

# ORIGINAL ARTICLE

## The Efficacy of “Care for Child Development” Intervention on the Improvement of the Development Skills of Orphanage Children

**How to Cite This Article:** Baraheni N , Heidarabadi S, Maleki Z , Azhdarzadeh F, Gharehgoz AB, Bagheri Z. The Efficacy of “Care for Child Development” Intervention on the Improvement of the Development Skills of Orphanage Children. Iran J Child Neurol. Autumn2023; 17 (4): 83-91

Nasrin BARAHENI MD <sup>1</sup>,  
Seifollah HEIDARABADI MD <sup>1</sup>,  
Zahra MALEKI MSc <sup>1</sup>,  
Fatemeh AZHDARZADEH MSc<sup>2</sup>,  
Ali Bahari GHAREHGOZ PhD <sup>3</sup>,  
Zahra BAGHERI BSc<sup>1</sup>

1. Pediatric Health Research Center, Tabriz University of Medical Science, Tabriz, Iran.

2. Speech therapy, Neurosciences Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.

3. Psychology and Education of Exceptional Children, Faculty of Psychology and Education, Allameh Tabataba'i University, Tehran, Iran.

### Corresponding Author

Maleki Z. MSc  
Child Development Center,  
Mardani Azar hospital, Tabriz  
University of Medical Sciences,  
Tabriz, Iran.  
Email: zahra.maleki@sbmu.  
ac.ir

### Abstract

#### Objectives

Development refers to the progressive enhancement of skills and functional capacity, i.e., qualitative changes in the child's functions. The process of development begins before birth and continues throughout life. The present study aims to evaluate the effectiveness of the “Care for Child Development (CCD)” program on 4-42 months children's developmental skills in orphanages.

#### Materials & Methods

In this study, two orphanages in the capitals of East and West Azerbaijan provinces were selected using the convenience sampling technique, and thirty children were included. Then, they were randomly divided into two intervention and control groups (each group, N=15). Next, after obtaining consent from the head of the orphanages, a group of volunteers from the healthcare center performed the CCD program, considering children's chronological ages (4 to 42 months), for three sessions a week, with each session lasting two hours and it lasted for three months. At the end of the intervention process, the Bayley Scale of Infant and Toddler Development 3rd version (BSID-III) and the Ages and Stages Questionnaire-II (ASQ) were completed for the two intervention and control groups to compare them in the cognitive, motor, communication, and personal-social domains.

#### Results

Comparing the two control and intervention groups using the T-test (difference in mean) indicates that except for the domain of cognitive skills (Bayley: P-value = 0.176), there was statistically a significant difference between the two groups in communication (ASQ: P-value

Received: 18-Jun-2022  
Accepted: 20-Apr-2023  
Published: 26-Oct-2023

= 0.001; Bayley: P-value = 0.003), motor (ASQ: P-value = 0.000; Bayley: P-value = 0.009), and personal-social (ASQ: P-value <0.000) skills.

### Conclusion

In the present study, it was concluded that it is required to apply interventions, including standard ones such as the CCD program in environments like orphanages, to enhance the developmental skills of those children living in them.

**Keywords:** Child development, Orphanage, Care for child, Early childhood.

**DOI:** 10.22037/ijcn.v17i2.38644

### Introduction

Development refers to the progressive enhancement of skills and functional capacity, i.e., a qualitative change in the child’s functions. The development process begins before birth and continues throughout life (1). The first years of a child’s life, especially the first year, are particularly important for acquiring developmental skills (2), because of the high rate of growth and development in the first year of life, the main functions such as behavior, emotions, and motivation develop. Inattention or mistreatment of children during this sensitive period can greatly influence their ability to understand and their behavior in the future (2, 3). The importance of the early years of life has been emphasized for many years. In this period, an individual achieves maximum growth and all-round development. Since most of the neural pathways required for learning and balanced functions are formed and completed in this very sensitive period of life, i.e., from the embryonic period to the age of three, natural and healthy development in these years forms the basis of human life (4, 5). Thus,

the first years of life, especially the first three years, can be considered an important time for brain development and, thereby, an opportunity to achieve the desired level of development in various domains (6). Meanwhile, the first year of life is more important because the rate of growth and development is faster than at any time in human life, and any negligence in this regard is irreversible.

The results of studies indicate that 16 to 18% of children have some developmental disorder (7-10), which is a high prevalence in children. They can have major short-term and long-term impacts on the child’s health and daily functioning in the home, school, and community and can affect lifelong well-being (11). Unfortunately, half of these disorders are not detected until school age and are not treated, which results in numerous complications threatening the health and development of society (12, 13). Hence, these children need more attention from the healthcare system. Early identification and promotion of developmental status can benefit children and those who relate to them (11, 14).

## The Efficacy of “Care for Child Development” Intervention on the Improvement of the Development Skills

International experience has shown that if children with developmental disorders are subject to early treatment, most of them will be able to learn to sit, walk, grasp, and alike, according to the natural model, helping them not experience lifelong ominous living (15-17)

Today, in most major cities worldwide, orphanages have been established to care for orphans. The population of orphans in Iran, according to the Deputy Director of the Quasi-Family Affairs Office, is as follows: 9000 orphans under the age of 18 years are covered by the State Welfare Organization, of which about 1500 are children under the age of 3, who are held in 34 orphanages across the country (18).

Children living in orphanages are likely prone to delayed development in various dimensions (19, 20). Researchers cannot place children in a deprived environment for obvious moral reasons. However, there is little information on orphanages. For example, a study indicates that the children living in them are deprived of motor development (21), while motor development is important because it may overshadow other dimensions of development, such as intellectual, mental, and emotional development, even the organization of language (22, 23).

Therefore, the researcher has identified these environments as needing intervention to enhance the developmental skills of children living in them using standard interventions. This aim is important in Iran because no significant studies have been carried out in this field, and no significant measures have been taken. Therefore, considering the importance of setting goals for assessing children’s development and the high risk of delayed development among children living in orphanages, the researcher conducted a study to

enhance the developmental skills of infants living in them using an evidence-based care approach.

In orphanages, the children are with the caregivers around the clock. Therefore, it seems necessary for the caregivers to be aware of the children’s development and to be taught how to take care of the development of the children. The “Care for Child Development (CCD)” package, originally developed by UNICEF and the World Health Organization (WHO) in the late 1990s and updated in 2012, is based on the best evidence of children’s development (24). It was formed based on the latest evidence of the caregiver’s important skills (i.e., sensitivity and responsiveness) that affect a child’s healthy growth and development. The CCD is an approach developed to promote early learning and responsive caregiving through integration into existing services in various fields, such as health, nutrition, education, and child protection. The CCD emphasizes stimulating young children by coaching their parents and caregivers and teaches them how to engage in play and communication activities that promote motor, cognitive-language, and social-emotional skills. It also strengthens responsive caregiving skills by leading parents and caregivers during play interaction with their child to observe, interpret, and appropriately respond to their child’s signals (25).

This evidence suggests that these skills can be taught to caregivers. Caregivers and families can enhance the child’s growth and development through daily activities and interactions. In this program, adults learn how to motivate their children to learn through playing and communication, be sensitive to their needs, and meet them appropriately (24, 26-30). The present study aims to evaluate the effectiveness of the CCD program on the developmental skills of infants living in the orphanages in Tabriz.

## Materials & Methods

In the present study, the study population includes 4-42-month-old children living in orphanages. Among the orphanages in the capitals of East and West Azerbaijan (Tabriz and Urmia) provinces, two orphanages were selected using the convenience sampling technique, and thirty children, whose chronological age was in the age range specified in the present study, were included in the study. Then, they were randomly divided into two intervention and control groups (each group, N=15). Exclusion criteria were being hospitalized and ill, needing isolation in the orphanage, transferring the subject's custody to a family, clear and diagnosed developmental problems, genetic syndromes, and cleft lip and palate.

Necessary permits were obtained from the Welfare Directorate General of each province to enter the orphanages. Next, considering that in the orphanages, the head of the orphanage is the children's legal guardian, he/she was asked to give a letter of consent after being explained and justified on the research objectives. The heads of orphanages were assured about the confidentiality of information. They have explained the research subject in general, the research objectives, and the approximate time required to attend training sessions for the orphanage staff and the volunteers participating. Moreover, they were assured that the research results, including ethical considerations, would be provided. After obtaining consent, samples were selected from all children of the two selected orphanages (intervention and control) who were present in the orphanage during the research period and met inclusion criteria or those infants added to them during the research period. The intervention method of this research was the CCD package. It was designed as an intervention to

enhance the development of children by the World Health Organization and UNICEF (25). It provides information and recommendations for young children's cognitive stimulation and social support through sensitive and responsive caregiver-child interaction.

Due to the high workload of the caregivers and educators working in the orphanages, some volunteers from the healthcare center applied the CCD program to the children in the orphanages. The volunteers were selected through a call and an interview. The intervention (i.e., CCD) was implemented for three sessions a week, with each session lasting two hours per week, and it lasted for three months. At the end of the intervention process, the Bayley Scales of Infant and Toddler Development 3rd edition (BSID-III) and the Ages and Stages Questionnaire 2nd edition (ASQ-2) were completed for the children in both intervention and control groups.

The BSID-III is one of the most widely used tools in the world for assessing a child's developmental status. It was originally developed by Nancy Bayley in 1969, and its second, third, and fourth editions were published in 1993, 2006, and the fall of 2019, respectively. This test assesses the development of children in five domains: cognitive, language (receptive and expressive), motor (gross and fine), adaptive, and social-emotional development. The cognitive subscale includes items that assess sensorimotor development, exploration and manipulation, object relatedness, concept formation, memory, and other aspects of cognitive processing. The language subscale comprises two parts, receptive and expressive communication, and includes items assessing preverbal behaviors, vocabulary development, and verbal comprehension. The motor subscale is

also divided into the fine and gross motor, based on which fine motor skills, such as holding and grasping, and gross motor skills, i.e., movement of large muscles such as arm and leg, are assessed. The BSID-III test is applied individually and is used for the age range of 1 to 42 months. The third edition of this test has been standardized in Iran by Soleimani et al. The internal consistency reliability coefficients for cognitive, receptive, and expressive communication, fine motor, and gross motor subscales were estimated to be -0.96, 0.95, 0.95, and 0.94, respectively (31).

ASQ-2 is a developmental screening tool for children aged four to sixty months. It has 19 age-specific questionnaires that can be completed by the parents or caregiver and scored by a physician or health care provider. The score obtained in each domain of this questionnaire is compared with the standard values specified for each questionnaire. Each questionnaire has 30 items that assess the child's development performance in personal-social skills, fine motor, gross motor, communication (speech and language), and problem-solving skills. The questions are prepared so that people with primary education can answer them. It takes about 15 minutes to complete and 2 to 3 minutes to score. Its sensitivity (0.70 to 0.90) and specificity (0.76 to 0.91) have been reported to be moderate to good, and its reliability has been estimated to be excellent (0.95 for test-retest reliability as well as inter-rater reliability) (32, 33). The second edition of this test has been standardized in Iran by Vameghi et al., and the reliability, determined by Cronbach's alpha, ranged from 0.76 to 0.86, and the inter-rater reliability was 0.93. The validity determined by factor analysis was satisfactory (34).

The data were analyzed using the t-test (difference in mean) in the SPSS 21 software.

## **Results**

The results indicated a significant difference between the two intervention and control groups in motor, communication, and personal-social skills ( $p$ -value  $< 0.05$ ). Besides, no significant difference was found between them in cognitive skills (Bayley:  $p$ -value  $> 0.05$ ). According to the BSID-III, the following mean scores were obtained in the related subscales for the intervention and control groups: language development (intervention group:  $78.23 \pm 10.051$ , and control group:  $65.58 \pm 10.051$ ,  $p$ -value =  $0/003$ ), motor development (intervention group:  $72.36 \pm 19.162$ , and control group:  $54.89 \pm 10.775$ ,  $p$ -value =  $0/009$ ), and cognitive development (intervention group:  $76.15 \pm 16.093$ , and control group:  $67.86 \pm 14.899$ ,  $p$ -value =  $0/176$ ). Moreover, according to the ASQ test, the following mean scores were obtained in the related domains for the intervention and control groups: personal-social skills (intervention group:  $43.46 \pm 8.263$ , and control group:  $20.36 \pm 16.436$ ,  $p$ -value =  $0/000$ ), problem-solving skills (intervention group:  $45.83 \pm 8.263$ , and control group:  $27.50 \pm 16.261$ ,  $p$ -value =  $0/003$ ), communication skills (intervention group:  $40.77 \pm 11.875$ , and control group:  $20.36 \pm 16.463$ ,  $p$ -value =  $0/001$ ), gross motor skills (intervention group:  $53.08 \pm 6.30$ , and control group:  $25.71 \pm 14.657$ ,  $p$ -value =  $0/000$ ), and fine motor skills (intervention group:  $46.25 \pm 12.636$ , and control group:  $20.71 \pm 13.281$ ,  $p$ -value =  $0/000$ ). The intervention group obtained a greater mean score in all domains than the control group (Tables 1 & 2).



**Table 1.** Pvalue of evaluated developmental skills

Language (Bayley)	0/003
Motor (Bayley)	0/009
Cognition (Bayley)	0/176
Personal-Social (ASQ)	0/000
Problem solving (ASQ)	0/003
Communication (ASQ)	0/001
Gross motor (ASQ)	0/000
Fine motor (ASQ)	0/000

## Discussion

The authors designed this study to explore the impact of the implementation of CCD on children living in orphanages. This study’s results revealed that the CCD intervention had significantly affected children’s language, motor, and social-emotional development outcomes but not their cognitive development. In the orphanage, children have different caregivers over the early years of life, and these caregivers change periodically and don’t remain the same, so children experience a deprivation in the social-emotional caregiver-child interactions and lack of relationship experiences. Evidence suggests an association between early severe socioemotional deprivation and abnormal brain connectivity, which may partly underlie these children’s cognitive, socioemotional, and behavioral difficulties (35). One of the major principles of CCD is focusing on child-caregiver interactions and empowering the caregivers’ sensitivity and responsivity to the messages that the child is trying to convey, which, according to evidence, can enhance a child’s developmental scores in different scales (24, 27, 29, 36). The difference in developmental scores of control and intervention groups can be explained by having an eye on this rationale. The results of this

study in motor, language, and social-emotional development are consistent with the studies that suggest early childhood stimulation for improving their development. A study in Pakistan was executed with 757 participants (age: 0-2.5 Mo) who were followed up until the children were 24 months old.

CCD was chosen as the intervention method, and Bayley-III recorded developmental outcomes. Their results indicated significant motor, language, and cognitive improvement (30). Another study implemented in China revealed similar results with higher measures of child development on cognitive, social, and linguistic scales (27). Unfortunately, the authors couldn’t find evidence about CCD implemented in Orphanages, but some other orphanage researchers used interventions quite similar to CCD’s basic principles, such as play or training caregivers about sensitive-responsive interactions with children (14, 36). In an orphanage in India, they applied 90-minute play on children aged six months – 2.5 years using Bayley’s Scale of Infant Development and Vineland’s Social Maturity Scale for evaluating their Motor, Mental, and Social Quotients. The results suggested significant developmental improvement in all domains (14). In the cognitive domain, the study’s results differ

from those mentioned studies. Although the mean score in cognitive development was higher in children exposed to the CCD intervention than in those who were not, which may be a sign that the intervention provided some progress, it raises questions about how to develop a more rigorous curriculum design to support and promote cognitive development. For example, can caregivers build up plays appropriately to target cognitive development as children age? Or should the intervention last longer (due to studies above, which have a longer intervention period and show that differences are greater in longer durations (36))? Not defining a smaller age range could also be a reason because as a child grows up, compensating for early delays becomes more difficult (37).

The study's design and implementation have some strong points. The main strengths were that the current study was a randomized control trial in which intervention and control groups were similar in age, gender, culture, and children-caregiver ratio. Moreover, the intervention is a standard package confirmed by the World Health Organization, and all the study's team members were trained to implement it. Nevertheless, a limitation of this study was that we could not measure the long-term effects of the intervention due to the adoption process (children being adopted and leaving the orphanage), and they were out of access. In further research, exploring the long-term effects of intervention through a longer intervention period and following up after the intervention ends would be beneficial. Assessing more children by dividing them into smaller age ranges might be advantageous.

## **In Conclusion**

The early years of a child's life play a crucial role in forming his/her personality. Therefore, the

quality of the place of residence and the caregivers' behaviors greatly influence the spirits of orphans who are deprived of their own homes and families and grow up in orphanages. Therefore, the present study concluded that it is required to apply interventions, including standard ones such as the CCD program in environments like orphanages, to enhance the developmental skills of those children.

## **Acknowledgment**

This study is approved ethically by the Ethical Committee of Tabriz University of Medical Sciences (Ethical code: IR.TBZMED.REC.1399.741). The IRICT number of this study is 62785

## **Authors' Contribution**

Author has read and approved the final manuscript before submission.

## **Conflict of interest**

The author declare that they have no conflict of interest.

## **References**

1. Kosaryan M, Vahidshahi K, Shafaat B, Abaskhanian A, Azizi S, Shahrokh S, et al. Screening of developmental problem, day care centers, Sari, 2006. 2007;17(59):69-75.
2. Nahar B, Hossain I, Hamadani J, Ahmed T, Grantham-McGregor S, Persson LAJCC, Health, et al. Effect of a food supplementation and psychosocial stimulation trial for severely malnourished children on the level of maternal depressive symptoms in Bangladesh. 2015;41(3):483-93.
3. Shipra N, Shubhangna S, Johe. Influence of intervention on temperament and developmental outcomes of infants. 2009;28(2):121-6.
4. Raby KL, Roisman GI, Labella MH, Martin J, Fraley

- RC, Simpson JAJCd. The legacy of early abuse and neglect for social and academic competence from childhood to adulthood. 2019;90(5):1684-701.
5. Gilmore JH, Knickmeyer RC, Gao WJNRN. Imaging structural and functional brain development in early childhood. 2018;19(3):123-37.
  6. Sharma S, Nagar SJJoss. Influence of home environment on psychomotor development of infants in Kangra district of Himachal Pradesh. 2009;21(3):225-9.
  7. Pediatrics AAP. Committee on early childhood aadc. Health care of young children in foster care Pediatrics. 2002;109 (3):536-41.
  8. Soleimani F, Sajedi F, Akbari SAAJAiN, Midwifery. Developmental delay and related factors. 2014;24(85):61-70.
  9. Lartey A, Owusu WB, Sagoe-Moses I, Gomez V, Sagoe-Moses CJF, bulletin n. Implementation of the WHO Multicentre Growth Reference Study in Ghana. 2004;25(1\_suppl\_1):S60-S5.
  10. Frick MA, Forslund T, Fransson M, Johansson M, Bohlin G, Brocki KCJBJoP. The role of sustained attention, maternal sensitivity, and infant temperament in the development of early self-regulation. 2018;109(2):277-98.
  11. Tavakolizadeh J, Gahramani M, HADIZADEH TF, Chamanzari H. The survey of mental health condition on smoked and non-smoked youths of gonabad city. 2003.
  12. Soleimani F, Khoshbin E, Shams SJAoR. Report of motor developmental delay screening of infants (4-18 Months Old) of Karaj city. 2001;2(3):22-8.
  13. Rezaeian A, Behnam Vashani H, Ashrafzadeh F, Rezaeian MJJoNKUoMS. Effect of a developmental stimulatory package on the fine motor development of the 1-12 months old, foster care children. 2014;6(3):513-23.
  14. 2017 [Available from: <https://www.yjc.news/fa/news/6357556>.
  15. McCall RB, Groark CJ, Hawk BN, Julian MM, Merz EC, Rosas JM, et al. Early caregiver–child interaction and children’s development: Lessons from the St. Petersburg-USA orphanage intervention research project. 2019;22(2):208-24.
  16. Dalvand H, Dehghan L, Shamsoddini A, Joghataei M, Sazmand A, Feizi AJJoRUoMS. Standardized of Peabody Developmental Motor Scale (PDMS) in First Grade Elementary School Children in Tehran. 2008;7(2):137-44.
  17. Eickmann SH, Guerra MQ, Lima MC, Huttly SR, Worth AAJDM, Neurology C. Improved cognitive and motor development in a community-based intervention of psychosocial stimulation in northeast Brazil. 2003;45(8):536-41.
  18. Prommin S, Bennett S, Keeratisiroj O, Siritaratiwat WJECD, Care. Instability of gross motor development during the first year in orphaned infants: a longitudinal observation study. 2020;190(13):2041-9.
  19. Farsi A, Abdoli B, Kaviani M, Kaviani AJML, Movement–Sports. Influence of perceptual experience-gross and fine motor movements and motor development of infants 5-8 months of use. 2010;5:71-84.
  20. World Health Organization U. Care for child development: improving the care for young children. 2012. p. 157.
  21. Azari N, Soleimani F, Vameghi R, Sajedi F, Shahshahani S, Karimi H, et al. A psychometric study of the Bayley scales of infant and toddler development in Persian language children. 2017;11(1):50.
  22. Hay WW, Levin MJ, Accurso FJ. CURRENT Diagnosis & Treatment Pediatrics, William W. Hay-Myron J. Levin, 2009, The McGraw-Hill Companies, Inc: The McGraw-Hill Companies, Inc; 2009.
  23. Grossman DS, Mendelsohn AL, Tunik MG, Dreyer BP, Berkule SB, Foltin GLJpec. Screening for



## The Efficacy of “Care for Child Development” Intervention on the Improvement of the Development Skills

- developmental delay in high-risk users of an urban pediatric emergency department. 2010;26(11):793-7.
- 24.SAJEDI F, ALIZAD V. The incidence of motor developmental delay in high risk infants and effective risk factors in developing of it. 2004.
- 25.Leonard HC, Hill ELJC, Health AM. The impact of motor development on typical and atypical social cognition and language: A systematic review. 2014;19(3):163-70.
- 26.Abbott A, Bartlett DJCC, Health, Development. Infant motor development and equipment use in the home. 2001;27(3):295-306.

---

Copyright © 2023 The Authors. Published by Shahid Beheshti University of Medical Sciences.

This work is published as an open access article distributed under the terms of the Creative Commons Attribution 4.0 License

(<http://creativecommons.org/licenses/by-nc/4>). Non-commercial uses of the work are permitted, provided the original work is properly cited.