Effect of Maternal Deprivation and Family Surroundings on Institutionalized Preschool Children’s Development

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Introduction: Institutionalized children experience ineffective nurturing social and environmental conditions resulting in maternal, sensory, cognitive, linguistic, and psychosocial deprivation. Objective: Assessing the effect of maternal and family context deprivation on the development of preschool children living in orphanages. Subjects and Methods: 50 institutionalized children of both sexes with age ranged 3-5 years underwent auxological assessment height (Ht), weight (Wt), head circumference (HC), and left mid upper arm circumference (MUAC) and Portage developmental assessment in comparison to 50 home living controls of the same age and sex. Results: institutionalized children showed statistically significant lower Ht, Wt and HC Z-scores (median (IQR) -0.2 (-0.89 : 0.32), -0.27 (-0.87 : 0.5), 0.41 (-0.2 : 1.47 respectively) and percentiles and lower developmental quotient (DQ) scores across all developmental (median (IQR) for Social DQs was 92.55 (87.97 :101.4), for language DQs 91.45 (87.5 : 97.55), for self care DQs 89.75 (82.65 : 98.4), for cognitive DQs 84.3 (78.1 : 94.6) and for motor DQs 97.15 (94.67 : 104.7) when compared to home living children’s Ht, Wt and HC Z-scores (median (IQR) 0.51 (0.03 : 1.1), 0.1 (-0.28 : 0.51), 1.63 (0.45 :2.23 respectively) and percentiles and DQ scores (median (IQR) for Social DQs was 108.2 (105.5 :114.6), for language DQs 103.9 (100 : 108.4), for self care DQs 105 (100 : 110.1), for cognitive DQs 104 (96.9 : 108.2) and for motor DQs 110.6 (105.2 : 115.3), meanwhile; they had statistically significant higher MUAC Z-scores (median (IQR) 0.39 (-0.31 : 1.19) and percentiles compared to home living children (median (IQR) -0.02 (-1.2 : 0.52). Conclusion: Institutionalized maternally deprived children have delayed physical growth and development (social, language, self care, cognitive and motor). Keywords: Maternal deprivation – Institutionalization – Institutions – Child development – Growth – social development - development language – development - self care , cognitive development – motor development .

المستخلص

تأثير الحرمان من الأم ومن المحيط الأسرى على تطور أطفال مؤسسات الرعاية الخاصة في سن ما قبل المدرسة

مقدمة: الأطفال الذين تمت تنشئتهم في مؤسسات الرعاية يواجهون ظروف بيئية واجتماعية غير فعالة تؤدي الي الاحساس بالحرمان الأمومي والحسي والمعرفي واللغوي، والنفسي.

 هدف الدراسة: تقييم تأثير الحرمان من الأمهات والمحيط الأسرى على نمو وتطور أطفال مؤسسات الرعاية فى سن ما قبل المدرسة.

العينة وطرق البحث: اجريت هذه الدراسة علي 50 طفل وطفلة من أطفال مؤسسات الرعاية الخاصة تترواح أعمارهم بين 3 – 5 سنوات من كلا الجنسين ومقارنتهم ب 50 طفل اخر يعيشون مع ذويهم كعينة ضابطة وقد اخضعوا للتقييم الانثروبوميتري عن طريق قياس الطول، الوزن، محيط الرأس و محيط منتصف أعلي الذراع وللتقيم النمائي باستخدام قائمة بورتاج لتطور الطفل.

نتائج الدراسة: بعد مقارنة كلتا المجموعتين وجد أن الأطفال الأيتام حصلوا علي قياسات أقل في الطول -0٬2 (-0٬89 : 0٬32) الوزن -0٬27 (-0٬87 : 0٬5) و محيط الرأس 0٬41 ( -0٬2 : 1٬47) و أعمار نمائية أقل في جميع المجالات النمائية (معامل النمو الاجتماعي 92٬55 (87٬97 : 101٬4), معامل النمو اللغوي 91٬45 (87٬5 :97٬5 ), معامل الرعاية الذاتية 89٬7 (82٬65 : 98٬4), معامل النمو الادراكي 84٬3 (78٬1 : 94٬6) ومعامل النمو الحركي 97٬15 (94٬67 : 104٬7) عند مقارنتهم بأطوال 0٬51 (0٬05 : 1٬1) وأوزان 0٬1 (-0٬28 : 0٬51) ومحيط رأس 1٬63 (0٬45 : 2٬23) و الأعمار النمائية؛ معامل النمو الاجتماعي 108٬2 (105٬5 : 114٬6), معامل النمو اللغوي 103٬9 (100 : 108٬4), معامل الرعاية الذاتية 105 (100 : 110٬1), معامل النمو الادراكي 104 (96٬9 : 108٬2) ومعامل النمو الحركي 110٬6 (105٬2 : 115٬3)؛ لأطفال العينة الضابطة. بينما كانت قياساتهم في محيط منتصف أعلي الذراع 0٬39 (-0٬31 : 1٬19) أعلي من العينة الضابطة -0٬02 (-1٬2 : 0٬52).

الخلاصة: أطفال مؤسسات الرعاية الخاصة يتأخرون في النمو الجسماني والتطور (الاجتماعي، اللغوي، رعاية الذات، الادراكي والحركي).

الكلمات الكاشفة :

الحرمان من الامهات- مؤسسات الرعاية – نمو الطفل – تطور الطفل- النمو الاجتماعي – النمو اللغوي – الرعاية الذاتية – النمو الادراكي – النمو الحركي .

Background

Maternal deprivation (MD) is the lack of adequate physical care and of social and emotional stimulation and interchange (Molitor & Mayes, 2002). Early childhood MD, period from prenatal development to eight years of age, is a life stressor (Berman et al., 2014) which shapes behavioural and neurochemical phenotype, emotional and physiological responses (Kaffman & Meaney, 2007; Vetulani 2013) that influence outcomes across the entire course of an individual’s life (Irwin et al., 2007).

Orphans raised in institutional settings experience ineffective nurturing social and environmental conditions that result in profound sensory, cognitive, linguistic, and psychosocial deprivation ( Nelson, 2007) as well as lack of opportunities for attachment (Feigelman, 2011) leading to deficiency of the Interacting sensory, social and hormonal experiences coming from the mother (Melo, 2015), and of expected stimulating home environments and interpersonal relationships inputs (McLaughlin et al., 2010; Fernald et al., 2009; Walker et al., 2007). The effects of early deprivation include factors such as: inadequate sanitation, nutrition and medical care, lack of individualized, consistent and supportive caregiver relationships (Pollak et al., 2010), little linguistic stimulation (Nelson, 2007) social, emotional and cognitive impoverishment (Bick et al., 2015) and exposure to different types of child abuse including physical, sexual (Lueger-Schuster et al., 2014) and emotional and neglect (UNICEF, 2014). In addition, regimented daily schedules (Zeanah et al., 2009), large groups of children, high children: caregiver ratios, many and changing caregivers, children’s frequent changes of institution (Muhamedrahimov et al., 2004; McCall 2013; Wright et al., 2014) and caregiver-child interactions that lack warm, sensitive, responsive, and child-directed behaviours (McCall, 2013) add more to the instability and inconsistency of the children’s environment in institutional care (Muhamedrahimov et al., 2004; Wright et al., 2014).

Impact of Institutionalization on Children growth

Institutionalized Children develop global growth retardation with persistent abnormalities in the hypothalamic-pituitary-adrenal system (Johnson& Gunnar, 2011; Parks& Felner, 2011). They show delayd physical growth: height, weight, and head circumference (Johnson et al., 2010) to the extent that they lose about 1 month of linear growth for every 2–3 months in institutional care (Johnson, 2001) leading eventually to stunted growth (Rutter, 1998) and decreased head circumference (Nelson et al., 2011). This delay could be attributed to many interfering factors such as: nutritional deficiencies; quantity, quality, digestibility, and palatability of food, Improper feeding techniques, micronutrient deficiencies and poor appetite beside medical problems; dental disease, infections, parasitic infestation, malabsorption and others; timing and duration of orphanage confinement , growth status at entry, chronic stress and depression, caregivers consistency and nurturing qualities (Nelson et al., 2011; Miller, 2012).

Impact of Institutionalization on Children development

Cognitively, severe deprivation is associated with neurocognitive delay or impairment (Bick& Nelson, 2016) with presence of nervous system development maturational lag or cortical hypoactivation (McLaughlin et al., 2010; Marshall et al., 2004) and Institutionalized children  develop Impaired intellectual abilities, visual-spatial, learning/ memory, and attention/executive functions with worse academic performance and need for individualized education programs (DeBellis et al., 2009; Loman et al., 2009; Cohen et al., 2008; Colvert et al., 2008; Nelson et al., 2007). Linguisticallly, institutionalized Children show language delays and deficits, with inability to produce complex sentences (Windsor et al., 2007; Windsor, 2013), poor sentence comprehension abilities, difficulty with school-related language (Desmarais et al., 2012) and academic learning problems (van Ijzendoorn et al., 2005). Socially, they develop wide range of social problems including: speech reticence, low social engagement (Almas et al., 2015), few friends with poor friendship relations (Erol et al., 2010), difficulty in initiating contact with new peers, in solving disputes, in managing peer pressure, in emotions regulation, in using time wisely and in attending to teachers requests (Almas et al., 2012). Social rejection or exclusion with the resultant involvement in delinquent or risk-taking behaviours (Ollendick et al., 1992; Almas et al., 2015) and rule-breaking behavioral problems (Muhamedrahimov et al., 2014) are also found in institutionalized children. Motorically, Institutionalization does not afford adequate experiences of movement and exploration and other opportunities needed for the development of age-level motor activity and skills (Roeber et al., 2012) resulting in significant both gross and fine motor developmental delay (Rettig& McCarthy-Rettig, 2006) and delay in balance and bilateral coordination (Roeber et al., 2012).

Hypothesis and aim of the study:

Based on the hypothesis that maternal and family surroundings deprivation negatively impact child development causing developmental delay, children institutionalization as a cause of maternal, social and environmental deprivation will cause developmental delay. So, the study aims at assessing and early detecting the effect of maternal and family context deprivation on the development of preschool children living in orphanages.

Subjects & Methods

Study design

Case Control Comparative study

Subjects

Subjects in the study were 100 children, with age range from 3-5 years from both genders. They were divided into 2 groups: case group included 50 true orphans, 23 boys and 27 girls, who do not have any living parents and living in institutional care centers since birth and control group included 50 mothered home-living children, 25 boys and 25 girls, living with their families in normal home atmosphere. Children excluded from the study were those with any chronic medical health condition known through medical history taking or physical examination and could affect their growth and development, or those who were going to kindergarten.

Methods

After obtaining the required approvals from Egyptian Ministry of Social Affairs, and responsible persons in orphanages and nurseries included in the study, Institutionalized children were recruited from 17 Districts of Cairo Governorate to represent the main 4 sectors of Egypt; East, West, North and South over a period of 19 months starting from 1st of August 2014 to end of February 2016, while matching control children were collected from day care nurseries.

All children were assessed auxologically by measuring height, weight, head circumference and mid upper arm circumference and developmentally by Portage developmental checklist. For each child 3 interviews were required to complete the assessment.

History taking and physical examination

History taking included the following: Personal data and Health and development information history including pregnancy and birth history, dietitic history, family history, current and past medical information history, psychiatric history, developmental history. For institutionalized children most of personal data and some points in the history couldn’t be obtained or were missed. General examination and local systematic examination especially neurological examination were done to exclude any systemic disease that would affect development.

Physical growth measure

Auxological measurements were done following the standardized measurement protocols. Standing height (Ht) and weight (Wt) with the calculated Body Mass Index (BMI), head circumference (HC) and left mid upper arm circumference (MUAC) measurements were obtained by calculating an average of triplicate measurements. Age and gender specific Z-scores (standard deviation SD) and percentiles for HtA, WtA, WtHtA, BMIA, OFCA, MUACA indicators were calculated based on the WHO growth charts using WHO Anthro Software version 3.2.2 (WHO 2011).

Developmental assessment

Portage developmental checklist was administered to assess the developmental status. It is a behavioral checklist contains 580 developmentally sequenced behaviors individually administered to assess the child's progress in the main five developmental areas: socialization, language, self help, cognition, and motor skills. After administration of assessment, a domain specific developmental age was calculated and then converted to a developmental quotient (DQ) for each domain.

Statistical analysis

Statistical analysis was performed using SPSS software for Windows version 22.0. Most of collected data were non parametric and comparison of auxology and developmental assessment data between cases and controls was done using Mann Whitney Test with p values of ≤0.05 were considered to be significant.

Results

Physical growth parameters of both cases and control groups were descriptively represented in the form of mean (SD), and median (IQR) then compared to each other to detect the effect of institutionalization on growth status of orphans (Table 1) and a statistically significant lower scores of Ht, Wt and HC percentiles and Z-scores of institutionalized children were found compared to home living children meaning that they were shorter, thinner children with smaller head size than their controls, at the same time institutionalized children had higher MUAC Z-scores and percentiles values than home living children meaning that they were nutritionally better than their controls.

We also compared developmental status of institutionalized and home living children (Table 2) and found that institutionalized children had statistically significant lower DQ scores across all developmental domains when compared to control group children with the least DQ score is found in cognitive domain.

Table 1 Descriptive statistics, and comparison between study groups regarding physical growth parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Growth ParametersZ-Score | Group | Z | P-value |
| Institution living cases (N=50) | Home living Controls (N=50) |
| Mean± SD | Median (IQR) | Mean± SD | Median ( IQR) |
| HtA Z-Scoreand percentile | -0.2 ± 1.0543.31 ± 29.03 | -0.2 (-0.89 : 0.32)42.15(18.47: 62.67) | 0.41 ± 0.9363.4 ± 27.56 | 0.51 (0.03 : 1.1)69.4 (48.8: 86.27)  | 3.657(3.413) | 0.000\*\*0.001\*\* |
| WtA Z-Scoreand percentile | -0.3 ± 1.0941.96 ± 27.75 | -0.27 (-0.87 : 0.5)39.25 (19.3: 68.5) | 0.01 ± 0.851.7 ± 23.78 | 0.1 (-0.28 : 0.51)53.85 (39.25: 69.5) | 2.027(2.037) | 0.04\*(0.04\* |
| WtHt Z-Scoreand percentile | -0.35 ± 1.3641.79 ± 30.99 | -0.35 (-1 : 0.39)36.5 (15.87: 65.15) | -0.4 ± 1.0438.37 ± 26.3 | -0.35 (-0.97 : 0.12)36.4 (16.65: 54.9) | 0.255(0.286) | 0.790.77 |
| BMIA Z-Scoreand percentile | -0.25 ± 1.3543.19 ± 30.15 | -0.29 (-0.85 : 0.55)37.85 (18.45: 66) | -0.23 ± 1.1139 ± 26.7 | -0.36 (-1.04: 0.24)35.15 (14.67: 57.5) | 0.589(0.641) | 0.550.52 |
| HCA Z-Scoreand percentile | 0.6 ± 1.0465.5 ± 25.9 | 0.41 (-0.2 : 1.47)65.65 (42: 92.95) | 1.34 ± 1.180.8 ± 24.4 | 1.63 (0.45 : 2.23)94.85 (67.37: 98.7) | 3.423(3.375) | 0.001\*\*0.001\*\* |
| MUACA Z-Scoreand percentile | 0.39 ± 1.0262.13 ± 28.89 | 0.39 (-0.31 : 1.19)65 (37.77: 88.35) | -0.26 ± 1.0943.6 ± 31.6 | -0.02 (-1.2 : 0.52)44.9 (8.65: 69.8) | 2.817(2.965) | 0.005\*\*0.003\*\* |

Z = Mann Whitney Test, HtA= Height for age, WtA= Weight for Age, WtHt= Weight for Height, BMIA= Body Mass Index for age, HcA= Head Circumference for age, MUACA= Left mid Upper arm circumference for age, \* = Significant, \* \* = Highly significant.

Table 2 Descriptive statistics, and comparison between study groups regarding Portage assessment developmental quotients

|  |  |  |  |
| --- | --- | --- | --- |
| Developmental Quotient (DQ) | Group | Z | P-value |
| Institution living (cases) | Home living (Controls) |
| Mean± SD | Median (IQR) | Mean± SD | Median( IQR) |
| Social DQ | 95.2± 10.8 | 92.55(87.97- 101.4) | 110.2± 7.6 | 108.2(105.5-114.6) | 6.188 | 0.001\*\* |
| Language DQ | 92.02± 8.98 | 91.45(87.5- 97.55) | 105.0± 9.4 | 103.9(100-108.4) | 6.189 | 0.001\*\* |
| Self care DQ | 90.39± 10.37 | 89.75(82.65- 98.4) | 105.7± 8.5 | 105(100- 110.1) | 6.45 | 0.001\*\* |
| Cognitive DQ | 85.95± 11.68 | 84.3(78.1- 94.6) | 104.5± 11.6 | 104(96.9- 108.2) | 6.512 | 0.001\*\* |
| Motor DQ | 99.75± 6.89 | 97.15(94.67- 104.7) | 110.3± 6.4 | 110.6(105.2- 115.3) | 6.274 | 0.001\*\* |

Z = Mann Whitney Test, DQ Developmental Quotient, \* \* = Highly significant.

Discussion

This study was carried out to assess the effect of institutionalization as an etiological factor of early maternal, social and environmental deprivation on children’s growth and development.

As was predicted, significant delay in height, weight and head circumference measurements and global developmental delay was observed. These findings corresponded to Smyke et al., 2007 ones in which they found Romanian institutionalized 123 children (56 institutionalized since birth, all children had median percentage of life instititutionalization of 98.16) in Bucharest institutions to have physical growth parameters Z score for Ht −0.89 (0.90), for Wt −1.25 (1.07), for WtHt −0.79 (1.03) and for HC −0.77 (0.97) while their controls’ Z scores were for Ht 0.06 (0.98 ), for Wt −0.06 (1.02), for WtHt 0.002 (0.99) and for HC 0.17 (0.79) and to Cohen et al., 2008 who studied Chinese infants adopted to Canada and found that those adoptees had smaller physical development indices including Ht; within the 50th percentile, Wt; within the 10th percentile, HC; within the 50th percentile, HtA ratio, and WtHt ratio compared to their peers. Moreover, Hearst et al., 2014 who found that mean Z-scores for length-/height, Wt, and weight-for-length/-height in institutionalized children were all negative (−1.5 (1.9 ), −0.7 (1.5) and −1.3 (1.5) respectively) with with Z scores ≤ -2 in 37% of children for length/height; 31.5% for weight and 22.1% for Weight-for-length/height and Kroupina and his colleagues, 2015\* demonstrated that institutionalized children had Z scores for length/height, Wt, Weight-for-length/height and HC respectively −1.62 (1.61), −1.34 (1.17), −0.63 (1.41) and −1.70 (1.27) with Z scores ≤ -2 in 36 % of children for length/height; 22 % for weight, 19% for weight-for-length/height and 41 % for HC.

In addition, in a study conducted by Saboula et al., 2015, 57.6% of Egyptian children living in Menoufia Governorate orphanages were found to be underweight and 2.4% was obese, while, 33.6% had normal weight.

On contrary, Whetten et al., 2014 found after 36-month follow-up that institution-living children had statistically significant higher height Z-scores (−1.4 ± 1.3) than their control family-living fostered children (−1.6 ± 1.3) with P= 0.002). Most probably, that contradiction was attributable to: the large sample size Whetten and his colleagues worked on; 1357 institution-living children and 1480 family-living, or due to the older age they selected for the their study; age ranged from 6 to 12 and after 3 years follow up ranged from 8 to 16 years that gave children the opportunity to catch up the growth, or due to improved quality of institutional care in the studied countries more than home based care due to financial and social issues found in such  low and middle income countries (Cambodia, Ethiopia, Kenya, India and Tanzania) where the study was performed.

# Regarding children’s developmental level in the current study, comparing institutionalized children to family- reared children revealed that institutionalized children showed delay in all five developmental domains; social, language, self care, cognitive and motor

# This came in agreement with developmental levels of adopted Chinese children who were assessed developmentally by Miller& Hendrie, 2000 who used the Peabody Developmental Motor Scale and the University of Michigan Early Intervention Development Profile, and revealed that 75% of those children had significant developmental delay in at least 1 domain: gross motor in 55%, fine motor in 49%, cognitive in 32%, language in 43%, social-emotional in 28%, activities of daily living in 30%, and global delays in 44%, and Cohen et al., 2008 who found those children exhibiting developmental delays; denoted by lower scores on Mental Development Index (MDI score= 76.84, control score= 102.74) and Psychomotor Development Index (PDI score= 73.4, control score= 96.19) of the Bayley Scales of Infant Development-II at initial assessment and on Preschool Language Scale-3 at 6 months post adoption (receptive language score= 100.67, control score= 112.27 , expressive language score= 93.87, control score= 107.63) when compared to current peers. Moreover, in Rettig & McCarthy-Rettig, 2006 survey study of health, and development of 240 Chinese adoptees, 62% of children had developmental delay, of this number, 91% had motor development delays at the time of adoption.

# Added to the above, McCall et al., 2010 who worked on Latin America orphanages’ children using Battelle Developmental Inventory (BDI) to measure adaptive, personal-social, communication, motor, cognitive DQs and found that younger children had total DQ= 67.95 (8.62) and older children total DQ= 59.94 (7.38), with 82.0% of children had DQ ˂70, 13.1% DQ= 70-79, 4.9% DQ= 80- 89, 0% DQ ≥90 DQ.

#  In Greece, Giagazoglou and his colleagues, 2012 examined the differences in the psychomotor developmental profiles of 96 preschool (4-6 years) aged Greek children living in conventional institutions (N=28), in SOS villages (N=20) and in natural family environment (N=48) using Griffiths Scale No II, and found that family reared children had better performance in all scales of the Griffiths test compared with children of the other two groups (family reared children General DQ= 113.44 ± 13.03, conventional institutions children General DQ= 75.96 ± 12.31, SOS villages children General DQ= 95.30 ± 9.01 with P= ˂0.01 in between), while in United States Welsh & Viana, 2012 followed up post institutionalized internationally adopted children from China, Korea, Latin America, Eastern Europe, and other Asian countries; over a period of 18 months using Ages and Stages Questionnaire (ASQ) to assess them developmentally. Although they didn’t apply the ASQ immediately after arrival to United States, the 6 month post adoption assessment revealed developmental delay; score for communication 36.09 ± 15.81, for fine-motor score 43.80 ± 13.09, for gross-motor 46.85 ± 15.89, for personal-social 42.93 ± 12.32 and for problem-solving 42.22 ± 15.76 out of 60 for each domain. Further, In Kazakhstan Kroupina et al., 2015\* indicated that institution living children were developmentally compromised, denoting that by lower scores in BSID-II MDI 75.74 ± 18.75, PDI 77.93 ± 20.78 with 40 % of children scoring within the normal range on the MDI, 19 % scored in the mild delay range and 41 % with significant delay and 41 % showed normal PDI, 22 % with mild delay range and 37 % with significantly delayed and in Egypt, Fawzy & Fouad 2010 studied orphans aging 6-12 years in Sharkia governorate using Pediatric Symptom Checklist (PSC) to recognize cognitive, emotional, and behavioral problems as a reflection of their developmental status and/or developmental disorders and found that 61% of children had Developmental disorder, of them 82% were females.

Cognitive development in institutionalized children was spotted through many studies for example; Mbiya Muadi et al., 2014 evaluated of the quality of attachment effect on the cognitive development of 42 abandoned children placed in institutions in Kinshasa, Democratic Republic of Congo using Raven's colored progressive matrices Test in assessing nonverbal reasoning abilities, and demonstrated that the mean values of cognitive performance obtained from 42 control children (19,3 ± 4,7) were higher than those obtained from children in institutions(13,3 ± 4,7) with P= < 0,001. Further, reviews done by Berens & Nelson, 2015 and Juffer and his colleagues, 2015 proved the presence of cognitive delay in institutionalized children. Berens & Nelson in their review documented a meta-analytic study assessed the effects of institutionalisation on IQ/DQ for infants in data from 42 studies of more than 3888 children in 19 countries in which institutional care, when compared with family-based care, had a significant combined effect size on IQ/DQ of d=1·10 (95% CI 0·84–1·36, p<0·01), while Juffer et al., 2015 work on 7 studies conducted on Chinese children adopted to USA, Canada, and the Netherlands at arrival in the adoptive family and confirmed the delay in both cognitive and motor development.

Motor development also, examined in Ethiopian/Eritean children Post institutionalization by Miller and his colleagues, 2008 and were found to have gross/fine motor and cognitive skills of approximately 86% of the expected for age. In addition, Levin et al., 2014 in their work on institutionalized Romanian children aging 8 years to assess their motor proficiency level by applying Bruininks-Oseretsky Test of Motor Proficiency, Second Edition, Short Form (BOT2-SF), found that community children performed significantly better on the BOT2-SF than institutionalized children (p < .001) with average score equivalent to a 6.5-year-old child while community children’s score were equivalent to an 8-year-old child.

Like cognitive and motor development, institutionalized children were studied socially wise by Johnson et al., 2006 who reviewed studies performed on institutional care for young children across Europe in the period 1996 to 2003 and found 17 ones studied social and behavioural development and 12 ones addressing cognitive development, which proved presence of developmental delays in social, behavioral, cognitive and language domains and by Almas et al., 2012 who found that community Romanian children were rated significantly higher than institutionalized children by teachers on Social Skills Rating System (P < 0.01) which assessed children’s social skills, problem behaviors, and academic competence.

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