

**METHODS FOR ASSESSING ANTHROPOMETRIC
CHARACTERISTICS OF CHILDREN'S PHYSICAL
DEVELOPMENT IN RELATION TO DIETARY PATTERNS****Usmonova G.B.,****Mamasaidov J.B.**

Relevance of the Problem. In recent years, scientific research conducted in the Republic of Uzbekistan within the fields of pediatrics, neonatology, and hygiene has increasingly focused on identifying regional characteristics of children's physical development. However, the issue of differences in anthropometric indicators among children who are breastfed, mixed-fed, and artificially fed has not been sufficiently explored.

Therefore, in order to address this scientific gap, it is essential to analyze and highlight findings aimed at identifying the specific characteristics and indicators typical of children growing under different feeding conditions (breastfeeding, mixed feeding, and artificial feeding).

The distinctiveness of this study lies in its integrated approach, combining anthropometric, statistical, and morphofunctional analyses of child development. Such an approach enables the practical application of the obtained results in medicine, particularly in pediatrics, neonatology, and pediatric nutrition science. In this context, the selection of appropriate research methods, as well as the reliability and ease of application of the obtained indicators, are considered critically important.

Aim of the Study. The aim of this study is to conduct a comparative evaluation of changes in anthropometric indicators of children's physical development, as well as to analyze the advantages of modern, invasive, and experimental research methods in selecting effective approaches for determining qualitative indicators.

Results Obtained

Objective examination. Within the framework of the study, standard methods for examining children were applied: general examination, bimanual examination, and external inspection. During the general examination, body constitution, as well as the condition of the skin, hair, and nails, the degree of hair distribution, and the characteristics of adipose tissue distribution were assessed.

During the research, all necessary conditions for data collection were maintained: absence of preliminary selection of participants, consideration of children's age, and the use of the same instruments throughout the survey process.

The characteristics of physical development in children with different types of feeding attracted particular interest. To address this objective, body weight and length were measured, as well as chest circumference and head circumference. The examination was conducted in the first half of the day under comfortable conditions, with children undressed, at a room temperature of 24–26°C, strictly following all anthropometric measurement standards and using carefully calibrated instruments. Anthropometric data were evaluated using methods appropriate for each age and sex group.

All included subjects were divided into three groups:

- Group of children exclusively breastfed up to 5 months of age
- Group of children fed with artificial formulas from the first days of life
- Group of children receiving mixed feeding from the first days of life

The main objective of the study was to analyze the relationship between feeding type from the earliest days of life and anthropometric indicators of children's physical development, including body height, weight, head

circumference, chest circumference, and the timing of eruption of primary teeth.

This approach made it possible to identify potential influencing factors in advance. The evaluation of subjective indicators allowed for the assessment of children's physical development, as well as the determination of the intensity and frequency of morbidity.

The obtained anthropometric data were compared using the ANTHRO software and UNICEF reference indicators. The ANTHRO software (version 3.2.2, 2012), used for pediatric anthropometric calculations, is widely applied worldwide.

In this study, the reference population was defined according to WHO growth standards. Each of the three indicators of a child's nutritional status can be expressed in standard deviation units (Z-scores) relative to the median of the reference population.

Weight-for-age is an indicator used to assess both acute and chronic malnutrition. Children are considered moderately or severely underweight if their weight-for-age falls more than two standard deviations below the median of the reference population. Children whose weight-for-age is more than three standard deviations below the reference median are classified as severely underweight.

Height-for-age is a measure of linear growth. Children are classified as moderately or severely stunted if their height-for-age is more than two standard deviations below the median of the reference population. Those whose height-for-age is more than three standard deviations below the reference median are considered severely stunted.

Weight-for-height is used to assess wasting and overweight. Children are classified as moderately or severely wasted if their weight-for-height is more than two standard deviations below the median of the reference population. If weight-for-height falls more than three standard deviations below

the reference median, the condition is classified as severe wasting (hypotrophy). The hypotrophic form of dystrophy is typically associated with inadequate nutrition. This indicator is sensitive to seasonal variations, reflecting changes in food availability or the prevalence of disease.

Assessment of neuropsychological development (NPD) was carried out using the method proposed by G.V. Pantyukhina, K.L. Pechora, and E.L. Frucht (1996), which provides a qualitative evaluation of child development and categorization into age-specific neuropsychological development groups. During the first year of life, the following developmental stages were assessed:

1.5–3 to 5–6 months – development of visual and auditory orientation responses, cooing, and hand movements;

5–6 to 9–10 months – development of gross motor skills, preparatory stages of passive and active speech, and object-related actions;

9–10 to 12 months – development of gross motor activity, speech comprehension and production, and interactions with objects.

Based on the above method, the questionnaires developed by us made it possible to assess the age at which children acquire the following skills: visual orientation reactions, auditory orientation responses, emotional responses, gross motor activity, hand movements and object manipulation, procedural skills, play and interaction with objects, speech comprehension, and active speech. For each child, the age at which each skill emerged was recorded. A comparative analysis of the obtained data was carried out against standard reference values used in this methodology. When determining the developmental group, deficits in any indicator within a particular developmental domain were taken into account.

To evaluate the effect of feeding type on morbidity during the first year of life, parental questionnaires were conducted, and medical records reflecting the child's development and hospital history were analyzed. In addition, each

child included in the study underwent individual assessment within the framework of our research.

In modern medicine, scientific research aimed at the early detection of diseases and the development of effective diagnostic methods is becoming increasingly relevant [38]. In particular, the advancement of non-invasive yet highly accurate diagnostic approaches remains a priority in all periods. Among these, the analysis of biological fluids—especially saliva—has gained considerable attention as a means of early disease detection, and numerous large-scale studies have been conducted in this field [39,40]. The present study is also carried out within this framework, focusing on the processes of dehydration and crystallization of biological fluids (primarily saliva, and, where necessary, blood and other samples).

One of the key aspects of the study is the establishment of a standardized system for sample collection and storage. The processes of obtaining, transporting, and preparing biological fluids for initial analysis were organized in strict accordance with international standards and hygiene requirements, ensuring the accuracy, reliability, and reproducibility of the results. Therefore, in this study, not only standardized procedures for sample collection were implemented, but also uniform storage conditions were maintained, taking into account the medical status of participants and adhering to strict hygiene protocols [41].

The crystallization properties of saliva are closely associated with metabolic processes, water–electrolyte balance, and the concentration of bioactive substances in the body. In infants and young children, the type of feeding has a direct influence on saliva composition, which is subsequently reflected in the morphological characteristics of crystal structures formed during dehydration [42].

Collection and storage of saliva samples. Saliva samples were collected from infants aged 6–36 months, with careful consideration given to

their physiological characteristics, age-specific developmental stage, feeding regimen, and care conditions. Due to the limited voluntary motor control typical of this age group, direct contact and passive collection techniques were used for saliva sampling [43]. All procedures were carried out with written informed consent obtained from the parents of each infant. Prior to sample collection, caregivers (mothers or guardians) were informed about the hygienic requirements and scientific purpose of the procedure. Since saliva composition may vary significantly after feeding, sample collection was recommended at least 60 minutes after feeding [44,45].

For saliva collection, only sterile, single-use devices—saliva collection swabs—were used. These swabs are designed to be soft, non-fragile, and safe for use in infants, preventing accidental chewing or swallowing. Each swab and container was prepared in advance, labeled with unique identification codes, and sealed immediately after sample collection. Saliva collection was performed while the infant was calm and alert [46]. With the assistance of a caregiver, a soft sterile swab was gently placed in the infant's mouth, specifically in the lower jaw or cheek area, for approximately 2–3 minutes. During this time, the infant was soothed using visual and auditory interaction, allowing the swab to absorb saliva naturally through light chewing movements. A sufficient volume of saliva (at least 0.5–1 ml) was collected. After collection, each sample tube was labeled with an individual code or number to ensure confidentiality of personal data [47,48].

Additionally, specific data were recorded for each sample, including date of birth (age in months), sex, health status (based on medical records), type of feeding (breastfeeding, artificial, or mixed), and study group (control or main group).

Microscopic analysis. The digital microscope used in this study (see Figure 2.1) is a multifunctional device developed through the integration of modern technologies, including optical microscopy, an advanced photoelectric

conversion system, and LCD display technology. Unlike traditional binocular optical observation, this microscope allows direct visualization of the microscopic field on a screen, significantly improving the efficiency of the observation process [49].

The microscope is equipped with a high-resolution 14-megapixel camera and utilizes a CMOS color image sensor capable of capturing images in HD quality. The device can be connected to a computer via a USB 2.0 interface, enabling real-time image display at a speed of up to 480 Mb/s. This microscope is suitable for prolonged observation and detailed analysis [50,51].

Among compact microscope types, digital microscopes are particularly widespread, as their primary function is not only to magnify the observed object but also to provide high-quality image and video acquisition for scientific research purposes [52].

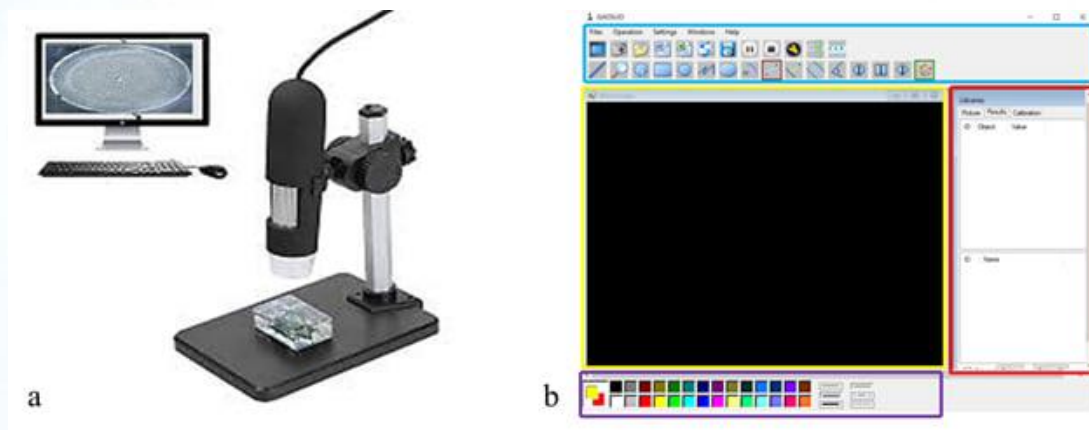


Figure 1. Figure 1a – digital microscope; Figure 1b – GAOSUO software interface: tools and settings window for working with digital microscope images.

The digital microscope used in this study was placed inside a specially isolated chamber, which ensured the stability of the internal environment during the experiment. This design minimizes the influence of external factors such as temperature fluctuations, airflow, and humidity changes on the experimental process. As a result, optimal and stable conditions were created for observations carried out using the microscope. Inside the

device, the temperature was maintained at 25 °C, while relative humidity was kept at approximately 32%. This made it possible to observe subtle physical changes occurring at the microscopic level without interference from external environmental factors [53]. The use of an isolated system ensures the reproducibility, reliability, and objectivity of the experiment.

Dehydration method. During the evaporation process, the selected substrate material significantly affects the characteristics of droplet dehydration. Studies indicate that surface properties, moisture resistance, and chemical inertness are key factors determining substrate performance. The glass surface used in this study is smooth, flat, and chemically inert, meaning it does not react with the saliva sample and does not interfere with evaporation or crystallization processes [54,55].

During sample preparation, the liquid was carefully applied onto the prepared glass substrate using a special dispenser (micropipette) (see Figure 2).



Figure 2. Droplet detachment and deposition onto the surface.

The applied saliva droplet (typically around 50 μL) assumes its shape on the glass surface under the influence of natural forces—surface tension and adhesion—and spreads according to the open droplet model. Observations based on this model demonstrate that the evaporation rate differs significantly between the central region and the peripheral zones of the droplet. Evaporation occurs more rapidly at the periphery, which, under the influence of internal

convective flows and surface forces, leads to the outward movement of molecules and ions from the center toward the edges [56,57].

Conclusion. Based on the conducted analyses, dynamic monitoring of anthropometric indicators, their comparative evaluation, correlation with additional minimally invasive analyses, and the application of morphological methods are of significant scientific and practical importance for assessing children's physical development.

REFERENCES

1. Abolyan, L.V. Ko'krak suti bilan boqishning zamonaviy jihatlari / L.V. Abolyan, S.V. Novikova // *Pediatrica*. – 2011. – T. 90. – No 1. – B.80-83.
2. Abolyan, L.V. Salomatlikning kelib chiqishida: akusherlik va bolalik tibbiyot muassasalarida emizishni tashkil etish / L.V. Abolyan, S.V. Novikova // *Bosh shifokor*. – 2017. - No 3. – B.35-41.
3. Amirova, V.R. Ko'krak suti bilan boqish muddatiga qarab chaqaloqlarning hayot sifati ko'rsatkichlari / V.R. Amirova, K.X. Gizdatullina // *Bolalar dietologiyasi masalalari*. – 2011. – T.9. - № 6. – B.9-11.
4. JSST Multifokal o'sish standartlarini o'rganish doirasida qo'shimcha oziqlantirishning rolini tahlil qilish. JSST Multifokusli o'sish mezonlarini o'rganish guruhi. *Acta Pediatrica*, - 2006. Suppl 450. - P.27-37.
5. Oxunova, M.T. Axborot, biologii va ijtimoi oid ba medisi, biolog va ijtimoi oid ba Jumhuri Tojikiston: referati. dis. ...kand. tibbiyot fanlari: 14.01.09 / M.T. Oxunova. – Dushanbe, 2000. – 26 b.
6. Oxunova, M.T. Vakolati musoidii zakhirai Jumhuri Tojikiston/M.T. Oxunova//*Tojikiston sog'liqni saqlash*. – 2008. - 1-son. – B.56-59.
7. Baranov, A.A. Tibbiyot va pediatriyada hayot sifatini o'rganish / A.A. Baranov, V.Yu. Albitskiy, I.V. Vinyarskaya // *Zamonaviy pediatriya masalalari*. – 2005. – T. 4. - No 2. – B. 7-12.

8. Baskakova, E.Yu. Chaqaloqlik davrida ovqatlanish xususiyatiga qarab bolalarda jismoniy rivolanish, haqiqiy ovqatlanish va metabolik kasalliklarning xususiyatlari: dissertatsiya referati. dis. ...kand. asal. Fanlar: 01/14/08 /E.Yu. Baskakova. – N. Novgorod, 2012. – 26 p.
9. Baturin, A.K. Rossiya Federatsiyasida hayotning birinchi ikki yilidagi bolalarni ovqatlantirish amaliyoti / A.K. Baturin, O.K. Netrebenko // Pediatriya. – 2010. -No3. – B. 99-105.
10. Baturin, A.K. Rossiya Federatsiyasida chaqaloqlar va yosh bolalarning ovqatlanish holati va ovqatlanish holatini baholash / A.K. Baturin, I.Ya. Ot, V.A. Tutelyan // Oziqlanish muammolari. – 2010.- No 6. – B.57-63.
11. Belmer, S.V. Qo‘shimcha oziqlantirish: moslashish jarayonlari va joriy etish tamoyillari uchun ahamiyat / S.V. Belmer // Bolalar dietasi masalalari. – 2014. – T.12. - № 2. – 50-56-betlar.
12. Bellmer , S.V. Qo‘shimcha oziqlantirishning zamonaviy kontsepsiyasi./S.V. Bellmer/ / Bolalar dietasi savollari . – 2014. – T.12. - № 5. – B.60-65 .
13. Belmer , S.V. Bolalar mahsulotlari haqida bahsli savollar va haqiqiy javoblar ovqatlanish/S.V. Belmer // Rossiya perinatologiya va pediatriya byulleteni. – 2015 yil. - 5-son. - B.121-126.
14. Bogomolova, E.S. Bolalar va o‘smirlarning jismoniy rivolanishini baholash / E.S. Bogomolova, A.V. Leonov, Yu.G. Kuzmichev - N. Novgorod: B.I., 2006. - 260 p.
15. Borovik, T.E. Chaqaloqlarni oziqlantirishda qo‘shimcha ovqatlar / T.E. Borovik, V.A. Skvortsova, OK Netrebenko // Pediatriya. – 2008. – 87-jild. – No 4. – B. 79-85.
16. Borovik, T.E. Bolalar ovqati: hozirgi va kelajak / T.E. Borovik, K.S. Ladodo, N.N. Semenova //Rossiya pediatriya jurnali. – 2011. - 3-son. – B. 4-10.

17. Borovikova, M.P. Kaluga viloyatida emizishni rivolantirish bo'yicha ishlarning xususiyatlari / M.P.Borovikova, I.A.Novitskaya, E.I.Temnikova // Bolalar dietologiyasi masalalari. - 2003. - T. 1. - No 3. - B. 74-76.
18. Bocharova, T.I. Hayotning birinchi yilidagi bolalarning ovqatlanishini baholash / T.I.Bocharova, S.A. Cherezova. Xalqaro ishtirokdagi XI Rossiya forumi materiallari "Tug'ilishdan boshlab sog'lom ovqatlanish: tibbiyot, ta'lim, oziq-ovqat texnologiyalari. - Sankt-Peterburg, 2016. – B.26-27.
19. Bulatova, E.M. Zamonaviy sharoitda yosh bolalarni boqish: mavhum. dis. ...Doktor med. Fanlar: 14.00.09 /E.M. Bulatova. – Sankt-Peterburg, 2005. – 50 b.
20. Burova, O.N. Bolalar klinikasida chaqaloqlarni ovqatlantirishni optimallashtirish uchun ilmiy asoslarni ishlab chiqish: tanlov uchun dissertatsiya. Ph.D. asal. Fanlar: 14.01.08, 14.02.03/O.N.Burova. – N. Novgorod, 2015.–192 p .
21. Vasyutin, K.A. Hayotning birinchi yilidagi turli xil ovqatlanadigan bolalarning sog'lig'ining holati / K.A. Vasyutin // Vyatka tibbiy byulleteni. – 2009. - 1-son. – B.62.
22. Veltishchev, Yu.E. Bolaning o'sishi: naqshlar, normal o'zgarishlar, somatotiplar, buzilishlar va ularni tuzatish: shifokorlar uchun ma'ruza //Ros.Vestn. perinatologiya va pediatriya: adj. M .: Moskva. Rossiya Federatsiyasi Sog'liqni saqlash vazirligining Pediatriya va pediatriya xirurgiyasi ilmiy-tadqiqot instituti, 2000. - P.97.
23. Vinyarskaya, I.V. Bolalarning hayot sifati salomatlik holatini va tibbiy texnologiyalarning samaradorligini baholash mezonlari sifatida (keng qamrovli tibbiy-ijtimoiy tadqiqotlar): dissertatsiya referati. dis. ...Doktor med. Sci. – M., 2008. – 50 b.
24. Hayotning birinchi yilidagi bolalarning neyropsik rivolanishiga emizishning ta'siri / I. G. Mixeeva, [va boshqalar] // Pediatriya. nomidagi jurnal G.P. Speranskiy. – 2003.- No 6. – B.83-85.

25. Qo'shimcha oziq-ovqat mahsulotlarini joriy etishning joriy sxemasini o'zgartirish imkoniyati: klinik baholash / I.Ya. Ot, [va hokazo]//Pediatriya. nomidagi jurnal G.N. Speranskiy. – 2013.– T.92 -№3. – 67-72-betlar.
26. Vorontsov, I.M. Bolalarni tabiiy oziqlantirish, uning ahamiyati va yordami / I.M. Vorontsov, E.M. Fateeva - Sankt-Peterburg: B.I., 2006. - 260 b.
27. Gizdatullina, K.X. Ko'krak suti bilan boqish muddatiga qarab chaqaloqlarning hayot sifati ko'rsatkichlari / K.X. Gizdatullina, V.R. Amirova //Bolalar dietologiyasi savollari. – 2011. - No 6. – B.9-11.
28. Gizdatullina , K.X. Jismoniy va neyropsik rivojlanish darajasiga qarab chaqaloqlarning hayot sifati ko'rsatkichlari / K.X. Gizdatullina, V.R. Amirova/ / Boshqirdiston tibbiy xabarnomasi. – 2011. - 6-son . – B.35-39.
29. Glanz, S. Tibbiy va biologik statistika /S. Glanz; qator ingliz tilidan – M.: Praktika, 1998. – 459 b.
30. Chaqaloqlar va yosh bolalarni oziqlantirish bo'yicha global strategiya. – Jeneva: JSST, UNICEF, 2003. – 34 b.
31. Gordeev, V.I. Pediatriyadagi "hayot sifati" tushunchasining holati / V.I. Gordeev, Yu.S. Aleksandrovich //Tibbiyotda hayot sifati bo'yicha tadqiqotlar: ilmiy konferentsiya materiallari. - Sankt-Peterburg, 2000 yil. – 38-39-betlar.
32. Jumagaziev, A.A. Ko'krak suti bilan boqishning ahamiyati va uning neyropsik rivojlanishi uchun ona va bolaning psixologik birligi / A.A. Jumagaziye in , O.N. Rojkova, T.F. Kozina // Bolalar dietasi bo'yicha so'rovlarda . – 2004 yil. – T.2. - № 6. – B.13-15 .
33. Durmashkina, A.P. Bolalarni chaqaloqlik davrida moslashtirilmagan sut mahsulotlari bilan boqishning uzoq muddatli oqibatlari: mavhum. diss. Ph.D. med.sk. – Nijniy Novgorod, 2009. – 26 p.
34. Evdokimova , T.A. Birinchi qo'shimcha oziqlantirish: qat'iy qoidalarga qarshi shaxsiy yondashuv / T.A. Evdokimova, T.N. Sorvacheva // Bolalar dietologiyasi masalalari. – 2016.- No 5. – B.36-41.

35. Zhurba, L.T., Mastyukova E.M. Hayotning birinchi yilidagi bolalarda psixomotor rivojlanishning buzilishi. – M., 1981.– 272 b .
36. Qonuni Jumhurii Tojikiston «Dar borai muhofizai tabbiyi khizmati bolalar», 2006.
37. Zaprudnov , A.M. Oziqlanish dasturi bolaning kelajakdagi sog'lig'ini shakllantiradimi? Yangi monografiyaning chiqarilishi haqida mulohazalar / A.M. Zaprudnov, K.I. Grigoryev // Bolalar dietologiyasi savollari. – 2016 yil.- 4-son. – B.55-58.
38. Hayotning birinchi yilidagi bolalarning salomatligi, jismoniy va neyropsik rivojlanishi uchun faqat emizishning ahamiyati (Volgograd misolida) / L.V. Abolyan [va boshqalar]//Pediatriya. – 2005. – T. 54 - No 5. – B. 53-57.
39. Yosh bolalarning ovqatlanishi va salomatligini o'rganish (0-5 yosh). – M.: Rossiya Federatsiyasi Sog'liqni saqlash vazirligining profilaktika tibbiyoti davlat ilmiy-tadqiqot markazi, 2002. - 56 p.
40. Hayotning birinchi yilidagi bolalarning hayot sifati masalasida / N.I. Kulakova, [va boshqalar] // Amaliy pediatriya masalalari. – 2010. – T.5. - № 1. – B.89-90.
41. Hayotning birinchi yilidagi bolalarning hayot sifati salomatlik holati mezon sifatida / N.V. Gonchar [va boshqalar] // Bolalar dietologiyasi masalalari. - 2015. - № 2. - B.68-69.
42. Keshishyan , E.S. Hayotning birinchi yilidagi bolalarga qo'shimcha ovqatlanishni joriy etish bo'yicha zamonaviy qarashlar / E.S. Keshishyan // Rossiya perinatologiya va pediatriya byulleteni. - 2010. – T.55. - Yo'q. 4. - B.98-100.
43. Qo'shimcha ovqatlarni joriy etishning yangi sxemasining klinik va fiziologik asoslari. /I.Ya.Kon, [va hokazo]/Savol. det. Dietetika. – 2011. - No 9(3). – 23-28-betlar.
44. Kozhevnikova , E. N. To'liq qo'shimcha oziqlantirish hayotning birinchi yilidagi bolalar uchun sog'lom ovqatlanishning muhim tarkibiy

qismidir / E. N. Kozhevnikova, S. V. Nikolaeva, L. I. Elezova // *Pediatrica : Consilium jurnaliga qo'shimcha Tibbiyot.* – 2012. - 2-son . – 19-20-betlar.

45. Kondratyeva, E.I. Qo'shimcha ovqatlarni joriy etishga tabaqalashtirilgan yondashuv /E.I. Kondratyeva, S.S. Stankevich // *Zamonaviy pediatriya savollari.* – 2013. – T.12.- 5-son. – B.66-73.

46. Kozlovskiy, A.A. Hayotning birinchi yilidagi bolalarni oziqlantirish : muammolar va ularni hal qilish yo'llari / A. A. Kozlovskiy, D. A. Kozlovskiy, I. A. Kozlovskaya//*Salomatlik va ekologiya muammolari.* – 2016. - 3-son (49). – 81-85-betlar.

47. Ot I.Ya. Hayotning birinchi yilidagi bolalarning ovqatlanishi: zamonaviy g'oyalar / I.Ya. Ot//*Pediatrica.* – 2006. - No 1. – B.63-72.

48. Ot I.Ya. Bolalar (pediatrik) dietologiyasi (ovqatlanish): yutuqlar va muammolar / I.Ya. Ot//*Pediatrica.* – 2012. – T.91.- No 3. – B.59-66.

49. Kopeikin, V.N. Hayotning birinchi yilidagi bolaning ovqatlanishi muammolari / V.N. Kopeikin // *Rossiya perinatologiya va pediatriyaulleteni.* – 2013 yil - No 4. – B.108-111.

50. Chaqaloqlar va yosh bolalarni oziqlantirish va oziqlantirish: Sobiq Sovet Ittifoqi respublikalariga alohida e'tibor qaratgan holda JSST Evropa mintaqasi uchun ko'rsatmalar / K. Fleischer, [va boshqalar] //JSSTning mintaqaviy nashrlari. Evropa seriyasi. – 2003. - No 87. – 369 b.

51. Lazareva, E.P. Hayotning birinchi yilidagi bolalarda ovqatlanish bilan bog'liq kasalliklarning oldini olish bo'yicha yondashuvlarni ishlab chiqish: mavhum. diss. ...kand. tibbiyot fanlari – Nijniy Novgorod, 2006. – 26 p.

52. Lebedev, A.G. Hayotning birinchi yilidagi bolalarni oziqlantirish bo'yicha milliy dasturga qo'shimcha ovqatlarni kiritish vaqti va ketma-ketligi muammosi haqida / A.G. Lebedev // *davolovchi shifokor.* – 2010.- 1-son. - 76-83 gacha

53. Levchuk, L.V. Hayotning birinchi yilidagi bolalarda etishmovchilikning erta oldini olish uchun qo'shimcha ovqatlarni buyurishga zamonaviy

yondashuv / L.V.Levchuk, T.V.Borodulina, N.E. Sannikova // Teri va tanosil kasalliklari rus jurnali. – 2014 yil. - No 6. – B.120-125.

54. Legonkova, T.I. Hayotning birinchi yilidagi bolalarning jismoniy va neyropsik rivolanishiga turli xil ovqatlanishning ta'siri: 12 oylik kuzatish natijalari / T.I. Legonkova, E.V. Matveeva // Zamonaviy pediatriya masalalari. – 2011. – T.10. -No 1. – 22-27-betlar.

55. Legonkova, T.I. Turli xil ovqatlanish turlari bo'lgan bolalarda jismoniy va birlamchi ruhiy salomatlik ko'rsatkichlarini baholash / T.I. Legonkova // Rossiya perinatologiya va pediatriya byulleteni. – 2013. – T. 58. – No 4. – B. 88-94.