of this study was to investigate the effect of developmental stimulation program on the developmental measures of the toddlers.

Method: The present randomized controlled clinical trial was conducted on 31 toddlers aged 1-3 years residing at Ali Asghar Foster Care Center within 2016-2017. Developmental interventions were carried out based on the modified guidelines of West Virginia Early Learning Standards Framework for eight weeks (three 2-hour sessions a week). The interventions included a range of age- and developmental-specific activities described in the given guidelines. Child development age was measured based on motor dimensions (i.e., gross and fine) and language development (i.e., receptive and expressive) before and after the intervention. The data were analyzed in SPSS software (version 11) using independent t-test and Chi-square test.

Results: The mean ages of the participants in the control and intervention groups were 19.9 ± 5.5 and 20 ± 6.02 , respectively ($P=0.62$). The mean ages of receptive language development ($P=0.003$), expressive language development ($P<0.001$), and gross motor development ($P=0.02$) were significantly different between the two groups. However, there was no significant difference between the two groups regarding the fine motor development ($P=0.96$).

Implications for Practice: The developmental stimulation program was effective in the receptive language, expressive language, and gross motor development. However, it exerted no significant effect on fine motor development.

Keywords: Child, Development, Toddler age

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Introduction

Development is characterized by a progressive increase in skill and capacity, which has different dimensions of gross, fine, language, and socioemotional motor skills (1). The subjects living in foster care centers are among the high-risk populations for developmental delay (2, 3). According to the latest statistics published in the United States, half a million children are accommodated in these centers (3). According to the latest reports, this rate is 1,800 children in Iran, which had a significant increase, compared to 1997 with 2,500 children (3).

This issue becomes worrisome when 30% of these children are under the age of 5 years (4), the time at which the human brain develops quickly through the formation of neurons and axons. Moreover, this age involves the growth of dendrites, as well as the formation of synapses and neuronal myelination, which make humans to learn faster in childhood than in other ages (5).

The children living in foster care centers are behind their peers nurturing in the family environment in terms of physical, mental, emotional, social, and lingual development due to experiencing negative environmental conditions, such as the lack of stimulation, child abuse, family violence, poor nutrition, and unsustainable living environment (2-4, 6). The absence or inadequacy of sensory and social stimuli, spending more time in bed, inaccessibility to various toys, and failure to play different games are considered as the causes of developmental delay in this population (7).

Studies show that the children's multiple exposures to these early life risks can change their mental architecture and result in devastating consequences. Children who experience negligence, such as the restrictions on food access and intake, as well as limitations on educational opportunities, will face difficulties regarding acquiring academic qualifications, executive functions, and ability to focus in their adulthood (8, 9).

According to the literature, the children accommodated in boarding environments are behind their peers, nurturing in the family environment, in terms of physical, mental, emotional, social, and lingual development (3, 6). Based on the statistics, the children living in foster cares have the developmental delay rate of 13-62%, while this rate in the children living with the family is within 4-10% (10-12). Several factors account for the delay in the development of the children living in the foster care centers. These factors include the high child-to-caregiver ratio and the classification of children in these centers, resulting in the reduction of the child's opportunity to participate in motor games with caregivers and peers (13).

Furthermore, these children spend 50% of their time lonely and in bed (14). In addition, inaccessibility to various toys and failure to play different games have been raised as the etiologies of developmental delay in this population (7). These factors direct the children with poor motor development toward a defective cycle. Accordingly, the motor delay results in the child's reduced participation in the game with peers, as well as decreased social competence and self-esteem, which ultimately lead to child exclusion from social activities, and the repetition of this defective cycle.

When children go to school with unfavorable early childhood and emotional physical abuse, they may face difficulties due to perceptual deficiencies and behavioral imperfections to adapt to the school system. These children have difficulty in communicating with peers, trusting others, showing honesty, as well as presenting educational and social skills (1). Therefore, developmental disorders in various areas (i.e., gross motor, fine motor, social skills, and speech skills) leave a huge impact on the individual and social performance of a person (5).

Given the reduced variability in achieving developmental skills after the first 3 years of life, the developmental delay needs to be identified early to plan for interventions. Several theories have been published to guide the research and therapeutic measures and promote the child health and development, mostly based on the enrichment of the environment as a scientific framework. The underlying foundation of these theories is that child development and health are rooted in the respective social environment that can minimize the damaging events, improve qualifications, provide appropriate levels of control, and facilitate psychological flexibility (1).

The identification of the developmental risk factors of the children residing in boarding centers in terms of developmental delay is an issue of fundamental importance. Regarding this, the present study aimed to investigate the effect of developmental stimulation program on the developmental measures of the 1-to-3-year-old children living in a foster care center located in Mashhad, Iran.

Methods

The present randomized controlled clinical trial was conducted on 31 toddlers aged within 1-3 years

living at Ali Asghar Foster Care Center of Mashhad, Iran, within 2016-2017. Based on the formula of determining the sample size for comparing the mean of two populations, the sample size was calculated as 9 cases for the investigation of gross motor development according to a study performed by Ali Abadi et al. (15) and 15 cases for fine motor development based on a study conducted by Farsi et al. (6) in each group.

The mean and standard deviation of 10 children in the pilot study were used to calculate the sample size for the investigation of the receptive and expressive language development. In this regard, 10 and 14 subjects were determined in each group for receptive and expressive language developments, respectively. Accordingly, the largest sample size was considered as the study population. A significance level of 95% and a test power of 80 were considered. Sampling was continued until the completion of the sample size.

Finally, 16 subjects in the intervention group and 15 cases in the control group were enrolled in the study. The research units were selected by convenience sampling method, and then assigned into two groups through simple random sampling technique using the tables of random number. The inclusion criteria were: 1) Iranian nationality, 2) age range of 12-36 months (according to the records), 3) no history of head trauma during birth, asphyxia, or intracranial hemorrhage during birth, 4) no severe malnutrition (child weight of $>5^{\text{th}}$ percentile), and 5) no history of physical illness or disorders in body systems (i.e., brain, digestive and kidney failures, diabetes, mental health limitation, such as mental retardation and depression) according to the records.

On the other hand, the exclusion criteria included: 1) child admission to the hospital or need for surgery during the intervention, 2) diagnosis of congenital disease by the physician during the intervention, 3) death during the study, and 4) severe stress, such as adoption by a family. We had no drop-outs in the study because the research units were in the foster care center.

The study was performed in a double-blind manner. The study population was unaware of the study because of their age. The control children were taken to the playroom on the opposite days of the intervention group, and they played the routine games of the institute. Furthermore, the examiner performing the Bayley Scales of Infant Development Screening Test (BSIDST) was unaware of the assignment of children to the intervention and control groups.

The data collection tools were demographic form, analog scales equipped with a stadiometer (SACA, Germany), and BSIDST (second edition, Bayley II) for measuring the developmental state. Bayley II is one of the most prestigious tools for assessing the development of the children within the age of 1-36 months. Pearson Corporation, which currently owns the Bayley Scales Test Scoreboard, has designed and published a series of studies to determine the validity and reliability of the tool.

The results of the studies are presented, along with the Bayley package. Accordingly, the content and face validities of this test have been approved in the original version (16). Suleimani et al. (2013) confirmed the content and face validities of the translated version of this test (17). In the present study, the content and face validities of the Bayley Scales Test was also verified by consulting with 10 faculty members experienced in the field of child growth and development.

Suleimani et al. (2013) examined the reliability of this test in Iran on 260 children. The validity of this test was assessed using three methods, namely internal consistency estimation, test-retest reliability, and credibility of evaluators. The internal consistency values of the test were 0.96, 0.95, 0.94, and 0.95 in the cognitive subscale, receptive/expressive subscales, gross motor development, and fine motor development, respectively. Furthermore, the test-retest reliability in five domains and inter-rater reliability were 0.99 and 0.99, respectively (17). Additionally, the reliability of the tool was measured by test-retest reliability over a two-week interval, which was 0.95%.

In order to obtain the guideline for the identification of the procedure for developmental stimulation program, we searched on the PubMed, Scencedirect, SID, and Proquest databases with the keywords of 'development', 'guideline', and 'children'. In addition, we used the guidelines derived from the capability criteria, precise definition of the programs for any developmental field, and the available resources. The West Virginia Early Learning Standards Framework Guidelines were obtained from the website of the United States Department of Children and Families Support-Care Services (www.wvchildcare.org).

The West Virginia guidelines were then presented to five pediatric nurses and pediatricians to be reviewed in terms of comprehensiveness and practicality. After verifying the efficiency of the guidelines by experts, the researcher began to translate them. Subsequently, the guidelines and their

translations were provided to the experts to be checked for the correctness of the translation. After verifying the validity of the translated version, the stories, games, and poems were replaced in accordance with the Iranian-Islamic culture in consultation with child development specialists, such as pediatric nurses, neurologists, and psychiatrists.

Subsequently, authoritative scientific resources, including reference books (e.g., Wong's Essentials of Pediatric Nursing), were considered to add further information to the guidelines. Moreover, a searching process was performed in the databases of PubMed, ScienceDirect, SID, Proquest, and Google scholar, using the keywords of 'development', 'developmental stimulation', 'child', 'foster care', 'fine motor development', 'gross motor development', 'language development', and 'psychosocial development' to enrich the interventions.

After adding more information, the translated and compiled guidelines were presented to five pediatric nurses and pediatricians to be reviewed in terms of the validity. As a result, the activities used by the nurse and child caregiver to boost the child's developmental dimensions were provided in this guideline in the domains of socio-emotional (i.e., communication with adults and peers, self-awareness, self-esteem, and emotions), sensorimotor (i.e., fine and gross motors) and language (i.e., listening, understanding, communicating, and speaking) developments.

An introduction letter was obtained from the Faculty of Nursing and Midwifery of Mashhad and presented to the authorities of the research environment. Coordination was also made with the officials of Ali Asghar Foster Care Center at the first visit. For the sampling purpose, the researcher completed the selection form for the participants, containing inclusion and exclusion criteria, through interviewing with child caregivers, reviewing the child's records, and measuring the height and weight of the children. The demographic form was completed by interview and child's record.

The toddler game department in the foster care center was considered as the place of the intervention. Therefore, it was prepared and equipped on the basis of the equipment used in the guideline (e.g., installing posters and mirrors on the wall, putting toys and paints, and Play-Doh). Prior to the intervention, the Bayley II tool was used by the researcher to determine the child's developmental age in terms of sensorimotor, language, and socio-emotional developments. The weight and height of the child were measured and recorded by calibrated meter and balance.

The purpose of the developmental stimulation in the present study was to provide standard interventions to meet the developmental needs of the children and help develop the developmental capabilities of any toddler based on the translated and compiled guidelines of the West Virginia Early Learning Standards Framework. These guidelines included developmental stimulation in the fields of socio-emotional (i.e., communication with adults and peers, self-awareness, self-esteem and emotions) and language (i.e., listening, understanding, communicating, and speaking) developments.

The timeline of the intervention was determined as every two weeks using the guidelines and the natural developmental stages of the children aged 1-3 years. During this age, the activities that the child should be able to do range from simple to complex. Chronological age was the child's inclusion criterion on the developmental map. Accordingly, the location of the child was determined on the designed map, and this was the starting point of the interventions. The interventions were implemented for the child after the point was marked on the map, indicating more complex activity than the starting point skills.

The developmental stimulation program was fulfilled for each child individually, but in a collective environment. In this regard, each child received 10-20 min of direct stimulation. If several children were in the same position on a map, the activity was usually carried out in a group. The interactions and activities in the room were indirectly monitored by the researcher. The intervention was held in eight weeks as three 2-h sessions per week on odd days. In this respect, nine children in two groups (each group for 2 h) came to the playroom and received the intervention.

The intervention was carried out by a researcher and with the aid of researcher assistants who were the member of interested and volunteer caregivers in foster care centers and trained by the researcher on the implementation of interventions. The purpose of the selection of researcher assistants from foster care centers was to facilitate the continuation of the intervention for children after completing the study. The intervention program in each session included familiarity items and communication with the child, chronological age determination, referral to the timeline of developmental stimulation intervention to identify the activities providing developmental needs, implementation of the

recommended activities for 10-20 min, permission to repeat activity individually during the rest of the session, and then end the meeting.

After completing the activities in the intervention group (the eighth week post-intervention), the second stage was related to the developmental measures. At this stage, as in the first stage in the playroom of the foster care center, the Bayley tool was used to obtain the developmental measures. In addition, the calibrated meter and balance were applied for the measurement of height and weight, respectively.

The children in the control group received the routine cares of the center. After the completion of the intervention in the intervention group and collection of the data before and after the intervention in both groups, the same procedure was performed for the control group in order to consider the ethics. The current study was approved by the Ethics Committee of Mashhad University of Medical Sciences, Mashhad, Iran (code of 931411). All ethical considerations in the research proposal were regarded in the process of the implementation of the study. Additionally, the interventions performed for the intervention group were identically conducted for the control group to observe the ethics in the research after the end of the data collection stage (i.e., after the second measurement step).

The data were analyzed in SPSS software (version 11) using Kolmogorov-Smirnov and Shapiro-Wilk tests to examine the normal distribution of the quantitative data. Descriptive statistics, including dispersion, central tendency (i.e., mean and standard deviation), and frequency distribution, were utilized to describe the children's profile in each of the two groups. The quantitative clinical outcomes of the two groups with normal distribution were evaluated using paired sample t-test. Furthermore, the independent t-test was run to compare the two groups. The confidence level of 95% and the significance level of 0.05 were considered for all tests.

Results

The mean chronological ages of the children (n=31) in the control and intervention groups were 19.9 ± 5.5 and 21.0 ± 0.6 months at the baseline, respectively. The independent t-test results showed that the two groups were homogeneous in this regard at the baseline ($P=0.61$). In total, the intervention group consisted of 10 males (62.5%) and 6 females (37.5%), and the control group included 7 males (47%) and 8 females (53%). According to the results of the Chi-square test, the two groups were homogeneous in terms of gender distribution ($P=0.53$). The comparison of the demographic characteristics of toddlers in both intervention and control groups is presented in Table 1.

Based on the independent t-test, the mean age of receptive language development ($P=0.64$) and expressive language development ($P=0.32$) was not statistically different between the two groups before the intervention. Nonetheless, these variables were significantly different between the two groups after the intervention ($P=0.003$ and $P<0.001$, respectively). Similarly, there was no significant difference between the two groups in terms of the age of gross motor development ($P=0.68$) and fine motor development ($P=0.36$) at the pre-intervention stage. Therefore, the two groups were homogeneous in terms of this variable.

However, the independent t-test results revealed a significant difference in the mean age of gross motor development between the two groups after the intervention ($P=0.02$). Nonetheless, no significant difference was observed between the two groups regarding the mean age of fine motor development at the post-intervention stage ($P=0.96$) (Table 2).

Table 1. Comparison of the demographic characteristics of toddlers in both intervention and control groups

| Variables | Intervention Mean±SD | Control Mean±SD | P-value* |
|-------------|-------------------------|--------------------|----------|
| Age (month) | 21.0±6.0 | 19.9±5.5 | 0.61 |
| Height (cm) | 79.5±5.5 | 84.0±5.5 | 0.03 |
| Weight (kg) | 9.8±1.7 | 9.9±1.0 | 0.94 |
| Gender | Frequency (%) | Frequency (%) | |
| Female | 6 (37.5%) | 8 (53%) | 0.53** |
| Male | 10 (62.5%) | 7 (47%) | |

** Independent t-test

** Chi-square test

Table 2. Comparison of development age between the intervention and control groups before and after the intervention

| Variables | Intervention (Mean±SD) | Control (Mean±SD) | Inter-group test results (independent t-test) |
|---|------------------------|-------------------|---|
| Receptive language development age (month) | | | |
| Before intervention | 14.7±4.4 | 6.2±15.6 | P=0.64 |
| After intervention | 4.1±25.7 | 4.8±20.3 | P=0.003 |
| Percentage of size difference before and after intervention | 75% | 30% | |
| Expressive language development age (month) | | | |
| Before intervention | 13.8±6.1 | 11.4±7.0 | P=0.32 |
| After intervention | 2.2±24.7 | 4.3±19.00 | P<0.001 |
| Percentage of size difference before and after intervention | 79% | 67% | |
| Gross motor age (month) | | | |
| Before intervention | 22.3±5.3 | 23.1±5.3 | P=0.68 |
| After intervention | 31.8±7.7 | 25.9±5.5 | P=0.02 |
| Percentage of size difference before and after intervention | 42% | 12% | |
| Fine motor age (month) | | | |
| Before intervention | 28.80±7.51 | 31.1±6.3 | P=0.36 |
| After intervention | 36.7±8.0 | 36.5±6.1 | P=0.96 |
| Percentage of size difference before and after intervention | 27% | 17% | |

Discussion

According to the findings of the present study, the developmental stimulation program improved the score of receptive language development, expressive language development, and gross motor development. Nevertheless, this intervention exerted no significant effect on fine motor development score. In the present study, the age of receptive and expressive language development in both groups was homogeneous at the baseline. However, 2 months after the intervention, the age of receptive and expressive language development in the intervention group showed a significant increase, compared to that in the control group.

Regarding this, it can be concluded that the present intervention was able to improve the age of the child's receptive and expressive language development. This is in line with the findings obtained by Aparicio et al. (2002) (18). Aparicio et al. (2002) conducted a study titled "Early Language Stimulation of Down's Syndrome Babies in Spain" on 36 children aged 0-7 months. In the mentioned study, the development stimulation program was implemented by the physician for the child in the presence of the mother. During the rest of the day, the mother was trained home-made procedures for one week (60 min each time).

The mothers played the educated games at home and regularly recorded daily efforts for each behavioral purpose on the development sheet. The results showed that the mean score of changes in the language development in children who were stimulated from the younger age was higher than that in the children stimulated at older age. Moreover, the results of one-way ANOVA between different stages indicated that this difference was significant in the successive evaluations. Although in the mentioned study, there was no separate report on the findings of receptive and expressive language development, this progress was consistent with children's linguistic skills (18).

In the present study, the study population was at the toddler age. The most important feature of language development in toddler age group is the rise of receptive language development, as the ability to express language is far more than the child's words. The toddler age is actually the golden age of language development. However, the best age of expressive language development occurs after the toddler age (i.e., preschool age). During the toddler age, the child mostly focuses on the perception of words and range of vocabularies (2).

Accordingly, the children subjected to language enhancement interventions were in great benefit since

they were in higher readiness for language perception, and thereby obtained improved language development score, compared to the control group. The preschool course is usually considered an ideal course for the expressive language development. However, the developmental interventions at this age also have a significant impact on the expressive language development.

In the present study, one of the reasons for the obtained results in the field of receptive and expressive language developments was the children's underlying developmental environment, namely, the foster care center. There is a defective attitude governing the foster care centers as they believe that the caregivers should not be emotionally dependent on children and should keep their distance with them to be effective (19). As a result, the caregivers show the commercial behavior with the child care profession in these centers and perform daily tasks perfunctorily with the least speech, minimum eye contact, and limited social interaction and affection for children.

The caregivers rarely respond to the children's feelings or attempt to make eye contact, make word, and cry by the child (20). In addition, these children have little social interaction with adults, and they interact almost exclusively with their caregivers for vital care, such as nutrition and health. Furthermore, the play equipment for these children is almost limited to balls, toy bricks, and dolls. Regarding the importance of the two essential components of care and education for infants and young children, these children have a sustainable and consistent caregiver for a long time regardless of their settlement places (weather at home or foster care center). The caregiver's behaviors create developmental opportunities for the child that are responsive (1).

In the present study, the child during the intervention were exposed to an environment rich in interactions and stimulations that were expanded with games, books, and poetry. As a result, the expressive language development of the intervention group showed a significant expansion. There was no significant difference between the two groups in terms of gross and fine motor developments before the intervention. However, after two months of intervention, gross motor development in the intervention group showed a significant increase, compared to that in the control group. However, the two groups showed no significant difference in terms of the fine motor development at the post-intervention stage.

Taneja et al. (2002) examined the impact of 90-minute game structure on 30 children within the age group of 6 months to 2.5 years residing in Mother Teresa orphanages in India. In this study, the games were designed in collaboration with psychologists in the department of child development, and then carried out by certain caregivers during the day within the hours when the child was in an open environment of foster care center in a three-month period. The results showed that the mean motor, cognitive, and social developments of the children were significantly higher than those before the intervention (21). The findings of the mentioned study are in line with those of our study although they did not report gross and fine motor developments separately.

The results of this study are consistent with the gross motor score and the motor development theory of 'dynamic system'. This theory expresses that the changes in toddlers' motor behaviors are the result of their interaction, environment, and tasks. Based on this theory, nerve and environmental factors are effective in establishing the developmental changes. Accordingly, not only inheritance, but also environment play active roles in the growth process (1).

In line with this theory, the manipulation of the environmental experiences of individuals in the intervention group, who had a similar state of gross motor to the control group at the baseline, resulted in a better overall performance in terms of gross motor over the same period. This advancement can be interpreted with the richness of the environmental experiences gained through the guidelines.

The manipulation of the environment and the facilities available to the child resulted in the enrichment of the child's environment. It can also be argued that the foster care centers, in spite of providing shelter and food for children, usually ignore the basic facilities required for the developmental needs of the children (3). Therefore, the child's initial experiences of motion and exploration, which are the vital mechanisms for the development of the nervous system of basic behaviors, are often overlooked in these centers.

The present study examined the activities recommended in the essential guideline. In this regard, based on the intervention, the children were required to leave the bed to perform collective activities in the environment of the foster care center. This helped improve the gross motor development of the children who were restricted to their rooms and beds. The results are inconsistent with the findings reported by Rezaeian et al. on infants (0-1 year old) living in foster care centers. In the mentioned

study, the implementation of developmental stimulation package for 24 sessions in 8 weeks was effective in fine motor development (22). However, there was no significant effect on the gross motor development age (23).

One of the reasons for these discrepancies can be attributed to the variations in the measurement tool, which seems to be effective enough here. In this regard, in the mentioned study, they utilized Denver tool as a developmental measurement instrument, which is commonly used as a screening tool. However, in the current study, we employed the Bayley II, which is commonly employed as a diagnostic tool and possesses high reliability and sensitivity for determining the developmental age. Regardless of this difference, another reason for disagreement between the findings of the present study and those of the mentioned study can be due to the difference in the age of children that seems to be a more important and meaningful difference between the two studies.

In this respect, the study population in the study of Rezaeian et al. was within infancy age, while our subjects were at toddler age. According to definition, the gross motor skills are those acquired from the early birth to the middle of the young age, and are focused on the child's locomotion skills. When children reach the age of two years, they can stand, walk, and climb stairs. These skills are acquired in the early years of life, and the person continues to strengthen and control them until adulthood. It can be said that gross motor skills involve large muscles of the body and whole body movement (1).

The fine motor skills involve the coordination of small muscles of the body in movements, such as the eyes, and fingers, allowing the person to write, grasp small objects, and clothe (1). As shown in the nature of these skills, gross motor skills often present at the lower extremities, while the motor skills present at the upper limb of the child. The developmental stimulation packages for ordering developmental interventions were based the developmental needs of each period for time-alignment interventions. With regard to the cephalocaudal principle of developmental skills, developmental packages were inevitably arranged to focus on the interventions in the upper limb skills more than that in the lower extremity in terms of timeline.

In this way, the two above-mentioned conclusions, which appear to be contradictory at the first sight, are in fact complementary. Finally, it can be concluded that the developmental stimulation packages arranged on the basis of children's developmental needs often focus on the stimulation of fine motor skills in the first year of life, and then on gross motor skills at toddler age. Accordingly, when these packages were only used at the infancy age, they had a greater impact on the fine motor skills, and when used only at toddler age, they had a greater impact on the gross motor skills.

One of the strengths of this study was the attraction of attention to the cultural context of the study population. In this respect, the recommended games and songs were equated before the intervention with the West Virginia Early Learning Standards Framework Guideline and replaced with games and Islamic-Iranian games and songs to have more acceptance among the children. According to Vygotsky's contextual perspective theory, the adults focus on the methods and principles that they transmit to children (i.e., their beliefs, values, customs, and cultural skills). He believed that the background culture should be considered in all fields of development because one of the main goals of all cultures is the empowerment of the child in order to acquire the values and cultural skills of the same societies (1).

One of the limitations of the present study is that there was no possibility to use a random sampling method because of the sample size limitation. Therefore, we had to use the convenience sampling method. Furthermore, since the investigated center was the only place of its kind in the city of Mashhad, there was no possibility of performing a multi-center trial. However, the implementation of a single-center trial leads to more uniform sampling and, it is more appropriate for a clinical trial. On the other hand, it can ultimately reduce the access to the samples.

Implications for Practice

Prevention is the best strategy for the treatment of developmental delay. The accomplishment of earlier diagnosis and implementation of developmental delay intervention would result in the achievement of better clinical outcomes. The results of the present study were indicative of the chance of promoting developmental skills at toddler age. Additionally, the modified West Virginia Early Learning Standards Framework can be used as an effective guide to elevate children's developmental skills. Therefore, this framework can be offered to well-being centers to be used in foster care centers and kindergartens.

The developmental guidelines are also recommended if they are sectioned and applied for a specific age group. The previous skills should not be omitted while using these guidelines because in the present study, the guidelines were sectioned for toddler age, the interventions of the infancy age were not used. Accordingly, no significant clinical success was achieved in the fine motor skills that are more often considered at the infancy age. It is recommended that future studies consider the gender differences in developmental measures following developmental stimulation.

In addition, the ordering of interventions should also be adjusted based on the gender differences at a later stage because the children at the toddler age are aware of sex differences and have a greater tendency toward behaviors and games tailored to their gender. However, in the present study, this issue was not considered due to the limited sample size.

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Conflicts of Interest

The authors declare no conflicts of interest.

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