Combined Effects of Lifestyle Factors on MASLD: A Bayesian Kernel Machine Regression Analysis

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Background : Metabolic dysfunction–associated steatotic liver disease (MASLD), formerly non-alcoholic fatty liver disease (NAFLD), is hepatic fat in people with obesity, diabetes, or metabolic syndrome. Its prevalence is rising globally and in Korea with lifestyle changes. Sleep, diet, activity, alcohol, and smoking influence metabolic health and may act jointly. Prior studies mostly examined single factors. We evaluated combined effects of multiple lifestyle factors on MASLD using mixture analysis.

Methods : We analyzed 37,931 adults ≥20 years from the Korea National Health and Nutrition Examination Survey (2015, 2018–2021). MASLD was defined as liver fat score > –0.640. Lifestyle factors were sleep, resistance exercise, aerobic activity, diet quality, sedentary time, alcohol, and smoking. Bayesian Kernel Machine Regression (BKMR) estimated mixture effects, relative importance, and interactions, adjusting for demographics, socioeconomic status, and adequate sleep (7–9 h).

Results : Among 37,931 participants, 3,632 had MASLD. Higher diet quality, resistance exercise, and aerobic activity related to lower risk, while sedentary time, alcohol, and smoking increased risk. Raising all six exposures from the 50th to 75th percentile reduced MASLD overall. Posterior inclusion probabilities identified resistance exercise as the strongest protective factor and sedentary time as the strongest risk factor. Interactions were seen between diet and aerobic activity, aerobic activity and sedentary time, and smoking and resistance exercise.

Conclusion : Multiple lifestyle behaviors collectively influenced MASLD risk. Integrated strategies with healthy diet, regular resistance and aerobic exercise, less sedentary time, and moderation of alcohol and smoking may reduce disease burden. Resistance exercise and sedentary reduction appeared as key modifiable targets. Prospective studies should confirm these findings and clarify mechanisms.

Keywords : Lifestyle, MASLD, Mixture analysis

Global Trends in Human Papillomavirus(HPV) Vaccine Promotion Research: A Narrative Literature Review

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Background : HPV is a major public health concern due to its association with various cancers. Despite global efforts to promote HPV vaccination, HPV uptake remains suboptimal in many regions. This review aims to analyze global research trends in HPV vaccine promotion.

Methods : Literature from 2006 to July 2025 was extracted from PubMed. Articles were classified into three phases: Implementation(national/regional policy programs), Challenge(time-limited campaigns), and Survey/Unknown(pre-program phase or unclear status).

Results : A total of 1,317 articles were analyzed. Articles have increased continuously since 2006, peaking at 161(12%) in 2024. The US led with 316(24%). Phase: “Implementation” 225(17%), “Challenge” 90(6.8%), and “Survey/Unknown” 860(65.2%). Across all phases, studies primarily targeted parents, school-aged children, and adult women, focusing on vaccination rates, knowledge, attitudes, and barriers to vaccination. “Implementation” were concentrated in Canada(20%), Australia(19%), and England(9.3%). These countries provided publicly funded school-based vaccination for both sexes. The studies predominantly evaluated HPV infection and cervical cancer trends post-implementation, with emerging studies on male vaccination, adolescent self-consent, and early vaccination. “Challenge” were prevalent in the US and African regions, implementing various approaches including school programs and education. These evaluated the program acceptability and effectiveness. Regardless of phase, studies addressed educational tool, cost-effectiveness, and impacts of COVID-19 and negative media coverage on vaccination. Growing research areas include oral cancer prevention and addressing low uptake among rural populations, ethnic minorities, low-income groups, and sexual minorities.

Conclusion : Research on HPV vaccine promotion has been conducted from various perspectives globally. The findings inform policy development in vaccine-lagging countries.

Psychological Distress and Sense of Coherence during COVID-19 in Rural Japan

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Background : Rural residents may be vulnerable to mental health problems during the COVID-19 pandemic due to limited access to healthcare and social support. Stressors such as fear of infection, perceived discrimination, and restricted medical access may exacerbate distress. Sense of Coherence (SOC), a psychological resource that enhances coping, may protect mental health under chronic stress. This study aimed to examine the associations among psychological distress, SOC, and pandemic-related stressors in a rural Japanese population.

Methods : This study was a cross-sectional study.The study population consisted of 704 agricultural health checkup participants in Shimane, Japan. We assessed psychological distress (K6), Sense of Coherence (SOC-13), and pandemic-related stressors, including fear of infection, perceived discrimination, and difficulty accessing medical care, and examined their associations with psychological distress using correlation and multivariate regression analyses.

Results : Among the participants, higher SOC was consistently associated with lower psychological distress. SOC was negatively related to all pandemic-related stressors, while these stressors were positively related to psychological distress. Regression analysis further indicated that low SOC and perceived discrimination were the strongest predictors of psychological distress.

Conclusions : This study showed that rural residents experienced increased psychological distress during the COVID-19 pandemic and that SOC played a critical role in mitigating this distress. Rural-specific stressors, such as limited healthcare access and stigma related to infection, were associated with lower SOC and heavy psychological burden. Promoting SOC through targeted interventions and improving access to healthcare and social support may help build resilience and reduce vulnerability in rural populations.

Keywords : COVID-19; Sense of Coherence (SOC); Psychological distress; Rural health; Japan

An OR-logic gate-gated lateral flow test strip for screening HPV16/18 in multiple scenarios

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Due to low human papillomavirus (HPV) vaccination rates and inadequate screening systems, cervical cancer incidence continues to rise in underdeveloped regions. Given that conserved sequences of HPV viruses typically exhibit complex higher-order structures, target sequences are likely to be obscured; furthermore, substantial extraneous material in clinical samples impacts probe activation probability. To achieve convenient, rapid, and precise HPV detection, we developed a triple-line lateral flow test strip system based on dual OR logic. This enables simultaneous detection of HPV 16/18 subtypes in a single assay. The system integrates signal amplification via three-channel catalytic hairpin assembly (TCHA) with a simplified OR logic signal output mechanism, enhancing detection rates while enabling subtype differentiation. Assay results demonstrate a detection limit of 10 aM for target sequences, with exceptional specificity in practical testing yielding no false-positive results. The colourimetric test strip demonstrated over 90% sensitivity for clinical samples, while the fluorescent test strip exceeded 95% sensitivity, exhibiting high concordance with real-time quantitative polymerase chain reaction (qPCR) results. This method provides a straightforward solution for rapid HPV screening.

Relationship between phase angle and lifestyle habits in elementary school children

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Objective : Phase angle (PhA) serves as an indicator reflecting cellular physiological function and nutritional status, yet research on Japanese children remains scarce. This study aimed to clarify the association between PhA and lifestyle habits among elementary school students.

Methods : A survey was conducted from 2021 to 2023 targeting fourth to sixth graders attending two public elementary schools in Himeji City, Hyogo Prefecture. The analysis included 541 boys and 493 girls for whom parental consent was obtained and whose data were complete. Survey items included height, weight, waist circumference, body composition measured by bioelectrical impedance analysis, and questionnaire items (exercise habits, sleep duration, dieting experience). Physical activity levels were calculated using the International Physical Activity Questionnaire for Children. PhA was calculated using the average of the right and left body halves. Multiple regression analysis was performed separately for boys and girls, using PhA as the dependent variable and grade level, body mass index, waist circumference, exercise habits, and dieting experience as independent variables, employing forced entry. The significance level was set at 5%.

Results : For both genders, PhA showed a positive relationship with BMI (boys: standardized partial regression coefficient (β) = 0.744; girls: β = 0.552), a negative relationship with waist circumference (β = -0.577; β = -0.327), and a positive relationship with high-intensity physical activity levels (β = 0.229; β = 0.220). Additionally, only boys showed a positive relationship with grade level (β = 0.111) (all $P < 0.05$).

Conclusion : The results of this study indicate that PhA is associated with body size and high-intensity physical activity levels. It is suggested that maintaining or improving PhA in elementary school children requires consideration of appropriate intensity levels, rather than simply increasing overall physical activity.