



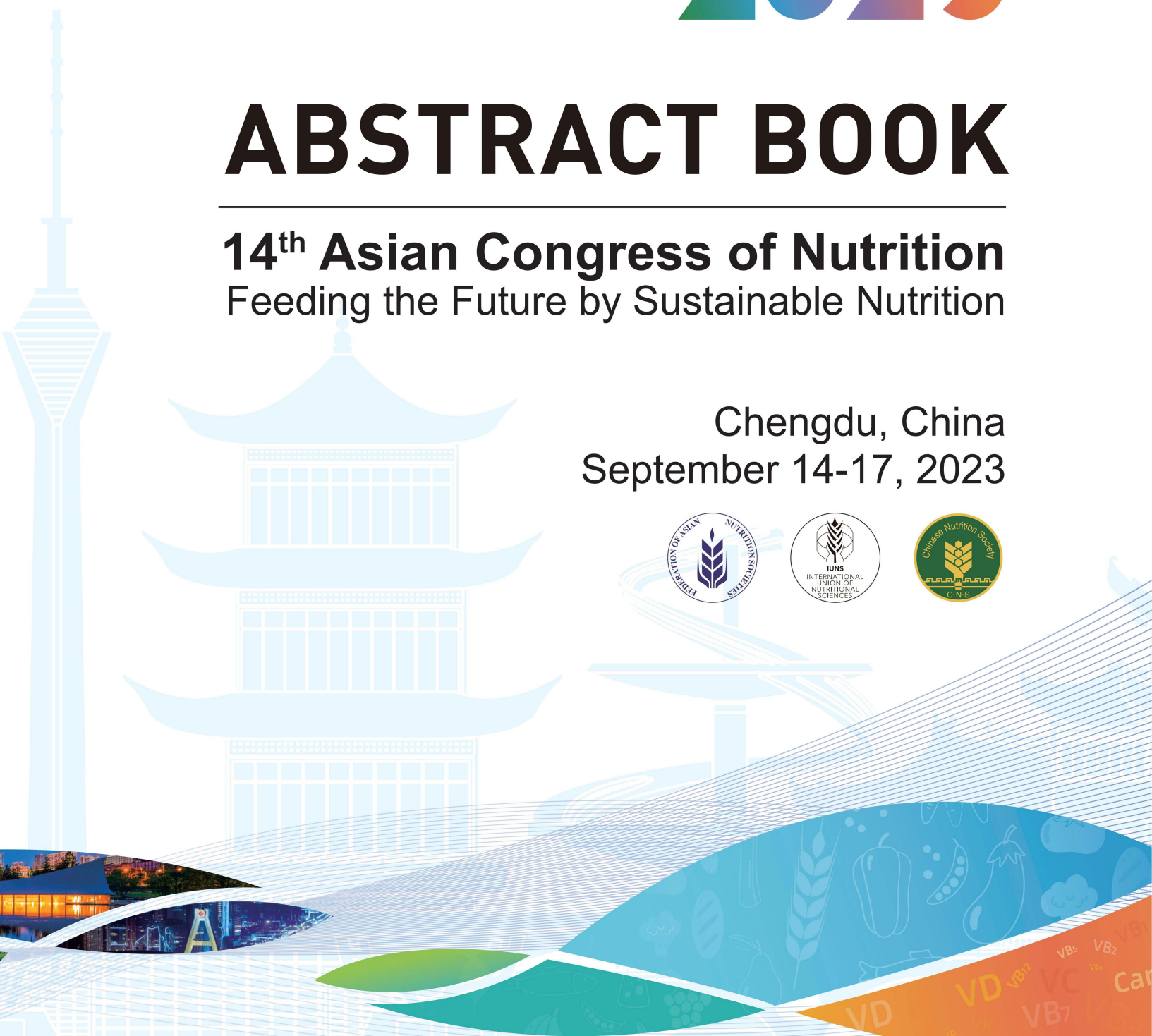
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# ABSTRACT BOOK

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Category: The thematic areas

# **关于哪种饮食更好的争论，素食主义者，还是弹性素食主义者？**

## **The debate of which diet is better, vegetarian, or flexitarian?**

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**Background:** A flexitarian diet is a plant-based diet that allows for occasional consumption of meat or animal products. This diet emphasises whole, minimally processed plant-based foods, such as fruits, vegetables, whole grains, legumes, nuts, and seeds, but also includes lean meat, fish, and dairy in moderation. A vegetarian diet, on the other hand, eliminates all meat and fish, but may still include dairy and eggs. Both diets have been associated with health benefits, such as reduced risk of heart disease, type 2 diabetes, and mental health improvements. Braakhuis and colleagues have investigated the effects of various dietary patterns on health and how research participants can be supported to make dietary behaviour change.

**Methods:** The methodology covers two key randomised controlled trials and details can be sourced via clinical trial registrations: 1) red meat versus vegetarian diet intervention in young adults: <https://clinicaltrials.gov/ct2/show/NCT04869163>; 2) Flexitarian diet intervention in participants with metabolic dysfunction: [www.anzctr.org.au](http://www.anzctr.org.au) Trial details: ACTRN12622000906752

**Results:** Our findings suggest neither the vegetarian or flexitarian are superior to each other regarding blood lipids, glucose control, body weight and other biomarkers of health. However, participants did struggle to adhere to the vegetarian diet, when compared to the flexitarian diet, despite an interest in following a vegetarian diet. Nutrition education and support underpins successful nutrition interventions.

**Conclusions:** Ultimately, the decision to follow a flexitarian or vegetarian diet come down to personal preferences and dietary needs. Both dietary patterns can be nutritionally balanced and meet daily nutrient requirements. Research using nutrition and social science frameworks to support nutrition education and behaviour change is recommended.

**Key words** metabolic health, red meat, young adults, nutrition behaviour

Category: The thematic areas

# 使用中国版营养环境测量工具（NEMS）对中国大学校园饮食环境进行评估

## Assessment of Chinese university campus food environment using the Chinese Version of the Nutrition Environment Measurement Tool for Stores

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**Background and Objectives:** Despite widespread education and healthy eating campaigns, the prevalence of excessive body weight remains stubbornly high in many countries. Particularly, young adults (18–24 years) in universities are frequently exposed to an environment that promotes unhealthy eating behaviors. Hence, this study aims to assess on-campus food environment in a Chinese university by using a validated tool, the Chinese Nutrition Environment Measurement Survey for Stores (C-NEMS-S).

**Methods and Study Design:** The food outlets assessed in this investigation were located within two campuses in an urban university in Shijiazhuang City, China. We employed a modified version of the validated C-NEMS-S tool. The advantage of using the C-NEMS-S included adjustments to food categories that reflect the actual food composition, to definitions of foods that belong to each category, and to scoring criteria and weighting.

**Results:** A total of 52 on-campus food outlets were categorized into general canteen outlets ( $n = 43$ ), self-served outlets ( $n = 7$ ), or beverage outlets ( $n = 2$ ). General canteen outlets and self-served outlets were further categorized into subtypes. C-NEMS-S scores were significantly different across food outlet types ( $P = 0.0024$ ) where the difference between noodle and rice outlets were the most prominent ( $P = 0.0415$ ). The scores for starchy tubers ( $P < 0.001$ ), dry beans ( $P < 0.001$ ), vegetables ( $P = 0.0225$ ), and fruits ( $P < 0.001$ ) were significantly different across food outlet subtypes. Vegetables and meat & poultry availability scores were significantly higher than fruits, seafoods, and dry beans. Outlets selling healthier options were scarce and only appeared in “grains” ( $n = 2$ ) and “meat and poultry” ( $n = 2$ ) categories.

**Conclusions:** C-NEMS-S highlighted the types of food outlets located in a Chinese university as well as assessing their food availability. However, it needs to be extensively accustomed to the Chinese university food environments for generalization in Chinese universities.

**Key words** university; food environment; food availability; healthier options; dietary behaviour

Category: The thematic areas

# 120 例结核性脑膜炎临床特征分析

## Clinical analysis of 120 tuberculous meningitis

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**Objective** This study investigated the early clinical features, cerebrospinal fluid changes, laboratory tests, imaging features and regression of tuberculous meningitis, aiming to improve the clinicians' ability to diagnose and treat the disease. **Methods** The clinical data of 120 cases, which were diagnosed as tuberculous meningitis in Qingdao Chest Hospital from October 2013 to February 2022 and had complete medical history, physical examination, cerebrospinal fluid and CT or MRI examination, were retrospectively analyzed. **Results** The 120 patients in this group were aged 15-85 years and the ratio of male to female was 1.26:1. The main clinical symptoms contained fever, headache, nausea with vomiting, meningeal irritation and neurobehavioral abnormalities. Atypical symptoms include dizziness, cough, obstruction, weight loss, fatigue, night sweats, and mental and behavioral disorders. The hospital admissions in stage I (32.5%), stage II (36.7%) and stage III (30.8%) were similar. The number of protein was increased in 1000-4000 mg/L (60.8%), as well as sugar and chloride reduction ratios were 45.8% and 70.8% respectively. The positive rate of mycobacterium tuberculosis culture was only 10%. The positive rate of MRI in cranial imaging examination (80.3%) was higher than that in CT (31.7%). In all cases, 94 patients were improved, 24 patients were deteriorated and 2 patient were died. **Conclusion** In this study, the tuberculous meningitis was mainly middle-aged and elderly, and the staging of the disease at admission was helpful to judge the prognosis. The clinical symptoms and imaging changes were diverse, the early stage of CSF changes was atypical, and the etiological detection rate was low. Patients suspected of TBM should have detailed medical history, complete cerebrospinal fluid examination and imaging for comprehensive diagnosis. As long as TBM diagnosis is not excluded, experimental anti-tuberculosis therapy should be given.

**Key words** Tuberculous meningitis; Clinical analysis; Diagnosis; Cerebrospinal Fluid

Category: The thematic areas

## **Factors Affecting Malaysian Consumers to Use Diet-Related Health Apps to Support Healthy Food Purchase**

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**Background and objective:** Unhealthy dietary patterns are the major risk factor for chronic non-communicable diseases (NCDs). However, the evidence for using health apps to support healthier food purchasing is more limited. The aim of this study was to explore the factors that affect consumers to use health apps to support healthy food purchases.

**Method:** A total of 269 Malaysians aged between 18 to 59 years old were recruited in Kuala Lumpur. A questionnaire comprising socio-demographic characteristics, usage of health applications and factors of using health apps to monitor healthy food purchases was used to collect data. All data were analysed using SPSS version 21.

**Results:** Approximately half of the participants (52%) had at least one health application on their mobile phone but 77% of them reported they downloaded health apps but no longer used them. Logistic regression analysis showed that there is significant relationship between education level (OR = 1.603, 95% CI: 1.150 - 2.234) and gender (OR = 1.926, 95% CI: 1.022 - 3.629) with the use of health apps. There was no statistically significant for age, ethnicity, marital status and income level ( $p > 0.05$ ). Participants emphasized the functionality such as ease of use, information that provided and the setting in the app can be customized, were the priority consideration before using the apps. In addition, the personal data is safely guarded, easy and free to use, educational content and the interaction platform to communicate with health professionals are provided, which were the factors to affect the participants using health apps.

**Conclusion:** The current findings provide further guidance to app developers as well as researchers on future studies regarding mobile health app implementation.

**Key words** Health Apps, Malaysian, Healthy Food Purchase, Consumers, digital health

Category: The thematic areas

## Prevention of diabetic nephropathy

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### Background and Objectives:

In Japan, about 40,000 patients each year enter the new hemodialysis in which 40% comes from diabetes mellitus.

### Methods and Study Design,

Recently, the negative spiral of the uremic toxin through gut-kidney axis has been found under the condition of chronic kidney disease (CKD). Uremic dysbiosis is associated with endotoxemia and chronic inflammation, disrupting the intestinal barrier and depletion of beneficial bacteria producing short-chain fatty acids.

We deleted rice protein from the brown rice bran layer by a special combination of enzyme solution and *Lactobacillus plantaris*. This fermented low protein genmai (FLPG) is approved for the product and process JAS.

### Results, and Conclusions

FLPG is characterized by (1) energy as same as white rice, (2) protein content is less than 0.2 g/ 100g boiled rice, (3) potassium being almost zero, (4) phosphorus being less than a quarter, (5) presence of dietary fiber, (6) g-oryzanol, and (7) antioxidant ability. These improved the negative spiral of the gut-kidney axis caused by uremic dysbiosis and leaky gut.

Dietary therapy for CKD patients is challenging to control both energy source intake and protein restriction simultaneously. We asked the patients to replace their staple foods with a FLPG package without restricting side dishes. A preliminary intervention study of 3 months of FLPG improved constipation by increasing *Blautia wexlerae*, *Bifidobacteria*, acetic acid, and decreasing harmful bacteria.

As expected, the protein intake decreased from 60 g to 50 g a day. So, people can easily practice a low protein diet to decrease protein intake.

Comparing pre-and post-assessment is a more straightforward and practical method under the solution-oriented strategy.

**Key words** diabetes, chronic kidney disease, prevention, gut-kidney axis, low protein fermented genmai

Category: The thematic areas

## 代谢组学角度揭示 4 种多环芳烃联合暴露致大鼠脂代谢紊乱 Disturbed lipid metabolism induced by PAH4 combined exposure in rats: from metabolomics perspective

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**Background and Objective:** While PAH4 (sum of benzopyrene, chrysene, benz[a]anthracene, benzo[b]fluoranthene) has been proposed as better marker than benzopyrene for assessing overall PAHs exposure in foodstuff, the toxicological information about PAH4 remains exactly rare. This study aims to investigate PAH4 induced toxicity profiles in rats by using UPLC-MS/MS metabolomics approach and evaluate the toxicity dose effect based on benchmark dose (BMD) method.

**Methods:** Male rats were daily exposed by gavage to 0, 10, 50, 250, 1000  $\mu\text{g/kg} \cdot \text{bw}$  PAH4 for consecutive 30 days. After final exposure, rats were sacrificed and blood and organs were collected. Serum liver function indexes (ALT, AST) and oxidative stress indexes (CAT, GSH-Px, SOD and MDA) were detected. Lipid indexes (TG, TC, HDL-C, LDL-C) were measured in serum and liver. Hematoxylin-eosin (H&E) staining were used to identify pathological alterations of liver. Serum metabolomics were conducted and the BMD analysis was based on sensitive toxicity endpoints with dose-effect relationships.

**Results:** PAH4 exposure induced hepatotoxicity including increased relative liver weight, hepatocyte swelling and degeneration, elevated serum AST and GSH-Px level. Serum metabolomics revealed lipid metabolites were significantly upregulated in dose groups, suggesting PAH4 exposure may perturb lipid metabolism. Increasement of hepatic TG further evidenced PAH4 induced lipid metabolism disorder in liver. Based on elevated hepatic TG content, the 95% lower confidence value of BMD (BMDL) was estimated as 4.28  $\mu\text{g/kg} \cdot \text{bw}$ , providing a more protective reference dose than the known BMDL (340  $\mu\text{g/kg} \cdot \text{bw}$ ) derived from cancer endpoint.

**Conclusions:** PAH4 exposure induced disturbed hepatic lipid metabolism and this toxicity effect should be further concerned when conducting risk assessment of PAH4 since it is more sensitive than carcinogenicity.

**Key words** Polycyclic aromatic hydrocarbons; Hepatotoxicity; Lipid metabolism; Metabolomics; Benchmark dose

Category: The thematic areas

## **MALT1 蛋白酶活性在 TLR 介导的 IRF 信号通路中的作用**

### **The role of MALT1 protease activity in TLR mediated IRF signaling pathway**

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Mucosal associated lymphoid tissue lymphoma translocation protein1 (MALT1) plays a key role in both innate and adaptive immunity. As the only known human paracaspase, MALT1 can cleave 12 different substrates to regulate multiple signaling pathways. Since MALT1 activation has been found to be closely related to certain malignant B-cell lymphoma (e.g., ABC-DLBCL) and some autoimmune diseases, inhibition of MALT1 protease activity may become an attractive strategy to treat these diseases. However, due to the complex signaling network regulated by various MALT1 substrates (including unknown ones), it still remains unclear how the inhibition of MALT1 paracaspase activity impacts on the immune signaling of inflammatory responses. In this study, we aimed to investigate the role of MALT1 protease activity in regulating innate immune signaling in inflammatory responses. Three different MALT1 inhibitors were employed: MI-2 (catalytic site), mepazine and MLT-748 (both act at allosteric site). We first used reporter cells of NF- $\kappa$ B and IRF activation to screen a variety of inflammatory signaling pathways including Toll-like receptors (TLR), TNF- $\alpha$ , IL-1 $\beta$  and IFN- $\beta$ . We found that all inhibitors were able to significantly down-regulate TLR4 induced IRF activation. Such inhibition was confirmed by immunoblotting of TBK1 and IRF3 activation. Interestingly, the inhibition of IRF signaling was pronounced by MI-2 than the other two inhibitors. The expression of downstream genes controlled by IRF pathways, such as IFN- $\beta$ , CCL5, CXCL10, ISG15 and ISG16, were all reduced by the MALT1 inhibitors. Our findings suggested that MALT1 may participate in regulating the LPS-TBK1-IRF3 signaling pathway; and we will further investigate which substrate of MALT1 primarily governs this signal transduction. This work demonstrated a new role of MALT1 protease function in innate immune signaling, which may provide new therapeutic potentials of MALT1 inhibitors in treating inflammatory diseases.

**Key words** MALT1, Innate immunity, IRF, TLR4



Category: The thematic areas

# 藏族成人双能 x 线吸收法和生物电阻抗分析评估的一致性验证

## Validation of assessment with the use of dual-energy X-ray absorptiometry (DXA) and bioelectrical impedance analysis (BIA) in Tibetan adults

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**Background:** Body composition (BC) may help predict health outcomes, and different devices can measure and estimate it. Bioelectrical impedance analysis (BIA) is a simple, non-invasive, low-cost device which broadly applied for BC measurement but needs to be validated agreement with Dual-energy X-ray absorptiometry (DXA), which is a reliable method for assessing BC.

**Objectives:** We aimed to evaluate the validation of BIA measures with DXA as reference in Tibetan adults residing in Qinghai, China.

**Methods and Study Design:** In this cross-sectional observational study conducted in 2022 among Tibetan adults (n=901) in Qinghai province, BC was estimated using BIA and was compared with that accessed by DXA. Correlation and Bland and Altman analysis were performed to investigate methods agreement.

**Results:** A total of 855 participants were included in the analysis. Concordance correlation coefficient for total fat mass (FM) and total lean mass (LM) between BIA and DXA were 0.91 and 0.89 for the whole sample, indicating fairly good relative agreement. The bias of BIA for total FM and total LM was -0.15 kg (-0.58%) and -1.49 kg (-3.51%) compared with DXA, respectively, whereas the bias for percentages of total FM and total LM was 0.91% (2.46%) and -1.74% (-2.80%), respectively. Absolute limits of agreement of DXA with BIA were wide, particularly for total FM in obese men and women and for total LM in overweight men.

**Conclusions:** BC assessed using BIA and DXA had good agreement at group level, but was not ideal at individual level.

**Key words** body composition, DXA, bioelectrical impedance, ethnic minority

Category: The thematic areas

# **认知训练和有氧锻炼对社区健康老人大脑灰质体积的影响**

## **The effects of cognitive training versus aerobic exercise on gray matter volume in the community-dwelling elderly**

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**Objective:** Aging is associated with gray matter volume (GMV) reduction and cognitive decline. The impact of cognitive training and aerobic exercise on brain structural volume remains unclear. The aim of this study was to investigate the unique contributions of cognitive training and aerobic exercise to GMV in community-dwelling older adults.

**Methods:** 100 healthy community elderly were randomly assigned to the cognitive training or aerobic exercise groups to receive 24 sessions over 3 months, or to a healthy control group. At baseline and 12-month follow-up, structural magnetic resonance imaging was obtained to detect ROI-based gray matter volumes, and cognitive function was evaluated by the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS). We used the repetitive measure analysis of variance (ANOVA) to evaluate the training effect on ROI-based GMV, and structural difference co-variance analysis to investigate inter-regional difference coordination patterns.

**Results:** There were significant time  $\times$  group interactions effect on the four ROI gray matter volumes, including the left posterior orbital gyrus (POrG) (only this ROI survived after FDR correction), left posterior insula (PIns), left subcallosal area (SCA), and left transverse temporal gyrus (TTG). Compared with baseline, the left POrG volume was only significantly increased in the aerobic exercise group at the 12-month follow-up, while it was significantly decreased in the healthy control group, and was not change in the cognitive training group. Furthermore, compared with cognitive training group, structural difference co-variance between the left POrG and left TTG was increased in the aerobic exercise group; and compared with aerobic exercise group, structural difference co-variance between the left SCA and left TTG was decreased in the healthy control group.

**Conclusion:** Collectively, these findings suggest that both cognitive training and aerobic exercise can delay GMV reduction in aging populations, and aerobic exercise shows better benefits when compared to cognitive training.

**Key words** Cognitive training; Aerobic exercise; Gray matter volume; Aging; Structural difference co-variance

Category: The thematic areas

# 川贝流浸膏对 PM2.5 所致肺损伤大鼠的可能机制

## The Possible Mechanisms of *Fritillaria cirrhosa* D. Don Fluid Extract on PM2.5 Matter-Induced Lung Injury in Rats

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**Background** PM2.5 can cause lung damage when inhaled into the body, causing inflammatory dysregulation and damage to the organism. *Fritillaria cirrhosa* D. Don is commonly used in the treatment of lung diseases.

**Objective** This study aimed to investigate the mechanism related to the effect of *Fritillaria cirrhosa* D. Don fluid extract on PM2.5-induced lung injury in rats.

**Methods** SD rats were randomly divided into blank group, model group, and low, medium, and high dose group, 10 rats in each group. The model group, and low, medium, and high dose groups were treated with PM2.5 (12mg/kg/bw, 2ml/kg/bw) by tracheal drip every other day for three times, and the blank group was treated with an equal dose of saline every other day three times to establish the lung injury model. 48h later, the low, medium, and high dose groups (262.71, 525.42, 1050.84mg/kg/bw) were gavaged with *Fritillaria cirrhosa* D. Don fluid extract solution, and the blank and model group were gavaged with equal doses of pure water (10ml/kg/bw) for 28 days. After the test, the expression levels of miRNA-21, PI3K/PI3K, AKT/AKT, mTOR/mTOR, and autophagy marker protein LC3-II/LC3-I were measured in lung tissues.

**Results** The results showed that miRNA-21 expression and LC3-II/LC3-I ratio were increased in the low, medium, and high dose groups compared with the model group, while the positive expression rates of P-AKT and P-mTOR were decreased, but none of them were statistically different ( $P > 0.05$ ). In addition, the positive expression rate of P-PI3K was significantly lower in the high-dose group compared with the model group ( $P < 0.05$ ).

**Conclusion** *Fritillaria cirrhosa* D. Don fluid extract may antagonize the effect of PM2.5-induced lung injury by inhibiting the PI3K-AKT-mTOR pathway in rats.

**Key words** Lung injury; Rats; *Fritillaria cirrhosa* D. Don; PM2.5; Autophagy

Category: The thematic areas

# 个性化营养干预改善超重肥胖中国成年人健康状况的随机对照临床试验

## Personalized nutrition intervention improves health status in overweight/obese Chinese adults: a randomized controlled trial

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**Background:** Overweight and obesity increase the risk of noncommunicable diseases (NCDs). Personalized nutrition (PN) approaches may provide tailored nutritional advice/service by focusing on individual's unique characteristics to prevent against NCDs.

**Objective:** We aimed to compare the effect of PN intervention with the traditional “one size fits all” intervention on health status in overweight/obese Chinese adults.

**Methods:** In this 12-week randomized controlled trial, 400 adults with BMI  $\geq 24$  kg/m<sup>2</sup> were randomized to control group (CG, n=200) and PN group (PNG, n=200). The CG received conventional health guidance according to the Dietary Guidelines for Chinese Residents and Chinese DRIs Handbook, whereas the PNG experienced PN intervention that was developed by using decision trees based on the subjects' anthropometric measurements, blood samples (phenotype), buccal cells (genotype), and dietary and physical activity (PA) assessments (baseline and updated).

**Results:** Compared with the conventional intervention, PN intervention significantly improved clinical outcomes of anthropometric (e.g., body mass index (BMI), body fat percentage, waist circumference) and blood biomarkers (e.g., blood lipids, uric acid, homocysteine). The improvement in clinical outcomes was achieved through behavior change in diet and PA. The subjects in the PNG had higher China dietary guidelines index values and PA levels. Personalized recommendations of “lose weight”, “increase fiber” and “take multivitamin/mineral supplements” were the major contributors to the decrease of BMI and improvement of lipid profile.

**Conclusion:** We provided the first evidence that PN intervention was more beneficial than conventional nutrition intervention to improve health status in overweight/obese Chinese adults. This study provides a model of framework for developing personalized advice in Chinese population.

**Key words** personalized nutrition, diet, physical activity, genotype, phenotype, clinical trial

Category: The thematic areas

## 高原低氧暴露人群高尿酸血症患病特点及不同暴露时间与血尿酸的相关性分析

### Characteristics of hyperuricemia in plateau hypoxia exposed population and association between different hypoxia exposure time and blood uric acid

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**Objective:** To analyze the characteristics of hyperuricemia in people exposed to plateau hypoxia, and to explore the effect of plateau hypoxia exposure time on the level of serum uric acid. **Methods:** A total of 192 serum samples from people exposed to hypoxia at high altitude (4000 meters above sea level) at different times were collected, and the blood serum uric acid was detected by automatic biochemical analyzer. The plain age-matched population was used as control. Independent sample t-test was used to compare the mean values between groups, and the counting data were tested by chi square test, Spearman correlation analysis was used to explore the association between plateau hypoxia exposure time and level of serum uric acid. **Results:** The prevalence of hyperuricemia and the level of blood serum uric acid in plateau hypoxia exposed population were significantly higher than those in plain living population ( $p < 0.001$ ). The prevalence of hyperuricemia in Han and Tibetan men was significantly higher than that in Han and Tibetan women ( $p < 0.01$ ;  $p < 0.05$ ). There was no significant difference between Han men and Tibetan men, Han women and Tibetan women. The level of blood serum uric acid in Han men was significantly higher than that in Tibetan men ( $p < 0.001$ ) and Han women ( $p < 0.01$ ). Han women were significantly higher than Tibetan women ( $p < 0.001$ ). There was no association between plateau hypoxia exposure time and serum uric acid levels. **Conclusion:** The prevalence of hyperuricemia in people exposed to plateau hypoxia was significantly increased. There was no statistically difference between nationalities, but in gender. High altitude can cause a significant increase in blood uric acid concentration, especially in Han men. There was no association between the increased level of serum uric acid and the exposure time of plateau. The monitoring of blood uric acid levels in people at high altitude should be strengthened in the future.

**Key words** plateau hypoxia; hyperuricemia; characteristics; correlation analysis

Category: The thematic areas

## 患者报告结局在我国心理健康领域应用研究

# Application of patient-reported outcome measurements in mental health-related clinical trials in mainland China

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**Objectives:** International health policy and researchers have emphasized the value of evaluating patient-reported outcomes (PROs) in clinical studies, while the characteristics of patient-reported outcomes in mental health in China are not well established.

**Methods:** A cross-sectional study of interventional clinical trials of mental health conducted in mainland China from January 1, 2010, to June 30, 2022. Trials data were retrieved from the Chinese Clinical Trial Registry and ClinicalTrials.gov. The trials were divided into the following three groups: (1) explicitly specified PROs (registration mentioned the use of PRO instruments precisely), (2) implicitly specified PROs (registration mentioned the use of PRO instruments, which were not clarified), or (3) PROs not mentioned (registration did not mention the use of PRO instruments).

**Results:** Of 1683 eligible trials in total, 1 224 (73.9%) used the explicit PRO instruments and 202 (12.0%) mentioned the use of PROs but did not include the names of the assessment instruments. From more than 265 thousand participants included in the registered trials, data on 22 thousand (85.4%) patients were scientifically collected by PRO instruments. Depressive disorders (36.9%), insomnia disorders (18.7%), and neurocognitive disorders (16.3%) were the most common conditions listing explicitly PRO instruments. The most common instruments for PRO measurements were the Hamilton Depression Scale, Pittsburgh Sleep Quality Index, and Hamilton Depression Anxiety Scale.

**Conclusions:** The major increase from 2010 to 2022 in the number of clinical trials of mental trials originating in mainland China. While PRO instruments as primary and secondary outcomes were still not widely used in clinical trials. Future studies should fully consider patients' feelings and standardize the use of PRO tools, which is conducive to the construction of mainland China's mental health cause.

**Key words** Patient-reported outcomes; Randomized Clinical trials; Primary outcomes; Secondary outcomes; Mental health