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ABSTRACT BOOK

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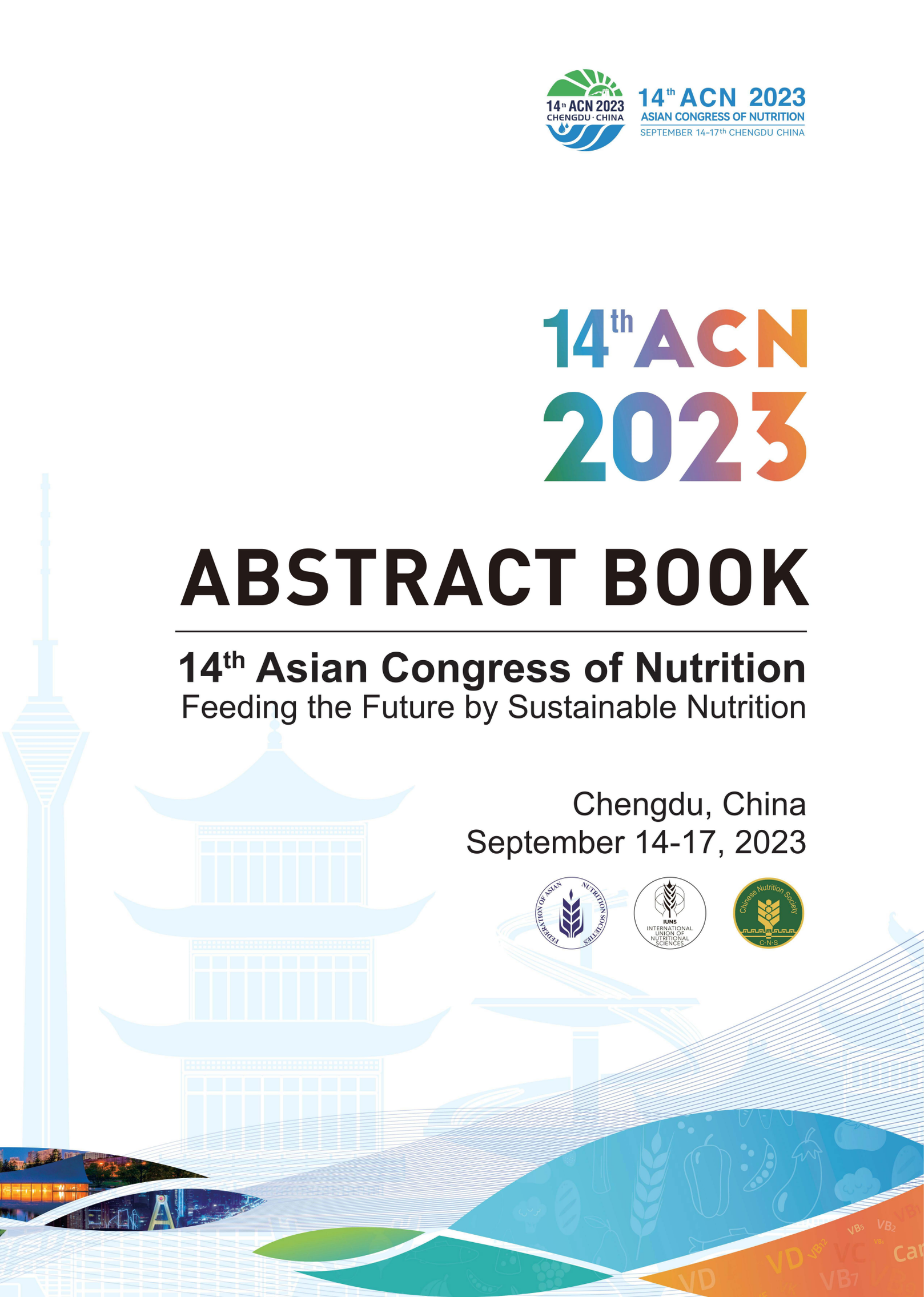

Category: Nutrition Across Lifespan

Dietary Provision for Grandchildren Among Grandparents in Kuantan, Pahang, Malaysia

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Background and objectives:

Grandparents who are involved as caregivers can influence the development of grandchildren's eating habits and preferences. The food environment at an earlier age can impact the nutritional status and health outcome of the children. This study aims to explore the dietary provision among grandparents with at least a grandchild aged 3 to 12 years in Kuantan, Pahang, Malaysia.

Methods:

This qualitative study involved 30 grandparents with an average age of 61.9±5.2 years old. A semi-structured, in-depth interview was conducted using Whatsapp or FaceTime video call and was audio-recorded. Information obtained from the grandparents includes types, quantities, and frequency of foods provided to the grandchildren.

Results:

The results of the study show that all grandparents provide carbohydrate-type foods for their grandchildren. The most common types of foods provided by grandparents include rice, chicken dishes, biscuits, fresh milk, carrot, apple, and banana. Most grandparents provide plain water or sugary drinks for their grandchildren. Only 13.3 % of the respondents prepared food from all the food groups stated in the Malaysian Food Pyramid 2020. A total of 73.3% of respondents prepared two to six times of main meals and snacks a day for their grandchildren.

Conclusions:

These findings support the need for further improvement of grandparents' feeding knowledge to ensure grandparents are engaged in optimum dietary provision for their grandchildren. Future interventions targeting grandparents are essential to improve dietary-related health outcomes in grandchildren.

Key words dietary provision, grandparents, grandchildren, nutrition knowledge

Category: Nutrition Across Lifespan

Which factors are associated with breastfeeding attitudes among NICU mothers?

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Background and objectives: Breastfeeding provides the ultimate nutrition for premature infants. However, the practice was questionable due to the separation of mothers and infants in the Neonatal Intensive Care Unit (NICU), which may cause emotional stress among the mothers. Thus, we aim to identify factors related to breastfeeding attitudes among NICU mothers. Results from this study may enlighten practitioners to specifically enhance breastfeeding in premature infants. Methods: A total of 291 mothers with premature infants in selected NICUs of hospitals in Selangor, Malaysia participated in this cross-sectional study. The Parental Stress Scale: NICU was used to evaluate stress levels, alongside demographic and Body Mass Index information. The Iowa Infant Feeding Attitude Scale (IIFAS) was administered to measure the attitude of mothers towards infant feeding. Binary logistic regression was applied in the statistical analyses using SPSS software to determine factors related to breastfeeding attitudes. Results: Overall, we found that 36.8% of mothers have negative attitudes towards breastfeeding. Of that, 16.5% of mothers indicated high parental stress. Further analyses revealed that mothers who have high perceived stress in terms of their role alteration (adjusted OR 0.535, 95% CI 0.286, 0.998) and those who are underweight (adjusted OR 0.315, 95% CI 0.104, 0.955) were less likely to have positive attitudes towards breastfeeding. Interestingly, we identified that mothers who were working in the government sector had a threefold increase in the positive attitude towards breastfeeding compared to the non-government sector (adjusted OR 3.695, 95% CI 1.448, 9.432). Conclusions: In summary, we ought that increase the willingness of breastfeeding among mothers should emphasize the factors related to their attitude. Maternal stress in NICU is alarming, therefore tackling mental health issues in NICU mothers is essential. Improving the nutritional status of post-natal mothers should also be a priority.

Key words Breastfeeding, breastfeeding attitude, NICU mother, underweight

Category: Nutrition Across Lifespan

Do maternal nutritional status and dietary habits associate with their emotional well-being?

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Background and objectives: Postpartum mothers in Malaysia typically followed their traditional postpartum diet. However, these practices might interfere with their macro- or micronutrient intake, hence the effect on their mental and physical health is doubtful. This study is aimed to identify whether there is an association between nutritional status and dietary habits with emotional well-being among mothers with preterm infants in Neonatal Intensive Care Unit (NICU).

Methods: A cross-sectional study was carried out on 351 postpartum mothers with preterm infants. Participants were recruited through purposive sampling from government hospitals with NICU in Selangor, Malaysia. A demographic factor, anthropometric measurement, and validated Malay version of both; Parental Stress Scale: Neonatal Intensive Care Unit (NICU), and Confinement Practice Questionnaires were administered.

Results: The results demonstrate that mothers with obesity were 6 times more likely to have greater stress levels (Adjusted OR 6.651; 95% CI 1.428, 30.986) compared to mothers with normal body mass index (BMI). According to their postpartum dietary habits, mothers who consume fewer leafy vegetables (Adjusted OR 5.523; 95% CI 1.713, 17.802), ginger (Adjusted OR 4.071; 95% CI 1.023, 16.200) and plain water (Adjusted OR 4.735; 95% CI 1.376, 16.290) have a higher risk of experiencing stress than those who consume more of these foods. However, mothers who consumed more seafood (Adjusted OR 27.351; 95% CI 1.090, 686.499) and herbal tea (Adjusted OR 8.502; 95% CI 1.865, 38.753) were positively associated with higher stress levels than mothers who consumed less of these foods.

Conclusion: In conclusion, higher BMI and certain trends in postpartum dietary intake (such as consuming less vegetables/ plain water, and consuming more herbal tea) had substantially associated with mothers' emotional well-being. This study revealed that good nutritional intake and status are essential to improve emotional well-being among mothers with preterm infants in the NICU.

Key words Postpartum mothers, maternal stress, dietary habits, obesity, traditional postpartum diet

Category: Nutrition Across Lifespan

Assessment of the effect of Low-FODMAP recipes based on the Korean diet

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The diagnosis rate of Irritable Bowel Syndrome (IBS) has been continuously increasing over the past five years in Korea. To alleviate IBS symptoms, our research team has developed 83 types of low-FODMAP recipes based on the Korean diet. The assessment of these recipes is scheduled to take place in June 2023 in Seoul, Korea. The study will recruit 40 adult Koreans with IBS, who will answer a questionnaire to determine the status of their symptoms. Based on the questionnaire, the research team will assess whether the participants meet the criteria to be considered IBS patients. Eligible participants will receive low-FODMAP meals cooked with the developed recipes twice a week. Participants will be required to consume all delivered meals and record any other food intake to track their diet. After six weeks of consuming the low-FODMAP meals, participants will again complete the questionnaire. By comparing the questionnaire results from baseline to endpoint, the study aims to determine the effect of the newly developed low-FODMAP recipes on IBS. This study is expected to provide evidence that Korean low-FODMAP recipes can help alleviate IBS symptoms among Koreans.

Key words Irritable bowel syndrome, Low-FODMAP

Category: Nutrition Across Lifespan

Effects of dietary intake on the nutritional status of pregnant women

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Background and objectives

During pregnancy, proper nutrition is important because it affects the nutritional status of both the mother and the fetus. The objective of this study was to assess the effects of dietary intake on the nutritional status of pregnant women.

Methods

A total of 150 second-trimester pregnant women, who attended the maternal clinics in the Pannala and Kuliyapitiya areas in Sri Lanka, were recruited. An interviewer-administered questionnaire, anthropometric measurements, information in pregnancy records; Mid-Upper-Arm-Circumference (MUAC), pre-pregnancy height and weight, biochemical parameters; hemoglobin levels by using hemocue meter, serum total protein by biuret test, serum albumin by bromo cresol green test, and a three-day diet diary were used to collect information. Nutritional status was determined using pre-pregnancy Body-Mass-Index (BMI), MUAC, and nutrient intake. Nutrient intake was analyzed by Foodbase 2000 software and compared with RDA for pregnancy.

Results

The mean age of the sample was 26 (SD 4.58) years. Based on MUAC, 89% had normal nutritional status (≥23 cm). The mean daily intake of energy, carbohydrates, and protein was 2383 (SD 556.6) kcal, 380 (SD 89.7) g, and 63.7 (SD 23.3) g, respectively, and they were higher than RDA for pregnancy. Their dietary intake of iron, calcium, iodine, folic acid, vitamin C, and vitamin A was 15.5 (SD 5.1) mg, 632.3 (SD 228.6) mg, 62.5 (SD 18.4) μg, 226.5 (SD 85.7) μg, 47.8 (SD 32.9) mg and 439.7 (SD 214.5) μg, respectively, and they were lower than RDA. Results revealed that dietary intake of carbohydrates positively affects ($p<0.05$) MUAC and protein intake positively affects hemoglobin level ($r=0.305$), serum total protein ($r=0.348$), and albumin status ($r=0.310$). Further, dietary intake of iron positively affects hemoglobin levels ($r=0.270$).

Conclusions

The study concluded that dietary intake of carbohydrates, protein, and iron positively affects the nutrition status-related indices of MUAC, serum total protein, albumin status, and hemoglobin level.

Key words Anthropometry, Biochemical parameters, Dietary intake, Nutritional status, pregnant women

Category: Nutrition Across Lifespan

Nutrient Intake of Indonesian Workers in Gold Mining Industry: A Case-Study of A Gold Mines Site in Luwu, South Sulawesi.

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Background and Objective: Workers who are required to live in the site area are prone to various nutritional problems. This study aims to determine the nutritional intake of workers who lived in a gold mines site area.

Methods: A cross sectional study was conducted in a site office of the gold mining industry in Luwu, South Sulawesi. A total of 100 workers with various positions participated in this study. Two days non-consecutive 24 hour food recalls were conducted to identify nutritional intake of the workers. In addition, secondary data of nutritional status as well as non-communicable disease (NCD) history were collected from the clinic in the site area.

Results: In the site, the main meal is served three times a day which consists of white rice, two types of protein resources, and one type of vegetable. Snacks are also served three times a day, including at brunch time, at afternoon, and at night. Meals and snacks are served at a buffet in the cafeteria. Majority of the sample in this study are male (91%) and aged 30-49 years-old (65%). The mean of energy consumption was 2,346.98 kcal, carbohydrate 326.81 gr, protein 75.96 gr, fat 74.64 gr, vitamin C 62.46 mg, iron 8.08 mg, and zinc 5.98 mg. In addition, a total of 99% of workers have inadequate consumption of dietary fiber (< 25 gr per day) while 86% of workers have excess natrium consumption (> 2 gr per day). Nutritional status data indicate that 44% of workers are overweight and 39% are diagnosed with NCD.

Conclusions: Despite the provision of meal in the site area, workers in the gold mining area are having imbalanced nutrition. More nutrition promotion should be provided in the site area to encourage consumption of fruits and vegetables and reduce consumption of ultra-processed foods.

Key words adult, worker, nutritional intake, gold mine, nutrition at work

Category: Nutrition Across Lifespan

Transepidermal Water Loss to Assess Skin Barrier Function in Healthy Chinese Formula-Fed Infants: Anatomical Insights and Preliminary Descriptive Results

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Background and Objectives: Specific partially hydrolyzed whey-based infant formulas (pHF-W) have been associated with reduced risk of atopic dermatitis (AD) in certain infant populations. Increased transepidermal water loss (TEWL) can indicate disrupted skin barrier function and may be associated with higher risk of AD development. The study purpose is to determine whether healthy infants consuming pHF-W until age 6mo have lower TEWL compared to infants consuming intact cow's milk protein formula (CMF). Here, we present descriptive TEWL results from this ongoing study to establish a broader understanding of TEWL assessment and measurement patterns.

Methods: Healthy infants aged 35-56 days (n=169 enrolled; target n=200) who had no previous exposure to pHF-W and no diagnosed cow's milk protein intolerance were randomized to receive pHF-W or CMF until age 6mo. Primary outcome of this randomized, controlled, open-label study is the cumulative change from baseline to age 6mo in TEWL of the volar forearm measured by a closed-chambered vapometer. This validated technique measures water transpiration from the skin. In this descriptive report, we present TEWL results at 4 anatomical locations for all infants (both groups combined, FAS) who completed the baseline (n=160) and/or 6mo visit (n=76).

Results: Mean±SD volar forearm TEWL values were similar at baseline (15.4±5.6 g/m^2/h) and 6mo (15.4±6.4 g/m^2/h). Compared to volar forearm, forehead TEWL values were slightly lower (12.1±6.0 and 13.1±5.6 g/m^2/h at baseline and 6mo, respectively) while results in flexural anatomical locations were slightly higher at both timepoints: cubital fossa (19.3±7.9 and 18.7±9.8 g/m^2/h) and thigh fossa (19.8±9.3 and 20.0±10.3 g/m^2/h).

Conclusions: Mean TEWL values varied slightly among anatomical locations, likely due to differences in habitual environmental exposure (forearm vs. forehead) and flexural (fossae) vs. non-flexural skin. These preliminary results demonstrate the feasibility of measuring TEWL in healthy Chinese infants, which may potentially serve as a non-invasive risk indicator of developing AD.

Key words infant formula, atopic dermatitis, skin barrier function, transepidermal water loss, partially hydrolyzed whey formula

Category: Nutrition Across Lifespan

Is Quality of Life related to Muscle Mass, Muscle Strength and Physical Performance of Community-Dwelling Older Filipinos?

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Background and Objectives:

In the Philippines, the older population group is projected to steadily increase in the next 10 years. The ageing process is inevitable and is accompanied by physiologic changes such as loss of muscle mass and strength (Sarcopenia) which may affect the functional status, and ultimately, the overall quality of life. This study was conducted to determine the association of muscle mass, strength and physical performance with the quality of life of community-dwelling older Filipinos aged 60 years and older.

Methods:

From November 2021 to June 2022, a total of 536 older adults coming from the cities of Tarlac, Tacloban and Davao participated in this cross-sectional study. Muscle Mass was measured using a body impedance analyzer. Handgrip strength was assessed using a hand dynamometer while physical performance was evaluated through a short physical performance test battery and the chair stand test. Quality of life was determined using a culturally-validated questionnaire. Prevalence of Sarcopenia was determined using the 2019 Asian Working Group for Sarcopenia criteria which is the presence of loss of muscle mass, plus low muscle strength, and/or low physical performance. Binary logistic regression was used to determine the association between quality of life and Sarcopenia (criteria).

Results:

Nearly 25% of the respondents (n= 130) were Sarcopenic. After adjusting for age, The increased odds to attain higher overall quality of life score was associated with normal muscle mass (OR = 1.68; 95%CI 1.12-2.51), normal muscle strength (OR= 1.50; 95% 1.03-2.17) and absence of sarcopenia (OR= 1.81; 95%CI 1.19-2.78).

Conclusion

Increased overall quality of life score among older Filipinos was associated with normal muscle mass, normal muscle strength and absence of Sarcopenia but not with physical performance. The findings provide valuable and relevant input in crafting nutrition and lifestyle intervention for older Filipinos before the country transitions into an ageing society.

Key words Ageing, Nutrition, Sarcopenia, Quality of Life, Philippines

Category: Nutrition Across Lifespan

特殊职业人群营养状况研究进展

Research progress on nutritional status of special occupational populations

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With the development of China's economy and the improvement of people's living standards, China's nutrition scientific research has made great progress, a lot of research has been carried out on the nutritional status of different specific population in the whole life cycle. The nutritional needs and dietary guidelines of different population of infants and children, the elderly, and pregnant women in the whole life cycle have been formulated/revised, which plays an important role in guiding all kinds of people in the whole life cycle and improving the overall health quality of Chinese residents.

Occupational population, especially special occupational population, such as those engaged in navigation, aerospace, construction, mining, long-distance freight, and internet workers, etc., have different needs for certain nutrients because of the particularity of their working environment and conditions. On the other hand, some special occupation exposure can cause damage to the body due to harmful factors in the working environment, and reasonable nutrition maybe reduce or eliminate the damage caused by special occupation exposure.

The nutritional needs and intervention research of special occupational population are weak point in nutrition research. Understanding the nutritional and health status and the nutritional needs of different special occupational population, further studying the protective effect of nutrients on the body caused by harmful factors in special occupations, and providing reasonable health guidance for special occupational population is an important part of comprehensively improving people's health level. Therefore, this article systematic reviewed the nutritional and health status of different special occupational population at home and abroad.

Key words occupational populations; nutritional status; diet; health

Category: Nutrition Across Lifespan

凉山地区学龄儿童家庭功能与超重肥胖相关行为的关联性研究

Study on the Relationship between Family Functioning and Overweight/obesity-related Behaviors among School-aged Children in Liangshan Area

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Abstract: Objective To explore the relationship between family functioning and overweight/obesity-related behaviors among school-aged children in Liangshan area, and provide scientific basis for intervention of overweight and obesity in school-aged children. **Methods** 1 890 school children were recruited in Liangshan area in March 2021. Information on overweight/obesity-related behaviors and General demographic information were collected through questionnaires, and family functioning was measured using the Chinese Family Assessment Instrument (C-FAI). The multivariate logistic regression analysis was used to analyze the relationship between family functioning and overweight/obesity-related behaviors. **Results** After adjusting for gender, age, and ethnicity, school-aged children with good family functioning were less likely to have low frequency of breakfast (OR=0.327, 95%CI=0.220-0.486) and exercise (OR=0.303, 95%CI=0.215-0.427), but more likely to have low frequency of late night snacks (OR=1.469, 95%CI=1.023-2.112), low intake of Sugar-sweetened beverages (OR=2.551, 95%CI=1.567-4.152) and fried foods (OR=2.533, 95%CI=1.614-3.975), and less time using electronic devices (OR=6.273, 95%CI=2.405-16.360), and were less likely to mock their obese classmates (OR=9.228, 95%CI=3.903-21.819). **Conclusion** There is a certain correlation between family functioning and overweight/obesity-related behaviors in school-aged children. Good family functioning is of great significance for forming good dietary and lifestyle habits and controlling weight. Therefore, a family-functioning-centered intervention strategy for overweight and obesity in school-aged children can be explored.

Key words School-aged children; Overweight/obesity; Family functioning; Related behaviors; Intervention

Category: Nutrition Across Lifespan

Chrono-eating habits of pregnant women: The impact of pregnancy-related symptoms on sleep-wake schedules and meal time

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Pregnant women are often challenged by pregnancy-related symptoms such as morning sickness, insomnia, and backaches which alter their sleep-wake patterns and meal schedules. The change in meal and sleep-wake time may lead to changes in chrono-eating habits. This study aims to determine the influence of pregnancy symptoms on sleep, wake, and mealtimes and their influence on chrono-eating habits.This was a cross-sectional study conducted in ten randomly selected government maternity clinics in Kuala Lumpur, Malaysia. Pregnant women in their second trimester completed the Chrononutrition Profile Questionnaire-Pregnancy (CPQ-P) to determine their weekly frequency of pregnancy-related symptoms affecting their sleep time, wake time, and mealtime and chrono-eating habits. 399 pregnant women with a mean age of 31.7 (4.6) years participated. Mean gestational age of the pregnant women was 25.5 (8.4) weeks, with majority of them being Malay (47.3%), having tertiary educational level (79.5%), and from middle household income (58.5%). The average weekly frequency of pregnancy symptoms affecting their sleep, wake up and mealtime was 3.67 (2.51) days, 3.03 (2.53) days, and 2.38 (2.65) days, respectively. On a weekly average, pregnant women skipped breakfast for 0.97 (1.83) day, snack after dinner for 3.44 (2.07) days, and had an eating window of 12.08 (1.47) hours. Night snacking was increased when the frequency of pregnancy symptoms affecting sleep time increased ($r=0.150$, $p=0.003$). Night eating was found to increase as the frequency of pregnancy symptoms affecting wake time ($\beta=0.116$, $p<0.001$), sleep time ($\beta=0.117$, $p<0.001$), and mealtime ($\beta=0.102$, $p=0.001$) increased. Pregnancy-related symptoms have a significant influence on the sleep-wake patterns and meal schedules of pregnant women. This disruption in sleep and mealtimes can lead to changes in their chrono-eating habits, particularly an increase in night snacking and night eating. Future studies should focus on the management of pregnancy symptoms to promote healthier eating behaviours and improve maternal outcomes.

Key words Circadian rhythm, chrononutrition, night snacking, pregnancy symptoms, maternal health.

Category: Nutrition Across Lifespan

Longitudinal trajectories of dietary sugar intakes and their determinants in early childhood

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Background and Objectives: High intake of dietary sugar is a well-recognised contributor to childhood obesity. Research into dietary sugar intakes in early childhood, a critical window underpinning the development of obesity and dietary habits, remains scarce. This study described the longitudinal trajectories of total and free sugar intakes and examined their determinants in early childhood.

Methods and Study Design: Data (n=445) from the Melbourne INFANT program were used. Dietary intake was assessed by three 24-hour recalls at ages 1.5, 3.5 and 5 years. Group-based trajectory modelling was conducted to identify trajectories of total and free sugar intakes (grams/day) from ages 1.5 to 5 years. Multinomial logistic regression examined the association of child sex, maternal age, pre-pregnancy BMI, country of birth, and education level with sugar intake trajectories.

Results: Three trajectory groups were identified for total sugar intake: “Low-stable” (27%; 52 to 56 grams), “Mid-rising” (60%; 72 to 85 grams) and “High-rising” (13%; 83 to 129 grams). In contrast, two free sugar intake trajectory groups were identified: “Low-rising” (88%; 11 to 24 grams) and “High-rising” (12%; 23 to 66 grams). Relative to the “Low-stable” total sugar trajectory group, boys versus girls and children of Australian versus overseas born mothers had higher odds of following the “Mid-rising” and “High-rising” total sugar trajectory groups. For free sugar intake, boys and children of mothers with no tertiary education appeared to have higher odds of following the “High-rising” versus “Low-rising” trajectory groups. Maternal age and pre-pregnancy body mass index were associated with neither total sugar nor free sugar trajectory groups.

Conclusions: Children exhibited heterogeneous trajectories of total and free sugar intakes in early childhood, with most children showing a rising trajectory. Interventions to reduce sugar intake should start in early childhood and target boys and children whose mothers are Australian-born and without tertiary education.

Key words Dietary sugar, free sugar, early childhood, trajectory modelling, longitudinal

Category: Nutrition Across Lifespan

Maternal Vitamin D Levels During Pregnancy, Infant Feeding Practices, and Growth in Infants During the First Year of Life

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Background and objectives: Adequate nutrition during early life is crucial for proper growth and development. Few studies have investigated the role of maternal vitamin D levels and feeding practices on postnatal growth of infants in developing countries. This study aims to determine the associations between maternal vitamin D levels during pregnancy, infant feeding practices, and growth in infants during the first year of life.

Methods: In this prospective cohort study, serum 25(OH)D concentrations of 379 third-trimester pregnant women were measured using a chemiluminescent immunoassay. Infant feeding practices including duration of exclusive breastfeeding (EBF), timely initiation of complementary feeding, and minimum dietary diversity (MDD) were assessed using parental reports. Infant length-for-age (LAZ), weight-for-age (WAZ), and weight-for-length (WLZ) Z-scores were assessed at birth, three, six, and 12 months.

Results: Vitamin D deficiency (<30nmol/L) was observed in 43.3% of women during late pregnancy. Nearly half of the mothers complied with the infant feeding recommendations to exclusively breastfeed their child for at least 6 months (46.6%) and 97.1% introduced complementary foods at 6 months. Only 10.6% of infants met MDD at 6 months and the proportion increased to 54.6% at 12 months. After adjusting for potential confounders, results of the multivariable linear mixed models showed that higher maternal vitamin D levels during late pregnancy was associated with lower infant LAZ ($p<0.01$) and WAZ ($p<0.01$) at birth. EBF until 6 months was associated with lower WAZ ($p<0.05$) at 12 months. Compliance with MDD was associated with higher infant LAZ ($p<0.05$) and WAZ ($p<0.05$) at 12 months.

Conclusions: The present study suggests that maternal vitamin D levels, EBF, and compliance with MDD are critical factors that can impact infant growth, highlighting the importance of proper nutrition during pregnancy and infancy. Further research is necessary to examine whether these associations persist throughout the course of life.

Key words Vitamin D; pregnancy; feeding practices; growth; infant

Category: Nutrition Across Lifespan

Sleeping habits, social jetlag, and its association with chrono-eating habits during pregnancy

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Background and objectives

Social jetlag has been found to be associated with poor dietary behaviour and weight gain. It is plausible that the overall relationship between social jetlag, eating habits, and weight gain could extend to gestational weight gain as well. Hence, the current study aims to determine the association between sleeping habits and social jetlag with chrono-eating habits during pregnancy.

Methods

This was a cross-sectional study conducted in 10 government maternity clinics in Kuala Lumpur, Malaysia. Pregnant women in their second trimester were recruited and completed the Chrononutrition Profile Questionnaire-Pregnancy (CPQ-P) to determine their sleep timing and eating habits. Social jetlag was calculated as the difference between workdays and freedays sleep midpoint.

Results

A total of 399 pregnant women with a mean age of 31.7 (4.6) years were recruited. The average workdays sleep time was 22:53 (0:56) while the freedays sleep time was 23:06 (0:59). The average naps taken was once a week and the average duration of their naps was 68.29 (55.08) mins. The median social jetlag duration was 15.00 (45.00) mins. Sleeping later was associated with consuming a larger meal later in the day for both workdays ($r=0.186$, $p<0.001$) and freedays ($r=0.137$, $p=0.007$). Increased daytime napping frequency was associated with increased night snacking ($\beta=0.218$, $p=0.029$). Greater social jetlag was associated with increased breakfast skipping frequency ($\beta=0.206$, $p=0.034$).

Conclusions

This study revealed that sleeping later is associated with a later largest meal, napping in the day could increase night snacking, and greater social jetlag could lead to greater breakfast skipping habits, which is not favourable for maternal health. More studies are warranted to strengthen the findings and support policymakers in establishing recommendations for pregnancy sleep habits for optimum maternal and infant health outcomes.

Key words Circadian rhythm, chrononutrition, daytime napping, social jetlag, maternal health

Category: Nutrition Across Lifespan

Interactions between maternal vitamin D binding protein level and maternal vitamin D status on intrauterine transfer and umbilical cord 25-hydroxyvitamin concentration

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Background and objectives: Vitamin D has autocrine effects in the developing fetus, and intrauterine transfer of 25-hydroxyvitamin D (25OHD) is the only supply of vitamin D to the fetus. Previous studies have suggested that transplacental transfer of 25OHD is driven primarily by receptor-mediated endocytosis and the placenta uptake is increased by the presence of binding proteins, suggesting the role of vitamin D binding protein (VDBP) in the intrauterine transfer of 25OHD. However, little is known about the influence of maternal VDBP level on intrauterine transfer and umbilical cord 25OHD concentrations. The present study aims to explore the associations and interactions between maternal VDBP level and maternal vitamin D status on intrauterine transfer and cord 25OHD concentrations.

Method: This paper included the analysis of data from 216 mother-neonatal dyads at birth. Maternal and umbilical cord blood 25OHD concentrations were assessed using ultra-high-performance liquid chromatography (UHPLC). VDBP concentrations were measured using a commercial enzyme-linked immunoassay (ELISA) kit. The intrauterine transfer percentages for 25OHD were calculated: (umbilical cord blood 25OHD concentration/ maternal 25OHD concentration) x 100.

Results: There was a significant interaction between maternal VDBP level and maternal vitamin D status on umbilical cord 25OHD concentration ($P_{interaction}<0.001$). The magnitude of association between maternal 25OHD and cord 25OHD was almost twice as much ($\beta=0.57$, 95%CI: 0.44, 0.69) in mothers in the highest tertile of VDBP concentrations compared to those with middle tertile ($\beta=0.37$, 95%CI: 0.26, 0.47) and triple compared to those with lowest tertile ($\beta=0.18$, 95%CI: 0.07, 0.28). There was no statistically significant difference in the intrauterine transfer percentage of 25OHD between maternal VDBP tertiles. However, intrauterine transfer increased in vitamin deficient (defined as 25OHD<30 nmol/L) compared to non-deficient mothers (106% versus 64%, $p<0.001$).

Conclusions: Results suggest that the intrauterine transfer of 25OHD is prioritized in case of maternal deficiency.

Key words vitamin D, vitamin D binding protein, intrauterine transfer

Category: Nutrition Across Lifespan

Insufficient gestational weight gain and dietary intake were associated with low infant birth weight: A prospective clinic-based study in Malaysia

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Background and objective: Low birth weight (LBW) is a crucial health issue related to under-five mortality. Findings from the developed countries reported associations between maternal nutritional status prior to conception and during pregnancy with fetal growth and development. This study aimed to determine the contribution of maternal nutritional status on infant birth weight in selected health clinics within Malaysia. **Methods:** There were 467 pregnant women interviewed for their socio-demographic information, obstetrical history, and dietary intake in the third trimester of their pregnancy. The pregnant women were followed up prospectively until childbirth, and their childbirth weight was obtained when the infants were one-month-old. **Results:** The study showed that nearly half (45.8%) of pregnant women were malnourished before pregnancy (underweight: 9.6%; overweight; obese: 36.2%) and had undesirable gestational weight gain during pregnancy (insufficient: 32.5%; excessive: 28.1%). There were more than half of pregnant women consumed inadequate energy, protein, fat, and essential nutrients during pregnancy (vitamin A, vitamin B, vitamin D, calcium, iron, and iodine). The mean infant birth weight was 3.0 ± 0.4 kg, in which 9.2% of the infants had LBW (born less than 2.5kg). Based on the multivariate logistic regression analysis, insufficient maternal GWG (OR: 2.726), energy (OR: 8.888), iron (OR: 1.014), and vitamin D intake (OR: 7.553) less than the Malaysian recommended nutrient intake (RNI) contributed towards the LBW of infants ($p < 0.001$). **Conclusion:** In short, one out of ten Malaysian infants were born with LBW. Hence, women need to gain optimal weight during gestation and consume adequate energy and micronutrients, especially iron and vitamin D throughout the pregnancy to improve infant birth weight.

Key words Gestational weight gain, low birth weight, dietary intake, infant, Malaysia

Category: Nutrition Across Lifespan

Towards Healthy and Active Ageing: Physical Activity and Eating Behaviours of Community-Dwelling Older Adults in Klang Valley, Malaysia

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Background and objectives: Malaysia is rapidly becoming an ageing nation. Regular physical activity is not only important for physical health but also for mental health and well-being. The present study aimed to determine the physical activity behaviours, eating behaviours and nutritional status among community-dwelling older adults in Klang Valley, Malaysia.

Methods: This cross-sectional study was conducted among more than 200 community-dwelling older adults aged ⩾60 years old residing in neighbourhoods across urban Kuala Lumpur and Klang Valley (Malaysia). The older adults were recruited by purposive sampling. Weight, height, BMI, body fat percentage and muscle mass percentage were measured using standard protocols. Self-reported physical activity was assessed using the International Physical Activity Questionnaire (short, last 7 days version) adapted for the elderly. Eating behaviours traits were assessed with the Adult Eating Behaviour Questionnaire (AEBQ).

Results: About 62.4% of the older adults had low muscle mass for their age. Only 12.9% of the older adults had high physical activity level, while 23.8% were categorised into the low physical activity level category. Older adults of Chinese ethnicity showed higher physical activity levels ($p<0.05$). Results showed weak, negative correlations between physical activity using total MET-mins/week and BMI ($r= -0.269$, $p < 0.001$) as well as body fat percentage ($r= -0.271$; $p < 0.001$). Muscle mass percentage had a weak, positive correlation with physical activity level ($r= 0.222$, $p < 0.01$). Several significant relationships were found between nutritional status indicators with 'food approach' appetitive trait and 'food avoidance' appetitive traits.

Conclusions: A large proportion of older adults had low physical activity levels and low muscle mass. With the benefits of physical activity to the health and fitness of older adults well-established, regular moderate-to-vigorous intensity physical activity and nutrition are important components of lifestyle management to promote healthy and active ageing.

Key words Physical activity, older adults, eating behaviour, active ageing, ageing

Category: Nutrition Across Lifespan

Nausea and Vomiting in the First Trimester of Pregnancy and Its Association With Dietary Intake and Constipation: A Preliminary Finding

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Background and objectives:

Nausea and vomiting in pregnancy (NVP) is a common symptom experienced by pregnant women in early pregnancy. Its occurrence may alter nutritional status of mothers during pregnancy and subsequently affect optimal growth of infants. However, the relationship between constipation and dietary intake with NVP among Malaysian pregnant women in their first trimester remained underexplored. These are preliminary findings of an on-going cohort study of pregnant mothers from first trimester to infants age 12 months old in Malaysia. The present analysis determined the NVP in the first trimester of pregnancy and its association with constipation and dietary intake.

Methods:

34 pregnant women were included in the present analysis, in which sociodemographic background, constipation, and NVP were assessed using questionnaires. A 3-day 24-h dietary recall was used to assess their dietary intake.

Results:

Findings showed that as many as 97.1% of the pregnant women had NVP, with 26.5%, 64.7%, and 5.9% of them developing mild, moderate, and severe NVP, respectively. More than two-third of them did not achieve dietary adequacy for energy, total fiber, vitamin A, thiamin, riboflavin, niacin, vitamin C, and calcium. There were no significant differences in constipation and dietary intake between pregnant women with no or mild NVP and pregnant women with moderate or severe NVP.

Conclusion:

Pregnant women were prone to developing NVP in early pregnancy. More studies should be conducted to identify modifiable lifestyle and nutritional factors affecting NVP among pregnant women.

Key words Nausea, vomiting, dietary intake, constipation, pregnant women

Category: Nutrition Across Lifespan

A Moderated and Mediation Lifestyle Factorial Model for Excessive Body Fat among Malaysian Children from Urban-poor Background

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Background and Objectives: Obesity is a significant public health concern among urban-poor children, who are at risk of unhealthy diets and sedentary lifestyles. This study aimed to investigate the inter-relationships between dietary intake, physical activity level, physical fitness, and body fat percentage in urban-poor children. Additionally, the potential mediating effect of physical fitness on the relationships between physical activity level and body fat percentage, as well as the potential moderating effect of macronutrients' intake, were examined.

Methods: A cross-sectional study was conducted among 408 urban-poor who lived at low-cost flats in Kuala Lumpur using cluster sampling. Physical activity level, body fat percentage, macronutrient intake and physical fitness components such as cardiorespiratory fitness, muscular strength, muscular endurance, and flexibility, were assessed. Multiple linear regression and moderated mediation analysis was performed to determine the inter-relationships of physical activity level, physical fitness, and macronutrient intake with body fat percentage.

Results: About one in three (31.9%) of the children were classified as having excessive body fat, with mean body fat percentage of 21.7±10.1%. Multiple linear regression analysis revealed that high physical activity level, low fat intake, high cardiorespiratory fitness, high muscular strength, and high muscular endurance were predictors of low body fat percentage ($R2=0.24$, $F(7,400)=17.97$, $p<0.001$). Mediation analysis showed that cardiorespiratory fitness ($B=-0.650$, $p=0.028$) and muscular strength ($B=-0.746$, $p=0.012$) mediated the relationship between physical activity level and body fat percentage. Fat intake was found to moderate the relationships between physical activity level and muscular strength ($B=0.075$, $p<0.05$), as well as muscular endurance ($B=0.098$, $p<0.05$).

Conclusions: The present study proposed a moderated mediation lifestyle factorial model based on cardiorespiratory fitness, muscular strength and fat intake for excessive body fat among urban-poor Malaysian children. These findings have important implications for the future development of effective lifestyle interventions to improve body composition among children's populations.

Key words Children, physical fitness, body composition, macronutrient

Category: Nutrition Across Lifespan

Uncovering Positive Deviance in Child Feeding Practices: Insights from Urban Poor Caregivers in Kuala Lumpur, Malaysia

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Background and objectives:

Children in their young age rely primarily on adults for their daily diet. Inappropriate food and feeding practices may lead to poor diets and undernutrition. It is challenging for urban poor caregivers who face resource constraint that limit their ability and affordability to provide adequate diets for their children. However, some urban poor caregivers are able to raise their children healthily despite these challenges and are referred to as positive deviants. This qualitative study aimed to explore the positive deviance related to foods fed to children and feeding practices among urban poor caregivers.

Methods:

Caregivers together with their under-five children were recruited from eight public low-cost flats in Kuala Lumpur. Caregivers were divided into two groups based on their children's anthropometric measurements: positive deviance (PD) group with well-nourished children (n=12) and non-positive deviance (NPD) group with undernourished children (n=15). Semi-structured face-to-face in-depth interviews were conducted, transcribed and analysed using thematic analysis.

Results:

The PD caregivers fed their children with local foods such as anchovies, tempeh, curry flavoured foods and watermelon and used high responsiveness and demandingness techniques when feeding their children. Moreover, they often used positive rewards, such as healthy snacks and commitments to take them on outdoor outings, to encourage their children to eat more and involved their children in home-cooked meal preparation. These foods and practices were the positive deviance that were beneficiary, but not commonly practised by the NPD caregivers.

Conclusions:

These findings highlight the PD related to food and feeding practices among urban poor caregivers in Kuala Lumpur. Findings could be used in developing appropriate interventions to disseminate and promote PD as an initiative to reduce child undernutrition in the urban poor community.

Key words Child undernutrition, positive deviance, urban poor, child feeding practices

Category: Nutrition Across Lifespan

Relationship between nutrition status and cognitive performance in Thai school -age children

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Background Malnutrition in Thailand has been successfully controlled since 1980s. Data from Nutritional status and dietary intakes of 0.5-12-year-old Thai children in 2012 indicated that Thailand is faced with double-burden malnutrition problem where under and over nutrition coexist.There are some malnutrition , such as stunting and iron deficiencies anemia , they are important factors in cognitive development.

Objectives To study the association between nutritional status and cognitive performance among school-age children.

Methods The cross-sectional study was conducted in 1899 school-age children (aged 7.3 years) from October 2021 to September 2022. A multistage cluster sampling method was used to selected participants from five regions ,i.e. central,north,northeast,east,and south of Thailand (ten provinces) ,except Bangkok. Body weight was measured with digital weighing scale to the nearest 0.1 kg and height was measured in the standing position to the nearest 0.1 cm. Hb concentration was measured using the HemoCue instrument. Non-verbal IQ was measured using Standard Progressive Matrices(SPM) parallel version 1998 update 2013 by clinical psychologist.

Results A total of 1899 children were included in the study. From this,101 children (5.3%) were stunted,27 children (1.4%) were thinness,166 children (8.7%), were overweight and 139 children (7.3%) were obesity. The prevalence of anemia was 12.1% (229 children) and mean Hb levels were 12.7 ±1.3 g/dL.Almost 23.2 %(443 children) of children had poor IQ levels (low average, borderline and mental retardation) and mean IQ levels were 101.8±18.0. Height-for-age and non-verbal IQ were significant association in school-age children ($p < 0.05$),whereas there were no difference the relationship between weight-for-height and non-verbal IQ (p=0.477) as well as hemoglobin and non-verbal IQ (p=0.98)

Conclusion Malnutrition and non-verbal IQ were significantly association in school-age children consequently effective to improve nutrition in preschool and school-aged children promote cognitive performance.

Key words Height-for-age:Weight-for height:Non-verbal intelligence quotient:School-age chldren:Malnutrition

Category: Nutrition Across Lifespan

生命早期饥荒暴露与成年期癌症风险:一项系统综述和荟萃分析

Famine exposure during early life and risk of cancer in adulthood: A systematic review and meta-analysis

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Objective: Emerging evidences have explored the association between famine exposure during early life and cancer risk in adulthood, but the results remain controversial and inconsistent. This study aimed to provide a comprehensive evidence on the relation of famine exposure to later cancer risk.

Methods: Relevant reports published up to March, 2022 were identified by searching PubMed, Embase, Web of sciences and Medline databases. English-language observation study on famine exposure during early life were included that provided outcomes on risk of cancer. Data were extracted from each study by two authors independently. Discrepant data were then resolved through consensus. Pooled relative ratios (RRs) with 95% confidence intervals (CIs) were used to evaluate the effect famine exposure on cancer risk.

Results: Totally, 18 published articles with 6,061,147 subjects were included in this study. Compared with unexposed group, early life famine exposure dramatically increased the risk of cancer in adulthood (RR=1.13, 95% CI: 1.04-1.22). The pooled RRs were different in terms of sex, exposure severity, exposure period, famine type, study design type and cancer location. A remarkably elevated risk for cancer was discerned in women exposed to famine (RR=1.09, 95% CI: 1.00-1.18), severe exposure (RR=1.12, 95% CI: 1.02-1.22) and adolescence exposure (RR=1.76, 95% CI: 1.02-2.50), Chinese famine exposure (RR=1.55, 95% CI: 1.29-1.82) and cohort studies (RR=1.28, 95% CI: 1.13-1.42). Moreover, a significant association of early life famine exposure with increased risk of breast (RR=1.16, 95% CI: 1.05-1.27) and stomach cancers (RR=1.89, 95% CI: 1.24-2.54) was observed.

Conclusions: This meta-analysis suggests that exposure to famine during early life may increase the risk of cancer in adulthood. The above-mentioned association is pronounced in women exposed to famine, severe exposure, adolescence exposure, Chinese famine, cohort studies, breast and stomach cancers.

Key words famine exposure, early life, cancer, systematic review, meta-analysis

Category: Nutrition Across Lifespan

孕期叶酸、维生素 B12 及二者不平衡对妊娠期糖尿病的影响及机制研究：在中国开展的巢式病例对照研究

The impact of maternal serum folate, vitamin B12 and their imbalance during pregnancy on the occurrence of gestational diabetes mellitus and related mechanism: a nested case-control study in China

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Background and Objective: Gestational Diabetes Mellitus (GDM) causes serious harm to the health status of mother and child. The prevalence of GDM is high and is on the rise. Nutrition during pregnancy is one of the important modifiable factors of GDM. This study aims to explore the associations of maternal serum folate, vitamin B12 and their imbalance in early pregnancy with GDM, and the mediation effects of the methionine cycle related metabolites.

Methods: This nested case-control study was conducted based on a prospective birth cohort in Beijing, China. A total of 172 GDM case-control pairs were included in the analysis. Maternal serum concentrations of total folate, 5-methyltetrahydrofolate (5-MTHF), vitamin B12, S-adenosylmethionine (SAM), S-adenosylhomocysteine (SAH) and Homocystine (Hcy) in early pregnancy were measured.

Results: The level of 5-MTHF and its ratio to vitamin B12 in early pregnancy were significantly higher in the case group than that in the control group ($P<0.05$). Conditional logistic regression analysis showed that the risk of GDM was higher in the group with high total folate (OR = 1.98, 95%CI: 1.07-3.66). High serum levels of 5-MTHF during early pregnancy may cause higher risk of GDM (OR = 1.58, 95%CI: 1.12-2.22). Compared with the group of the lowest tertile concentration of vitamin B12, the group of the highest concentration had a lower risk of GDM (OR = 0.46, 95%CI: 0.22-0.97, Ptrend < 0.05). Compared with the group with the lowest tertile ratio of 5-MTHF/vitamin B12, the group with the highest tertile ratio had a higher risk of GDM (OR = 2.09, 95%CI: 1.08-4.02, Ptrend < 0.05). Besides, no significant mediation effect of SAM, SAH, SAM/SAH or Hcy was found.

Conclusions: High serum folate level, low vitamin B12 level and the resulting imbalance in early pregnancy may increase the risk of GDM. Further study on the mechanism is warranted.

Key words Gestational diabetes mellitus, Folate, Vitamin B12, Methionine cycle, Nested case-control study

Category: Nutrition Across Lifespan

人乳低聚糖和儿童期肥胖关系的研究进展

Research progress on the relationship between human milk oligosaccharides and childhood obesity

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Childhood obesity has become a major global public health problem. Human milk oligosaccharides (HMOs) may be one of the reasons for breastfeeding to prevent childhood obesity. By searching the following keywords from 4 electronic databases (PubMed, Medalink, CNKI, and Wanfang): human milk oligosaccharide, Bifidobacterium, gut microbiome, infant obesity, weight gain, and adiposity, we review the potential role of HMOs in preventing the risk of obesity in infancy and childhood and the possible pathways. HMO diversity (associated with weight z-score, β=-0.048, 95%CI:-0.087,-0.009)and Lacto-N-neotetraose (LNnT) (associated with weight z-score, β=- 0.225 nmol/mL,95%CI:-0.389,-0.061)may reduce weight gain in infancy and the risk of childhood obesity by modulating the gut microbiome profile and reducing appetite; Other HMOs such as 6'-Sialyllactose (6'-SL), 3'-Sialyllactose (3'-SL) and Lacto-N-fucopentaose I (LNFPI) may also reduce the risk of obesity in infants and children by several ways, including promoting the growth of bifidobacteria, affecting intestinal epithelial cell responses, and reducing food intake. As most studies have focused on the relationship between HMOs and obesity in early infancy, more studies with follow-up into childhood are needed to confirm these hypotheses and to determine the mechanisms of action of different HMOs on childhood obesity, to obtain more evidence on the relationship between HMOs and childhood obesity.

Key words human milk oligosaccharides; childhood obesity; gut microbiota; infant obesity

Category: Nutrition Across Lifespan

中国母亲感知无母乳状况及危险因素分析

Risk factors for perceived absence of breast milk supply among Chinese mothers

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Objective:To estimate the prevalence of perceived absence of breast milk supply among Chinese mothers and to identify associated factors.

Methods: The data were extracted from Chinese National Nutrition and Health Status Surveillance in 2013, which was a cross-sectional study on children aged 0-5 years and their mothers. We defined perceived absence of breast milk supply as failure to breastfeed due to lack of breast milk supply. Breastfeeding information, maternal breastfeeding knowledge, and general characteristics were collected via a structured questionnaire. Univariate analysis and logistic regression were used to analyze the factors associated with perceived absence of breast milk.

Results: The study subjects included 12,091 women from 55 monitoring sites in 30 provinces across China, with 419 cases in the no-breastfeeding group and 11,672 cases in the control group. The prevalence of perceived absence of breast milk among mothers in China was 3.5% in 2013.

Maternal age（OR=1.055，95%CI：1.034~1.076）， postpartum hemorrhage（OR=2.062，95%CI：1.323~3.215）， unclear how to breastfeed（OR=3.428，95%CI：2.403~4.891）, and belief that breastfeeding should continue≤6 months（OR=1.504，95%CI：1.006~2.248）are risk factors for perceived absence of breast milk supply ($p<0.05$). Multiparity（OR=0.606，95%CI：0.475~0.774）is a protective factor for perceived absence of breast milk supply($p<0.05$).

Conclusion: Primiparity, postpartum hemorrhage and lower level of breastfeeding konwledge were the primary risk factors for perceived absence of breast milk. Based on our findings, breastfeeding education during pregnancy is recommended to lower the risk of perceived lack of breast milk.

Key words Breastfeeding; Perceived absence of breast milk supply; Cross-sectional studies; Lactating women; Influence factors

Category: Nutrition Across Lifespan

咖啡因干预吸气肌训练对青年男性自主神经与心血管的急性影响

Acute autonomic and cardiovascular effects of caffeine intervention on inspiratory muscle training in young men

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Objective: Caffeine is one of the most popular sports nutrition supplements. Inspiratory muscle training (IMT) can improve lung function and increase respiratory muscle strength, thereby weakening the metabolic reflex of respiratory muscles, promoting recovery from respiratory muscle fatigue. However, research on the effects of caffeine on IMT is limited. To investigate the acute effects of caffeine intervention in inspiratory muscle training on lung function and cardiovascular system in young men.

Methods: In this study, 12 healthy male college students aged 18 to 25 years with no training history were selected for two tests at a sports college in Beijing. Subjects underwent medium-intensity inspiratory muscle training (60% MIP) in both tests, and lung function parameters were measured before and after training, including: spirometry, one-second rate, maximum inspiratory pressure; cardiovascular system, including heart rate variability, blood pressure. The study was reviewed and approved by the Ethics Committee of the Capital Institute of Physical Education (approval number 2022A57).

Results: There were no significant differences between the pre-training caffeine and placebo groups at baseline levels in terms of basal information, lung function and cardiovascular system ($p>0.05$). Compared to the placebo group, there were significant differences in heart rate variability, heart rate, systolic blood pressure and maximum inspiratory pressure in the caffeine group after the intervention ($P<0.05$), and no significant differences in spirometry, one second rate, diastolic blood pressure or blood flow irrigation values ($P>0.05$). Further studies are needed to confirm the effects and safety of caffeine on the acute effects of inspiratory muscle training.

Conclusion: caffeine intervention enhances training status in inspiratory muscle training and has a positive acute effect on lung function and the cardiovascular system in healthy male university students.

Key words caffeine; inspiratory muscle training; lung function; cardiovascular system

Category: Nutrition Across Lifespan

基于自我决定理论的回应性喂养干预对母乳喂养和婴儿生长发育的影响：一项随机对照试验

Effects of responsive feeding intervention based on self-determination theory on breastfeeding and infant growth ：A Randomized Controlled Trial

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Objective：This study was to evaluate the effects of a responsive feeding (RF) intervention program on maternal breastfeeding and infant growth and development, based on self-determination theory (SDT).

Methods：This study was a randomized controlled trial. A total of 110 mother-infant pairs were recruited and randomly divided into intervention group (n=55) and control group (n=55). The RF intervention program was divided into three parts: before delivery, during postpartum discharge, and post-discharge follow-up. The primary outcomes were breastfeeding motivation score (BMS), breastfeeding self-efficacy (BSE) and exclusive breastfeeding rate, and the secondary outcomes were infant physical development at 6 weeks and 3 months.

Results：Repeated measures variance results showed that at different time points after the intervention, the intervention group scored higher than the control group on the "enjoyment," "self-perception of connectedness and motherhood," and "actual need" dimensions of BMS (all $p<0.05$), while the "stress from significant others" score was lower than the control group (all $p<0.05$). The intervention group had higher breastfeeding efficacy scores and higher rates of exclusive breastfeeding at different time points postpartum compared to the control group (all $p<0.05$). There was no significant effect of the RF intervention program on the physical development of infants at 6 weeks postpartum ($P>0.05$), and the weight and length of 3-month-old infants was significantly lower in the intervention group than in the control group ($p<0.05$). Infants in the RF group grew at a smoother rate, with no excessive growth of infants over a short period of time.

Conclusion：Our RF intervention program based on SDT showed good results in improving mothers' motivation to breastfeed, building breastfeeding self-confidence and increasing the rate of exclusive breastfeeding, and the effects on infant physical development will need to be verified with longer follow-up in the future.

Key words responsive feeding; self-determination theory; exclusive breastfeeding; infant physical development; breastfeeding motivation; breastfeeding self-efficacy

Category: Nutrition Across Lifespan

中国 TAWS 队列中自我报告的孕前体重与孕早期测量体重的一致性分析

Agreement between self-reported pre-pregnancy weight and measured first trimester weight in Chinese TAWS cohort study

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Background Pre-pregnancy BMI is critical to pregnancy-induced symptoms and birth outcomes. However, it is not easy to measure pre-pregnant weight due to the high percentage of unplanned pregnancies. **Objective** This study aimed to evaluate the agreement between self-reported pre-pregnancy weight (SRW) and first-trimester measured weight (FMW). **Methods and Study Design** Pregnant women before 14 weeks of gestation were enrolled in Taicang and Wuqiang mother-child cohort study (TAWS) in China. Well-trained nurses queried SRW at enrollment and measured FMW and height at their first clinical care. We used the Spearman correlation, intraclass correlation coefficient, and Bland and Altman plot to assess the agreement between SRW and FMW. We estimated the agreement of BMI categories based on SRW and FMW using the Kappa coefficient. **Results** Medians (*P*25, *P*75) of SRW and FMW in our participants (n=1579) were 52.5 (48.0, 57.5) kg and 53.0 (48.3, 58.4) kg, and their median difference was 0.4 (-1.0, 2.0) kg. Higher weight differences were found among overweight and obese women than normal-weight women (2.0 kg vs 0.5 kg, P<0.05), when FMW measured in 13 weeks of gestation than in 12 weeks of gestation and earlier (1.0 kg vs 0.0 kg, P<0.05), and when FMW measured in November to April than in May to October (1.0 kg vs 0.0 kg, P<0.05). SRW and FMW had a high correlation (r=0.925, P<0.001) and consistency (ICC=0.936; 95%CI:0.924-0.945). There were 84.2% of participants classified into the same BMI categories based on SRW and FMW (κ=0.728; 95%CI:0.696-0.760). **Conclusion** SRW has good agreement with FMW, and BMI based on SRW can be used for clinical gestational weight gain consultation and weight-related research.

Key words self-reported, pre-pregnancy weight, body weight, first trimester, birthweight

Category: Nutrition Across Lifespan

部分水解配方对幼儿生长发育和健康效益的前瞻性对比研究

Growth and Sensitivity Conditions of Feeding a Partially Hydrolyzed Formula in Healthy Chinese Toddlers: A Prospective Comparative Study

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Background and Objectives: “Minor sensitivity” describes a series of well-understood symptoms related to gastrointestinal comfort, skin, sleep and respiratory conditions in children 12-36 months old. While partially hydrolyzed proteins have in infant formulas shown benefits of preventing atopic dermatitis and improving digestive comfort (Wen 2015, Huang 2021), current research lacks data in children aged 12 months onwards. This is the first study to generate growth and health effect data of a partially hydrolyzed formula (pHF) in this population.

Methods: Healthy children aged 48-72 weeks (n=256) regardless of previous feeding type were partially randomized to receive either pHF or intact protein formula (CMF) for 4 months. Primary outcome is the change in weight-for-age z-scores (WAZ) compared between pHF and CMF groups. Anthropometrics and sensitivity symptoms were collected every 4 weeks using standardized techniques and questionnaires.

Results: The two groups were similar at baseline in age, birthweight, family history of allergy and timing of complementary feeding. Compared to CMF, pHF group had significantly more children with previously diagnosed food allergy or intolerance (6.3% vs. 20%, P=0.0015) and food-related sensitization or discomfort (16% vs. 39%, P<0.0001), which was expected as previous knowledge showed that pHF can be used in the management of cow’s milk allergy and the partially randomized design allowed parents to self-elect their child to continue with pHF when enrolled in the study. Despite differences at baseline, after 4 months of feeding, pHF demonstrated non-inferiority (margin = -0.5 z score) in supporting age-appropriate growth comparable to CMF, and anthropometric z scores of both groups tracked closely against the WHO standards. pHF group also showed decreasing sensitivity over the 4 months of feeding.

Conclusions: These preliminary results demonstrated that pHF can support healthy growth after the first year of life and may provide added benefits in improving signs of “minor sensitivity”.

Key words growing-up formula, partially hydrolyzed whey formula, sensitivity, age-appropriate growth

Category: Nutrition Across Lifespan

中国孕妇血糖水平与维生素 B12、叶酸、同型半胱氨酸状况的关联性

The correlation between blood glucose and vitamin B12, folic acid, and homocysteine status in Chinese pregnant women

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Objective: To explore the relationship between blood glucose and serum vitamin B12, folate, and homocysteine status in pregnant women in China.

Method: A cross-sectional survey was used to explore the relationship between vegetarian diets and vitamin B12 levels in Chinese pregnant women based on the data from the Chinese National Nutrition and Health Surveillance (2015-2017). Background information and diets of the subjects were collected using a questionnaire and a food frequency questionnaire. The fasting blood glucose concentration was detected by hexokinase method. The serum vitamin B12 and serum folate concentration were detected by electrochemiluminescence, and the serum homocysteine concentration was detected by circulating enzyme method. Univariate regression and multivariate regression were used to analyze the relationship between maternal blood glucose and vitamin B12, folate, and homocysteine status.

Results: A total of 6967 pregnant women were included in the analysis. The average fasting blood glucose is 4.19 (3.78,4.60) mmol/l. The average concentrations of serum vitamin B12, folic acid, and homocysteine were 262.10 (178.90372.00) pg/mL, 5.52 (2.90,10.24) ng/mL, and 6.81 (5.17,9.73), respectively μ mol/L. The results of multivariate regression analysis showed that fasting blood glucose in pregnant women positively correlated with serum vitamin B12 concentration（ β= 0.135，t=8.36，P＜0.001）, not correlated with serum folic acid and homocysteine concentrations after adjusting for confounding factors such as maternal age, education level, gestational week, and pre pregnancy weight,

Conclusion: There is a positive correlation between fasting blood glucose during pregnancy and serum vitamin B12; And it may not be related to serum folic acid and homocysteine.

Key words pregnant; glucose; vitamin B12; folic acid; homocysteine

Category: Nutrition Across Lifespan

父母生活方式与后代抑郁症状之间的关系:中国一项基于人群的研究

Associations between parental lifestyles and depressive symptoms in offspring: A population-based study in China

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Background Adherence to healthy lifestyles has been associated with a lower risk of depression among adults, but little is known about the potential impact of parental healthy lifestyle on offspring depressive symptoms.

Objective To explore the cross-sectional and prospective associations between overall parental healthy lifestyles and depressive symptoms in offspring.

Methods We included 2,398 children and adolescents aged 10-15 years at baseline, drawn from the China Family Panel Studies (CFPS) in 2012. The overall parental lifestyle scores were defined as a composite score including smoking, drinking, exercise, napping, and diet. Offspring depressive symptoms were measured in 2012, 2016, 2018, and 2020 using the Center for Epidemiological Studies Depression Scale (CES-D20). Offspring with CES-D scores of 16 or above were considered to have depressive symptoms. Among them, 1,119 children and adolescents without depressive symptoms were included in subsequent follow-ups. Logistic regression models were used to examine the cross-sectional and prospective associations between parental healthy lifestyle and offspring depressive symptoms.

Results In the cross-sectional analysis, each 1-unit increment in overall parental healthy lifestyle score was associated with lower odds of offspring's depressive symptoms (OR=0.83, 95% CI: 0.73-0.94, p-trend=0.003). The association was similar for paternal and maternal lifestyle scores and across most subgroups but varied by residential area and household income level, with significant associations only observed among individuals in rural areas and those with lower household income level (P for interaction<0.05). In the prospective analysis, we did not observe a significant association between overall parental healthy lifestyle and offspring depressive symptoms (OR=0.91, 95% CI: 0.76-1.10, p-trend=0.331). However, paternal adherence to the highest lifestyle score was associated with lower risks of developing depressive symptoms in offspring (ORT3 vs T1=0.67, 95% CI: 0.44-1.00).

Conclusion Our findings suggest that the adoption of healthy lifestyles by parents, particularly by fathers, may contribute to the primary prevention of offspring depressive symptoms.

Key words Parental healthy lifestyle, offspring, depressive symptoms, maternal paternal lifestyle

Category: Nutrition Across Lifespan

孕期血浆氨基酸水平与婴儿生长的关系

Association between plasma amino acid during pregnancy and infant growth

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Objectives: This study examined the association between plasma amino acid levels during pregnancy and infant growth, and whether these associations were influenced by infant gender.

Methods and study design: A prospective cohort study was used to recruit 1158 pregnant women from Huazhong University of Science and Technology Union Shenzhen Hospital. Maternal plasma sample were collected during the second-trimester and analyzed for amino acid using liquid chromatography tandem mass spectrometry. General demographic data were obtained from hospital records. Sorting based on the gender of the infants, analyses were performed using linear mixed models.

Results: For males, after adjusting for confounding factors, maternal plasma levels of Alanine, Proline, 3-Hydroxyproline, and Homoarginine are positively correlated with infant weight (β : 1.355×10^{-3}-1.134, p : 0.027-0.049); Citrulline, Proline, Glutamine, Kynurenine, Ornithine, Asparagine are positively correlated with infant height (β : 2.694×10^{-3}-0.608, p : 0.004- 0.048); and there was no correlation between amino acids and infant head circumference. For females, maternal plasma levels of methionine, citrulline, asparagine were positively associated with infant weight after adjusting for confounders (β : 8.550×10^{-3}-1.811×10^{-2}, p : 0.015-0.045), while ornithine was found to be negatively associated with infant head circumference growth(β = -0.020, p = 0.037). No correlation was observed between amino acids and infant height for females.

Conclusions: The plasma levels of certain amino acids during pregnancy are related to the growth of infants, and the effects of these amino acids differ between male and female infants.

Key words Maternal plasma; Amino acid; Infant; Growth; Gender

Category: Nutrition Across Lifespan

中国老年人营养指数的构建与研究

Construction and study of nutrition index for the elderly in China

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OBJECTIVE: To investigate the relationship between exercise and nutrition in Chinese elderly people, construct a nutrition index, find the main influencing factors affecting the nutrition index, and personalize the improvement of the nutritional status of Chinese elderly people by adjusting the influencing factors.

METHODS: A cross-sectional study was conducted on 136 elderly people in Beijing, excluding subjects with special safety risks. The included subjects were asked for basic information (medical history), morphological and body composition tests (16 items), exercise capacity tests (10 items) and nutritional assessment (Simple Nutritional Assessment Scale MNA). After cleaning the data, logistic regression was performed and the main factors influencing nutritional status were screened by stepwise regression of variables using the stepAIC function in the MASS package.

RESULTS: The main factors affecting nutritional status were waist circumference, skinfold thickness, presence of gastric disease, and SPPB. the nutritional index was Y= -0.1 waist circumference - 0.1 skinfold thickness + 1.4 presence of gastric disease - 0.1 SPPB. where Y is the nutritional index, the closer to 1 the better the nutritional status; SPPB is the summary physical status.

Conclusion: Nutritional index is not a nutritional supplement, but the nutritional status of the organism. This study found that the waist circumference and skin fold thickness reflect the body fat content will affect the nutritional status of the body, and controlling the fat content is one of the main factors to improve the nutritional status of the body; stomach disease also affects the nutritional status of the body, and the digestion and absorption of food has a close practice with whether the stomach can work normally; interestingly, the physical fitness status is also the main factor to affect the nutritional status, so maintaining a good physical fitness level is also It is important to maintain a good level of fitness.

Key words Exercise; Nutrition; Elderly

Category: Nutrition Across Lifespan

产后早期危险因素与儿童中期超重/肥胖的纵向关联研究

Longitudinal associations of postnatal early risk factors with overweight/obesity in mid-childhood

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Objectives: Many studies have identified the association between exposure to a single prenatal risk factor and childhood obesity. We examined the association of postnatal early risk factors, individually or in combination, with late childhood risk of overweight/obesity in an Australian cohort.

Methods: We studied 945 mother-child pairs in the Longitudinal Study of Australian Children (LSAC). Six common postnatal early risk factors were included: maternal, paternal overweight/obesity at 24 months post-delivery, smoking exposure, low family socioeconomic score, short breastfeeding duration, and rapid weight gain in the first 2 years. Overweight/obesity outcomes are defined as body mass index ≥ 85th percentile according to the Centers for Disease Control and Prevention reference. The cumulative number of risk factors was summed to obtain each child's risk score, and the association between risk scores and overweight/obesity outcomes was assessed using multivariable logistic regression model.

Results: Among 945 children, 593 (73%) had >1 postnatal early risk factors. While individual postnatal early risk factor was significantly associated with childhood risk of overweight/obesity, the more risk factor scores exposed, the higher risks of childhood overweight/obesity (p-for-trends <0.001). Compared with those with 0-1 risk factor, the risk of being overweight/obesity for children with 4-6 risk factors was 6.22 (95%CI: 3.64, 10.62). The probability of being overweight/obesity at 11-12 years ranged from 6.7 (2.9, 10.7)% (with no risk factors) to 61.8 (41.8, 81.7)% (with all six risk scores). It is worth noting that children exposed to maternal 20.1 (10.2, 30.1)% or paternal overweight/obesity status 12.6 (6.7, 18.5)% had the largest predicted probability of overweight/obesity.

Conclusions: We found that multiple risk factor exposures from birth to age two were associated with a cumulative increased risk of overweight/obesity in late childhood. Therefore, interventions to prevent obesity may be more effective if targeting multiple modifiable factors early in life than a single one.

Key words the developmental origin of health and diseases, obesity, body mass index, postnatal risk factors, children

Category: Nutrition Across Lifespan

同型半胱氨酸水平与心血管疾病风险：一项剂量反应 meta 分析
Homocysteine levels and risk of cardiovascular disease: a dose-response meta-analysis

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Background: Whether elevated homocysteine (Hcy) levels prior to the development of hyperhomocysteinemia increase the risk of cardiovascular disease (CVD) remains controversial. This study aimed to explore the dose-response relationship between Hcy and CVD risk, and to provide scientific basis for primary prevention of CVD.

Methods: Searches were conducted in PubMed, Embase, and Web of Science from inception to 23 April 2022 to obtain observational literatures examining the association between Hcy and CVD. The proportion of cumulative CVD cases relative to total CVD cases at each Hcy level was calculated. Summary results were received through random effects model. Linear and nonlinear association were constructed through generalized least squares method and restricted cubic spline with three knots, respectively.

Results: A total of 94 original studies on 193,234 participants were included. The proportion of cumulative CVD cases relative to total CVD cases increased rapidly when the Hcy level rose from 8 to 12 μmol/L. The increase of blood Hcy level was associated with higher CVD risk (relative risk (RR): 1.79, 95% confidence interval (CI): 1.65-1.94). Nonlinear dose-response relationship between Hcy and CVD risk was shown, with significantly elevated risk when Hcy ≥ 10 μmol/L. Similar results were found in separate analyses of cohort studies, case control studies and cross-sectional studies (RR: 1.57, 95%CI: 1.37-1.80; RR: 2.12, 95%CI: 1.82-2.46; RR: 1.62, 95%CI: 1.45-1.81, respectively). In addition, the risk of CVD also increased significantly when blood Hcy ≥ 11 umol / L and ≥ 9 umol / L in cohort studies and case control studies, respectively.

Conclusions: Elevated Hcy significantly increased the risk of CVD when blood Hcy ≥ 10 μmol/L. Earlier nutritional intervention to reduce blood Hcy level may be an effective strategy for primary prevention of CVD.

Key words homocysteine, cardiovascular disease, meta-analysis, dose-response relationship

Category: Nutrition Across Lifespan

四川偏远农村地区婴幼儿看护人营养包认知-采用过程的作用机制及关联动态研究

Study on the influence mechanism and association dynamics of the cognitive-adoption process of Ying Yang Bao for children's caregivers in remote rural areas of Sichuan Province

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Background

Child nutrition improvement interventions with Ying Yang Bao as the main tool have been widely used in remote rural areas of China.

Objectives

This study aimed to investigate the factors influencing the adoption behaviors of Ying Yang Bao based on the innovation-decision making process of innovation diffusion theory. In addition, this study aimed to explore the dynamic association between information perception and adoption behaviors using three-period panel data.

Study Design

This study was a three-phase longitudinal study from 2019-2020. Data were collected using face-to-face household questionnaire interviews.

Methods

A multi-stage whole-group random sampling method was used to select infant and toddler caregivers among the 32 project counties in Sichuan Province. Multi-layer structural equation modeling was used to investigate the factors influencing Ying Yang Bao adoption behaviors. In addition, cross-lagged panel models with random intercepts were constructed to verify the dynamic association between information perceptions and adoption behaviors over time.

Results

A total of 1556 pairs of infants and toddlers aged 2-24 months and their caregivers were included in this study. The results of the multilayer structural equation modeling showed that information perceptions directly influenced their Ying Yang Bao adoption behaviors and indirectly influenced adoption behaviors through health beliefs. The results of the three-period random intercept cross-lagged panel model showed that information perceptions positively predicted the caregivers' subsequent Ying Yang Bao adoption behaviors (period 2 to 1: β = 0.439, 95% CI = 0.016-0.825; period 3 to 2: β = 0.328; 95% CI = 0.086- 0.532).

Conclusions

In the next step of Ying Yang Bao promotion process, there should be a focus on the promotion and explanation of the core information of the Ying Yang Bao to strengthen the infant and toddler caregivers' understanding and knowledge so as to promote their Ying Yang Bao adoption behaviors.

Key words Early life nutrition; Ying Yang Bao; Diffusion of innovation; Child caregivers; Random-intercepts cross-lagged panel model

Category: Nutrition Across Lifespan

过敏及健康儿童肠道菌群和短链脂肪酸的差异：一项横断面研究

Differences in gut microbiota and SCFAs between allergic and healthy children: a case-control study

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The hygiene hypothesis suggests that gut microbiota may influence the development of allergy directly or through its metabolites. The present study was conducted to compare the differences in gut microbiota and its metabolites between allergic and healthy children. 95 school-age children (6~8 years old) were included from our birth cohort. Allergy data and demographic characteristics were derived from parental self-report. Serum immunoglobulin E (IgE), blood routine, and blood biochemical parameters were detected. A total of 91 stool samples from subjects were obtained. Gut microbiota were profiled by 16s rRNA gene sequencing. Short-chain fatty acids were extracted from stool and detected by Gaschromatography-mass spectrometry. 36 allergic children and 59 healthy children completed the survey. At the phylum level, Firmicutes, Bacteroidota, and Actinobacteriota were the top 3 dominant bacteria with no significant difference between groups. The relative abundance of Verrucomicrobiota and Cyanobacteria in the allergic children were significantly lower than that in the healthy children. At the genus level, Akkermansia in the allergic children were significantly lower than that in the healthy children, and the reverse was found in Subdoligranulum. There were no significant differences in alpha and beta diversity between groups. The content of acetic, propionic, butyric, isobutyric acid, valeric, isovaleric acids, serum IgE, and blood indexes showed no significant differences between groups. We observed that the relative abundance of certain gut microbiota might be associated with allergic diseases although the SCFAs on allergy were not found. The results also suggested that serum IgE might not be the main feature of allergy. Combined with our previous researches, the gut microbiota in the early life were more important than that in the childhood.

Key words allergy, gut microbiota, short-chain fatty acids, serum immunoglobulin E, blood indexes

Category: Nutrition Across Lifespan

全营养配方粉与乳清蛋白粉改善老年人群营养状况及体成分的随机对照干预研究

Impact of standard enteral nutrition formula and whey protein powder in improving nutritional status and body composition of elderly subjects: a randomized controlled trial

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Objectives: We examined whether the standard enteral nutrition (EN) formula or the whey protein powder improves the nutritional status and body composition among elderly people.

Methods: In an 8-wk, randomized, controlled, open-label trial, 37 individuals were randomized to receive an oral nutritional supplementation either standard EN formula (N=18, 96g/d) or whey protein powder (N=19, 20g/d) twice a day(10 a.m. and 3 p.m.). Nutritional status was determined through Minimum Nutritional Consulting (MNA). Subjects who were over the age of 60 years old and scores of MNA below 23.5 were conducted. MNA and body composition were carried out at baseline, then after 8 weeks of supplementation.

Outcomes: Compaed with baseline, there were statistically significant increase in scores of MNA and body composition [body weight, BMI (body mass index), body lean mass, body fat mass] in both "standard EN formula group" and "whey protein powder group". However, the results showed no statistically significant differences in body composition (body weight, BMI, body lean mass, body fat mass) and scores of MNA between the two groups at the end of the clinical trial

Conclusions: Both supplementations of standard EN formula and whey protein powder can improve the nutritional status and body composition in elderly people who are in nutritional risk or in malnutrition.

Key words elderly people; standard enteral nutrition formula; whey protein powder; body composition; nutritional status

Category: Nutrition Across Lifespan

中国3～5岁儿童膳食维生素D摄入量

Dietary vitamin D intake of children aged 3 to 5 years in China

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Objectives:

To analyze dietary vitamin D intake among preschool children aged 3~5 years based on a national representative cross-sectional study in China.

Methods:

In a national representative cross-sectional study, children were randomly sampled by using a multi-stage stratified cluster sampling method in China, and dietary intake of preschool children aged 3~5 years was collected using the 3-day 24-hour weighted food records method. Demographic characteristics and socio-economic status of children were collected by using a structured questionnaire. The dataset for vitamin D contents in foods was established by using FoodEXplorer™ platform and the food composition data from the United States and India. Total energy intake abnormally (less than 300 kcal/day or more than 2000 kcal/day) and dietary weighing record < 3 days were excluded. We calculated the mean daily vitamin D intake by averaging the 3-day dietary intake data (not included the vitamin D supplements doses), as well as calculated the percentage of vitamin D intake from each food group for each child.

Results:

Totally 559 children aged 3~5 years were included. Dietary vitamin D intake was 1.85 (0.97, 4.40) μg/d, and the proportion of dietary vitamin D intake below the Estimated Average Requirement was 98.9%. The main food source of vitamin D was egg. The dietary vitamin D intake of north children was higher than south children (2.13 μg/d vs 1.74 μg/d, P=0.0007), and there were differences in the dietary vitamin D intake among children in eastern, central and western regions (3.01 μg/d, 1.61 μg/d and 1.20 μg/d, respectively) (P<0.01). There was no significant difference in dietary vitamin D intake between urban and rural areas or other population characteristics.

Conclusion:

The dietary vitamin D intake was very low among children aged 3~5 in China and great attention needs to be paid to improve dietary vitamin D intake.

Key words Food composition database; Preschool children; Vitamin D; Dietary intake; China

Category: Nutrition Across Lifespan

一项用于中国老年人肌少症诊断的低肌肉质量快速筛查方法的开发

Development of a Quick Screening Tool to Predict Low Muscle Mass for Sarcopenia Diagnose in Chinese Older Adults

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Background: The feasibility of performing muscle mass measurement remains limited due to the high cost and technique limitation. Our study aim is to develop a quick screening tool to predict muscle mass and sarcopenia status in Chinese older adults.

Methods: Two thousand eight hundred and twenty-three community-dwelling older adults (≥ 60 years old) were recruited from Beijing, Shanghai and Chengdu in China. Appendicular muscle mass (ASMI) was assessed through bioelectrical impedance analysis (BIA) and dual-energy X-ray absorptiometry (DXA). Body mass index (BMI), upper arm circumference (UAC), calf circumference (CC) and handgrip strength were measured. Linear regression models were applied to predict the ASMI through the anthropometric parameters (BMI, UAC and CC) and handgrip strength. The optimal cut-off in Chinese population was used (7.05 kg/m^2 for men and 5.85 kg/m^2 for women) to define low ASMI.

Results: ASMI was positively correlated with handgrip strength, UAC and CC in both men ($r = 0.39$, $p < 0.001$; $r = 0.54$, $p < 0.001$; and $r = 0.67$, $p < 0.001$, respectively) and women ($r = 0.38$, $p < 0.001$; $r = 0.57$, $p < 0.001$; and $r = 0.67$, $p < 0.001$, respectively). A final model has been identified for ASMI prediction through the combination of handgrip strength and CC in men ($R^2 = 0.66$, $p < 0.0001$) and women ($R^2 = 0.66$, $p < 0.0001$), after adjusting for age, BMI and living location in Chinese older adults. The area under the receiver operating characteristic curve (AUC) was 0.89 (95% confidence interval [CI]: 0.88-0.91) for men and 0.90 (95% CI: 0.89-0.92) for women.

Conclusion: The model using the combination of handgrip strength and CC can be used as an alternative tool to identify low muscle mass for sarcopenia screening in community settings with high accuracy.

Key words Sarcopenia, Low Muscle Mass, Handgrip Strength, Calf Circumference, Chinese, Older Adults

Category: Nutrition Across Lifespan

基于上海队列研究的母亲妊娠期鱼类摄入量和血液 ω-3 脂肪酸水平对 18 个月龄儿童神经发育的影响

Maternal Fish Intake during Pregnancy, Blood Omega-3 Fatty Acids Levels, and Child Neurodevelopment at Age 18 Months in a Shanghai Cohort

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Background: Fish are the primary source of protein, docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) for pregnant women and children, but harmful contaminants such as methylmercury (MeHg) are the potential hazard of fish consumption. This study aimed to study the balance of contaminant risk and nutritional benefit from maternal prenatal fish consumption for child neurodevelopment.

Methods: Using data from a prospective cohort study of 397 Chinese mother-child pairs in Shanghai enrolled in 2018, the authors studied associations of maternal prenatal fish intake and plasma DHA+EPA levels with children's suboptimal development on the Ages & Stages Questionnaire (ASQ) at age 18 months. Dietary intakes of MeHg and DHA+EPA were calculated, and then net IQ points gain was used to evaluate the health risk and benefit at a population level by FAO/WHO model.

Results: The average consumption of total fish was 87.47g/d. Mean maternal MeHg and DHA+EPA intakes were 0.035μg/kg·bw/d and 345mg/d, respectively. Geometric mean maternal DHA+EPA level was 71.52 (geometrics standard deviation, 1.92) μg/mL. After adjustment using Poisson regression model, higher fish intake was associated with better performance of problem solving among baby boys, but higher maternal DHA+EPA level was not associated with a benefit. 62.8% of the population met the recommended daily intakes of 250 mg DHA+EPA meanwhile not exceeded the MeHg reference dose of 0.1μg/kg·bw/d. In FAO/WHO model, the proportion of 69.7% reached the maximum IQ points gain.

Conclusions: The pregnant women in Shanghai have an adequate fish consumption, but balancing the benefits of fish intake and risk of potential MeHg exposure is still a challenge. It is necessary to develop local dietary recommendations for pregnant women that incorporate the nutritional benefits as well as the risks of fish intake.

Key words fishes; child development; pregnancy; omega-3 fatty acids; methylmercury

Category: Nutrition Across Lifespan

孕前膳食模式对孕期体重增重轨迹的影响：一项前瞻性队列研究

Dietary Patterns Prior to Pregnancy Are Associated with Gestational Weight Gain Trajectory: A Prospective Cohort Study (TAWS)

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Objective: To explore the association between pre-pregnancy diet pattern and gestational weight gain (GWG) trajectory.

Methods: Data were extracted from the Taicang and Wuqiang cohort study (TAWS), a maternal and child nutrition and health cohort study in China. ALL participants entered the TAWS at early-pregnancy and completed the baseline questionnaire and food frequency questionnaire at their first visit. Totally, 1080 eligible women, living in Wuqiang, were included in the current analysis. Dietary intake was assessed by a validated 57-item food frequency questionnaire recording food consumed “in the one month prior to pregnancy”. Weight was repeatedly measured at 12-16, 24–28, 32-36 weeks of pregnancy and before delivery; pre-pregnancy was self-reported.

Dietary patterns were derived by using principal component analysis. The latent class mixed model was conducted to identify distinct weight gain trajectories. Multinomial logistic regression model was conducted to study the association between dietary patterns prior to pregnancy and GWG trajectory.

Results: Four dietary patterns were retained, accounting for 48.7% of the overall diet. Dietary patterns were named the “cereals, vegetables and fruits” pattern, “meats” pattern, “fishes and eggs” pattern and “dessert and nuts” pattern. Three GWG trajectories were identified: ‘normal growth trajectory(n=783)’, ‘fast growth trajectory(n=157)’ and ‘slow growth trajectory(n=140)’. Compared with GWG normal growth trajectory, higher “fishes and eggs,” pattern scores prior to pregnancy were associated with lower odds of GWG fast growth trajectory during pregnancy (adjusted Odds Ratio (OR): 0.755, 95% Confidence Intervals(CI): 0.615, 0.926).

Conclusion: Diet prior to pregnancy is an important target for interventions and may be important for weight control during pregnancy, especially for those who are overweight or obese pre-pregnancy.

Key words pre-pregnancy diet pattern; gestational weight gain; trajectory pattern; pregnant cohort study

Category: Nutrition Across Lifespan

富含 α-乳清蛋白、骨桥蛋白和神经节苷脂的婴儿配方奶粉调节肠道微生物组成和促进双歧杆菌的生长

Infant formula enriched with alpha-lactalbumin, osteopontin and gangliosides modulates gut microbiome and promotes growth of Bifidobacteria similar to breastfed infants

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Background and objectives

Breastfeeding, the gold standard for infant nutrition, results in a higher abundance of Bifidobacteria. In a prospective, open label study of an infant formula with unique whey protein concentrate enriched in α-lactalbumin, osteopontin and gangliosides, after 6 weeks of intervention, we explored the bifidogenic effect and changes in the microbial-derived metabolites, compared to a breastfed reference group.

Methods

Chinese infants were enrolled between 3 and 28 days and assigned to predominantly formula-fed (FF) (N= 60) or breastfed (BF) group (N=60) per their feeding practice, for 6 weeks. Fecal samples were collected at baseline and after week 6. Fecal metagenomic data was processed using MetaPhlAn3. Bacteria relative abundances was analyzed with a zero-inflated negative binomial (ZINB) model. Bacteria genus and species were compared for FF versus BF group at week 6. Short chain fatty acids (SCFAs) and branched-chain fatty acids (BCFAs) were analyzed by ultra-performance liquid chromatography-tandem mass spectrometry (UPLC-MSMS) and results expressed as μmol/g of dry feces. Both microbiota and SCFAs analyses were adjusted for covariates including baseline age, sex, delivery mode, site and baseline measures.

Results

Bifidobacterium genus relative abundance was not significantly different ($p=0.686$) between the FF and BF groups at end of trial. Bifidobacterium bifidum species increased over time with intervention formula ($p=0.0105$). After 6 weeks, total SCFAs were significantly higher ($p=0.048$) in the FF versus BF group. The increase in SCFAs level was mainly driven by the increased levels of, valeric and propanoic acids ($p<0.05$ for both). Also, after 6 weeks, total BCFAs, isobutyric and isovaleric acids were significantly higher in FF vs BF ($p<0.05$ for all).

Conclusions

Our study provides evidence on the effectiveness of a unique infant formula in modulating the gut microbiome and promoting Bifidobacteria abundance similar to that of the BF group. **Key words** Osteopontin, Gangliosides, Oligofructose, Gut Microbiome, Short Chain Fatty Acids (SCFAs)

Category: Nutrition Across Lifespan

富含 α-乳清蛋白、骨桥蛋白和神经节苷脂的婴儿配方粉支持健康足月儿的生长、肠道健康和免疫反应

Infant formula enriched with alpha-lactalbumin, osteopontin and gangliosides supports growth, gut health and immune response

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Background and objectives

Bioactive proteins and lipids found in human milk such as osteopontin and gangliosides have immune modulatory functions, improve gastrointestinal (GI) tolerance, and may result in functional benefits when added to infant formula. In this prospective, intervention study we tested the feeding tolerance, gut and immune health of Chinese infants fed on an infant formula with unique whey protein concentrate enriched in α-lactalbumin, osteopontin and gangliosides.

Methods

Predominantly formula-fed (FF) and breastfed (BF) infants were enrolled between 3 and 28 days and assigned to the FF (N= 60) or BF group (N=60), per their feeding practice, for 6 weeks. The primary endpoint was Infant GI Symptom Questionnaire (IGSQ) index score assessed using a validated IGSQ-13 questionnaire after 6 weeks of intervention; non-inferiority of FF vs BF was tested. Secondary endpoints included fecal markers of immune response, inflammation and gut barrier integrity (sIgA, cytokines, calprotectin, α-1-antitrypsin) assessed using ELISA, stool consistency assessed using GI diary, anthropometric assessments, physician reported adverse events (AE), and use of medications.

Results

Baseline infant characteristics (age, sex, gestational age at birth) were not significantly different between groups. More infants were born by cesarean section in the FF vs. BF group (55% vs. 30%, $P<0.05$). IGSQ index score demonstrated good GI tolerance in both groups at week 6 (Mean (SD); FF: 19.9 (7.4) BF: 16.8 (4.2); difference of means 1.35 [-1.312, 4.012]. The IGSQ domain scores (spitting up/vomiting, flatulence, crying, fussiness and stooling), mean stool consistency, fecal marker levels, anthropometric Z-scores and AE were not significantly different between groups at week 6. Incidence of diarrhea, respiratory tract infections and antibiotic usage were low overall and not significantly different between groups.

Conclusions

Our data provides evidence on the safety and effectiveness of the unique infant formula in supporting growth, gut barrier integrity and immune response.

Key words Osteopontin, Gangliosides, Gastro-intestinal tolerance, immune response, gut health

Category: Nutrition Across Lifespan

基于营养充足评价和不良妊娠结局风险预测的中国孕妇健康膳食指数的建立和验证

Development and validation of the Chinese Healthy Diet Index for Pregnancy for the nutrition adequacy assessment and risk prediction of adverse pregnancy outcomes.

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Background and objectives: In China, few diet quality index was designed for pregnant women to assess their diet simply and intuitively. We aimed to develop and validate a food-based index to assess Chinese pregnant women's diet quality, the Chinese Healthy Diet Index for Pregnancy (CHDI-P).

Methods and study design: A prospective cohort study was conducted in southwest China to collect pregnant women's food intake through 24h recalls for three consecutive days. The CHDI-P was developed on dietary guidelines and food and health outcomes studies. The CHDI-P has three dimensions comprising 26 components and a total score of 100 points. Reliability was assessed by Cronbach's alpha coefficient and item-item correlation between components. Validity was assessed, including Spearman correlation analysis for the relationships between CHDI-P with nutrients and energy intake, multiple logistic regression for the association between the CHDI-P and anemia-in-pregnancy (AIP), differences comparing in the median between groups categorized by the known factors that influenced diet quality.

Results: 1663, 1036, and 1045 participants in early, middle, and late pregnancy were included. The median score in early, middle, and late pregnancy were 55.50, 56.00, and 56.25. Cronbach's alpha for CHDI-P in early, middle, and late pregnancy was 0.709, 0.738, and 0.743. Most of the correlations between components were low. The CHDI-P score was significantly positively associated with selected nutrient intake. Pregnant women with the highest level of CHDI-P score in middle [*OR (95%CI)*: 0.595 (0.408, 0.869)] and late pregnancy [*OR (95%CI)*: 0.668 (0.465, 0.960)] had a lower risk of AIP compared with the lowest level. The elderly, who were highly educated and had pre-pregnancy exercise habits, had higher CHDI-P scores.

Conclusion: The CHDI-P can easily and precisely assess the diet quality of Chinese pregnant women and predict nutritional adequacy and the risk of adverse pregnancy outcomes.

Key words diet quality, pregnancy, diet indexes, healthy diet, diet assessment

Category: Nutrition Across Lifespan

无锡市巨大儿发生现况及其影响因素分析

Analysis of the Current Situation and Influencing Factors of Macrosomia in Wuxi, China

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Objective: To investigate the occurrence of macrosomia in Wuxi City and analyze its influencing factors.

Methods: A total of 403 pregnant women who were hospitalized for childbirth in Wuxi Maternal and Child Health Hospital from January 2016 to December 2017 were selected as the study subjects. A questionnaire survey was used to collect data on the pregnant women's pre-pregnancy and pregnancy-related information. The information of infants at birth was collected through the maternal and child health system and hospital medical records.

Results: The incidence of macrosomia in this survey was 13.90%. Univariate analysis found that there were statistically significant differences in maternal age, pre-pregnancy BMI, paternal BMI, family economic status, number of pregnancies, history of diabetes, and maternal serum 25-hydroxy D concentration (P<0.05). Multivariate logistic regression analysis revealed that maternal age ≥35 years (OR=2.624, 95% CI: 1.642~3.751), pre-pregnancy BMI ≥28 (OR=2.161, 95% CI: 1.5562.346), history of diabetes (OR=6.653, 95% CI: 3.152~8.658), and insufficient maternal serum 25-hydroxy D concentration during pregnancy (OR=1.653, 95% CI: 1.115~2.778) and lack (OR=3.652, 95% CI: 2.052~5.154) were risk factors for macrosomia.

Conclusion: In future clinical work, attention should be paid to pregnant women with advanced age, pre-pregnancy obesity, multiple pregnancies, a history of diabetes, and low serum 25-hydroxy D concentrations to prevent the occurrence of macrosomia and take intervention measures.

Key words Pregnant women; Macrosomia; Influencing factors; Logistic analysis

Category: Nutrition Across Lifespan

孕期碘过量和甲状腺功能与18-24个月婴儿神经发育的关系

The relationship between iodine excess and thyroid function during pregnancy and infantile neurodevelopment at 18-24 months

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Background and Objectives: Thyroid disease is a prevalent condition during pregnancy, and excessive iodine intake can lead to changes in thyroid function. However, research on the relationship between maternal iodine excess, thyroid hormones during pregnancy, and infantile neurodevelopment is limited. This study aimed to explore the relationship between maternal iodine excess and thyroid hormones during pregnancy and infantile neurodevelopment. The objective is to provide evidence to support and enhance the prevention of infant neurodevelopmental retardation.

Methods and Study Design: From 2016 to 2018, a prospective study was conducted from pregnancy to 18-24 months postpartum. Maternal urinary iodine concentration (UIC), thyroid stimulating hormone (TSH), total serum iodine (TSI) and non-protein bound serum iodine (nbSI) during pregnancy were determined. The Gesell Development Scale (GDS) was used to assess neurodevelopment of infant at 18-24 months. The iodine status of pregnant women was divided into four groups based on the distribution of maternal UIC: <100μg/L (moderate deficiency), 100-149μg/L (mild deficiency), 150-249μg/L (sufficiency) and >250μg/L (above requirement).

Results: 469 mother-infant pairs participated in our study. Compared with the maternal UIC of 150-249μg/L during pregnancy, the risk of adaptive developmental delay was increased in infants with maternal UIC≥250μg/L (OR=2.38, 95%CI: 1.06, 5.35). Pregnant women with TSI>90th quantiles were more likely to have offspring with language developmental delay than those with lower TSI in 10-90th quantiles (OR=3.06, 95%CI: 1.09, 8.58). The risk of fine motor developmental delay was increased in infants with maternal TSH≥2.5mIU/L during pregnancy (OR=4.32, 95%CI: 1.43, 13.0).

Conclusions: Maternal iodine nutritional status above requirement (UIC≥250μg/L or TSI>90th quantiles) during pregnancy negatively affects infantile neurodevelopment. Maternal TSH≥2.5mIU/L during pregnancy was an independent risk factor for infantile neurodevelopment.

Key words Pregnancy; Infant; Iodine excess; Thyroid function; Neurodevelopment.

Category: Nutrition Across Lifespan

中国65岁及以上老年人食物多样性与其跌倒风险的关联研究

Association of dietary diversity and falls in Chinese people aged 65 years and older

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Background: Dietary diversity is widely recommended as a means of promoting health. However, there is little evidence supporting the relationship between dietary diversity and falls in older adults.

Objective: To estimate the prevalence of falls and examine the association between the dietary diversity score (DDS) and falls among older Chinese adults.

Methods: We used data from the Chinese Longitudinal Healthy Longevity Survey (CLHLS), a nationwide longitudinal survey that aimed to investigate the determinants of health and longevity among older adults in China. The outcome observed was the incidence of falls in the past year, as self-reported by the participants. The DDS was constructed based on 12 items from a food frequency questionnaire. DDS was categorized into quartiles, and the lowest quartile was used as the reference group. Logistic regression was used to examine the association between DDS and the risk of falls in the elderly.

Results: Fall was reported by 22.9% of the 11208 participants. Each 1-unit increase in DDS corresponded to a 5% lower risk of falls (adjusted odds ratio [aOR]; 0.95; 95% CI: 0.93, 0.97]. After adjustment for demographic and lifestyle characteristics, compared to the lowest quartile of DDS, ORs (95% CIs) were 0.82 (0.73, 0.94) for quartile 2, 0.80 (0.70, 0.91) for quartile 3, and 0.74 (0.65, 0.85) for quartile 4 (P for trend<0.001). Protein-rich food items, including meat, fish, and beans were associated with protective effects against falls. In addition, a significant association was observed between higher consumption of fresh vegetables and fruits, and lower risk of frailty.

Conclusions: A higher DDS was associated with a lower risk of falls in Chinese individuals aged 65 years and older. This study highlights the importance of a diverse diet as a potential modifiable behavioral factor for preventing falls in older Chinese adults.

Key words dietary diversity; falls; older Chinese adult

Category: Nutrition Across Lifespan

母亲妊娠期饮食模式对低出生体重和小于胎龄儿发生的影响：中国的前瞻性出生队列

The influence of maternal dietary pattern during pregnancy on the occurrence of low birth weight and small for gestational age: a prospective birth cohort in China

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Background: To investigate the dietary pattern of pregnant women in Tongzhou District of Beijing, China, and to explore the association between maternal dietary pattern during pregnancy and low birth weight (LBW) and small for gestational age (SGA).

Methods: A prospective cohort study was conducted in the Tongzhou Maternal and Child Health Care Hospital of Beijing from July 2018 to February 2019. Maternal socio-demographic and lifestyle information was obtained from questionnaires in three different trimesters, and pregnancy outcomes were obtained from the hospital information system. Inconsecutive 2-day 24-hour dietary surveys were conducted to assess maternal diet in both the 1st and 2nd trimesters. Principal component analysis was performed to extract dietary patterns during pregnancy. Multivariate logistic regression analysis was performed to explore the independent effect of maternal dietary patterns during pregnancy and the occurrences of LBW and SGA.

Results: A total of 3856 pregnant women were included. The prevalence of LBW and SGA was 3.8% and 6.0%, respectively. Six dietary patterns were extracted in the 1st trimester, including the “milk-fast food” pattern, “eggs-fish-shrimp” pattern, “vegetables-mushrooms and algae-poultry meat” pattern, “potatoes-fruit-nuts” pattern, “dry beans-snacks” pattern and “livestock meat” pattern. In the 2nd trimester, five dietary patterns were extracted, including the “eggs-vegetables-mushrooms and algae” pattern, “milk-snacks-fast food” pattern, “fruit-potatoes-nuts” pattern, “poultry meat-livestock meat-beans” pattern and “fish and shrimp” pattern. Pregnant women adhering to the “milk-snack-fast food” pattern (OR=0.525, 95% CI: 0.282-0.977) and “poultry meat-livestock-beans” pattern (OR=0.579, 95% CI: 0.359-0.933) in the 2nd trimester had a lower risk of SGA. Pregnant women adhering to the “fruit-potatoes-nuts” pattern in the 2nd trimester had a lower risk of LBW (OR=0.433, 95% CI: 0.199-0.940).

Conclusion: Pregnant women should consume sufficient fruits, milk and meat in the 2nd trimester to prevent adverse pregnancy outcomes caused by relatively low birth weight.

Key words dietary pattern, low birth weight, small for gestational age, early pregnancy, mid-pregnancy, China

Category: Nutrition Across Lifespan

短期营养干预对专业运动员体能测试指标的影响

Influence of short-term nutrition intervention on physical fitness test indexes of professional athletes

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Objective: Physical fitness test plays an important role in evaluating the training level and physical quality of athletes. Periodic physical fitness test is a powerful index to examine the basic physical fitness of professional athletes and the effect of winter training.This study provides data support for scientific diet and nutritional supplement to improve physical performance of male Wushu routine athletes through nutritional intervention.

Methods: experimental group: wushu (15), control group: diving (15), age 19.67 + / - 2.91, are men, 14 days experimental period, experimental dietary nutrition and nutrition supplement nutrition points: dietary nutrition ratio of relying on the scientific wisdom restaurant dining, and more nutritional supplement to energy, electrolyte, glycogen reserve supplies, fitness test on that day, dynamic resistance accelerate jelly (38 g) exercise 30 minutes before eating 1 bag, Odyssey, glycogen from powder (80 grams), eat before breakfast.The events tested were 30 meters (explosive power), 1,500 meters (aerobic endurance), one-minute double swing rope jump (flexibility and agility), and planking (core strength).

Results: One-minute double rope skipping: experimental group 87.85 + / -22.98, control group 48.87 + / -25.84 ($P < 0.05$).30 m: 4.80 + / -0.25 in the experimental group and 5.18 + / -0.28 in the control group ($P < 0.05$).There was no difference in the test results of 1500m and plank support between the two groups.

Conclusion: Short-term nutrition intervention has significant effect on the performance of explosive power events, but has no significant effect on the performance of endurance events.

Key words short-term nutrition; physical fitness test; professional athletes

Category: Nutrition Across Lifespan

补充白藜芦醇通过调节 NF-κB/SIRT1/NLRP3 抑制力竭运动中的肾脏炎症反应

Resveratrol supplementation inhibits kidney inflammation during exhaustion exercise by regulating NF-κB/SIRT1/NLRP3

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Objective. Exhaustive exercise can lead to renal inflammatory response and subsequent kidney injury, while resveratrol has been shown to possess anti-inflammatory properties. The aim of this study is to investigate whether resveratrol supplementation can alleviate kidney injury induced by exhaustive exercise and explore its possible mechanisms of action. This study has the potential to provide new therapeutic strategies for the prevention and treatment of exercise-related kidney injury.

Methods. 30 SD rats were divided into four groups: control (CON, n=8), resveratrol (RSV, n=8), exhaustion exercise (EE, n=7), and exhaustion exercise with resveratrol (RSV+EE, n=7). EE and RSV+EE groups underwent 6 weeks of exhaustion exercise, while RSV and RSV+EE groups were given resveratrol. Kidney tissue was collected for analysis 24 hours after the last exercise. Hematoxylin-eosin staining (HE) was used to observe morphological changes in kidney tissue. Enzyme-linked immunosorbent assay (ELISA) was used to measure interleukin (IL)-1β, tumor necrosis factor (TNF)-α, IL-6, and IL-10 levels in kidney tissue. Western blot was used to measure the expression of SIRT1, nuclear factor (NF)-κB p65, NLRP3, apoptosis-associated speck-like protein (ASC), and IL-1β in kidney tissue.

Results. EE group showed kidney damage, while RSV+EE group had some improvement. Compared with CON, RSV and RSV+EE groups had significantly increased SIRT1 expression ($P<0.05$), and RSV and RSV+EE groups had significantly decreased NLRP3 and ASC expression compared to EE group ($P<0.05$). The expression of NF-κB p65 protein was significantly higher in the EE group than in the control ($P<0.01$), while it was significantly lower in RSV+EE group than in EE group ($P<0.05$). EE group had significantly higher levels of IL-1β and IL-10 protein expression than CON($P<0.01$), while RSV+EE group had significantly lower levels than EE group ($P<0.01$).

Conclusion. Resveratrol can alleviate kidney injury induced by exhaustive exercise through regulation of the SIRT1/NF-κB/NLRP3 pathway.

Key words Resveratrol; Exhausted exercise; Kidney inflammation; NF-κB; SIRT1; NLRP3.

Category: Nutrition Across Lifespan

产后第一年母乳乳铁蛋白浓度的变化- TAWS 队列研究

Longitudinal changes of human milk lactoferrin concentration during the first year postpartum- a TAWS cohort study

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Objectives: To explore longitudinal changes of human milk lactoferrin (hLF) concentrations during the first year postpartum and associated factors.

Methods: This was a prospective cohort study, in which 160 dyads of newly delivered healthy mothers and full-term newborns were recruited in Wuqiang, Hebei, China. Milk samples were collected at 0-7 days, 30±3 days, 3 months±1 week, 6 months ±1 week, and 12 months±1 week postpartum. Infant feeding practice was evaluated with World Health Organization infant and young child feeding indicators. Characteristics of mothers and infants were collected by using a structured questionnaire. Complete blood count was tested before delivery. Concentrations of hLF was measured using an Enzyme-linked Immunosorbent Assay (ELISA). Linear mixed model was used to examine its longitudinal changes and associated factors.

Results: The concentrations of hLF were 7.17±2.38 g/L, 4.02±1.79 g/L, 2.95±1.54 g/L, 2.19±1.56 g/L, and 2.43±1.65 g/L at 0-7 days, 30 days, 3 months, 6 months, and 12 months postpartum, respectively. LF concentrations decreased during the first six months postpartum (time 0 vs 1: β=3.17, P＜0.001; time1 vs 3: β=1.11, P＜0.001; time 3 vs 6: β=0.70, P＜0.001). However, it increased between 6 month and 12 month postpartum (time 6 vs 12: β=-0.63, P=0.004). The frequency of breastfeeding in the past 24 hours was negatively associated with LF concentrations (β=-0.08, P=0.031). Prenatal mean corpuscular volume(MCV) and red blood cell volume distribution width(RDW) status may influence the longitudinal changes of human milk LF (PMCV*time=0.006, PRDW*time=0.049).

Conclusions: The concentrations of hLf decrease during the first 6 months and may increase from 6 months to 12 months. Its change may be associated with the frequency of breastfeeding in the past 24 hours and prenatal MCV and RDW status.

Key words human milk ; lactoferrin; cohort

Category: Nutrition Across Lifespan

维生素 D 干预对中国北方社区老年人肌肉衰减综合征患者骨骼肌质量和功能的积极影响

The Positive Effect of Vitamin D Supplementation on Skeletal Muscle Mass and Physical Function among Community-dwelling Elderly individuals with Sarcopenia in Northern China

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Background and Objectives: Sarcopenia is defined as a syndrome characterized by declines in skeletal muscle mass and strength or an alteration in physical function. The purpose of this study was to evaluate the improvement of skeletal muscle mass and physical function after one year vitamin D supplementation in elderly with sarcopenia and vitamin D deficiency. Methods and Study Design: This study was a one year randomized controlled trial. After screening, 68 elderly patients with sarcopenia were randomly divided into intervention group (n= 36) and control group (n=32). The intervention group was given vitamin D capsules (800IU/d) and the control group was given vitamin E capsules (100mg/d) with similar appearance. Skeletal muscle mass (Dual-energy x-ray), handgrip strength and physical function were evaluated at 0 and 12 months respectively. Results: There were no significant differences in sun exposure, energy intake, protein intake, quality protein intake and amount of exercise between the two groups at 0, 6 and 12 months ($p>0.05$). The increase of serum 25 (OH) D level in the intervention group (8.17 ± 7.34ng/ml) was significantly higher than that in the control group (2.92 ± 6.20ng/ml) ($p=0.002$). The intervention group compared to the control group, skeletal muscle mass increased by 0.90kg ($p<0.01$), relative skeletal muscle mass index increased by 0.41kg/m2 ($p<0.01$), 4-meter gait speed increased by 0.28m/s ($p<0.01$), single feet balance time adding 2.90 seconds ($p=0.02$), five chair stand time decreased by 2.60 seconds ($p<0.01$). Conclusion: Vitamin D intervention can effectively increase skeletal muscle mass and physical function in the elderly.

Key words elderly, sarcopenia, vitamin D, intervention, randomized controlled trial

Category: Nutrition Across Lifespan

妊娠期糖尿病女性不同泌乳阶段 母乳蛋白组学研究

Proteomics study of breast milk at different lactation stages in women with gestational diabetes mellitus

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Objectives: This study aims to compare the differences in protein composition and function of breast milk proteome between gestational diabetes mellitus (GDM) and healthy women (H) at different lactation stages and its possible impact on offspring growth and development.

Methods: Twenty healthy mothers and twenty GDM mothers were enrolled and human milk samples were collected at four-time points covering colostrum (postpartum 4-6 days), transitional milk (postpartum 12-14 days), early mature milk (postpartum 42 days) and mature milk (postpartum 4 months). The milk proteome was analyzed by a shotgun proteomics approach using nano LC-Orbitrap-MS/MS. The function of the differently expressed proteins was analyzed by gene ontology (GO) enrichment.

Results: A total of 1652 proteins were detected, 1223 of which were shared in GDM and H groups. The PCoA analysis showed that the milk proteome of earlier lactational periods was clearly separated between GDM and H groups, but the distance gradually decreased as the lactation period extended. Furthermore, 33, 42, 47, and 9 proteins were differentially expressed in colostrum, transitional milk, early mature milk, and mature milk, respectively. For all the differently expressed proteins, 34 of them showed the same direction of change in at least two lactation stages. Based on the GO enrichment analysis, up-regulated proteins in GDM were involved in the innate immune system, complement and coagulation cascades, cell secretion, enzymatic and binding activity, and platelet activation.

Conclusions: The milk proteome is altered by GDM and the degree of alternation was decreased in mature milk.

Key words gestational diabetes mellitus, proteomics, breast milk, immunity, lactational period

Category: Nutrition Across Lifespan

重庆市青少年体重误解与零食模式的关系:一项基于中国重庆市人群的横断面研究

Association Between Body Weight Misperception and Snacking Patterns Among Adolescents: A Population-Based Cross-Sectional Study in Chongqing, China

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Objectives: Our study aimed to examine the relationship between body weight misperception and snacking pattern choice among school adolescents.

Methods: A cross-sectional study was conducted using an online survey platform. Body weight misperception was defined based on perceived body weight and true weight. Snack intake was measured using a qualitative food-frequency questionnaire. Factor analysis was used to identify snacking patterns, and multiple linear regression was employed to examine the association between body weight misperception and snacking patterns.

Results: 190,296 students with the average age of 13.3 ± 1.0 years were included, and 44.5% of students misperceived their weight. Overestimation was more prevalent than underestimation. Two snacking patterns, namely a high-calorie snacking pattern and a healthy snacking pattern, were identified with eigenvalues > 1. Weight underestimation was positively linked to high-calorie snacking pattern scores for both normal weight students (β: 0.16, 95% CI: 0.11, 0.21) and students with overweight/obesity (β: 0.44, 95% CI: 0.35, 0.52), and to healthy snacking scores for students with overweight/obesity (β: 0.28, 95% CI: 0.22, 0.33), but negatively linked to healthy snacking pattern scores for normal weight students (β: -0.12, 95% CI: -0.15, -0.09). Conversely, weight overestimation was negatively linked to both high-calorie and healthy snacking pattern scores for normal weight students (β: -0.07, 95% CI: -0.11, -0.04 and β: -0.13, 95% CI: -0.15, -0.10), but positively linked to healthy snacking scores for underweight students (β: 0.15, 95% CI: 0.08, 0.21). Interactions were found between sex, grade, accommodation, only child, primary guardians, parental education level and weight misperception to snacking patterns.

Conclusions: Adolescents with normal weight and overweight/obesity who misperceived their weight exhibited less healthy snacking patterns, whereas underweight students who misperceived their weight displayed healthier snacking patterns. Comprehensive programs are crucial to educate and guide adolescents in understanding their weight status and making healthier snack choices.

Key words body weight misperception, snacking patterns, adolescents, healthy eating, nutrition survey

Category: Nutrition Across Lifespan

新生儿胎便能否通过16s rDNA测序检测到微生物？
Does neonatal first-pass meconium have a detectable microbiota by 16s rDNA sequencing?

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Background: A growing body of evidence supports that the gut microbiome is not established prior to birth. It remains no conclusion whether the first-pass meconium has a detectable microbiota. **Objectives:** To examine whether the first-pass meconium has a detectable microbiota and associated factors with the detection. **Methods:** This is a cross-sectional study conducted from April to September in 2021 in a rural area of Hebei province in China. First-pass meconium samples (n=144) were collected from the healthy full-term singleton neonates within 24 hours after birth at hospital. We used 16s rDNA sequencing to examine microbiota, and the microbiota composition was described using α and β diversity measures. We used the multinomial logistic regression to explore the characteristics between the samples with/without a detectable microbiota. **Results:** Approximately 72.2% (104/144) of the first-pass meconium samples had a detectable microbiota by 16s rDNA sequencing. The likelihood of detection was much higher if the meconium were collected in April, May and June than that were collected in July, August and September (AOR: 17.70, 95%CI: 4.37-71.68). Samples that were transferred to -80 ° cryogenic freezer less than 2 hours after collection were more likely to be detected than those time intervals of transferring were longer than 2 hours (AOR: 5.56, 95%CI: 1.43-21.57). The newborns whose airway were cleared after birth immediately had 5.39 times of microbiota detection in their first-pass meconium higher than those without airway clearance (95%CI: 1.69-17.26). **Conclusions:** Nearly thirty percent of the neonatal first-pass meconium does not have a detectable microbiota by 16s rDNA sequencing. Month of sampling, the time interval of transferring to -80° cryogenic freezer and the airway clearance might influence the likelihood of the microbiota detection. More sensitive technique method and robust controls should be used to study bacteria present at very low abundances in the future.

Key words Meconium, Microbiota, 16s rDNA sequencing, Determinants, Composition

Category: Nutrition Across Lifespan

分析中国 32,217 名 0-36 月龄婴儿辅食喂养与发育之间的相关性

ANALYSIS OF THE CORRELATION BETWEEN COMPLEMENTARY FEEDING AND THE DEVELOPMENT OF 32,217 BABIES AGED FROM 0-36 MONTHS IN CHINA

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Background and Objectives To investigate the current situation of complementary feeding in China and the correlation between complementary feeding and the development of babies.

Methods and Study Design A total of 32,217 subjects were enrolled and separated into four groups depending on their age. The complementary feeding data were collected from media from 33 provinces in China. Data analysis was conducted by IBM SPSS Statistics version 25 and SAS version 9.4.

Results The proportion of starchy food contributed to the largest on feeding, followed by fruits and vegetables. Feeding with teething rusks is the most common at 0-12 months of age. Moreover, the proportion of wheat products is the highest at 13-36 months of age. The walnut oil intake dominated the largest area compared with other kinds of oil at all month-age periods. Vitamin A & A&D dominated the largest proportion compared with other supplements at 0-12 months of age. Additionally, the DHA was the most prevalent nutrient during the whole period. Only vegetables and fish and shrimp feeding at 13-18 months of age, and only meat, fish and shrimp, beans and eggs feeding at 19-36 months of age statistically significantly benefit subjects on reaching p25 and above on length. Feeding babies with fruits and fish and shrimp at 7-18 months of age, and beans, egg, and liver and blood-feeding at 19- 36 months of age statistically benefit subjects on reaching p25 and above weight. Only starchy food feeding could help subjects achieve p25-75 on weight/length. Finally, the variety of complementary feeding was positively associated with the length and negatively associated with weight/length.

Conclusions Currently, the situation of complementary feeding in China is unsatisfactory. The variety, type, and time of complementary feeding were associated with the development and growth of babies. It is necessary to promote scientific complementary feeding in China.

Key words Complementary feeding, Baby, Development, Growth, Children

Category: Nutrition Across Lifespan

孕期膳食炎症指数与先天性心脏病的关系

Dietary inflammatory index during pregnancy and congenital heart defects

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Background and Objectives: Congenital heart defects (CHD) is the most common birth defects worldwide, and has become a great public health issue. Maternal inflammatory condition is important in fetal cardiovascular development, and diet is a major modifiable factor for systemic inflammation. However, to our knowledge, it remains unknown on the relationship between diet-related inflammation during pregnancy and CHD. The present study aimed to investigate the association between dietary inflammatory index (DII) during pregnancy, reflecting the overall inflammatory potential of maternal diet, and the risk of CHD, and assess the prediction value of DII on CHD.

Methods and Study Design: A hospital-based case-control study including 474 cases and 948 controls was performed in Northwest China. Eligible women waiting for delivery were recruited. Maternal diets in pregnancy were collected by a validated food frequency questionnaire and other information was gathered by a standard questionnaire. Logistic regression models were used to estimate the relationship between DII and CHD, and operating characteristic curves were constructed to evaluate the prediction value of DII on CHD.

Results: The maternal DII ranged from -1.36 to 5.73 in cases, and 0.43 to 5.63 in controls. Pregnant women with per 1 higher DII score were at 31% higher risk of fetal CHD (OR=1.31, 95%CI=1.14-1.51), and the adjusted OR (95%CI) comparing the pro-inflammatory diet group with the anti-inflammatory diet group was 2.04 (1.42-2.92). The inverse association of DII score with CHD risk was consistent across various subgroups of baseline characteristics. Maternal DII in pregnancy had good predictive value for fetal CHD, with the area under the receiver operating characteristic curve higher than 0.7.

Conclusions: Maternal higher DII score during pregnancy, indicating a more pro-inflammatory diet, was associated with higher risk of CHD. These findings suggested that avoiding a pro-inflammatory diet during pregnancy should be emphasized in the prevention of CHD.

Key words dietary inflammatory index; congenital heart defects; pregnancy; case-control study; Chinese

Category: Nutrition Across Lifespan

中国老年人的饮食和血液炎症对糖尿病与认知间关系的影响
The effects of dietary and blood inflammation among Chinese elderly people on the relationship between diabetes and cognition

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Objective: This study aimed to evaluate the associations between dietary inflammatory index (DII), systemic immune inflammation index (SII) and system inflammation response index (SIRI), diabetes and mild cognitive impairment (MCI). The different synergistic effects of DII, SII and SIRI on blood glucose and cognition were also explored based on diabetes status.

Method: Study included 1050 participants from Beijing. Food frequency questionnaire was used to calculate energy-adjusted DII scores. Cognitive function was evaluated by neuropsychological tests. Fasting plasma glucose (FPG) were obtained by blood samples, to calculate SII, SIRI. The log regression and generalized linear regression models were built to investigate the potential associations.

Results: The diabetes patients with MCI consumed less Mg, niacin and thiamin than others ($p<0.001$). Lower levels of DII, SIRI and SII might increase the risk of diabetes, MCI and co-morbidity of diabetes with MCI ($p<0.05$). The synergistic effects of DII and SII or SIRI on MCI were enhanced by higher FPG. Among diabetes patients, the lower levels of DII, SIRI and SII were significantly correlated with higher MoCA scores and lower FPG ($p<0.05$). However, these relationships were significantly diminished or even disappeared in non-diabetes population.

Conclusion: Lower levels of DII, SIRI and SII might play protective roles in reducing the risks of diabetes and/or MCI. The benefits of anti-inflammatory diets on cognitive protection and FPG control were more sensitive in elderly people with diabetes.

Key words Diabetes; Dietary inflammatory index; System inflammation response index; Systemic immune inflammation index; Mild cognitive impairment; Elderly.

Category: Nutrition Across Lifespan

四周肌酸补充和吸气肌训练对心肺健康的影响:一项随机对照试验

The effects of four weeks of creatine supplementation and Inspiratory muscle training on cardiorespiratory fitness: a randomized controlled trial

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Background: Inspiratory muscle training(IMT) improves lung function and increases respiratory muscle strength, thereby weakening the metabolic reflex of the respiratory muscles, promoting recovery from respiratory muscle fatigue . Creatine supplementation may enhance strength , leading to even greater physiological adaptations. The purpose of this study was to determine the effects of Inspiratory muscle training and creatine supplementation on cardiorespiratory fitness and endurance performance in college-aged men.

Methods: participants were randomly assigned to one of two groups: creatine (creatine citrate) (Cr; n = 12),or control (Con;n = 11) groups. The Cr and Con groups completed four weeks of IMT prior to post-testing. Test their lung function, respiratory muscle strength and maximum oxygen uptake.

Results: Pulmonary function, respiratory muscle strength and aerobic endurance indexes improved in both groups before and after training.There was a significant difference in the elevation of FVC and FIVC in the Cr group ($P<0.05$) and an extremely significant difference in the increase in FEV1/FVC and FEV1 ($P<0.01$). There was a highly significant difference between the Cr and IMT groups in the increase in MIP and MEP before and after training ($P<0.01$).There was no significant difference between the two groups before and after training in VO_2max ($P>0.05$), but there was a highly significant difference in the increase in exercise duration in the IMT(Cre) group ($P<0.01$).

Conclusion: Both Cr and Con can improve lung function, respiratory muscle strength and endurance performance. Compared to IMT, IMT (Cre) had a more significant effect on their lung function, respiratory muscle strength levels and duration during endurance exercise.

Key words Creatine; Inspiratory muscle training; Lung function; Respiratory muscle strength;

Category: Nutrition Across Lifespan

长期高碘暴露对中国孕妇甲状腺不良影响

Adverse effects on thyroid of Chinese pregnant women exposed to long-term iodine excess

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Background and Objectives: Ensuring optimal iodine nutrition in pregnant women is a global public health concern. However, there is no direct data on safe tolerable upper intake levels (UL) for pregnant women. A cross-sectional study was performed in an area with large variability of water iodine concentration in the natural environment and restricted iodized salt supply to determine the UL of pregnant women.

Methods and Study Design: We measured 24-h urinary iodine excretion (UIE) and thyroid function for pregnant women across a range of iodine intakes. Logistic regression was used to assess the relationship between UIE and thyroid dysfunction, thyroid nodules, and thyroid volume.

Results: 744 pregnant women were enrolled in this study. The median (IQR) UIC in pregnant women was 150.2(87.6, 268.0) μg/L, and the 24h-UIE was 204.2 (116.0, 387.0) μg/day. Compared with UIE 150-250μg/day, the reference group, the prevalence of thyroid dysfunction was 5.7 times higher (95%CI: 1.7, 19.2) in pregnant women with UIE 450-550 μg/day, and 3.9 times higher (95%CI: 1.5, 10.3) in pregnant women with UIE ≥550 μg/day. Compared with EII 100-200μg/day, the reference group, the prevalence of thyroid dysfunction was 4.3 times higher (95%CI: 1.3, 14.4) in pregnant women with UIE 500-600 μg/day, and 3.6 times higher (95%CI: 1.5, 8.9) in pregnant women with UIE ≥600 μg/day.

Conclusions: Excessive iodine intake during pregnancy increases the risk of thyroid dysfunction. Avoiding chronic iodine intakes of 500 μg/day or higher, or UIE ≥450μg/day is recommended for pregnant women.

Key words Pregnant women; Tolerable upper intake levels; Urinary iodine excretion; Thyroid dysfunction; Iodine.

Category: Nutrition Across Lifespan

基于宿主-微生物交互作用对羊乳和牛乳蛋白在改善肌肉衰减综合征中的比较分析

Comparative analysis of goat and bovine milk proteins in the improvement of sarcopenia based on host-microbial interactions

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Background and Objectives Diet intervention, especially supplementation with high-quality protein, is considered to be a critical strategy in sarcopenia. However, different sources and types of protein have different health impacts. The aim of this study is to explore the differences in the ameliorative effects and mechanisms of different sources and types of proteins on sarcopenia, providing an optimal path for the prevention and treatment of sarcopenia.

Methods and Study Design A sarcopenia model was established by intraperitoneal injection of dexamethasone (5 mg/kg). Sixty male C57BL/6 mice (8 months old) were randomly divided into the normal control, sarcopenia, goat whey protein, goat milk casein, bovine whey protein, and bovine milk casein groups. Animals were treated for eight consecutive weeks. Organism-level and molecular phenotypes, 16S rRNA gene sequencing, and untargeted metabolomics profiling based on GC-TOF/MS were employed to investigate the correlation between host metabolism, microbial metabolism, autophagy and inflammation and their influence on sarcopenia in C57BL/6 male mice.

Results All four proteins increased muscle mass, and goat whey protein improved muscle strength in sarcopenic mice. Goat and bovine milk proteins promoted muscle regeneration by increasing MyoD1 and MyoG expression, and the former had a more distinct effect in inducing autophagy and decreasing inflammation than the latter. In addition, goat whey protein and casein could modulate host-microbial arginine co-metabolism. Notably, goat milk proteins responded well to sarcopenia comorbidities, including sarcopenic obesity, osteosarcopenia, and osteoarthritis.

Conclusions The study confirmed that goat milk proteins were more effective than bovine milk proteins for the control of sarcopenia. Moreover, we found that whey protein and casein could modulate host-microbial arginine co-metabolism, which shows their potential as precision nutritional supplements for the management of sarcopenia. Our study provides theoretical support for the prevention and control of sarcopenia.

Key words sarcopenia; whey protein; casein; comorbidity; host-microbe co-metabolism

Category: Nutrition Across Lifespan

多种心脏代谢疾病加重低白蛋白血症对中国百岁老人死亡率的不良影响

Multiple Cardiometabolic Diseases Enhance the Adverse Effects of Hypoalbuminemia on Mortality among Centenarians in China

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Background Although hypoalbuminemia was associated with high risk of mortality in community-dwelling older adults, as well as in the hospitalized older adults, little is known among centenarians. And there are limited data on whether having cardiometabolic diseases (CMDs) is associated with additive effects.

Methods Baseline examinations including a determination of albumin levels were performed in 1002 Chinese centenarians from January 2014 through to December 2016, and the survival status was subsequently ascertained until 31 May 2021. Cox proportional risk model was performed to assess the risk of all-cause mortality associated with albumin levels and hypoalbuminemia combined with CMDs.

Results Of 1002 participants included in the analysis, the mean level of albumin was 38.5 g/L (±standard deviation, 4.0 g/L), and 174 (17.4%) had hypoalbuminemia (albumin <35 g/L). The multivariable analyses showed that albumin level was negatively associated with all-cause mortality (Ptrend<0.05). Compared to normoalbuminemia, hypoalbuminemia was associated with an increased mortality risk in the overall participants (hazard ratio [HR]: 1.55, 95% confidence interval [CI]: 1.22–1.97). Furthermore, the HR (95% CI) of hypoalbuminemia combined with multiple CMDs was 2.20 (1.16-4.17). There was evidence of an additive deleterious dose effect of an increasing number of CMDs (Ptrend=0.001).

Conclusions Hypoalbuminemia is associated with an increased risk of all-cause mortality in Chinese centenarians, and this risk is more pronounced among older adults with multiple cardiometabolic diseases. Our findings suggest that older adults with hypoalbuminemia, especially comorbid multiple CMDs warrant early identification and management.

Key words Serum Albumin; Cardiometabolic Diseases; All-cause Mortality; Centenarians; Cohort study

Category: Nutrition Across Lifespan

中国家庭6-10个月婴儿喂养行为研究

Feeding practices demonstrated by Chinese caregivers of 6–10-month-old infants: A behavioral observation study in Shaanxi province

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Caregiver feeding practices in early childhood are important for the development of children's eating habits. All infant feeding occasions were recorded during one day by 28 families in Shaanxi, China with infants (age 6-10 months) who have started a complementary feeding. Videos were coded for feeding practices, feeding environment, and responsive feeding. The most common feeding practices of Chinese caregivers were opening mouth, instruction, and interference. Most prompts to eat were effective at this age. Overweight infants' caregivers used more coercive prompts to eat ($p < .05$). Mothers used more autonomy-supportive prompts to eat than did fathers ($p < .05$). Early, active, and late infant fullness cues were captured in 25.6%, 34.8% and 8.5% of videos, respectively. 53.6% of caregivers fed at the right pace while 14.5% and 31.9% fed too slow or too fast, respectively. Only 5.5% videos had a screen on, but 33.5% videos included at least one other distraction during the meal. The types of feeding practices observed being used by Chinese caregivers of infants in this age are largely positive. Differences in feeding practices among caregivers suggest that targeted advice may further improve feeding practices. Caregiver awareness in identifying satiety cues and responsiveness to infant eating rate may also help to avoid potential risk of overfeeding.

Key words Infant feeding practices; Behavioral observation; Responsive feeding; Infant obesity

Category: Nutrition Across Lifespan

根据 IOM 指南，中国双胎妊娠妊娠期体重增加与围产期不良结局的关系

Association of Gestational Weight Gain with Adverse Perinatal Outcomes in Chinese Twin Pregnancies According to the Institute of Medicine Guidelines

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Objectives: To explore the association between gestational weight gain (GWG) and adverse perinatal outcomes in Chinese twin pregnancies according to the 2009 Institute of Medicine (IOM) recommendations.Methods: This birth-based retrospective study was conducted in a tertiary hospital in Beijing, China, between January 2012 and October 2022. A total of 794 women with twin pregnancies and 1,588 viable infants were included in our study. Univariate analysis and multivariable logistic regression models were used to estimate the independent influence of GWG on perinatal outcomes.Results: In total, 360 (45.3%), 356 (44.8%), and 78 (9.8%) twin-pregnant women with GWG were defined as within, below, and above the IOM guidelines, respectively. Both the below and above IOM guideline groups were associated with an increased risk of preterm birth (gestational age < 37 weeks) (adjusted OR: 1.39 [95% CI: 1.03–1.87] and adjusted OR: 1.74 [95% CI: 1.07–2.83], respectively). GWG below IOM guidelines was also associated with an increased risk of gestational diabetes (adjusted OR: 1.42 [95% CI: 1.01–2.01]) and low-birth-weight infants (BW＜2500 g) (adjusted OR: 1.89 [95% CI: 1.48–2.4]) and a decreased risk of gestational hypertensive disorder (adjusted OR: 0.49 [95% CI: 0.34–0.71]), cesarean delivery (adjusted OR: 0.49 [95% CI: 0.31–0.79]), and twin growth discordance (adjusted OR: 0.56 [95% CI: 0.37–0.85]). Meanwhile, GWG above IOM guidelines was associated with an increased risk of gestational hypertensive disorder (adjusted OR: 2.7 [95% CI: 1.61–4.53]), large size for gestational age (adjusted OR: 3.9 [95% CI: 1.54–9.89]), and a reduction in the risk of low-birth-weight infants (BW＜2500 g) (adjusted OR: 0.45 [95% CI: 0.3–0.68]).

Conclusion: In this study, the GWG of approximately half of Chinese twin-pregnant women was below the IOM guidelines. We found that GWG below or above IOM guidelines was associated with less favorable perinatal outcomes, especially with an increased risk of preterm birth.

Key words gestational weight gain; twin pregnancy; preterm birth; gestational diabetes; gestational hypertensive disorder

Category: Nutrition Across Lifespan

母亲孕期红细胞多不饱和脂肪酸与子代2岁时神经发育的关联
Association between maternal erythrocyte PUFAs during pregnancy and neurodevelopment of offspring at 2 years of age

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Background and Objectives: Polyunsaturated fatty acids play an important role in brain structure and function. However, previous studies on prenatal polyunsaturated fatty acids and neurodevelopment of offspring obtained inconsistent results with limited types of fatty acids and using dietary intake or concentrations in serum/plasma as biomarkers. In this study, we aimed to investigate the association between maternal erythrocyte polyunsaturated fatty acids during pregnancy and children neurodevelopment at 2 years of age in the Chinese population.

Methods and Study Design: We included 242 mother-child pairs from the Yuexiu birth cohort. Maternal blood samples were obtained during the 20-28 gestational weeks, and the composition of erythrocyte fatty acids was measured using gas chromatography. Neurodevelopment of children was assessed with the Ages and Stages Questionnaire.

Results: We found that maternal eicosapentaenoic acid [OR (95% CI): 0.36 (0.16, 0.77) for second tertile, 0.34 (0.15, 0.75) for highest tertile, and P for trend = 0.032] was associated with a reduced risk of potential developmental delay in gross motor skill. Contrarily, total n-6 polyunsaturated fatty acids [OR (95% CI): 2.89 (1.09, 8.21) for second tertile, 2.74 (1.08, 7.48) for highest tertile, and P for trend = 0.034] and arachidonic acid [OR (95% CI): 4.54 (1.66, 13.76) for highest tertile, and P for trend = 0.005] were associated with an increased risk of potential developmental delay in personal-social skill. Furthermore, the ratio of eicosapentaenoic acid/arachidonic acid [OR (95% CI): 2.56 (1.15, 5.89) for highest tertile, and P for trend = 0.019] was associated with an increased risk of potential developmental delay in gross motor skill. Non-significant associations were observed in other PUFAs.

Conclusions: Prenatal erythrocyte polyunsaturated fatty acids are associated with children’s neurodevelopment, emphasizing the importance of appropriate amounts and ratios of polyunsaturated fatty acids in pregnant women.

Key words neurodevelopment; polyunsaturated fatty acids; pregnancy, children, birth cohort

Category: Nutrition Across Lifespan

红细胞多不饱和脂肪酸与妊娠期糖尿病的关联

Association between erythrocyte polyunsaturated fatty acids and gestational diabetes mellitus in Chinese pregnant women

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Background and Objectives: We aimed to explore the associations of erythrocyte polyunsaturated fatty acids (PUFAs) with risk of gestational diabetes mellitus (GDM) in Chinese pregnant women.

Methods and Study Design: A total of 951 Chinese women in mid-pregnancy were recruited during 2017-2018. Erythrocyte polyunsaturated fatty acids were measured by gas chromatography and expressed as a percentage of total fatty acids. Women underwent a 75g oral glucose tolerance test for GDM diagnosis. Logistic regression and restricted cubic spline models were conducted.

Results: Of the 951 participants, 180 were diagnosed as GDM (18.93%). For n-3 PUFAs, for per standard deviation (SD) increase, the multivariable-adjusted ORs (95%CI) of GDM were 0.789 (0.649, 0.961, P=0.018) for α-linolenic acid (ALA) and 0.782 (0.638, 0.957, P=0.017) for docosapentaenoic acid (DPA), whereas the associations became marginally significant after post hoc false-discovery rate (FDR) correction (both PFDR=0.065). A nonlinear association was observed for ALA and GDM risk (P-nonlinearity=0.001). For n-6 PUFAs, γ-linolenic acid (GLA) was significantly associated with a 46.0% higher risk of GDM [OR (95%CI): 1.460 (1.195, 1.785), PFDR=0.003) for per SD increase, and the non-linear relationship was also significant (P-nonlinearity=0.031). Arachidonic acid (AA) was borderline significantly associated with a lower risk of GDM after FDR correction [OR (95%CI): 0.736 (0.568, 0.953), P=0.020, PFDR=0.065]. No associations were found for other PUFAs and risk of GDM.

Conclusions: We documented that GLA was significantly associated with an increased risk of GDM in Chinese pregnant women. We firstly showed significant non-linear associations of ALA and GLA with GDM risk.

Key words Gestational diabetes mellitus; Erythrocyte; Polyunsaturated fatty acids

Category: Nutrition Across Lifespan

补充蛋白质的时间和类型对接受阻力训练的成年人肌肉质量、力量和功能改善的比较效果：随机对照试验的系统回顾和网络荟萃分析

Comparative effects of timing and types of protein supplementation on improving muscle mass, strength and function in adults undergoing resistance training: a systematic review and network meta-analysis of randomized controlled trials

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Background and Objectives

The timing or specific type of protein supplementation has been debated as a potential “anabolic window” to improve muscle mass, strength and function of adults undergoing resistance training.

Methods and Study Design

We carried out a systematic review and network meta-analysis of randomized controlled trials with protein supplement and resistance training ≥ 2 weeks within a frequentist framework. PubMed, Web of Science, Cochrane Library and SPORTDiscus databases were searched until 1st December 2022. Outcomes included fat-free mass, skeletal muscle mass, appendicular lean mass, handgrip strength, squat strength, gait speed, etc.

Results

We included 116 eligible trials with 4711 participants that reported on 11 timing and 14 types of protein supplementation. Compared with placebo, after exercise (0.54 kg, 95% CIs): 0.10-0.99 for fat-free mass and 0.34 kg, 95% CIs: 0.10-0.58 for skeletal muscle mass) and at night (2.85 kg, 95% CIs: 0.49-5.22 for handgrip strength and 12.12 kg, 95% CIs: 3.26-20.99 for leg press strength) were found the most consistent effective protein intake timing for gains in muscle mass and muscle strength, respectively. Milk proteins (milk, whey, yogurt, casein and bovine colostrum), red meat and mixed protein were proved to be effective proteins for gains in both muscle mass and strength. No timing or type of protein supplementation showed a significant enhancement in muscle function.

Conclusions

Overall, after exercise and at night are key recommendation timing for protein intake to increase muscle mass and strength, respectively. Milk proteins are the preferred type of protein supplement for improvements of muscle mass and strength. Future studies that directly compare the effects of those effective timing or types of protein supplementation on muscle mass and strength are of great significance.

Key words Muscle; Network meta-analysis; Protein supplementation; Protein type; Timing