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Nutraceuticals and Functional Foods in Health

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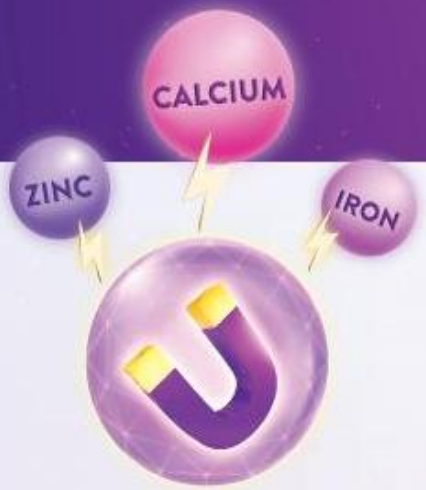

NUTRI PULL SYSTEM~

Reference: *Ghosh Ak et al. Journal of International Medical Research 2018, Vol. 46(6) 2186–2201. ~MareszK. Integrative Medicine: A Clinician's Journal. 2015. Fitzgerald RJ et al. Int. Dairy Journal. 1998. Hansen M, et al. Journal of Pediatric Gastroenterology and Nutrition. 1997. Van SummerenM, et al. . Pediatricresearch 2007, Lynch SR, and Cook JD. Ann NY AcadSci. 1980 Dec 1;355(1):32-44. Christakos S, et al.2011

Disclaimer: *Growth implies to Mean change in BMI for age z score at day 90: 0.54 Vs 0.26 (>50%) (p<.0001) in developmentally at risk picky eating children 2 to 6 years. Children aged 24 to < 48 months were asked to consume at least one serving (224 mL) and those aged 48 to 72 months to consume two servings (448 mL) of PediaSure. #Claims are based on 1-2 serves (with water) per day. ~Nutri-Pull system includes vitamin D to support calcium absorption, Vitamin K2 to support utilization of calcium, vitamin C to support iron absorption, and CPPs (from casein hydrolysate) that are more rapidly digested and absorbed than whole protein.

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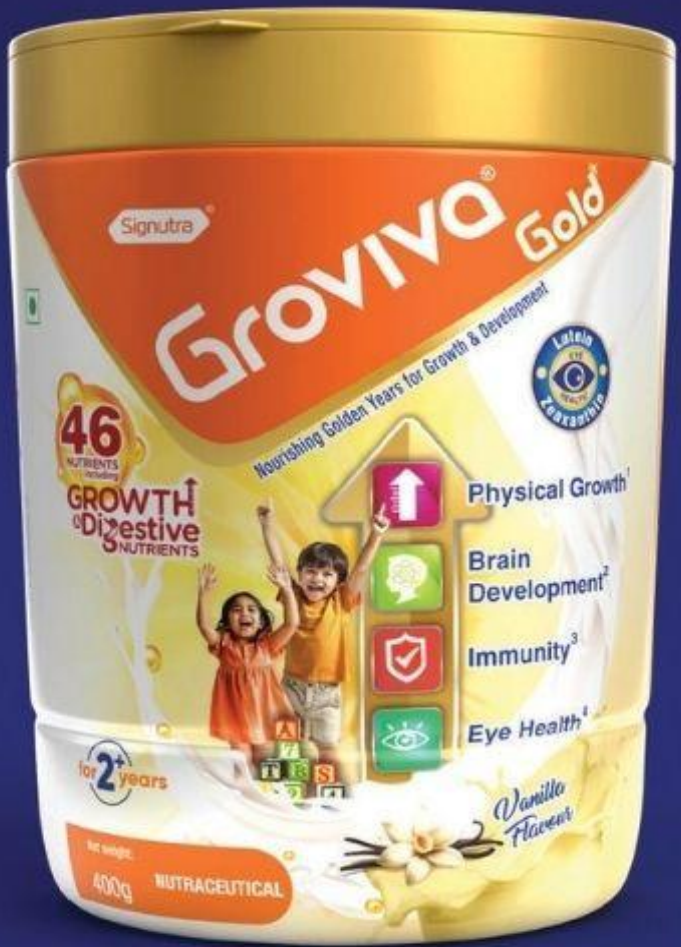

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Table of Contents

Summary Talk

Functional Foods for Endocrine (Hormonal) Health

Dr. Shilpa Varma (M.sc PhD)

Chief nutritionist, Bellevue Multispeciality Hospital, Mumbai

The endocrine system plays a crucial role in regulating various physiological processes, including metabolism, growth, reproduction, and mood. Hormonal imbalances can result in conditions such as diabetes, thyroid disorders, and polycystic ovary syndrome (PCOS). Functional foods, which provide health benefits beyond basic nutrition, can support endocrine health by promoting hormonal balance and reducing inflammation.

Some of the Key Functional Foods for Hormonal Health

Cruciferous Vegetables (Broccoli, Kale, Brussels Sprouts, Cauliflower)

These vegetables contain indole-3-carbinol and sulforaphane, which support oestrogen metabolism and liver detoxification, helping to regulate hormonal balance, particularly in women with oestrogen dominance.

Fatty Fish (Salmon, Mackerel, Sardines)

Rich in omega-3 fatty acids, these fish help reduce inflammation and support the production of hormones like cortisol and insulin. Omega-3s also improve cell membrane function, aiding in hormone transport.

Flaxseeds and Chia Seeds

These seeds are high in lignans and omega-3s, which contribute to hormonal balance by modulating oestrogen levels. Flaxseeds, in particular, help manage symptoms of menopause and PCOS.

Fermented Foods (Yogurt, Kimchi, Sauerkraut, Kefir)

Gut health is closely linked to hormonal balance. Probiotic-rich foods enhance gut microbiota, which plays a role in metabolizing hormones like oestrogen and serotonin.

Nuts and Seeds (Almonds, Walnuts, Sunflower Seeds, Pumpkin Seeds)

These provide essential fatty acids, zinc, magnesium, and selenium, all of which are crucial for testosterone and thyroid hormone production.

Avocados

Rich in healthy monounsaturated fats, avocados support adrenal and reproductive hormone function while also providing fiber, which aids in blood sugar regulation.

Turmeric

Curcumin, the active compound in turmeric, has anti-inflammatory properties that support the endocrine system, particularly in reducing cortisol levels and improving insulin sensitivity.

Dark Leafy Greens (Spinach, Swiss Chard, Collard Greens)

These greens are packed with magnesium, a key mineral involved in stress regulation and thyroid function.

Cinnamon

Helps regulate blood sugar and improve insulin sensitivity, making it beneficial for individuals with metabolic disorders such as diabetes and PCOS.

Berries (Blueberries, Strawberries, Raspberries)

High in antioxidants, berries reduce oxidative stress and inflammation, supporting adrenal and thyroid health.

Bioactives like-

Adaptogenic Herbs: Ashwagandha, Rhodiola, Holy Basil (reduce cortisol and stress)

Magnesium: Found in leafy greens, nuts, and seeds (regulates stress response)

Vitamin C: Citrus fruits, bell peppers (essential for cortisol production and adrenal function)

Phosphatidylserine: Found in soy lecithin and fish (helps regulate cortisol levels)

Iodine & Selenium: Found in seaweed, Brazil nuts, fish (essential for thyroid hormone synthesis)

Zinc & Iron: Shellfish, legumes, red meat (support T3 and T4 hormone conversion)

L-Tyrosine: Eggs, dairy, poultry (precursor for thyroid hormones)

Omega-3 Fatty Acids: Fatty fish, flaxseeds (reduce inflammation and support thyroid function)

Berberine: Found in barberry, goldenseal (improves insulin sensitivity, similar to metformin)

Cinnamon: Ceylon cinnamon (enhances glucose uptake)

Chromium & Magnesium: Nuts, whole grains, leafy greens (help regulate blood sugar)

Fiber & Resistant Starch: Oats, legumes, green bananas (slow glucose absorption)

Conclusion

Incorporating functional foods into the diet can significantly improve endocrine health by regulating hormone production, reducing inflammation, and supporting metabolic functions. A balanced diet rich in these foods, combined with lifestyle changes such as regular exercise and stress management, is essential for maintaining optimal hormonal health.

Neutraceuticals for Women's Health – A Growing Market

Dr. Geeta Dharmatti (M.Sc., PhD RD)

Registered Dietician and Clinical Nutritionist

Women's health is increasingly gaining attention, with a rising focus on nutraceuticals – food -based products offering health benefits beyond basic nutrition. These supplements help address hormonal balance, pregnancy, bone health, gut health, skin and mental well-being across different life stages.

Nutraceuticals bridge the gap between food and medicine, playing a key role in preventive healthcare.

Definition (FSSAI): Any food substance that provides health benefits beyond basic nutrition, including disease prevention.

Categories:

Vitamins & Minerals (e.g., Vitamin D, Calcium, Iron, Folate)

Botanicals & Herbs (e.g., Cranberry, Black Cohosh, Evening Primrose Oil)

Probiotics & Prebiotics (for gut health)

Omega-3 Fatty Acids (for brain, heart, and hormonal health)

Bioactive Compounds (e.g., Isoflavones, Resveratrol)

Women experience unique health challenges at different stages of life, requiring targeted nutrition.

Hormonal changes (puberty, pregnancy, menopause)

Nutritional deficiencies due to menstruation, pregnancy, or aging

Rising awareness of preventive healthcare

Global nutraceuticals market: $454.55 billion (2023), with strong demand for women's health supplements. Key drivers in increased health awareness, urbanization, and lifestyle-related disorders.

Key Health Areas for Women & Nutraceuticals

Health Concern	Key Nutrients
Hormonal Health & Menopause	Phytoestrogens (Soy Isoflavones), Calcium, Vitamin D, Magnesium, Vitamin B6 & B12
Pregnancy & Fertility	Folic Acid, Iron, Omega-3s (DHA/EPA), Choline
Gut Health & Immunity	Probiotics, Prebiotic Fiber, Zinc, Vitamin C
Skin & Hair Health	Collagen, Biotin, Hyaluronic Acid, Vitamin E
Mental Health & Stress	Magnesium, Adaptogens (Ashwagandha, Rhodiola), Omega-3s, B-Complex

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Absorption & Timing of Nutraceuticals

The body absorbs nutrients differently based on timing and combination with other foods.

Nutraceutical	Best Timing	How to Take	Notes
Iron	Morning (Empty Stomach)	With Vitamin C	Avoid with calcium, dairy, tea, coffee
Vitamin B-Complex	Morning	With water	Can cause nausea if taken on an empty stomach
Vitamin C	Morning/Afternoon	With or without food	Enhances iron absorption
Probiotics	Morning (Before Food)	With water	Take 2-3 hours apart from antibiotics
Omega-3s	With Meals	With healthy fats	Supports heart & brain health
Vitamin D	With Meals	With healthy fats	Best with Magnesium, K2, and Calcium
Calcium	Evening	With or without food	Avoid taking with iron or thyroid meds
Magnesium	Evening	With or without food	Helps with relaxation and sleep

Nutraceutical	Best Timing	How to Take	Notes
Collagen	Morning/Afternoon	With coffee, tea, or smoothies	Works best with Vitamin C
Melatonin	Night (30-60 min before bed)	With water	Supports sleep cycle
Zinc	With Meals	With food	Avoid with calcium or iron
Folic Acid/Folate	Morning/Afternoon	With or without food	Essential for pregnancy and hormone health

Challenges and Opportunities

Safety concerns and regulation, Misconformation about efficiency, nutrient -drug interactions. Opportunities are good increasing awareness of women's health, personalized nutrition and scientific advise and growth in online and direct-to consumer sales

Conclusion & Future Outlook

Nutraceuticals play a vital role in women's health by addressing preventive care, hormonal balance, gut health, and skin vitality. However, scientific backing, proper dosing, and professional guidance are essential for safety and efficacy.

Final Takeaway: Choose evidence-based supplements, follow RDA guidelines, and consult health professionals for personalized nutrition plans.

Vitamin D and Calcium Supplementation for Bone Health

Dr. Anuradha Khadilkar, MD, DCH (London), Deputy Director, Hirabai Cowasji Jehangir Medical Research Institute, Jehangir Hospital, Pune

Introduction: Bone health is a crucial determinant of overall well-being, particularly in countries like India, where a high prevalence of vitamin D deficiency (VDD) and inadequate calcium intake is observed across all age groups. Despite abundant sunlight, factors such as cultural practices, environmental pollution, and dietary inadequacies contribute to this deficiency, exacerbating the risk of rickets, osteomalacia, osteoporosis, and fractures.

Interplay Between Vitamin D and Calcium: Vitamin D is essential for calcium absorption and bone mineralization. Low dietary calcium intake can amplify the effects of VDD by disrupting the balance of parathyroid hormone (PTH) and bone metabolism. Research indicates that calcium and vitamin D work synergistically to optimize skeletal health, with dietary sources, particularly dairy-based calcium, proving more effective than pharmacological supplements.

Evidence from Research: Studies in Indian adolescents and toddlers have demonstrated that vitamin D and calcium supplementation significantly improve bone mineral content. However, the benefits are more pronounced when administered during critical growth phases, such as early childhood and adolescence. Moreover, chronic disease conditions, including Type 1 Diabetes Mellitus and thalassemia, further compromise bone health, necessitating targeted nutritional interventions.

Recommendations for Public Health Strategies: To mitigate the widespread deficiencies, a multifaceted approach is required, including:

- **Promotion of Dietary Calcium:** Enhancing intake through dairy and non-dairy sources such as ragi, sesame seeds, and almonds.
- **Vitamin D Supplementation:** Especially for high-risk groups such as pregnant women, lactating mothers, and adolescents.
- **Encouraging Sunlight Exposure:** At least 30 minutes of daily exposure to enhance endogenous vitamin D synthesis.
- **Physical Activity:** Regular weight-bearing exercises to support bone strength.
- **Fortification Policies:** Implementation of vitamin D fortification in staple foods to address widespread deficiencies.

Conclusion

Optimizing vitamin D and calcium intake is essential to prevent skeletal disorders and improve public health outcomes. Strategic dietary modifications, supplementation

programs, and behavioral changes are critical to ensuring long-term musculoskeletal health across different life stages.

Abstract

Theme: Community Nutrition & Health Surveys

A Cross-Sectional Study to Compare Birth Weight And Current Anthropometric Status In Paediatric Population With Congenital Heart Disease

Theme: Community Nutrition and Health Surveys

Achrekar Divya, **Babar Shreya**, Pokar Maitri

Clinical Nutrition and Dietetics Department, SRCC Children's Hospital, Mumbai, Maharashtra.

Background and Rationale: More than 200,000 children with congenital heart disease (CHD) are born in India annually. Malnutrition significantly impacts their health, necessitating targeted interventions. This research helps to identify the trends in birth weight and anthropometric status in these children to enhance care strategies for improved health outcomes.

Aim and Objectives: This research aims to identify trends in birth weights among paediatric patients with congenital heart disease (CHD), evaluate their anthropometric measurements against growth standards, and determine the necessary weight gain for achieving ideal body weight based on age.

Material and Methods: A cross-sectional study at SRCC Children's Hospital, Mumbai, managed by Narayana Health was conducted which focused on children aged 0-18 with confirmed diagnosis of CHD. Children with genetic syndromes and recent major cardiac surgery were excluded. Birth weight was sourced from medical records, while weight and height were measured by trained staff using standardized protocols. Weight-for-age (WFA) and height-for-age (HFA) were calculated using the IAP Growth Chart App, and data was analysed using Microsoft Excel.

Results: The study reveals that 70% of the population had normal birth weight (>2.5kg), while 26% had low birth weight (<2.5kg). While the current anthropometric data with respect to WFA suggests that 62% of the total sample were severely acute malnourished (SAM), and 14% were moderately acute malnourished (MAM). Similarly, HFA of 42% of the total sample were severely stunted and 20% of the total sample were moderately

stunted. Notably, 26% of total sample population fell short of their IBW by 21-30% and 31-40% each, indicating a significant gap in optimal growth according to IAP standards. **Conclusion:** Research findings emphasize that disease burden may hinder standard growth patterns in the children with CHD, despite normal birth weight. Hence, continuous growth monitoring and appropriate nutrition interventions is the need in this population.

Keywords: Congenital heart disease, Birth weight, Anthropometric status, Weight-for-age, Height-for-age.

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Funding Source: NA

From Screens to Spoons: The Influence Of Social Media On Food Choices And Eating Habits Of Adults

Theme: Community Nutrition and Health Survey

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Background: Social media is an integral part of daily life for adults aged 18-30, shaping their food choices and eating habits. Platforms like Instagram, YouTube, and Facebook are filled with food-related content, from influencer endorsements to health campaigns. This age group, navigating independence and lifestyle choices, is highly influenced by these trends. While social media offers valuable health tips and food inspiration, it also poses risks, impacting dietary patterns and overall well-being.

Objective: The present study aimed to identify the types of food-related contents that have the most significant influence on food choices and dietary habits among adults. It also explored the potential connections between social media exposure and the emergence of both healthy and unhealthy eating habits, including the growing popularity of fad-diets and the increased consumption of processed or convenience foods, as well as its impact on overall nutritional status.

Methodology: A self-designed, pretested questionnaire was administered to 218 adults (aged 18-30 years) who actively engage with social media, spending at least one hour per day on platforms such as Instagram, Facebook, YouTube, etc. The study collected data on various aspects, including social media usage (with a focus on engagement with food-related content), food choices and eating habits (exploring the influence of social media on dietary decisions), and nutritional status.

Result: The study findings highlighted a statistically significant correlation between the content participants viewed or the influencers they followed and their food choices ($p<0.005$), indicating that social media had a strong influence on young adults' food choices and dietary habits. Platforms like Instagram and YouTube shaped eating

behaviors through visually appealing content, nostalgia, and trending diets. While many found value in nutritional information, recipes, and restaurant recommendations, social media also posed risks such as impulsive eating, short-term diet adherence, and increased processed food consumption.

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Keywords: social media, Food choices, Dietary habits, Adults

Prevalence Of Hypertension And Its Association With BMI Among College Students: A Gender-Based Analysis

Theme: Community Nutrition & Health Surveys

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Background: Hypertension is a growing health concern among young adults, often linked to lifestyle, overweight, and obesity. In India, its prevalence is rising, with 25% of 13–19-year-olds diagnosed with stage 1 or 2 hypertension (Zaidi & De Ferranti, 2022). Despite being a key cardio-metabolic risk factor, its association remains understudied in Indian college students.

Aims and Objectives: This study aims to assess the prevalence of hypertension among college-going students and explore its association with gender, BMI, and heart rate.

Materials and Methods: A total of 165 college students (104 girls), aged 18-23 years from Mumbai, were selected via purposive sampling. Anthropometric measurements (height, weight, BMI) followed standardized protocols, while blood pressure and heart rate were recorded using Medtech BP Monitor Novacheck BP-18. Data analysis was conducted in Jamovi (Version 2.6).

Results: The mean age of participants was 19.5 ± 1.2 years. 31.6% had elevated SBP (≥120 mmHg) and 21.8% had elevated DBP (≥80 mmHg), while 13.3% had an increased heart rate (>100 bpm). Males had higher SBP (124.3 ± 16.3 mmHg), DBP (77.4 ± 14.7 mmHg), and heart rate (85.7 ± 13.5 bpm) than females. 50.8% of males were overweight or obese. BMI correlated significantly with SBP ($r = 0.465$, $p < 0.001$) and DBP ($r = 0.329$, $p < 0.001$).

Conclusions: The high prevalence of elevated blood pressure and increased heart rate among young adults is alarming, particularly in males, with over 50% being overweight or obese. The strong correlation between BMI and hypertension highlights obesity as a key

risk factor. Early-onset hypertension significantly increases the risk of cardiovascular disease, stroke, and metabolic disorders later in life (Chobanian et al., 2003; AHA, 2017). Urgent lifestyle interventions and regular screenings are crucial to prevent long-term health complications (Ng et al., 2014).

Keywords: hypertension, BMI, obesity, cardiovascular diseases

Funding Source: None

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Use Of Online Food Delivery Aggregator Applications In Adults Aged 25 To 40 Years From Mumbai City

Theme: Community Nutrition & Health Surveys

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Background: There is a stark increase in use of online food delivery aggregator applications (OFDAA) to order food from convenience of home/ office. There is lack of information regarding the use of OFDAA.

Objectives: To assess use of online OFDAA and factors associated with their usage.

Methods: A cross-sectional study was conducted in 200 adults (116 females) with mean age of 30.8±7.5 years. Participants were asked regarding use of popular OFDAA and frequency of ordering using these applications. The reasons for using the OFDAA type of meals ordered and amount of money spent was also inquired.

Results: From 200, 56.5% participants used Swiggy, 48.5% used Zomato, 10% used Uber Eats and 12.5% used Box8 regularly. Most commonly ordered meals were family meals (73.5%), combination meals (67.5%) and value meals (49.5%). Overall, 4.5% used these FDAA less than once/month, 27.5% used them monthly, 47% used them fortnightly, 17.5% weekly, 1.5% alternate day and 2% daily. The average spend per order was Rs 551±451. Males spent slightly more (Rs 616±574) compared to females (Rs 504±330), but the difference was not statistically significant ($p > 0.05$). Convenience (61.5%), pricing (61.5%), technology (26%), speed of delivery (20%) and flexible payment options were common reasons for using OFDAA. Hidden charges (37.5%), non-availability of food

item of choice (31.5%), payment issues (22.5%) and high charges (19.5%) were the most common reasons for unpleasant experiences with OFDAA.

Conclusion: All study participants had at least one OFDAA on their phone with major market share dominated by 2 companies. Usage of OFDAA is very high with at least 50% using them once/ week. Owing to increasing usage of OFDAA and also the unhealthy lifestyles, it is important to raise more awareness regarding home cooked meals and disadvantages of ordering using OFDAA.

Keywords: Online Food Delivery Aggregator Application (OFDAA), Consumer behavior, Spending Patterns, Convenience Factors, Home cooked meals awareness.

Funding source: None.

References: Jadhav, S., Titus, R., Babu, T., & Chinnaiyan, R. (2023). Evaluation of consumer behavior regarding food delivery applications in India.
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Self-Reported Quality Of Life Of Elderly Aged 60-80 Years From Thane City – a Pilot Study

Theme: Metabolic Disorder, Risk Assessment & Prevalence

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Background: Quality of Life (QoL) is a crucial indicator of effective or healthy aging since it is a measure of overall welfare that takes into account both positive and negative aspects of life. QoL is a key indicator of health status.

Objectives: To access the Quality of life of elderly aged 60 – 80 years from Thane city.

Methods: A cross-sectional, pilot study was conducted in 60 elderly. Weight, height, was measured and body mass index (BMI) was calculated. QoL was assessed using Older People Quality of Life Questionnaire (OPQoL). OPQoL has 35 questions divided in eight subdomains: overall (n=5), health (n=4), social relation (n=5), independence, control over life and freedom (n=4), home and neighbourhood (n=4), psychological and emotional well-being (n=4), financial independence (n=4) and leisure activities (n=6). Each question is scored from 1 to 5. Scores were summed to calculate the score for each domain as well as the score for OPQoL.

Results: The mean age was 70.2±3.4 years, weight was 65.4±10.2 kg and BMI was 25.5±10.1 kg/m^2. 3.3% were underweight, 23.3% were overweight and 50% were obese. The mean score for overall was 20.4±1.8 [total possible score (tps) =25], health was 14.8±1.9 (tps=20), social relation was 22.4±2.7 (tps=25), independence, control over life and freedom was 15.7±1.6 (tps=20), home and neighborhood was 18.4±2.0 (tsp=20),

psychological and emotional well-being was 18.2±1.8 (tps=20), financial independence was 15.7±2.2 (tsp=20) and leisure activities was 25.2±2.8 (tps=30). Total OPQoL was 151.6±11.7 (tps=175). No significant difference in scores when classified according to BMI categories or gender ($p>0.05$).

Conclusion: Scores for all subdomains of OPQoL as well as overall OPQoL was extremely high and very close to the total possible average for the domain indicating extremely poor QoL in elderly from Thane City. Study with larger sample size is needed to establish association with metabolic health.

Keywords: Elderly, Quality of life, OPQoL

Funding source: None

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Correlation Of Caffeine Intake And Stress In Females Aged 20-40 Years From Mumbai, India

Theme: Community Nutrition & Health Surveys

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Background: Coffee/ tea, rich sources of caffeine, are the most commonly consumed beverages in India. There has been an exponential increase in stress levels over the last few decades. Caffeine intake and stress levels are known to be correlated to each other.

Objectives: To assess the correlation of caffeine intake with stress in females aged 20-40 years from Mumbai India.

Methods: A cross-sectional study was conducted in 240 females aged 20-40 years. Caffeine intake would be assessed using a semi-quantity questionnaire of foods rich in caffeine. Stress levels measured using Perceived Stress Scale (Cohen et al, 1983).

Results: From 240 females, 84 did not drink tea, 39 had 1 cup tea/day, 95 had 2 cups tea/day, 10 had 3 cups tea/day and 12 had 4 cups of tea/ day; 176 did not drink tea, 48 had 1 cup coffee/ day and 16 had 2 cups coffee/day. Other sources of caffeine included chocolate preparations, carbonated beverages, and energy drinks. Eleven females had no caffeine intake in their diet. The minimum caffeine intake was 5.6 g/day and maximum intake was 173.1 mg/day and mean intake was 75.2±46 mg/day. Based on Perceived Stress Scale, 24 (10%) had slightly lower levels of stress, 22 (9.2%) had average stress, 95 (39.6%) had slightly higher stress and 99 (41.3%) had much higher levels of stress. Number of cups of coffee/ day was negatively correlated with stress levels (r_s=-0.240,

p=0.001), however, no such correlation of number of cups of tea was observed with stress (r_s=0.047, p=0.467). Total caffeine intake was also significantly negatively correlated with stress levels (r=-0.180, p=0.005).

Conclusion: Tea was more commonly consumed beverage as compared to coffee. Very high prevalence of stress is observed in females in the current study. Caffeine intake was negatively correlated with stress levels.

Keywords: Stress, Caffeine, Tea, Coffee, Correlation

Funding source: None

Reference:

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Meal Pattern Of Nurses Working In A Tertiary Care Hospital From Mumbai City

Theme: Community Nutrition & Health Surveys

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Background: Shift work, common in healthcare, disrupts daily routines, including eating habits and nutrition. Nurses working in rotating shifts often face irregular eating patterns and difficulty in consuming balanced and nutrient-dense meals due to inconsistent schedules.

Objectives: To analyse meal pattern of nurses working in tertiary care hospital from Mumbai city.

Methods: A survey was conducted in 120 nurses aged 20 to 60 years working in a tertiary care hospital in Mumbai city. A structured questionnaire was used to assess meal patterns and dietary preferences of nurses. Healthy Eating Assessment Tool (HEAT) tool was used to assess dietary adequacy in terms of consumption of various food groups.

Results: Overall, 23.3% consumed 1-2 meals/day, 28.3% consumed 3-4 meals/day, 21.7% consumed 5-6 meals/day and 26.7% consumed more than 6 meals/day. 48.3% nurses reported to skipped meals regularly; 21.7% skipped breakfast daily where as 20% skipped breakfast 3-4 times/ week. Stress (48.3%), lack of time (51.7%), late work hours (53.3%), food not ready (41.7%) and no break during office hours (48.3%) were most common reasons for skipping meals. From 120 nurses, 51.7% carried tiffin with them whereas 48.3% did not carry tiffin. Nurses who did not carry tiffin either at hospital

canteen or ordered food online. Based on the HEAT tool, 0.8% nurses needed improvement in their dietary habits, 43.3% had fair dietary habits, 54.2% had good dietary habits and 1.7% had excellent dietary habits in terms of consumption of various food groups.

Conclusion: The dietary habits and meal patterns of nurses were average with large percentage of nurse skipping meals or eating out daily. However, consumption of various food groups seemed fairly adequate amongst nurses. Awareness sessions need to be planned for nurses to improve their dietary habits and meal patterns.

Keywords: Nurses, Meal Patterns, Dietary Habits

Funding source: None

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Food Waste Composition And Strategies Adopted To Reduce Food Waste By Women Aged 25 To 50 Years From Mumbai City

Theme: Community Nutrition & Health Surveys

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Background: Reducing the amount of wasted food is a key element in developing a sustainable food system. The wastage of food occurs at all stages of the food life cycle, starting from harvesting, through manufacturing and distributing and finally consumption, but the largest contribution to food waste occurs at home.

Objectives: To understand type of food wasted at home and strategies adopted to reduce food wastage in a metropolitan city like Mumbai.

Methods: A survey was conducted in 300 women aged 25 to 50 years from Mumbai. Behaviour and attitude regarding food waste management would be collected using a pre-validated tool by Ghinea and Ghiuta 2017 and questionnaire used by Ahmed et al 2021.

Results: Ocwell 112 (37.3%) reported that they regularly had food waste. Composition wise 22% reported fruits, 26.7% reported vegetables, 21.4% reported bread, 5% reported eggs, 18.3% reported milk, 17.7% reported sweets and 21.6% reported homemade composite meals contributed fair to large amounts of food waste. Reasons for food wastage included lack of ability to cook (20.7%), expiry date surpassed (42.3%), made similar food in week (18.3%), improper storage (38.7%), dislike for taste (31%), improper packaging (12%), forgot about purchased food (34.7%), food looked bad (36%), stayed in

fridge for too long (51.7%). The most common strategies adopted to reduce food waste included cooking small amounts of food (53.3%), consume leftovers (38.7%), prioritizing leftover food over fresh foods (38.3%), utilizing leftover foods in future meals (36.7%) and freezing (46.3%). Overall, 32% had tried food composting and 64.3% separated dry and wet waste whereas 72.3% purchased only necessary fresh food to avoid wastage.

Conclusion: A large amount of food is wasted in modern Indian metropolitan household with sub-optimal strategies to control food waste. Awareness programs need to be developed regarding strategies to reduce food waste.

Keywords: Food waste, strategies to reduce waste, food waste composition

Funding source: None

Reference:

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Assessment Of Knowledge, Attitude, Practices (KAP), And Dietary Patterns Among Women School Teachers In Mumbai

Theme: Community Nutrition and Health Surveys

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Background: Women school teachers play a crucial role in shaping students' behaviors, yet their nutrition knowledge and dietary habits remain underexplored. Poor dietary choices and limited nutrition awareness can affect their well-being and ability to promote healthy eating among students. Assessing their knowledge, attitudes, and practices (KAP) and dietary patterns is essential for identifying gaps and improving health interventions.

Aim: This study aimed to assess KAP related to nutrition and dietary patterns among women school teachers and identify key areas for improvement.

Objectives: To evaluate nutrition knowledge, attitudes, and dietary practices among female teachers using a KAP questionnaire and To analyze dietary consumption patterns using a Food Frequency Questionnaire (FFQ) and identify nutrient intake gaps.

Materials and Methods: The study included 100 female teachers from two schools in Mumbai. A KAP questionnaire with six questions each regarding balanced diets, meal frequency, protein intake, hydration, food label reading, and portion control was administered. The FFQ assessed cereal consumption, nuts and oilseeds consumption, fruit and vegetable intake, protein sources, processed food intake, and sugar consumption.

Results: The KAP findings showed significant gaps in nutrition knowledge, with only 40% correctly identifying balanced diet components. 62% ate breakfast 2–3 times per week,

and 44% occasionally read nutrition labels, indicating limited food awareness. FFQ results revealed low fruit and vegetable intake (46%), a diet dominated by refined cereals, and inconsistent protein consumption.

Conclusion: The study highlighted critical gaps in nutrition awareness among female teachers. Encouraging better meal planning, increased whole grain and protein intake, and improved hydration can enhance their well-being.

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Key Words: Nutrition Knowledge, Dietary Patterns, Women School Teachers, KAP

Comparison Of Nutrient Adequacy Ratio Between Urban And Rural Women From Pune City, Western India

Theme: Community Nutrition & Health Surveys

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Background: Nutritional status varies between urban and rural populations due to differences in diet, lifestyle factors, socio-economic status, food availability and accessibility. This study aims to compare the nutritional adequacies among women from urban and rural areas around Pune city.

Methods: This study included 398 women, 182-Urban and 216-Rural, residing in Pune city and nearby villages. Data collected included anthropometry (height, weight, BMI), 24-hr dietary recall, and socio-demographic information. BMI was categorized as per WHO guidelines. Nutrient intake (energy, protein, fat, carbohydrate, calcium, iron, zinc, vit C, phosphorus) was calculated from dietary intakes using C-diet software. Nutrient Adequacy Ratio (NAR) was calculated based on RDA and nutrient intake adjusted for 1000 kcal energy. NAR >70% was considered as adequate nutrient intake.

Results: Urban and rural women had a mean age of 52.7±7.6 and 53.2±7.5 years, respectively. Rural women had a lower BMI (24.7±4.7 vs. 27.6±4.2 kg/m^2, $p<0.05$), with lower prevalence of overweight (30% vs. 39%) and obesity (14% vs. 28%) than urban women. The NAR for carbohydrates and fats was >70% in all women. Protein intake was adequate in urban, but inadequate in rural women (79.4% vs 56.5%, $p<0.05$). Micronutrient intakes (calcium, zinc, iron, vitamin C) except phosphorus, were below 70%, in both urban and rural women with greater inadequacies in rural women. No significant NAR differences were found between urban pre- and post-menopausal women, but rural post-menopausal women had lower NAR for protein, calcium, and vitamin C.

Conclusion: While carbohydrate and fat intakes were adequate among all participants, protein intake was significantly lower in rural women. Micronutrient intakes were inadequate in both groups, with greater inadequacies in rural women. Post-menopausal rural women had lower protein, calcium, and vitamin C intake, highlighting their nutritional vulnerability and need for targeted dietary interventions.

Funding: This study was supported by an intramural grant from Hirabai Cowasji Jehangir Medical Research Institute, Jehangir Hospital Pune.

Keywords: Nutritional adequacy, NAR, urban-rural, post-menopausal, India

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To Study The Factors Associated With Premenstrual Syndrome In Young Adults Aged 15-23 Years Old – A Cross-Sectional Study

Theme - Community Nutrition and Health Survey

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Background: Premenstrual Syndrome (PMS) is a prevalent condition among young women, characterized by physical, emotional, and behavioral symptoms during the luteal phase of the menstrual cycle. The exact etiology of PMS remains unclear, but hormonal fluctuations, neurotransmitter imbalances, and lifestyle factors may contribute.

Aims and Objective: This study aims to investigate the factors associated with PMS among young adults aged 15-23 years, with a focus on sleep patterns, physical activity, stress levels, and symptom severity.

Materials & Methods: A cross-sectional study was conducted among 100 young females in Mumbai using a purposive convenience sampling method. Validated questionnaires assessed sleep (Athens Insomnia Scale), stress (Perceived Stress Scale), and PMS severity (Premenstrual Symptoms Screening Tool). Anthropometric measurements were recorded. Data were analyzed using social science statistics software, employing descriptive statistics and chi-square tests to examine associations.

Results: Significant associations were found between PMS severity and multiple factors. Perceived stress exhibited a strong correlation with PMS ($p = 0.027$), indicating that higher stress levels increase PMS severity. Sleep disturbances were significantly linked

to PMS ($p = 0.001$), with moderate and severe insomnia strongly associated with severe PMS.

Conclusion: This study highlights the strong association between PMS and modifiable lifestyle factors such as sleep and stress. Addressing these factors may help in the management of PMS symptoms.

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Keywords: Premenstrual Syndrome, physical activity, stress, sleep, young adults

Funding Source: None

Dietary Consumption Patterns Of Fruits And Vegetables In Preschoolers

Theme: Community Nutrition and Health Surveys

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Background: Since early childhood is an important phase for growth and development, it is crucial to understand the fruit and vegetable consumption pattern of preschool-aged children. Chronic illnesses such as heart disease and certain cancers can be prevented if there is sufficient amount of fruits and vegetables intake.

Aim and Objectives: The aim was to study the dietary consumption patterns of fruits and vegetables in preschool-aged children. With entailed objectives to assess the nutritional status of preschoolers, understanding the knowledge, attitude and practice of parents along with examining whether the participants consume an appropriate amount of fruits and vegetables each day by ICMR recommendation.

Materials and Methods: The present study was a cross-sectional survey conducted in Mumbai. After ethical clearance, CTRI registration, 200 preschool aged children (3-5 years age) were selected for study. Informed consent was obtained from schools and participant's parents. KAP, diet about preschoolers was formulated by the investigators was administered for the parents, anthropometric measurements and KAP surveys for parents were collected through a structured questionnaire. Using NCHS references the nutritional status was assessed and fruits and vegetables intake was compared with ICMR recommendation to analyse the adequate intake among the participants. Data analysis was performed using SPSS software to evaluate the dietary pattern and health status.

Results: The study finding for nutritional assessment revealed that majority of the participants were having normal weight for age(55%) and height for age (64%). Frequent illnesses like common cold, diarrhoea and constipation were also reported by parents and the visits to dentists were more common among the boy's population. The KAP

revealed that majority of the parents were aware about the benefits of fruits and vegetables consumption and also the availability and accessibility of fruits and vegetables was very common and many of the children's were consuming fruits and vegetables in their daily diet. The KAP revealed various eating behaviours among the participants and also the attitudes of both parents and children towards the fruit and vegetables consumption which highlighted that parents were successful at developing healthy eating habits among children but they were lacking in modelling the daily consumption behaviour. The consumption pattern revealed that majority of the participants (92%) were meeting the requirements given by ICMR for fruits whereas only 11% were meeting the requirements for vegetables given by ICMR.

Conclusion: Although the consumption of fruits was adequate, vegetables intake was not in accordance with the ICMR recommendation. The significance of early dietary intervention was shown by the nutritional gap, particularly in vegetable intake and risk of undernutrition.

Key Words: Preschooler, ICMR, Fruits and Vegetable, Common Cold, Dental Visit

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Importance Of Breakfast On Academic Performance Amongst Girl Students 18 – 25 Years Studying In SMES Campus

Theme: Community Nutrition & Health Surveys

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Introduction: Breakfast is essential for energy replenishment and cognitive function, positively impacting memory, attention, problem-solving, and academic performance. A balanced breakfast (25–30% of daily energy intake) with carbohydrates, proteins, healthy fats, and micronutrients supports brain function, stabilizes glucose, and aids neurotransmitter production. In contrast, skipping or consuming an unbalanced breakfast can lead to poor concentration, lethargy, and reduced academic performance.

Objectives: To evaluate the breakfast choices using a 3 day breakfast diet record and eating habits of young adults aged 18 to 24 studying in SMES campus, To evaluate the academic performance of the participating students using the Report card (Unit test & Semester exams).

Methodology: The Institutional Ethics Committee of Seva Mandal Education Society gave its ethical approval for this cross-sectional study, which was conducted at Dr. BMN College and MMP Shah College. After eliminating 20 students with insufficient data, 200 students (18–25 years) were added, allowing for the Dietetics department to be excluded to prevent bias. A semi-structured interview for qualitative understanding and a standardized questionnaire on demographics, education, and breakfast attitudes were used to gather data. Meal quality and composition were assessed using a 3-day breakfast recall, with special focus paid to consumption patterns and their relevance to learning and health.

Results: This research examined the impact of breakfast on the study performance of 18-25-year-old female SMES campus students. The results indicated that 50.5% of individuals consumed breakfast daily, and 6.5% did not eat it, and that cereal foods (55.5%) and tea/coffee (43.5%) were the most commonly consumed foods. The largest barriers were oversleeping (22%) and lack of time (53%). There was a noteworthy disparity ($p=0.0037$) in academic achievement as defined by unit exams (66.8 ± 8.68) and semester exams (63.6 ± 8.87). Inadequate intake, potentially, could have impacted cognition and academic achievement. These findings agree with previous studies connecting good breakfasts to better memory, concentration, and performance.

Conclusion: This research emphasizes the need for breakfast in supporting cognitive function and academic achievement in female students (18–25) at SMES campus. A healthy breakfast enhances memory and attention, whereas missing breakfast causes fatigue and lack of focus. Results indicate that irregular breakfast consumption and suboptimal nutrition are associated with poorer semester exam performance because of greater cognitive load. Specific nutritional interventions are required to induce healthy breakfast consumption and maximize academic performance.

Keywords: Breakfast consumption, Nutritional composition, Academic performance, nutrient intake, Cognitive function, Exams, Breakfast habits

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Assessment Of Nutritional Knowledge, Attitudes, And Dietary Practices Among Senior Citizens residing In An Old Age Home : A Structured Nutrition Education Approach

Theme: Community Nutrition & Health Surveys

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Background: Aging leads to physiological and lifestyle changes impacting nutritional needs. Despite structured care and meal provisions in old-age homes, factors such as personal food preferences, cultural beliefs, limited nutrition awareness, and age-related changes contribute to suboptimal dietary habits. Misconceptions, ingrained eating behaviors, and restricted autonomy over food choices further hinder adherence to healthy eating patterns.

Aims and Objectives: To assess the baseline knowledge, attitude, and dietary practices of senior citizens residing in an old-age home and create awareness through a structured nutrition and lifestyle education program.

Materials & Methods: A single-center cross-sectional study was conducted at an old-age home in Mira-Bhayandar, India, with 120 elderly residents (≥60 years). Data collection included a structured Knowledge, Attitude, and Practice (KAP) questionnaire and anthropometric measurements (height, weight, and BMI). A structured Nutrition and Lifestyle Education Program was implemented, consisting of three interactive sessions covering fundamental geriatric nutrition principles, age-specific dietary needs, food choices and dietary and lifestyle modifications for healthy aging. Educational tools such as PowerPoint presentations, posters, and food models were used. Descriptive statistics (means, percentages) and the Chi-square test were applied to analyze demographic and KAP data.

Results: Baseline assessment revealed limited nutrition knowledge, misconceptions about food myths, hydration, and protein intake. Irregular meal patterns, meal skipping, inadequate fiber, dairy, and protein intake, and excessive salt and refined carbohydrate consumption were common. A high prevalence of overweight and obesity, particularly among females, was observed. The education program improved awareness of balanced diets and lifestyle modifications as evidenced by increased participant engagement, but long-term behavioral change requires further evaluation.

Conclusion: Despite structured care, elderly residents in old-age homes exhibit gaps in nutrition knowledge and inconsistent dietary practices. The nutrition and lifestyle education program effectively enhanced awareness, emphasizing the need for continuous education and behavioral reinforcement for sustained dietary improvements.

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Keywords: Elderly nutrition, knowledge-attitude-practice, institutionalized elderly, nutrition education, dietary habits.

Dietary Patterns, Dietary Diversity, And Weight Status Among Adolescents In Mumbai

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Background: Adolescence is a critical period of growth and development, during which adequate nutritional intake is of utmost importance to prevent malnutrition including both undernutrition and overnutrition. Dietary intake and diversity therefore play a key role in meeting macronutrient and micronutrient needs. This study explores the association between dietary intake, dietary diversity, and weight status among adolescents in Mumbai. (Sinai et al., 2021)

Aim and objective: This study aims to assess the association between dietary intake, dietary diversity, and weight status among adolescents in Mumbai.

Materials and Methods: This cross-sectional study was conducted among 200 adolescents (105 females and 95 males) aged 10-19 years in Mumbai. Participants were selected using purposive sampling, and informed consent was obtained from them. Dietary intake and food preferences were assessed using a 24-hour dietary recall and FFQ to evaluate food consumption patterns and dietary diversity. Height (cm), weight (kg), waist circumference (cm), and hip circumference (cm), were measured and BMI, WHR and WHtR were calculated using these measurements. Statistical analysis (t-test and one way ANOVA) were carried out to examine the association between dietary intake, dietary diversity, and weight status of the study participants.

Results: In the present study it was observed that despite moderate dietary diversity, overall nutrient intake remained inadequate, particularly among younger adolescents. The correlation between dietary diversity and weight status was weak and statistically insignificant, suggesting that other lifestyle factors may influence BMI. These findings emphasize the need for targeted nutritional interventions to promote balanced diets and

improve overall adolescent health. Future research should explore additional determinants of weight status beyond dietary diversity to develop more comprehensive health strategies.

Conclusion: These findings emphasize the need for targeted nutritional interventions to promote balanced diets and improve overall adolescent health. Future research should explore additional determinants of weight status beyond dietary diversity to develop more comprehensive health strategies.

Keywords: Adolescents, Dietary Intake, Dietary Diversity, Weight Status.

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Consumption Of Caffeine And Caffeinated Beverages And Its Impact On Sleep Quality Among Middle Aged Adults 40-60 Years In Mumbai

Theme: Community Nutrition & Health Surveys

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Background: Often used to improve alertness and cognitive function, caffeine is a psychoactive substance that can be found in a variety of beverages, including tea, coffee, and energy drinks. However, excessive caffeine consumption has been linked to sleep disturbances, such as delayed sleep onset and reduced sleep quality. Given the prevalence of caffeine consumption, it is important for public health to understand how different caffeine sources affect sleep quality.

Objective: To compare the impact of varying caffeine sources, such as tea, coffee, and energy drinks, on sleep quality in the population.

Methods: A cross-sectional study with 150 participants (75 male and 75 female) living in Mumbai between the ages of 40 and 60 was carried out. Purposive sampling was utilised in the selection of participants. The Pittsburgh Sleep Quality Index (PSQI) was used to measure sleep quality, and a semi-quantitative food frequency questionnaire was used to get specific information about caffeine use patterns.

Results: The effects of various caffeine sources on the quality of sleep varies. Sixty-five percent of tea drinkers reported mild to moderate sleep disturbances, thirty percent said it had no effect at all, and five percent reported severe disruptions. Coffee drinkers reported moderate to severe sleep problems on 80% of occasions, mild impacts on 15%, and no effect on 5% of occasions. Energy drink consumers had the most severe sleep

disturbances, with 90% reporting serious problems, 8% mild impacts, and only 2% no change. Tea has the least detrimental influence on sleep quality, whereas coffee and energy drinks have the biggest, according to this research. Therefore, to maintain better sleep quality, people who are sensitive to caffeine or have trouble sleeping should limit their intake, especially of coffee and energy drinks, especially in the evening.

Conclusion: The effects of caffeine on sleep quality vary; energy drinks disrupt sleep the most, followed by coffee, while tea has the least impact. People should limit their caffeine use, notably from coffee and energy drinks, especially in the evening, to enhance their quality of sleep.

Keywords: Caffeine consumption, tea, coffee, gender differences, demographic patterns, beverage preferences

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The Association Between Food Preferences, SES, Dietary Diversity And Nutrient Intake Adequacy Of College Going Students In Mumbai

Theme: Community Nutrition and Health Surveys

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Background: Food choices of college-going students are influenced by socioeconomic status (SES), lifestyle, and eating habits, affecting nutrition and health. This study examines how SES, food preferences, and dietary diversity impact nutrient intake of college-going students in Mumbai.

Aim & Objectives: To study the association between food preferences, SES, dietary diversity and nutrient intake adequacy of college going students in Mumbai.

Materials & Methods: A cross-sectional study was conducted with 200 students (135 females and 65 males) between the aged 16–22 years old. Informed consent was obtained from all participants. The data on food habits, SES, and dietary patterns were collected using a questionnaire and food frequency assessment.

Result: The study found that college-going students belonging to the higher SES had better dietary variety, while students from the lower SES relied more on staple foods. Non-vegetarians had higher protein intake but ate more highly processed foods. Additionally, 75% had normal BMI, while 18% were underweight.

Conclusion: This study found that SES is an important determinant of dietary diversity and quality among college-going students highlighting the fact that nutrition education may help in making better food choices for better health outcomes in this age group.

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Keywords: Food Preferences, Socioeconomic Status (SES), Processed Foods, Nutrition Awareness

Knowledge, Attitudes And Practices Regarding Sodium- Containing Foods Among Males And Females: A Comparative Study

Theme: Community Nutrition and Health Surveys

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Background: Excess sodium intake is a major risk factor for hypertension and cardiovascular diseases. Understanding public knowledge, attitudes, and practices (KAP) regarding sodium consumption is crucial for designing effective dietary interventions.

Aims and Objectives: This study aimed to assess the knowledge, attitude, and practices related to sodium-containing foods among male and female participants and to determine gender differences in sodium awareness and consumption habits.

Materials and Methods: A cross-sectional survey was conducted using a self-made questionnaire covering knowledge, attitude, and practices regarding sodium intake. The responses were analysed using the Chi-square test to identify significant associations between gender and sodium-related awareness and behaviours.

Results: Most participants were aware that salt contains sodium (Male: 86%, Female: 93%) and that sodium is present in food (Male: 90%, Female: 91%). However, only 2% of males and 19% of females knew that 1 gram of salt contains 387 mg of sodium (p=0.00). Knowledge of recommended dietary sodium intake was also low. Attitudinal responses revealed misconceptions, such as the belief that sodium is only present in salt and that sodium restriction applies only to hypertensive individuals. In practice, 43% of males and 25% of females read food labels before purchase (p=0.01), while 60% of males and 52% of females primarily consumed home-cooked meals. A significant proportion regularly consumed high-sodium foods like bakery products, chips, and restaurant meals.

Conclusion: The study highlights gaps in knowledge and misconceptions regarding sodium intake, particularly in dietary recommendations and sodium sources. Although participants showed some awareness, their dietary practices did not always align with sodium reduction guidelines. Targeted education and policy interventions are necessary to improve sodium-related health behaviours.

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Keywords: Sodium intake, dietary practices, awareness, processed foods, hypertension

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Identification Of Chronotypes And Dietary Patterns In Female College-Going Students Aged 18-23 Years

Theme: Community Nutrition and Health Surveys

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Background: Young adulthood, particularly between the ages of 18 and 23, is marked by significant physiological, psychological, and lifestyle changes. Female college students often experience shifts in sleep patterns, social behaviors, and dietary habits, which influence overall health and well-being. Chronotype plays a crucial role in shaping dietary habits, mental health, and lifestyle, making its identification essential for developing targeted health interventions. This study aimed to identify the chronotype and assess the dietary patterns of female college students aged 18 to 23 years.

Aim: To identify the Chronotype and assess the dietary pattern of female college students aged 18-23 years

Objective: To identify the chronotype of female college students using a morning eveningness questionnaire, To assess the dietary patterns of female college attendees using the Food Frequency Questionnaire.

Materials and Methods: A cross-sectional study was conducted in Mumbai with a sample of 120 female participants. Data collection involved a structured questionnaire covering demographic details, dietary patterns assessed using a Food Frequency Questionnaire, and chronotype identification using the Morning-Eveningness Questionnaire (MEQ).

Result and discussion: The results showed that 70% of participants belonged to the intermediate chronotype category. Most participants (51.7%) were Muslim, and the mean BMI was recorded as 23.02 ± 3.02. Tea and coffee were the most commonly consumed beverages, while cereals, pulses, and vegetables formed the staple diet.

Although no significant association was found between chronotype and dietary habits, a significant relationship was observed between chronotype and physical activity.

Conclusion: These findings highlight the importance of considering chronotype when addressing lifestyle behaviours in young adults, particularly about physical activity. Further research is needed to explore other factors influencing dietary habits and their potential links to chronotype

Keywords: Chronotype, Morningness-Eveningness, Assess, Food frequency questionnaire.

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Assessment Of Body Image And BMI Of Female Adolescents In Byculla Municipal Area, Mumbai

Theme: Community Nutrition and Health Surveys

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Background: Adolescence is a delicate phase of life. Adolescent girls in India often struggle with body image issues, which can contribute to unhealthy eating behaviors and malnutrition. In India, body image concerns are similarly spread widely. Body image perception, influenced by factors such as BMI and subjective body size evaluations, plays a critical role in understanding body dissatisfaction and distortion.

Aim and Objective: To assess the body image and evaluate BMI of female adolescents in Byculla Municipal Area, Mumbai using Stunkard FRS.

Methodology: A cross-sectional study was conducted among 288 females aged 14-17 years. BMI was calculated. Participants were asked to select their current figure and ideal figure from the Stunkard FRS. Statistical analysis included Spearman's correlation to evaluate the relationship between BMI and CF and one-sample t-tests for distortion scores. Results were considered significant at $p < 0.05$.

Results and Discussion: A strong positive correlation between BMI and CF selection suggests that participants with higher BMI tend to perceive themselves as larger. Analysis of distortion score indicates, mean score significantly greater than zero. This finding highlights a tendency among participants to overestimate their body size relative to their actual BMI.

Conclusion: These results aligned with previous studies emphasizing the prevalence of body image distortion in populations experiencing societal pressures related to weight

and appearance. Such findings underscore the need for targeted interventions to improve body image accuracy and reduce dissatisfaction. Future research may help correlate dietary intake and body composition associated with negative body image perceptions.

Keywords: BMI, female adolescents, body image, stunkard figure rating scale.

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Association Of Chrononutrition And Metabolic Health Among Young Adults (20-30 Years) In Mumbai

Theme: Community Nutrition and Health Surveys

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Background: Urbanization has led to misalignment in the dietary habits and circadian rhythm, contributing to the increased risk of metabolic disorders. Chrononutrition explores the interaction between meal timing, frequency, and regularity with human circadian rhythm.

Aim and Objective: To find the association between chrononutrition and metabolic health among young adults (20 -30 years) in Mumbai by assessing meal time, meal frequency and nutritional status and identifying chronotype and chrononutrition of the study participants.

Methodology: This cross-sectional analytical study was conducted in Mumbai among 200 young adults (100 males, 100 females) aged between 20-30 years. Participants were selected using purposive sampling, and informed consent was obtained from them. Participants included private and public sector employees, and students. Data collection involved eliciting information regarding demographics and dietary habits. Anthropometric measurements taken included height, weight, waist circumference and hip circumference, BMI, WHR, and WHtR were calculated using these measurements. Chronotype assessment was done using the Munich Chronotype Questionnaire and chrononutrition was assessed using meal timing and meal frequency information. Statistical analysis was performed using SPSS (version 25), and Fischer Exact Test and Chi-Square Test were used to study the associations between the variables.

Result: Results showed that 38.5% had an extended eating window, 35% a moderate eating window, and 26.5% a short eating window. Chronotype assessment classified 34% as intermittent, 33.5% as late, and 32.5% as early chronotype. Chi-square analysis revealed significant associations between chrononutrition and BMI ($p<0.05$), waist circumference ($p<0.05$), waist-to-hip ratio ($p<0.05$), waist-to-height ratio ($p<0.05$), and neck circumference ($p<0.001$). As these anthropometric measurements are indicators of adiposity, the findings highlight the impact of meal timing on metabolic health.

Conclusion: The study findings suggest that eating patterns, including meal timing and meal frequency, could be an important factor influencing metabolic health of individuals underscoring the need for chrononutrition-based dietary interventions to improve long term health outcomes.

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Key words: Chrononutrition, Metabolic disorders, Metabolic health parameters, Chronotype

Association Of Nutritional Status With Sleep Quality Of Middle Adolescent Girls (14-17 Years Old)

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Background: Sleep plays a key role in our life as it is essential for the proper functioning of the body, including development, immune function, psychological state, and overall well-being. India ranks eleventh worldwide with an average of 7.1 hours of sleep per night. There are various factors that affect sleep quality including digital exposure, dietary habits, physical activity, stress, etc. Sleep quality also influences the risk of future health problems. Therefore, this study focuses on finding an association between nutritional status and the sleep quality of middle adolescent girls in a suburb of Mumbai.

Aim: The aim is to understand the sleep quality and nutritional status of middle adolescent girls.

Material and Methods: This cross-sectional study was conducted among 200 school going middle adolescent girls aged between 14-17 years old in Byculla area Mumbai. Data was collected using a questionnaire that consisted of Pittsburgh sleep quality index (PSQI) and anthropometric measurements including height, weight and waist circumference were taken. Demographic information (age and socio-economic status) was also collected.

Results and discussion: There was approximately an equal distribution of girl children aged 14, 15 and 17 years. The majority of girl children studied in this study has a normal BMI and a normal WThR which indicated that they had a lower risk of future health conditions related to adiposity. It was found that 66 % of girl children had good quality of sleep whereas only 34 % of them had poor sleep quality.

Conclusion: Sleep quality did show correlation with nutritional status. Some children had poor sleep quality and central adiposity was found in them, which should be considered when planning interventions. Also there was no association found between the sleep quality and electronic device usage and exercise.

Keywords: middle adolescent girls, sleep quality, Pittsburgh Sleep Quality Index, nutritional status, waist to height ratio

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Knowledge, Attitude, And Practice (KAP) Study On Maternal Feeding Practices For Infants And Young Children In Mumbai

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Background: Undernutrition remains a critical public health concern in India, contributing to elevated morbidity, mortality, and developmental deficits in children under five. Despite economic progress, high prevalence rates of stunting, wasting, and underweight persist, primarily due to inadequate dietary intake, suboptimal infant and young child feeding (IYCF) practices, and recurrent infections. Maternal knowledge, cultural beliefs, and socioeconomic factors significantly influence feeding behaviors, impacting child nutrition and growth.

Aim and Objectives: This study aims to assess the knowledge, attitudes, and practices (KAP) of mothers regarding infant and young child feeding (IYCF) practices in Mumbai. It evaluate adherence to IYCF guidelines, including food selection, consistency, feeding frequency, and prevalent misconceptions. Additionally, the study attempts to understand the factors contributing to delayed complementary feeding and examine the relationship between maternal feeding practices and the nutritional status of infants and young children.

Material & Methods: This study was conducted among 200 participants, including mothers and caregivers of infants and young children aged 6 months to 3 years. Participants were selected were selected using purposive sampling based on predefined inclusion criteria. Data collection involved face-to-face interviews and anthropometric assessments. Socioeconomic status was evaluated using the updated Kuppuswamy scale (2024). Data analysis was performed using appropriate statistical methods to assess feeding practices and their association with nutritional status.

Results: The study identified cereals as the predominant complementary food introduced by most mothers, followed by fruits and vegetables. The consumption of non-vegetarian foods and eggs was comparatively lower. Traditional foods, such as rice water, dal, and broths, were commonly incorporated into infant diets. Food consistency preferences varied, with a notable proportion of caregivers opting for thin liquid or mashed foods due to concerns about choking. Delayed initiation of complementary feeding was frequently observed, extending up to one or two years in some cases. Feeding challenges were commonly reported, including cranky behaviour, picky eating, choking or gagging, and difficulties in transitioning to solid foods, highlighting significant challenges in the complementary feeding process.

Conclusion: The findings of this study emphasize the need for targeted interventions to enhance maternal knowledge and adherence to IYCF guidelines, ensuring optimal infant growth and development.

Keywords: Infant and Young Child Feeding (IYCF), Complementary Feeding Practices, Nutritional Status, Childhood Undernutrition.

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Assessment Of The Nutritional Status And Diet Diversity Of Central Mumbai Police (40-60 Years)

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Background: The Indian Police Service serves a critical role in upholding public order and safety, but they face significant challenges, including stress, irregular lifestyles, and demanding work schedules.

Aim and objective: To understand the consumption of specific HFSS by food frequency questionnaire

Methodology: A descriptive cross-sectional study was conducted among 300 police in Central Mumbai. Diet Diversity score and nutritional status were analyzed to understand the consumption. Statistical analyses, including Spearman's rank correlation, were performed to examine relationships between BMI and diet diversity score.

Result and Discussion: The study reveals that 74% of police personnel have a high Diet Diversity Score (DDS), but this is mainly due to frequent consumption of high-fat, high-sugar, and high-salt (HFSS) foods rather than balanced nutrition. This unhealthy eating pattern contributes to increased BMI and health risks. Despite a varied diet, no significant correlation was found between DDS and BMI, highlighting the need for dietary improvements to promote better health.

Conclusion: The results indicate that consumption of HFSS calculating DDS is an important factor to assess dietary intake. The study reveals that while most police have a diverse diet, it is dominated by unhealthy high-fat, high-sugar, and high-salt (HFSS) foods. Frequent consumption of these foods contributes to increased BMI and health risks. However, no significant correlation was found between diet diversity and BMI.

These findings emphasize the need for healthier food choices and dietary interventions to improve overall well-being among police personnel.

Keywords: Dietary intake, BMI, Diet Diversity Score ,Police Personnel, Central Mumbai, High fat High sugar high salt (HFSS)

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Does Dietary Potential Renal Acid Load Impact Cancellous Bone Density? A Study Of Rural Prepubertal Children In Pune, India

Theme: Community Nutrition and Health Surveys

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Background: Childhood optimal cancellous bone mineral density is associated with a stronger skeletal foundation and reduced fracture risk in adulthood. (Kim et al., 2022; Mitchell et al., 2018). Diet is an important factor affecting bone health. However, the impact of dietary composition and potential renal dietary acid load (PRAL) on bone health is still widely debated. (Darling et al., 2021; Mangano et al., 2014; Petrie et al., 2025).

Aim and Objective: Therefore, we aimed to explore the relationship between potential renal acid load and cancellous bone mineral density in children, to optimise cancellous bone mineral density by identifying appropriate nutritional strategies. The objective is to assess the impact of potential renal acid load on cancellous bone mineral density in children.

Methods: This observational cross-sectional study was conducted in 436 rural pre-pubertal children (mean age=9.5±1.0 yrs). Height was measured using SECA 213 – stadiometer and body weight by Tanita Body composition analyzer (Model BC-420MA). Cancellous bone density was measured using pQCT (XCT-2000 scanner, Stratec, Inc.; Pforzheim, Germany). 2-day dietary recall was used to collect dietary data. Sunlight exposure and physical activity were assessed using standardised questionnaires.

Results: Mean dietary PRAL (10.4±3.9) indicated a high dietary acid load in the population. BMIZ-scores, dietary protein, dietary calcium and PRAL were significantly positively ($p<0.05$) associated with cancellous bone density (176.1±32.9g) Regression analysis showed a significant positive ($p<0.05$) relationship between higher cancellous bone density and BMI Z-scores ($\beta=5.4$, $p<0.05$), dietary protein intake ($\beta=0.25$, $p=0.026$)

and dietary calcium (β=0.01, p=0.023). No significant relationship with PRAL (p=0.05) was noted.

Conclusion: This population of prepubertal children had high dietary acid load as indicated by their PRAL scores. However, this was not seen to have any effect on cancellous bone density. On the contrary, higher protein and calcium intake contributed to good bone density as well as potentially high PRAL scores. It seems that sufficient dietary protein intake outweighs the effect of PRAL on cancellous bone metabolism in children.

Keywords: Cancellous bone mineral density, Potential renal acid load (PRAL), Dietary composition.

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Taxonomic Assessment Of Indigenous Green Leafy Vegetables And Dietary Patterns Among Gond Tribes Of Bastar, Chhattisgarh Market Accessibility And Nutritional Insights

Theme: Community Nutrition and Health Surveys

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Background: Traditional green leafy vegetables (GLVs) of indigenous origin were consumed for their medicinal advantages but their botanical identity and seasonal variation were not fully explored. Bastar's Gond tribes of Chhattisgarh depended on these vegetables as an essential food component, but their nutritional value, dietary variety, and market potential remained to be assessed.

Aims and Objectives: The purpose of this research was to categorize indigenous green leafy vegetables according to their seasonal availability and conventional health benefits. The nutritional content of these native vegetables was examined using the Indian Food Composition Table (IFCT) 2017 by NIN-ICMR. The dietary diversity of the Gond tribes was also evaluated through dietary diversity questionnaires and food frequency surveys. The survey also covered the availability, access, and affordability of indigenous GLVs in local markets. Additionally, conventional recipes and preparation practices of these vegetables were recorded.

Materials and Methods: A cross-sectional survey was carried out among the Gond tribes of Bastar District, Chhattisgarh, with a population of 200 males and females in the age group of 20-40 years. Green leafy vegetables were taxonomically classified on the basis of seasonality and traditional medicinal virtues. Nutritional evaluation was carried out using secondary data on IFCT 2017. Food frequency and dietary diversity surveys were carried out to determine consumption patterns. Market surveys assessed the

availability, accessibility, and affordability of local GLVs. Local women and older community members were interviewed to document traditional recipes.

Results: The research revealed numerous seasonally abundant native GLVs that offered tremendous nutritional advantages. Dietary diversity scores showed medium-level consumption levels with seasonal effects playing a critical role in diet trends. Market evaluation demonstrated affordability and accessibility to be primary predictors of GLV uptake. Local dishes showed a variety of preparation methods to retain nutritional content.

Conclusion: Traditional GLVs are an important component of the Gond tribes' diet, contributing to the intake of necessary micronutrients. Their consumption is, however, dependent on market availability and economic considerations. Strategies should be aimed at enhancing awareness and access to these healthy vegetables to maximize community health benefits.

Keywords: Indigenous green leafy vegetables, dietary diversity, traditional recipes, community nutrition, Gond tribes, Bastar, food frequency survey

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Assessment Of Ultra- Processed Food And Nutritional Status Among Children (Ages 3-7 Years) In Urban Slums

Theme: Community Nutrition and Health Survey

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Background: Globally, diets have shifted toward ready-to-eat, high-fat, high-sugar foods over unprocessed options like fruits and vegetables. Ultra-processed foods are not just high in sugar, fat, and salt, they also lack natural ingredients and go through heavy processing. This can strip away important nutrients from whole foods.

Aim and objectives: The study aims to assess the intake of ultra-processed food and the nutritional status of urban slum children aged 3-7 years using anthropometric measurements and quantify their ultra-processed food consumption.

Materials and methods: Cross sectional study was conducted among 224 preschool children ages 3-7 years living in Govandi slum. Children were categorised based on socioeconomic status, calculated using modified kuppuswamy index. MUAC was taken and age appropriate z score was calculated to determine stunting and malnutrition. Ultra processed food consumption was assessed using a food frequency questionnaire.

Results: More than 50% of the participants belong to the upper middle class indicating that a significant portion of the participants has moderate economic resources. Majority of the participants had normal growth, while 15% were moderately stunted and 3% were severely stunted, based on IAP growth charts (2014). Similarly, over half had a normal weight, while about 12% were moderately or severely underweight. Most frequently consumed UPFs were chips, biscuits and flavored yogurt. Significant number of participants consumed ice creams and cakes occasionally.

Conclusion: The findings indicate an association between socioeconomic status (SES) , UPF consumption and nutritional status. While most participants from the upper middle class had normal growth and weight, a significant proportion still experienced stunting (15%) and underweight (12%). This suggests that despite moderate economic resources, UPF consumption may influence nutritional outcomes.

Key words: Ultra-processed, children, stunting, nutrition, slum.

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Assessing The Impact Of Online Food Delivery Apps On Dietary Patterns And Nutritional Health Of Young Adults

Theme: Community Nutrition & Health Surveys

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Background: The rapid adoption of online food delivery (OFD) apps has significantly influenced food consumption patterns, particularly among young adults (20-30 years). While these platforms offer convenience and variety, concerns regarding increased consumption of high-calorie, ultra-processed foods have emerged, potentially affecting community nutrition and overall health.

Objectives: To determine the frequency and types of food ordered through OFD apps among young adults and To assess dietary habits and the calorie density of foods consumed using dietary recalls.

Materials & Methods: A cross-sectional survey was conducted among 100 young adults in Mumbai. Data on OFD app usage, ordering frequency, and dietary intake were collected using structured questionnaires and 24-hour dietary recalls. Nutrient intake was analyzed using DietCal software and compared with ICMR 2024 guidelines.

Results: The study revealed that 70% of participants used OFD apps 3-4 times a week, primarily ordering fast food (48%) and Indian cuisine (30%), with lower preferences for healthier options like salads and whole grains. 60% of respondents reported meal skipping, citing lack of time and reliance on OFD for convenience. Macronutrient analysis highlighted a significant imbalance, with fat intake exceeding RDA by 77.3% and protein intake falling 17.8% below RDA, indicating a reliance on calorie-dense but nutrient-poor meals. Additionally, 60% of participants consumed sugary beverages alongside their orders, further contributing to excess calorie intake. BMI analysis showed that 16% were

overweight or pre-obese, while 19% were underweight, reflecting a diverse nutritional impact of OFD reliance.

Conclusions: The study highlights the impact of OFD apps on community nutrition, emphasizing the shift towards high-calorie, low-nutrient diets. This trend underscores the need for nutrition education, policy interventions, and healthier food choices on digital platforms to promote better dietary habits and public health outcomes.

Keywords: Community nutrition, online food delivery, dietary patterns, young adults, food choices

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Assessment Of Diabetes Knowledge Among The Type 2 Diabetic Patients (40 – 55 Years)

Theme: Community Nutrition and Health Surveys

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Background: The prevalence of non-communicable diseases (NCDs) continues to rise in India. In numerous developed countries. (1) Of all the non-communicable disease globally diabetes, is among the emerging ones. It is a chronic illness that significantly affects the well-being and quality of lives of families, communities, and individuals. (2)

Aims and Objective: The study aimed to assess the knowledge about diabetes among the type 2 diabetic patients.

Materials and Methods: A cross-sectional study was conducted on hundred type 2 diabetic patients from Vikhroli, Mumbai. A self – developed diabetes knowledge questionnaire was analyzed and given score to assess their knowledge levels.

Results: The study found that majority of the participants (12%) had poor knowledge about their disease. Only (5%) had good knowledge whereas (83%) had moderate knowledge about the disease. Significant lack in knowledge about causes, symptoms, lifestyle modifications and dietary terms like glycemic index, complex carbohydrates was analyzed.

Conclusion: The study highlights the importance of diabetes education to enhance patient care by helping them to manage their condition effectively, reducing complications and improving overall health.

Keywords: Diabetes type 2, Diabetes knowledge, Education, Lifestyle modifications

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Nutritional Status And Physical Fitness Of Adolescent Girls (10-19 Years) Residing In Mumbai City

Theme: Community Nutrition & Health Surveys

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Background: Adolescence is a crucial phase of growth and development, where nutritional status and physical fitness play a significant role in overall health (Norris et al., 2022). Assessing anthropometric measures, body composition, and fitness indicators is essential for identifying potential health risks and promoting optimal development (Casadei et al., 2022). This study focuses on evaluating the nutritional status and physical fitness of adolescent girls living in Mumbai.

Aims: To assess Body Mass Index (BMI) and Waist-to-Hip Ratio (WHR), body composition and physical fitness of adolescent girls (aged 10-19 years) residing in Mumbai.

Materials and Methods: A cross-sectional study was conducted on 100 adolescent girls (aged 10-19 years) residing in Mumbai. Participants were selected using a non-probability purposive sampling method. Data was collected on the socio demographic details using a Questionnaire, anthropometric measurements (height, weight, BMI, WHR) using standard protocols, body composition (fat mass, fat-free mass, muscle mass, total body water) using Tanita Body composition analyser (DC-13C). Physical fitness was assessed through muscle strength (hand grip test, push-up test), flexibility (sit-and-reach test, toe-touch test), and cardiorespiratory performance (shuttle run, PACER test, step test).

Results: Majority of the participants (75%) were from a low socioeconomic background. Among them, more than half (54%) had a normal weight, 44% were underweight, and a small proportion were overweight (1%) and obese (1%). 11% had a WHR above 0.85,

indicating central obesity. Body composition analysis revealed a healthy body fat percentage. Muscle strength assessment indicated moderate hand grip strength, while flexibility tests showed slightly below-average performance. Cardiorespiratory fitness parameters were within acceptable limits, with underweight individuals exhibiting better endurance.

Conclusion: The study highlights early risks of obesity and poor muscle content. Lower body weight may not affect flexibility and endurance but lower the muscle strength that may put adolescents at greater health risks associated with sarcopenia in future. These findings emphasize the need for targeted nutritional and fitness interventions for adolescent girls to promote holistic health.

Keywords: nutritional status, adolescent girls, body composition, physical fitness

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To Study The Effects Of Circadian Rhythm Sleep Disorders On The Health Of Women Aged 40-60 Years

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Background: Circadian rhythm sleep disorders (CRSDs) disrupt the natural sleep-wake cycle, leading to significant health issues. Middle-aged women (40-60 years) are particularly vulnerable due to hormonal fluctuations and lifestyle factors which can exacerbate sleep disturbances and
metabolic disorders.This study examines the prevalence and effects of circadian rhythm sleep
disorders among women aged 40-60 years, focusing on their association with sleep quality,
chronotype, and overall well-being.

Aim: To study the effects of circadian rhythm sleep disorders on the health of women aged 40-60
years. Objectives: To assess circadian rhythm disorder by Pittsburgh sleep quality index, To assess circadian rhythm through the Morningness-eveningness questionnaire.

Materials & methods: A cross-sectional study was conducted among 150 women aged 40-60 years in Mumbai, which were selected through purposive convenience sampling. Sociodemographic data, anthropometric measurements, medical and menstrual history, dietary intake, and sleep quality were assessed among participants. The Pittsburgh Sleep Quality Index and Morningness-Eveningness Questionnaire was used to determine sleep disturbances and chronotype distribution. Statistical analysis was performed to evaluate associations between sleep quality, chronotype, and CRSD prevalence.

Results: The study found that 42.67% of participants experienced CRSDs, with 86% reporting poor sleep quality. The mean MEQ score was 52.96, classifying 79.33% of

participants as intermediate chronotypes. No significant association was found between chronotype and CRSD presence (p= 0.063). However, a strong correlation was observed between poor sleep quality and CRSD (p< 0.001).

Conclusion: Therefore, CRSDs are prevalent among middle-aged women and are strongly associated with poor sleep quality. The findings highlight the need for targeted interventions focusing on sleep hygiene, dietary modifications, and lifestyle changes to reduce the adverse effects of circadian rhythm disruptions.

Keywords: Circadian rhythm sleep disorders, sleep quality, middle-aged women, chronotype, Pittsburgh Sleep Quality Index, Morningness-Eveningness Questionnaire.

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Knowledge, Awareness And Practice Of Type 2 Diabetic Patients Using Artificial Sweeteners Aged 45 To 65 Years

Theme: Community Nutrition and Health Surveys

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Background: Type 2 diabetes is a major public health concern, particularly in individuals aged 45 to 65 years. Artificial sweeteners are widely used as sugar substitutes to help manage blood glucose levels, but misconceptions and lack of awareness may impact their usage. While they offer a low-calorie alternative, concerns about safety and effectiveness persist. Assessing knowledge and awareness is crucial for improving diabetes management (2).

Aim : To assess knowledge and awareness on usage of Artificial Sweeteners among Type 2 diabetic patients aged 45 to 65 years. Objectives: To Assess the knowledge and use of artificial sweeteners among type 2 diabetic patients, and To evaluate awareness of different artificial sweeteners available.

Materials and Methods: A cross-sectional study was conducted in Bandra(E),Mumbai with a sample of 150 Type 2 diabetic patients using artificial sweeteners. Data collection involved a structured questionnaire covering demographic details, dietary patterns assessed using a Food Frequency Table, and knowledge and awareness levels evaluated using a Knowledge, Attitude, and Practice (KAP) questionnaire

Results: 78% of Type 2 diabetic patients are aware of artificial sweeteners, but misconceptions about their safety and effects are present . 62% use them regularly, while others avoid them due to health concerns. However, proper usage is not well understood, leading to potential risks or ineffective consumption(3). Awareness of different types of artificial sweeteners is also limited, with many relying on common brands without knowing their benefits and risks. These gaps highlight the need for better

education to ensure informed decision-making and safe consumption among diabetic patients(1)

Conclusion: Participants were aware of artificial sweeteners but had misconceptions about their safety and usage. Limited knowledge of different types led to incorrect use or avoidance, highlighting the need for better education.

Keywords: Type 2 diabetes, artificial sweeteners, knowledge, awareness, misconceptions, dietary management, KAP questionnaire, Food Frequency Table, diabetes education, healthcare guidance, safe consumption

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Adiposity In School Going Children Aged 10-15 Years In Mumbai

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Background: The global epidemic of obesity is increasing more in children as compared to adults which is evident by the reports of world obesity atlas 2024 which has estimated that India will be home to 14.79 million of overweight children aged 10-19 years by 2030.

Aim: The current study aims to observe the prevalence of adiposity in school going children in Mumbai.

Methodology: A cross sectional study was conducted on 297 students aged between 10-15 years from a private school in Mumbai. Anthropometric data were obtained after receiving formal consent from the school authorities. Height and weight measurements were taken by a trained nutritionist and Body Mass Index (BMI) was calculated. The participants were subjected to a body analyzer which used the Bioelectrical Impedance (BIA) technique for assessments. The participants were classified as overweight and obese using Indian Academy of Pediatrics (IAP) smoothened reference percentile for Asian Children and adult BMI equivalent cut offs.

Results: A total of 55.21% boys (164) and 44.78% (133) girls participated in the study (n=297) with mean age of 13 years for both belonging to upper middle socio-economic class. As per the adult BMI equivalent of 23 kg/m2 (overweight) and 28 kg/m2 (obese), 29% of boys and 20% of girls were overweight and 17% of boys and 19% of girls were obese. As per the IAP cut off ranges for body fat of 85th Percentile (overweight) and >95th percentile (obese), 17% boys and 16% girls were overweight and 9% boys and 13% girls were obese.

Conclusion: Adult BMI equivalents over-predict the number of overweight and obese children as compared to the actual body fat% in children and hence BMI alone is not a good predictor for obesity and alternative measurements should be used.

Key Words: Childhood Obesity, Adiposity, IAP guidelines, BMI, Body Fat %

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Study The Association Of Diet Quality Score And BMI In Individuals Of Young Adult Girls Age 18-23 Years

Theme: Community Nutrition & Health Surveys

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Background: Unhealthy eating patterns and increasing obesity rates among young adults aged 18-23 years have become a growing concern. Dietary habits play a crucial role in long-term health outcomes, making it essential to understand the relationship between diet quality and BMI. This study aims to explore how dietary patterns, along with lifestyle factors such as physical activity and sleep, contribute to BMI variations in young adult girls.

Aim and Objective: To assess the relationship between diet quality scores and BMI in young adult girls aged 18 to 23 years in Mumbai. It evaluates diet quality using standardized tools and examines the impact of lifestyle factors, including physical activity, sleep patterns, and sedentary behavior, on BMI. Additionally, to identify key dietary patterns contributing to BMI variations.

Material and Methods: A cross-sectional study was conducted in Mumbai city with a sample size of 150 young adult girls aged 18-23 years. A structured questionnaire was developed to collect data, and informed consent was obtained from participants meeting the inclusion criteria. Data collection included anthropometric measurements, a 24-hour dietary recall, a Sleep Quality Index assessment, a Rapid Active Physical Assessment, and a Diet Quality Score evaluation. The primary objective was to analyze the association between diet quality scores and BMI. Statistical analysis was performed to determine correlations, and findings were interpreted in the results and discussion section.

Results and Discussion: A significant relationship was found between sleep quality and BMI ($p = 0.05$) and between physical activity and diet quality ($p = 0.001$). Diet quality varied based on past medical history ($p = 0.000$), but BMI categories and diet quality scores showed no significant variation ($p = 0.290$). These findings align with previous research, highlighting the interconnected nature of diet, sleep, and physical activity in maintaining health.

Conclusion: The study emphasizes the importance of a balanced lifestyle, including a high-quality diet, regular physical activity, and good sleep hygiene, in managing BMI and preventing health risks.

keywords: Body mass index, Non communicable disease, sleep, diet quality score, young adult

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Meal Pattern And Minimum Dietary Diversity Among Women (35-55 Years) Belonging To Dhobi Community Residing In Raipur City, Chhattisgarh

Theme: Community Nutrition & Health Surveys

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Background: Diets are influenced by culture and religion, availability of local ingredients, food preferences, cooking habits and socio-economic status. Community specific diet patterns and dietary diversity especially for women will help in better understanding of health and nutritional status and address health disparities if any.

Objectives: To determine the typical dietary patterns and dietary diversity among middle-aged women (35–55 years) from the Dhobi community in Raipur city, Chhattisgarh.

Methodology: Cross-sectional study was conducted among middle-aged Dhobi women (N=180). Using a structured questionnaire and personal interview, demographic data, dietary pattern, cooking methods, and specific foods consumed were recorded. A 24-hr dietary recall and the Minimum Dietary Diversity for Women was used to determine nutrient intakes and diet diversity. Data was analyzed using Sociostat software.

Results: The mean age of the participants was 42.64 ± 6.16 year. Most women (96%) consumed three main meals daily with minimal snacking. Home-cooked meals, primarily consisting of traditional and local Chhattisgarhi dishes, like jimikanda, Kanda bhaji (sweet potato bhaji), pyaz bhaji, rice chilla, fara were preferred. Methods of cooking used were frying, roasting and baking, boiling, steaming. Working participants (14%) carried homemade lunch box, usually consisting of rice, dal and sabji. Feasting was observed during occasions, such as on birthdays, festivals and wedding season. The main festival celebrated was Diwali & Holi where khurmi, thethri, anarsa, saloni were commonly prepared. On Fasting days, this community people had only one full meal

made using Rock salt i.e. mostly at dinner. The mean MDD-W score was 8.5±0.5 based on 24 hr dietary recall. All participants were consuming at least five food groups. However, 51% showed high dietary diversity score of 9–13 out of 13 food groups. The mean intake of iron was 5.19±2.89mg of the EAR.

Conclusion: These findings indicate that most of the participants had relatively diverse diets, which contributed to better micronutrient adequacy.

Keywords: Chhattisgarh, Dhobi, Dietary diversity, Meal pattern.

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Effects Of screen Time On Appetite And Nutritional Status In College-Going Female Students In Mumbai

Theme: Community Nutrition & Health Surveys

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Background: The COVID-19 pandemic has significantly altered lifestyle patterns, notably increasing screen time among college students, which may adversely affect their dietary habits and nutritional status. Increased screen time often leads to mindless eating, higher intake of unhealthy foods, reduced consumption of fruits and vegetables, and disrupts appetite regulation, contributing to obesity.

Aims and Objectives: The primary aim of the study is to investigate how varying levels of screen time influence eating habits and appetite regulation among female college students aged 18-25 years, highlighting potential links to unhealthy dietary patterns.

Materials & Methods: A cross-sectional study was conducted in Mumbai, involving 100 female college students from diverse academic backgrounds, recruited through stratified random sampling. Data were collected using validated self-administered questionnaires assessing daily screen time (academic vs. non-academic) and appetite regulation. Dietary pattern was evaluated and anthropometric measurements (BMI, waist circumference) were taken to assess nutritional status. Statistical analysis was performed using SPSS software, employing correlation analyses to evaluate associations between screen time and eating behaviors.

Results: The analyzed data indicated significant positive correlation between increased screen time and the prevalence of poor dietary choices. Participants who spent too

much time on screens consumed less fruits and vegetables and ate more fast food and unhealthy snacks. These eating patterns significantly raised incidence of overweight and obesity in the cohort, emphasizing a troubling trend in this group.

Conclusions: The study concluded that excessive screen time is closely linked with unhealthy eating patterns and appetitive behaviors among female college students. These results underscore the need for targeted interventions to promote healthier lifestyle choices and manage screen time effectively, particularly in context of ongoing digital interactions heightened by the pandemic. Educational institutions should prioritize active living and nutritional awareness to combat the adverse effects of increased screen exposure.

Keywords: Screen time, Appetite regulation, Dietary habits, Obesity, Female College students, Health behaviours, Nutritional status indicators

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Determination Of General And Abdominal Obesity And Risk Of Diabetes In Working And Non- Working Muslim Women (25-35 Years)

Theme: Community Nutrition and Health Survey

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Background: The rising prevalence of diabetes and pre-diabetes among women, as seen in NFHS V, is strongly linked to above normal weight and abdominal obesity. Community-wise obesity assessment is crucial for early diabetes risk identification and timely prevention.

Objective: To determine general and abdominal obesity and risk of diabetes between working and non-working Muslim women (25-35 years).

Methodology: The study included working (n=75) and non-working (n=75) Muslim women enrolled using purposive sampling in Mumbai Metropolitan Region. Anthropometric measurements i.e. Height, Weight, Hip Circumference and Waist Circumference were recorded and Body Mass Index, Waist to Hip Ratio and Waist to Height Ratio were calculated. Indian Diabetes Risk Score (IDRS) was used to assess the risk of diabetes. Data analysis was performed using social science statistics software.

Results: More than 90% of working and non-working women were found to have higher mean WC (88.12 ± 5.95), WHR (0.92 ± 0.44) and WHtR (0.89 ± 2.32) than cut-offs, indicating central obesity. Moreover, women in normal and underweight BMI categories from both groups were found to have higher mean WHR (0.94 ± 0.00). The mean IDRS scores were 37.86 ± 8.03 (moderate risk) for working and 36.13 ± 7.40 (moderate risk) for non-working women. The IDRS score showed a significant positive correlation with WC ($p<0.01$) and WHtR ($p<0.05$) for working women and significant positive correlation for both WC and WHR ($p<0.01$) for the non-working women. Overall, IDRS scores were

significantly correlated to all indicators of central obesity i.e. WC ($p<0.01$) WHR ($p<0.05$) and WHtR ($p<0.05$).

Conclusion: The study highlights a strong link between central obesity and its significantly positive correlation with the risk of diabetes urging immediate integrative preventive interventions.

Keywords: Abdominal Obesity, Risk of Diabetes, Muslim women, Waist Circumference, Waist to Hip Ratio

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Survey On Dietary Habits And Prevalence Of Obesity Among Young Adult Females In The City Of Mumbai

Theme: Community Nutrition & Health Surveys

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Background: Obesity among young adults is a growing public health concern, with dietary habits established during adolescence playing a crucial role in long-term health outcomes. In urban settings like Mumbai, rapid socio-economic transitions have led to increased consumption of high-energy, processed foods and sugar-sweetened beverages, contributing to rising obesity rates. Sedentary lifestyles and changing food environments further exacerbate this trend. Research suggests that poor dietary habits, such as frequent consumption of fast food and low intake of fruits and vegetables, significantly increase the likelihood of obesity in early adulthood.

Objective: To map the dietary patterns of young adult females in Mumbai and To assess the prevalence of obesity in individuals aged 18-25 years.

Materials & Methods: A descriptive cross-sectional study was conducted among 100 college-going females aged 18 to 25 years in Mumbai. Data was collected using a self-administered questionnaire, which included demographic details, anthropometric measurements (height, weight, BMI, waist circumference, waist-to-height ratio), and dietary assessment using a 24-hour dietary recall and Food Frequency Questionnaire (FFQ). Statistical analysis was performed using SPSS software.

Results: The study found that 37% of participants were overweight and 13% were obese, with a mean BMI of 25.12 ± 4.3 kg/m^2. Additionally, 57% had a waist circumference above 80 cm, and 56% had a high Waist-Hip Ratio (≥ 0.86), indicating increased central obesity risk. A weak but significant correlation ($r = 0.203$, $p = 0.043$) was observed between BMI

and WHR. Dietary assessment revealed high intake of refined cereals and processed foods, with low consumption of fibre-rich millets, fruits, vegetables, legumes, and seeds.

Conclusion: The study highlights a significant prevalence of overweight and obesity among young adult females in Mumbai, primarily due to imbalanced dietary patterns. The high intake of processed foods and refined cereals, coupled with insufficient consumption of fibre-rich and nutrient-dense foods, suggests a shift toward unhealthy eating habits contributing to obesity. These findings emphasize the need for targeted nutritional interventions, awareness programs, and lifestyle modifications to promote healthier dietary choices. Encouraging whole grains, nutrient-dense foods, and protein-rich diets while reducing processed food intake is essential to mitigate obesity risk and improve overall health outcomes.

Keywords: Obesity prevalence, Dietary patterns, Dietary habits and obesity, young adult nutrition

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Study Of Health And Nutritional Status Of Children (8-15 Years) Of Tribal Community In Mumbai

Theme: Community Nutrition and Health survey

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Background: Malnutrition persists globally, especially among children in poorer countries. India's Warli tribe, isolated and poor, face high risk. Their children (8-15 years) are especially vulnerable due to traditional practices and poor diets.

Objectives: To assess dietary habits, to determine nutritional status using anthropometric measurements (weight, height, MUAC). To classify children's nutritional status using Z score interpretation, and to provide nutritional education to improve the health of malnourished children.

Methods: The study analyzed dietary patterns, growth trends, and health issues among Warli children. Total 200 number of participants were included in the research (100 girls and 100 boys). A purposive sampling technique was used for the research. By identifying nutritional gaps, the aim was to empower families through educational interventions to adopt healthier practices and improve child health.

Result: The study found that tribal children mainly consumed rice (65%), wheat (50%), mung (63%), and masoor (37%) pulses daily. However, they lacked intake of vegetables, fruits, and nuts, while consuming high fats and salt, especially cold drinks (37.7%). Millet, fat, dairy, and meat consumption varies. The population included 2% moderate stunting, 28% mild stunting; 3% mild wasting based on MUAC. The Warli children consumed a carbohydrate-rich diet, hence lacked essential nutrients like vitamins and minerals, while over-consuming unhealthy foods like cold drinks.

Conclusion: The study highlights the significant nutritional deficiencies among Warli tribal children, primarily due to a carbohydrate-rich diet lacking essential vitamins and

minerals. Despite consuming staple grains and pulses, their low intake of fruits, vegetables, dairy, and protein sources, coupled with high consumption of unhealthy foods like cold drinks, contributes to malnutrition and stunting. Addressing these nutritional gaps through targeted interventions, including dietary education and improved access to diverse food sources, is essential to enhance the overall health and well-being of these children.

Keywords: Malnutrition, tribal Children, Nutritional Status ,Dietary Habits.

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A Study on the Phytochemical Properties of Traditional Indigenous Foods and Dietary Patterns Among Warli Tribe Women (20-40 Years) in Mumbai

Theme: Community Nutrition and Health survey

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Background: The indigenous populations in India have long depended on locally cultivated, nutrient-dense foods. But with modernization and socioeconomic transition, their diets are changing. The present study investigates the dietary habits and nutritional status of a tribal population to determine these changes.

Aim and Objective: The work assesses dietary habits and nutrition status among tribal women (20–40 years), compares proximate composition among selected green leafy vegetables, and detects bioactive compounds using High-Performance Thin-Layer Chromatography (HPTLC).

Materials and Methods: 150 tribal women (20–40 years) were randomly chosen by stratified sampling. A Food Frequency Questionnaire (FFQ) was used to examine their dietary consumption. Proximate analysis and HPTLC analysis were applied to selected green leafy vegetables.

Results: High cereal (70.91%) and pulse (69.87%) dependency, low consumption of dairy (77.4%) and flesh foods (54.84%), and resultant gaps in nutrition were found by the study. The daily consumption of high-fat and high-salt foods was practiced by 67.25%, whereas 47.66% of the subjects refrained from sugar. 74.60% consumed green leafy vegetables weekly instead of daily, limiting the intake of antioxidants. 38% achieved the Minimum Dietary Diversity for Women (MDD-W) status only. The highest moisture content was in Luni (86.08%) and Spinach (84.43%), which are very perishable. Gavthi Methi (69.32%) was more resistant to shelf life. Low contents of alkaloids and flavonoids

were recorded in green leafy vegetables using HPTLC analysis, decreasing their antioxidant value.

Conclusion: The research emphasizes poor dietary variety and nutrient deficiencies, raising the risk of deficiency. Although green leafy vegetables are rich in minerals, low content of bioactive compounds restricts health benefits. Dietary behavior improvement and nutritional knowledge are needed for improved health.

Keywords: Dietary patterns, Nutritional status, Tribal community, Indigenous foods, Macronutrients, Socioeconomic factors, HPTLC analysis, Proximate analysis, MDD-W.

Nutrition Education Activities, Eating, And Food Preferences Of Preschool-Going Children

Theme: Community Nutrition and Health survey

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Background: Preschool years are crucial for developing lifelong eating habits. Understanding children's food preferences and the impact of nutrition education can help in designing effective interventions. This study explores the eating habits and food preferences of preschoolers and assesses the effectiveness of nutrition education activities in shaping their dietary choices.

Aim: To assess the eating habits and food preferences of preschool children and evaluate the impact of nutrition education activities on their dietary choices. Objective: To understand the eating habits and food preferences of the preschool participants.

Materials & Methods: The study was conducted in Mumbai, including 150 preschool children aged 3 to 5 years, selected using purposive sampling. Data were collected through pre- and post-questionnaires, a Food Frequency Questionnaire (FFQ), and a general questionnaire. The study assessed the children's dietary patterns before and after targeted nutrition education activities, which included interactive storytelling, games, and visual aids. Statistical analysis was performed to evaluate changes in food choices.

Results: The pre-assessment revealed a high preference for junk food, with limited consumption of fruits and vegetables. After implementing nutrition education activities, there was a significant increase in children's willingness to try healthier food options. Parental influence and peer interactions were found to play a crucial role in shaping food choices.

Conclusion: Nutrition education activities are effective in improving children's awareness of healthy eating. Preschoolers exposed to interactive and engaging methods showed positive behavioral changes, demonstrating a shift towards healthier food choices. Early nutrition education can contribute to better dietary habits and long-term health benefits.

Keywords: Preschool children, eating habits, food preferences, nutrition education, dietary behavior Funding Source: No external funding received.

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Theme: AI, Digital Applications in Health and Disease

Bot- Sized Nutrition: Evaluating Chatbot- Generated Diets Through The Global Diet Quality Score Lens

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Background: The rapid innovations in Artificial Intelligence (AI), & the integration of AI-driven platforms such as ChatGPT, Meta AI, and Gemini have enabled the computerized generation of personalized diet plans.

Aims and Objective: To assess the proficiency of widely used artificial intelligence-driven chatbots-ChatGPT-4.0, Meta AI, and Gemini in the development of balanced diet plans adhering to the Recommended Dietary Allowance (RDA) reference values, considering gender & activity level.

Materials & Methods: This study compared the quality of chatbot-generated diet plans for a reference man and woman using specific prompts. Twelve plans (N=12) were analyzed (n=6 per gender, two per chatbot). The Global Diet Quality Score (GDQS) was used to assess the diet plans for a total of 4 macronutrients, 5 micronutrients, GDQS+ (healthy score) & GDQS- (unhealthy score). Caloric accuracy was evaluated by percentage deviations. ANOVA analyzed differences in nutrient adequacy against RDA and GDQS, independent t-tests compared GDQS scores by gender, and one-sample t-tests analyzed caloric deviations from the RDA.

Results: According to the GDQS scale, AI-generated diets showed high (N=4) and moderate (N=7) risks of nutrient inadequacy and NCDs. There were significant differences among the chatbots in the GDQS scores for male diet plans($p=0.03$).GDQS+ scores were lower in AI-derived diets than the male reference($p=0.02^*$), with Meta and Gemini producing moderately healthy plans.GDQS- scores varied significantly across

chatbots for both genders ($p<0.01$).GDQS- scoring revealed that AI-derived diets may be less risky in terms of unhealthy components compared to the reference score of GDQS-. Additionally, protein content differed significantly from the RDA (Male: $p=0.03$, Female: $p=0.04$), with fiber composition differing in female diets ($p=0.006$).

Conclusions: AI chatbots demonstrate potential in formulating nutritionally adequate diets but need refinement for cultural diversity and food group integration. They should complement, not replace, dietetic expertise.

Keywords: Artificial Intelligence, Global Diet Quality Score, Recommended Dietary Allowance, Non-communicable Disease (NCD)

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ChatGPT a Future Dietitian? Exploring The AI- Powered ChatGPT's Efficacy For Dietary Management Of Infectious Diseases

Theme: AI, Digital Applications in Health & Disease

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Background: Recently, the rampant rise in infectious diseases has increased the patient's information-seeking behavior, especially for treatment purposes, including diet therapy. The advent of AI-powered chatbots, including ChatGPT, led to extensive use as an expeditious resource for disease information and management due to its popularity and easy accessibility. However, the authenticity, accuracy, and personalization of the nutrition therapy provided by ChatGPT remain unexplored.

Objective: To evaluate the accuracy, quality, clarity, and cultural sensitivity of the nutrition therapy offered by ChatGPT in the management of COVID-19, HMPV, Zika Virus, Chikungunya, Guillain Barre Syndrome, and Pulmonary TB in accordance with the Indian Council of Medical Research-National Institute of Nutrition (ICMR-NIN) guidelines.

Methods: We assessed four dietary management-related domains: (1) Medical Nutrition Therapy (MNT), (2) Nutrition Care Process (NCP) guidelines, (3) Diet Planning, and (4) Ayurvedic/ Herbal Remedies 5) Functional Foods/ Nutraceuticals. A total of 90 prompts were used, and two experienced dietitians evaluated the ChatGPT's recommendations using a 4-point Likert scale against ICMR-NIN guidelines.

Results: Dietitians reported differences in the nutrition therapy recommended by ChatGPT for most domains, indicating a lack of accuracy, quality, and clarity. Significant differences ($p \leq 0.05$ for all) in energy, carbohydrates, fats, and proteins were observed in

the diet plans provided by ChatGPT for all infectious diseases. Additionally, the micronutrient contents of the diet plans by ChatGPT were either overestimated or underestimated for all of the infectious conditions ($p \leq 0.05$ for all). The major gaps identified in the ChatGPT-generated output were a lack of personalized advice, contradictory nutrient recommendations, overestimation of energy and protein, culturally insensitive menu options, and common recommendations for functional foods.

Conclusion: While AI-powered ChatGPT serves as an accessible resource, its standardized dietary recommendations do not adequately address the critical role of patient-centered, personalized nutrition therapy in infectious disease management. Therefore, it should be regarded as a complementary tool rather than a definitive source for dietary guidance.

Keywords: Artificial Intelligence, ChatGPT, Chatbots, Infectious diseases, GBS, HMPV

Funding: This study was conducted without any financial support.

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Ayurved Based, Artificial Intelligence Driven Test For Future Diabetes Risk Assessment- A Window Of Opportunity For Preventive Intervention

Theme: AI, Digital applications in Health and Disease

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Honorary Sr. Consultant at Diabetes OPD – S.Tarachand Hospital, (Tilak Ayurved College), Pune, MH, Founder of the Start-up 'Swasthya Sampada Health Services LLP', Pune, MH floated for this invention, Founder Director - BluMark Foods, DSHS Pvt. Ltd., Pune, MH. (India's Lowest GI Staple Foods Start Up with clinically proven, internationally patented products developed under DST Research Project), Practising Ayurvedic Physician since 1996, Chiranjeev Ayurved, Bavdhan, Pune, Maharashtra, Member – Ayurved for Diabetes Protocol Committee, AYUSH Ministry, Government of India

Background: Diabetes-Heart Disease-PCOS-Obesity are growing in India like epidemic. Prevalence of Type2-Diabetes(T2D) in 20s/30s has dramatically increased in last 2-3 decades, with 25% of diabetics being under 25years. With 50% of India below 25 and over 65% below 35; such trend is even more a concern, as the T2D-Onset age is down and age of woman becoming mother going up, posing challenges for the generation to be born!

Aims & Objectives: CATCH-D'M-YOUNG: Designing a Proven/Handy/Non-invasive/Economic/On-line Early-Warning-System for T2D to sensitize the population for action by applying/verifying/validating the Ayurvedic principles of "Prameh-Poorvarup" condition to a population-sample longitudinally.

Materials & Methods: 1.)Systematic Longitudinal Data Collection from Sample Population of >1000: Under Pune-Maternal-Nutrition-Study(PMNS), in KEM-Hospital-Pune, 319 non-diabetic families (average-age: Father32 yrs, Mother27 yrs, Children 6yrs) were studied for ayurvedic/biochemical markers of T2D-Risk every 6years(2001-2019). **2.)Analysis of Data:** "Ayurvedic prameh-poorvarup" signs were compared & analysed with various biochemical parameters of metabolic risk like Body-Fat%/BSL/Lipids/Insulin etc. in this population-sample. **3.)Practical Application Development & Validation:** Results of above analysis validated the hypothesis of

Ayurvedic Prameh Poorvarup being able to predict the progress of metabolic risk factors reliably, even when the biochemical parameters are normal. This finding gave rise to fulfilling the aim of developing a handy/non-invasive tool in questionnaire format with a weighted quantitative/qualitative know-how to assess a subject's future diabetes risk based on the insight from his answers to questionnaire. **4.)Scaling up of Tool:** Validated 'manual-questionnaire-based-test' above was transformed into an 'Artificial-Intelligence(A.I.)-Driven-Test' in collaboration with Maharashtra-Knowledge-Corporation-Ltd.(MKCL)'s team to achieve almost 100% accuracy.

Results: The future diabetes risk or undetected diabetes could be reliably identified in the subjects taking test in a Proven/Handy/Non-invasive/Economic/On-line method.

Conclusion: To stop the T2DM-epidemic, since Prevention is always Better/Cheaper/Achievable/More Enjoyable than Cure, a research-based/reliable/cheap/non-invasive/online tool useful for dietitians/doctors/population-screening to assess test-taker's future diabetes risk/detect undetected diabetes stands developed as "Proven-Early-Warning-System". Nation/State-Health-Policy-Makers can use this to launch "Stop-Diabetes" Campaign like Pulse-Polio.

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Keywords: Future Diabetes Risk, PCOS Risk, Metabolic Risk, Health Assessment, Lifestyle Disease Risk Assessment Test, Ayurved based A.I. Test, Catch D'M Young Test, How to reverse diabetes risk, If you have not checked your sugar, how can you assess your sugar disease / problem risk without checking blood / urine

Funding Sources:

1. **MKCL** for the AI part of development in step 5
2. **Self** (start up SSHS LLP) for steps 3-5 from analysis to the test's algorithm know-how development
3. **PMNS** project funding for steps 1 & 2

Theme: Functional Foods in Health and Disease

The Association Of Micronutrients Rich Food Source With Premenstrual Syndrome Among Young Women

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Background: Premenstrual syndrome (PMS) involves significant physiological and psychological symptoms occurring during the luteal phase of the menstrual cycle. The objectives were to assess the micronutrient rich food intake in young women and investigate its correlation with the PMS.

Aim and Objectives: To investigate the role of micronutrients rich food intake on the occurrence and severity of PMS in young women aged 18 to 24 years old.

Materials And Methods: An observational study was conducted involving apparently healthy 330 participants from Pune city. A semi-structured questionnaire was used to collect information on nutrient intake, dietary habits, and PMS was assessed using Moose's Menstrual Distress Questionnaire and Premenstrual Symptoms Screening Tool, which were utilised for the identification and classification of PMS. A 3 day diet recall and FFQ was utilized to assess micronutrient intake from food sources and were calculated using DietCal version 5.0.

Results: Out of the 330 participants, 46.9% had mild PMS, 31.5% had moderate PMS, 8.3% had strong PMS, and 13.3% had no symptoms. Intake of iron, calcium, vitamin C, vitamin B12 were significantly lower than the RDA across all PMS groups. A positive correlation of PMS severity was observed with frequency consumption of mithais and other ultra processed foods. PMS occurrence negatively correlated with frequency consumption of soybeans(τ_b= -0.088, p= 0.005) and sprouts/legumes (τ_b =-0.103, p=0.024), which were consumed more frequently by non-PMS participants. Similarly,

negative correlation with the frequency consumption of salads and oilseeds (sesame/flax seeds) (ρ =-0.117, p=0.007) were seen.

Conclusion: The findings suggest that consumption of micronutrient rich foods may influence PMS severity. Additionally, intake of salads and oilseeds reduced likelihood of PMS, highlighting the need for inclusion of micronutrient rich food sources to mitigate PMS in young women.

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Keywords: Dietary patterns, Micronutrients intake, Nutrient composition, Premenstrual syndrome

Funding Source: None

A Study On The Consumption Patterns, Perceptions, And Awareness About Soy- Based Products Among Pre- Menopausal Women

Theme: Functional foods in health and disease

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Background: Soybeans are a nutrient-rich legume abundant with protein, essential fatty acids, and phytoestrogens. Menopause the natural end of menstruation, involves the declining of estrogen, potentially causing various health issues including hot flushes, osteoporosis, and risk of cardiovascular-diseases. Understanding soy consumption and its awareness is exemplary for promoting informed dietary choices during this transition.

Aim of this study is to explore soy-product consumption patterns, perceptions, and awareness among pre-menopausal women.

Materials & Methods: With a sample size of 150, the population involved was housewives aged 40-55 years from Kolkata. A detailed questionnaire was circulated virtually to gather information on their protein preferences, consumption patterns, and perceptions on including soy in diets, experiences with menopausal symptoms, and awareness of soy's health benefits. Data analysis and statistical analysis were done using SPSS.v.24.0.

Findings and Results: The majority population in the study was premenopausal. Women in the study preferred animal protein (53.3%), especially eggs and fish; plant protein preferred (46.7%), particularly pulses and soya-bean. Most women (94%) consumed soy products, most commonly consumed were soy chunks and soy flour. Awareness about soy's health benefits varied, as 52% were aware of its role in osteoporosis prevention, 67.3% were cognizant of its role in cancer prevention, 52.7% were knowledgeable about its effect on estrogen-levels during menopause, 56% were unaware of its role in Cardiovascular disease prevention. Significant correlations were observed between

perceptions of soy-milk consumption and its role in the reduction of osteoporosis ($\tau b=0.206$, $p< 0.01$); between perceptions of soy paneer and soy flour consumption and reduction in risk of Cardiovascular diseases ($\tau b= 0.161$, $p<0.05$), and increase in estrogen level during menopause ($\tau b= 0.149$, $p<0.05$).

Conclusion: In the study population which prefers non-vegetarian sources, plant-based protein was almost equally preferred. Positive perceptions and awareness of women towards the functional properties of soybean were also observed.

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Keywords: Awareness, consumption patterns, menopause**,** perceptions, soy products.

Funding Source: None

Development And Evaluation Of Blended Finger Millet And Coconut Milk, A Plant Based Milk Alternative

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Theme: Nutraceuticals and functional foods in health, Sub-theme: Functional foods in health

Introduction: Plant-based milks are formulated from water-soluble extracts derived from oilseeds, cereals, nuts, legumes, and pseudo-cereals. The shift towards plant-based milk alternatives as functional beverage is boosted by apprehensions concerning lactose malabsorption, lipid profiles, and ecological sustainability.

Aim: To develop a plant based milk alternative. Objective: The main objective of this study was to evaluate the physicochemical parameters and microbial load of the blended milk by analysing sensory characteristics through the standardization of finger millet and coconut milk blend.

Methodology: Two milk extracts with different ratios from finger millet milk and coconut milk (60:40, 70:30 and 80:20) were formulated as variation 1(FiCoM1), variation 2 (FiCoM2) and variation 3(FiCoM3). These variations were compared with control V0 (CM). A sensory evaluation was carried out for all the variations of the blended plant-based milk alternative. The best variation of finger millet and coconut milk blend was selected for the evaluation of proximate analysis.

Result: The cow's milk which considered to be control scored sensory values of 8.04±0.2. Variation with 60:40, 70:30 and 80:20 scored sensory value of 8.1±0.2, 7.8±0.19 and 7.8±0.3 respectively. Besides, the fat content of variation of 60:40 had 36.2%, 70:30 had 24.8% and 80:20 had 10.9%. Consequently, the 80:20 variation (FiCoM3), although characterized by comparatively diminished sensory attributes,

demonstrated the lowest fat content, which is crucial for achieving optimal homogenization**.** FiCoM3 exhibited a carbohydrate content of 9.2g, protein 4.9g, and fat 10.9%. The estimated values for iron were 3.6mg and calcium values are 292mg respectively.

Conclusion: This study will contribute significantly to the formulation of a plant-based milk alternative consisting of a blend of finger millet and coconut milk. The blend provides a nutrient-rich beverage that is vital for children's growth and development, with sensory qualities that can be tailored to align with consumer preferences.

Keywords: Plant based milk alternative, Finger millet milk, Coconut milk, Functional beverage.

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Role Of Immunonutrients And Functional Foods In Maternal And Infant Growth: A Longitudinal Study

Theme: Functional Foods in Health and Disease

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Background: Immunonutrients and functional foods provide antioxidants that help combat oxidative stress generated during normal placental development. In absence of antioxidants, heightened oxidative stress within placenta and maternal circulation could adversely affect maternal and infant growth[1].

Aims and Objective: To assess longitudinal intakes of dietary immunonutrients and functional foods among pregnant women and to examine relationship between immunonutrients, functional foods, and maternal and infant growth.

Materials & Methods: Data were collected from 268 dyads of pregnant mothers and their infants enrolled in prospective longitudinal cohort, MAI (Mother and Infant), from August 2020-September 2023 in and around Pune, Maharashtra. Anthropometric measurements of mothers and infants were taken. Mothers were interviewed for consumption of immunonutrients and functional foods (3-day diet recall) that were compared with EAR (NIN, ICMR 2020). T-test and Pearson's correlation were used to derive results (SPSS v.27).

Results: Insufficient intake of dietary immunonutrients like calcium (EAR adequacy-48%), folic acid (17%), zinc (32%), beta-carotene (20%), and iron (22%) were seen across pregnancy. Consumption of functional foods like papaya (64.9%), jackfruit (50.4%), and probiotics (16.4%) were low. Immunonutrient intake was positively correlated with maternal weight gain (r=0.173), fetal weight (r=0.134), and infant birth weight (r=0.131). Women not consuming functional foods due to food taboos reported inadequate intakes of calcium (r=−0.180) and beta-carotene(r=−0.158). Maternal weight gain (12.0±4.2 vs. 10.4±4.1kg) and infant weight (2.8±0.5 vs. 2.7±0.4kg) were significantly low among women not consuming functional foods. Infants of women with lower intake of immunonutrients and functional foods were small for gestational age (38.7%), had lower birth weight (20.4%), and had preterm (17.1%) birth.

Conclusions: Pregnant women were found to consume insufficient immunonutrients and functional foods owing to food taboos that led to poor maternal, fetal, and infant nutritional status. This study underscores the critical need to educate pregnant women for optimal delivery outcomes.

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Keywords: Functional foods, Immunonutrients, Pregnancy, Infant

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Gut Matters: Prebiotics In Type 1 Diabetes Mellitus Management

Theme: Functional Foods in Health and Disease

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Background: Children with type 1 diabetes mellitus (T1DM) exhibit gut dysbiosis (imbalance), disrupting eubiosis (balance) and glucose metabolism(1). Diet plays a key role in shaping the gut microbiome, and influencing glycemic control(2).

Aim and Objectives: To study the effect of prebiotic supplementation on glycemic control and gut microbiome profile in children with T1DM.

Materials and Methods:A pilot, randomised, double-blind, placebo-controlled study was conducted in children with T1DM (n=68), where 35 children (Intervention group-IG) were supplemented with prebiotic (inulin oligofructose), and remaining 33 (age, gender, and BMI-matched) children (Placebo group-PG) were supplemented with placebo (maltodextrin) for 3 months. Pre- and post- intervention assessments included clinical data, anthropometry, HbA1c, 3-days dietary recall along with the microbiome analysis of stool samples using 16s-rRNA sequencing technique. Percent change was calculated as the percentage of the difference in relative abundance of microorganisms between pre- and post-intervention for each group. SPSS (version-26) was used for statistical analysis, and $p<0.05$ indicated statistical significance.

Results: In pre-intervention assessment, for IG and PG groups, the mean age was 12.8±2.6yrs and 13.2±3.0yrs, disease duration was 5.1±2.1yrs and 5.5±3.4yrs, and HbA1c levels 9.5±1.6% and 10.1±1.9%, respectively. Post-intervention, the mean HbA1c levels were 9.8±1.4% and 10.6±2.5%, respectively. No significant differences were noted post-intervention in HbA1c percent change between IG and PG (12.1±12.3% vs 13.2±12.6%).

In IG group, the percent-change in relative abundance of short chain fatty acid (SCFA) producing microbes like Agathobacter, Akkermensiaceae, Bifidobacteriaceae, Succinivibrionaceae was increased as compared to PG group, indicating improvement in the gut health (eubiosis).

Conclusion: Prebiotics offer a novel, cost-effective, and low-risk way to improve the gut health and restore eubiosis in children with T1DM. However, we did not find any differences in HbA1c levels between IG and PG post-intervention. Longer duration intervention studies with larger sample size are needed to confirm benefits of prebiotics on glycaemic control.

Keywords: Gut microbiome, Type 1 diabetes mellitus, Prebiotics, Short chain fatty acids.

Funding source: Hirabai Cowasji Jehangir Medical Research Institute, Jehangir Hospital, Pune, India.

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Micronutrient Intake Among Children And Adolescents With Type 1 Diabetes

Theme: Functional Foods in Health and Disease

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Background: Type 1 Diabetes Mellitus (T1D) is an autoimmune disease causing insulin deficiency, leading to hyperglycemia[1] as well as affects lipid metabolism causing varying degree of dyslipidemia even with good glycemic control[2]. Data is insufficient on micronutrient intakes among children and adolescents with T1D, despite the vital role it plays in glucose[3] and lipid metabolism[4].

Aims and Objective: To assess micronutrient adequacy and its association with glycemic control and lipid profile in Indian children and adolescents with T1D.

Methods: Data were collected during 2023-24 from 588 children and adolescents (5-19y) with T1D who were part of the Sweetlings cohort, based in Pune, Maharashtra. Anthropometry and biochemical assessments (HbA1c-glycemic control and lipid profile-dyslipidemia[5]) were performed using standard methods. Dietary intake was assessed using 24-hour recall and compared with the 2024 Estimated Average Requirements (EAR) for Indians.

Results: Mean age of children and adolescents was 7.7±1.4 and 15.1±3.2years, respectively. Prevalence of underweight (6.3 vs. 4.3%) and overweight/obesity (5.6 vs. 8.1%) was similar. High prevalence of inadequate micronutrient intakes was noted among all: (calcium (91%), iron (79%), zinc (82%), folic acid (96%), vitamin C (83%), beta-carotene (97%), and fiber (52%). Overall, 54% children and 33% adolescents were deficient in these micronutrients as per EAR. While glycemic control (HbA1c-%) between children (9.8±1.7) and adolescents (10.1±2.4) was similar, prevalence of dyslipidemia

was higher among adolescents (74%) than children (51%); cholesterol (157.6±30.5 vs. 147.3±25.3mg/dL), LDL (99.4±31.4 vs. 91.1±23.4mg/dL), triglycerides (90.9±104.0 vs. 71.6±22.9mg/dL), HDL (39.8±7.4 vs. 41.9±8.0mg/dL). Serum cholesterol was correlated with intakes of zinc (ρ=−0.119), iron (ρ=−0.106), fiber (ρ=−0.133), and HDL with beta-carotene (ρ=0.233), folic acid (ρ=0.212). No associations were found between micronutrient intakes and glycemic control.

Conclusions: A high prevalence of micronutrient inadequacy associated with deranged lipids, but not with glycemic control was noted. Further studies investigating the effect of micronutrient supplementation on metabolic control in this population are required.

Keywords: Type 1 Diabetes Mellitus, Micronutrient, Lipid profile, Glycemic control

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Assessment Of Knowledge, Attitude And Practices Towards Functional Food Consumption In Delhi NCR

Theme: Functional Foods in Health and Disease

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Background: The potential health benefits of functional foods have sparked their significance globally. There is an intricate web of factors which influence the integration of functional foods into our dietary patterns. These factors could be spanning from socio economic and demographic profiles to varied behavioral patterns.

Aims and Objectives: To assess the knowledge, attitude and practices towards functional foods consumption between the age group of 18 – 50 years in Delhi – NCR.

Materials and Methods: A cross-sectional study was conducted on 456 participants by convenience sampling. A knowledge, attitude and practice (KAP) questionnaire was developed and administered to the participants to record information on socioeconomic/ demographic data and food frequency consumption of various functional foods. Chi square test was applied to analyze association between variables and a P value of < = 0.05 was used for level of significance. SPSS version 22 was used for statistical evaluation.

Results: The results indicated that participants n=302(65.9%) demonstrated adequate knowledge of functional foods by defining it appropriately with a significant difference

(p<0.02) among genders. Participants n=231(50.4%) could identify more than three types of functional foods. Only participants n=11(2.4%) encountered the concept of functional foods for the first time. Participants n=378(82.5%) recognized the importance of awareness of functional foods with a significant difference (p<0.02) between genders. Variables like age, education and income showed no significant association with knowledge and attitude while gender was strongly associated with both knowledge and attitude of the participants. The food frequency indicated a preference for certain commonly known functional foods and a limited intake of foods like black rice, bajra, hempseeds, kale and asparagus.

Conclusion: The study highlights that despite eliciting adequate knowledge and awareness regarding functional foods, participants showed less interest in its consumption. There is a gap between knowledge and implementation which can be bridged through nutritional education.

Key words: Functional foods, Knowledge, attitude, food frequency

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An Ethnobotanical Survey Of Traditional Leafy Vegetables In Purulia District West Bengal: Crude Fat Extraction, Biomolecule Analysis, And Traditional Food Product Development

Theme- Functional Foods in Health and Disease

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Background: The northern region of West Bengal, India, is rich in wild edible resources, including resilient indigenous leafy vegetables widely used in traditional recipes. This study explored the traditional ethnobotanical knowledge among tribal communities in Purulia, West Bengal, focusing on wild leafy green vegetables. Findings were limited due to deforestation, migration, and environmental changes. The research involved the crude fat extraction of 5 leaf samples, viz., Coriander leaves (Coriandrum sativum), Mustard greens (Brassica juncea), Moringa leaves (Moringa oleifera), Spinach (Spinacia oleracea) and Colocasia leaves (Colocasia esculenta), identification of its bioactive compounds for phytonutrient properties and development of traditional food products to enhance daily dietary antioxidants content.

Aim and Objectives: To identify and taxonomically classify traditional leafy vegetables from Purulia, West Bengal, and analyze their crude fat through Soxhlet extraction, determine phytochemicals present, and develop traditional food products as measures of improving dietary antioxidants.

Materials and Methods: A purposive convenience sampling method was employed to collect leaf samples for taxonomic classification and traditional usage, according to the informant consensus factor (ICF). This was followed by crude fat extraction using Soxhlet, phytochemical identification, and analysis through HPTLC, as well as Rf factor determination for five leaf samples. Traditional Bengali preparations were made using the original procedures.

Results and Discussion: Crude fat extraction from five leafy vegetables revealed that Spinach (Spinacia oleracea) had the highest phytosterol content at 1.67g, while Colocasia (Colocasia esculenta) exhibited the lowest at 0.74g. Overall, the fat content was relatively minimal, highlighting the nutritional suitability for low-fat diets. The HPTLC analysis, along with confirmatory tests using derivatizing reagents, confirmed the presence of alkaloids and flavonoids, with coriander showing the highest Rf values of 0.83 and 0.74, respectively. Indigenous recipes were developed to preserve antioxidant properties.

Conclusion: The exploration and sustainable incorporation of leafy vegetables are vital for diversifying and enriching traditional diets into functional foods and providing people with useful ways to tackle non-communicable diseases (NCDs).

Keywords: Traditional, ethnobotanical, leafy vegetables, functional foods, antioxidants.

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Theme: Nutraceuticals in Health and Disease

Effect Of Oral Vitamin D And Calcium Supplementation On Sarcopenia Indices And Bone Density Among Post- Menopausal Women- A Pilot Randomized Controlled Trial

Theme: Nutraceuticals in Health and Disease

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Background: Sarcopenia is age-related loss of muscle mass, strength, and function, leading to reduced mobility, increased risk of falls and premature deaths. Osteoporosis is caused due to reduced bone density. Evidence suggests supplementation with vitamin D and calcium improves muscle and bone health. We aim to examine the effect of vitamin D and calcium on sarcopenia indices and bone density among rural, post-menopausal women.

Methods: This pilot, randomized, controlled trial was performed in 93 post-menopausal women (mean age 54.9± 3.5 years) residing in rural areas near Pune city for the period of six months. Women were divided into three groups, 31 each. Group A received Calcium-Vitamin D_3, Group B received Vitamin D_3, and group C was Control group. Assessments included anthropometry, measurement of appendicular muscle mass (ASM) and bone density (Dual Energy X-ray Absorptiometry), muscle strength (JAMAR hand dynamometers), muscle function (Short Physical Performance Battery) and biochemical parameters (serum vitamin D_3, parathyroid hormone (PTH)) using standard protocols at baseline and endline.

Results: Serum vitamin D_3 concentrations (ng/ml) increased significantly in groups A and B post-supplementation (22.5±6.7 vs 49±30.6 and 21.4±7 vs 55.1±29.3), while PTH (pg/ml) reduced in group B (61.0±17.0 to 41.6±24.3), and increased in group C (41.5±25.1 to 66.6±29.8, $p<0.05$). No significant effect was observed on ASM, muscle strength and

function, and bone density at lumbar spine and femur post-intervention in supplementation and control group.

Conclusion: As expected, Vitamin D_3 supplementation helped in improving vitamin D and reducing PTH concentrations. However, improved vitamin D levels and additional calcium supplementation did not show any effect on improving sarcopenia indices and bone density. Further larger and longer studies are needed, considering protein or exercise interventions, as supplementation alone shows no effect.

Funding: This study was supported by an intramural grant from Hirabai Cowasji Jehangir Medical Research Institute, Jehangir Hospital Pune.

Keywords: Sarcopenia, bone density, vitamin D and calcium, post-menopausal

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Theme: Therapeutic Food Product development

Development Of Healthy Snacking Option From Millet And Seeds For Diabetic Population

Theme: Therapeutic Food Product development

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Background: This study was done to develop product that is made from millet and seeds. To replace refined wheat flour in snacking option also to incorporate micronutrients in it.

Aim: To develop a new product from millet and seeds. Objectives: To replace Maida, Adding micronutrients by incorporating seeds, and Healthy snacking option for diabetic population.

Materials and Methods: Name of the product: Bajra crackers incorporated with seeds. The product developed was designed in a way to provide the goodness of millets which are traditionally used in India. As millets like bajra has low glycemic index and can be used for snacking option for diabetic population. Ingredients: Bajra flour, Whole wheat flour, Pumpkin seeds, Sesame seeds, Sunflower seeds, Carom seeds, Cumin seeds, Ginger garlic paste, Turmeric powder, Red chilli powder, Oil, Salt. Flow of the product preparation

1. Blenderize sunflower seeds and pumkin seeds coarsely.
2. In a bowl add Bajra flour, whole wheat flour, blenderized seeds, sesame seeds, carom seeds, cumin seeds, turmeric powder, red chilli powder, salt and mix it.
3. Add oil and water to the mixture and knead the dough until it forms a firm ball. Knead the dough and then cover and let it sit for half an hour.
4. Start rolling the dough into thin layer and then cut it into small squares.
5. Bake the crackers for 8-10 minutes or until lightly golden brown.
6. Bajra crackers are ready!

Hedonic rating scales was used to analyse appearance, aroma, taste and texture.

Result: Appearance, taste and texture were liked a lot by people. Aroma was liked a little.

Conclusion: According to sensory evaluation of the final product, the appearance of the product was nice, the aroma was good, the taste was very good, the crunchiness was good, and texture and mouth feel was as expected.

Keywords: Bajra, seeds, healthy snacks.

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Development of a Healthy Snacking Option For Diabetic Population

Theme: Therapeutic Food Product Development

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Background: Broken Wheat (Laapsi) is a good source of fiber and other essential nutrients. It is considered a wholesome and healthy dish. The preparation of Whole Wheat (Laapsi) has been passed down through generations, maintaining culinary traditions and family recipes. No chemical preservatives were used in the production of the product making it 100% chemical free.

Aim: To develop a new product for diabetes population. Objectives: Develop a diabetes-friendly, low-GI snacks, Ensure good taste and consumer acceptability, Avoid artificial additives and refined sugars, Offer a nutrient-dense, convenient alternative to unhealthy snacks

Material and Method: Name of the product - Laapsi bites. Laapsi Bites are a diabetes-friendly alternative to conventional snacks like Kurkure or chips offering a nutrient-dense, low-glycemic option. Laapsi Bites support better glycemic control, digestive health, and overall well-being.

Ingredients - Laapsi (broken wheat), cumin powder, salt, butter, coriander leaves, mint leaves, chaat masala, chilli masala, garam masala , dry mango (amchur) powder. Flow Of the Product Development: For Laapsi bites - In a mixing bowl add laapsi flour, cumin powder, salt and butter. Mix all the ingredients by gradually adding water to get dough consistency. Let the dough set for 15 mins. After the dough is set roll into small balls and flatten the balls and cut them into desired shapes. Deep fry till the kurkure turns golden brown. Add the flavors to enhance the taste. For Green chutney flavor dry roast coriander and mint leaves. Grind them to fine powder. Mix the powder with Chaat masala. For Kitchen spice flavor mix Chilli powder, Garam masala , Aamchur powder and Salt. Hedonic rating scales were used to analyse appearance, aroma, taste and texture.

Result: Appearance, taste , texture and aroma was liked a lot by people

Conclusion: Sensory evaluations confirm their acceptability, making them a healthier, convenient option for individuals with diabetes.

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Key Words: Laapsi , broken wheat, diabetes friendly snack , low GI snack

Study and Nutritional Evaluation of Dates Ladoo for Lactating Mothers

Theme: Therapeutic Food Product Development

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Background: Lactation significantly increases a mother's nutritional requirements, necessitating a diet rich in energy, protein, and essential micronutrients. Traditional Indian foods, such as ladoos,
have long been used to support postpartum recovery and milk production. This study aimed
to develop a nutrient-dense dates ladoo, specifically formulated to meet the dietary needs of
lactating women while ensuring convenience, taste, and affordability.

Aims and Objectives: Develop and standardize a dates ladoo rich in essential nutrients for lactating mothers. Enhance sensory appeal to encourage regular consumption. Assess the nutritional composition to ensure balanced macronutrient and micronutrient intake. Design appropriate packaging and labeling for market presentation. Conduct a cost analysis to ensure affordability without compromising quality.

Materials & Methods: The ladoo was formulated using dates, almonds, walnuts, sesame seeds, ghee, and flaxseeds. 1. Standardization Trials – Multiple formulations were tested and refined based on sensory panel feedback. 2. Nutritional Analysis – The final recipe was analyzed for macronutrient content, including energy, protein, fiber, and essential vitamins and minerals. 3. Sensory Evaluation – A 5-point hedonic scale was used to assess taste, texture, and overall acceptability. 4. Cost and Packaging Analysis – The product was designed to be cost-effective
while ensuring premium nutritional quality and market appeal.

Results: The final product demonstrated high sensory acceptability with an appealing taste

and texture. Nutritional analysis confirmed the ladoo's rich profile of healthy fats, proteins, fiber,

and lactation-supporting nutrients. Cost analysis indicated feasibility for large-scale production with a competitive price point.

Conclusion: The development of dates ladoo successfully integrates traditional ingredients with modern nutritional insights, offering lactating mothers a wholesome and convenient snack. Rich in essential nutrients, it provides sustained energy, supports milk production, and promotes overall well-being. This innovative product stands out as a healthier alternative to conventional sweets, catering to the dietary needs of postpartum women.

Keywords: Dates Ladoo, Lactation Nutrition, Functional Food, Maternal Health, Sensory Evaluation.

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Development Of a Healthy Snacking Option For All Age Group Arifa Bano

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Background: The Ragi Jowar Brownie is prepared as a nutritious and wholesome alternative to traditional baked goods, using ingredients that are rich in essential nutrients such as calcium iron and fiber while maintaining the flavor.The addition of apples not only enhances the flavor but also provides additional vitamins and natural sweetness. This modified recipe aims to provide a balanced, wholesome option for healthy snack. It serves as a tasty, nutritious replacement for conventional snack or dessert option, ideal for all age groups.

Aims And Objectives: Enhance the nutritional value of popular, processed food by incorporating the power of traditional Ingredients. Create healthier versions of well-loved treats using nutritious and delicious items. This modified recipe aims to provide a balanced, wholesome option for better health.

Material And Methods: Ingredients: Ragi flour, jowar flour, Apple, Milk, Jaggery, Walnut, Cocoa powder, Ghee, Vanilla essence, Baking powder. FLOW OF THE PRODUCT DEVELOPMENT: Roast Ragi flour and Jowar flour in a dry pan, then cool. Peel and chopped the Apples add it to a blender with a milk, ghee, vanilla essence, and jaggery make it into a thick paste. In a bowl, combine the paste with sieved Ragi, roasted Jowar flour, Cocoa powder, baking powder and chopped walnuts. Pour the better into a parchment-lined baking pan, topping with walnuts. Preheat the oven to 180°C and bake for 25 minutes. Check with a skewer, let the brownies cool in the pan. Cut into pieces and store in an airtight container at room temperature. RATING:
Hedonic rating scale was used to analyse Appearance, Texture, Taste and Aroma.

Result: Appearance, taste, texture and aroma was liked by a lot of people.

Conclusion: In conclusion, this product serves as an enjoyable, sustainable choice for replacing unhealthy snack options, promoting overall well-being while maintaining great taste.

Keywords: Ragi Jowar Brownie, Healthy Alternative, Calcium Rich, Apple.

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Shelf-Life Study Of Bajra Based Functional Snack

Theme: Therapeutic Food Product Development

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Background: The increasing demand for nutrient-dense, functional foods has led to the development of innovative snacks that cater to health-conscious individuals, particularly athletes, gym-goers, and individuals with metabolic disorders. This study aimed to formulate and assess the shelf life of a Bajra-based functional snack, and its acceptability over time.

Aims and Objectives: Develop and standardize a bajra-based protein-energy bar with improved sensory attributes. Assess shelf stability through sensory analysis. Design a cost-effective packaging and label. Evaluate consumer acceptability using sensory evaluation.

Materials & Methods: This study was conducted as part of the Food Product Development curriculum at the postgraduate level. The product was formulated using bajra flour, groundnuts, jaggery, sesame seeds, pumpkin seeds, and dark chocolate: **Standardization Trials** – Two formulations were tested, and modified based on sensory panel feedback. **Shelf-Life Study** – The final product was stored in airtight packaging at room temperature and analyzed over five days for sensory deterioration (texture, taste, aroma, and appearance). **Sensory Evaluation** – A **5-point hedonic scale** was used to assess acceptability. **Cost Analysis & Packaging** – The product was designed for cost-effective production, ensuring affordability while maintaining nutritional quality.

Results: The final standardized product demonstrated a high level of sensory acceptability, with improved texture, taste, and visual appeal. Sensory Evaluation indicated that the product remained stable for up to five days without preservatives. The nutritional composition was optimized to provide sustained energy, protein, iron,

calcium, magnesium, and fibre, supporting bone health, muscle recovery, and metabolic functions. The cost analysis confirmed the feasibility of large-scale production, with a competitive market price.

Conclusions: This study successfully developed a clinically beneficial, shelf-stable, and cost-effective bajra-based functional snack. Its high nutrient density, energy-boosting properties, and inclusion of functional foods make it a promising alternative to conventional energy bars. Further research can explore extended shelf life with natural preservatives and alternative storage conditions.

Keywords: Bajra, Functional Food, Shelf Life, Sensory Evaluation, Sports Nutrition

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Concluding Remarks

Concluding Remarks

Nutrition and Health Research Conference 2025 (NHRC – 2025)

What We've Learned

The conversations have highlighted the incredible potential of nutraceuticals and functional foods in shaping health outcomes. A few standout themes that will stay with us include:

Inaugural Session: Guest of Honor:

- **Role of nutraceuticals and Functional foods in health by Dr. D.B. Ananth Narayana**
  - How nutraceuticals are bridging the gap between food and medicine
  - Recognition of the role of a nutritionist in the regulations
  - Illness centric healthcare to wellness centric healthcare
  - Gave an idea of a whole host of opportunities as scientists, food technologists.

Session 1- Advances in Functional Foods

- **Keynote Address: Health Advantages of Fermented Indian Foods: A Multi-omics Approach by Prof. Dr. Jyoti Prakash Tamang**
  - The untapped power of fermented foods and their role in gut health
  - Importance of interpreting our rich cultures scientifically to support evidence-based practice
  - Some Indian fermented foods are recognized for their health benefits.
  - However, there are no studies on humans to show that these foods can effectively treat lifestyle-related diseases or other health issues.
  - Human trials for any food that makes health claims must adhere to the safety regulation adopted by each country.

- Before starting clinical studies, researchers must provide safety data, including animal toxicity tests and genetic details of starter cultures to be used as a food-grade organisms.
- Choosing volunteers for human trials is influenced by the types of fermented foods being studied. Popular fermented foods can be tested more easily because there are many willing participants.
- However, studying rare or region-specific fermented foods is challenging due to the small number of diverse participants familiar with those foods, and the lack of medical facilities for trials in those areas.
- Using multi-omics approaches in clinical trials of fermented foods could provide evidence of their advantages in fighting terminal diseases.

🔹 **Vitamin D & Calcium Supplementation for Bone Health by Dr. Anuradha Khadilkar**

- High prevalence of vitamin d deficiency; calcium intake is also poor in most populations
- Vitamin D and calcium intake need to be assessed together
- Calcium intake influences the relationship between vit D and PTH
- Bone health is assessed using a bone densitometer or DXA
- Periods of rapid growth such as adolescents and toddlers need more attention
- Supplementation with vitamin D and calcium is beneficial for improving bone health, more so if milk is the source of calcium
- Strategies for improving calcium intake through non-dairy foods are required
- Supplementation to improve bone health in chronic disease states is critical

🔹 **Functional Foods for Endocrine (Hormonal) Health Dr. Shilpa Varma**

- The endocrine system plays a crucial role in regulating various physiological processes, including metabolism, growth, reproduction, and mood.
- Hormonal imbalances can result in conditions such as diabetes, thyroid disorders, and polycystic ovary syndrome (PCOS).

- Functional foods, which provide health benefits beyond basic nutrition, can support endocrine health by promoting hormonal balance and reducing inflammation.
- Incorporating functional foods into the diet can significantly improve endocrine health by regulating hormone production, reducing inflammation, and supporting metabolic functions.
- A balanced diet rich in these foods, combined with lifestyle changes such as regular exercise and stress management, is essential for maintaining optimal hormonal health.

Session 2: Industry Trends and Regulatory Landscape

- **Nutraceuticals for Women's Health: A Growing Market by Dr. Geeta Dharmatti**
  - Diet is an outdated term. It makes me feel restricted. The term we should use is nutrition or nourishment instead of diet.
  - Women’s health is increasingly gaining attention, with a rising focus on nutraceuticals – food -based products offering health benefits beyond basic nutrition.
  - These supplements help address hormonal balance, pregnancy, bone health, gut health ,skin and mental well-being across different life stages.
  - Nutraceuticals play a vital role in women's health by addressing preventive care, hormonal balance, gut health, and skin vitality. However, scientific backing, proper dosing, and professional guidance are essential for safety and efficacy.
  - Choose evidence-based supplements, follow RDA guidelines, and consult health professionals for personalized nutrition plans.

- **Regulatory Aspects of Health Supplements & Nutraceuticals Labelling by Dr. Sheetal Gupta**
  - Breakthrough discussions on regulatory challenges and safety standards in functional foods
  - Mandatory labelling requirements have to be followed as per FSS (Labelling and Display) Regulations, 2020
  - Specific labelling requirements are mentioned in FSS (Health Supplements, Nutraceuticals, Food for Special Dietary Use, Food for Special Medical Purpose, Functional Food and Novel Food) Regulations, 2022
  - If you are making a claim, you have to refer to specified claims as per FSS (Advertising and Claims) Regulation, 2018.

Session 3: Research Challenges & Opportunities

- **Overcoming Barriers in Nutraceutical RCTs by Mrs. Neelambari Bhosale**
  - **Enhance Recruitment and Retention**
    - Community Engagement (schools, anganwadis, etc)
    - Use Technology (mobile apps for data collection, follow ups)
    - Simplify Eligibility
    - Compliance management (product administration)
  - **Address Ethical Issues**
    - Transparent Communication (Informed consent)
    - Study Design (Placebo and Blinding), power Calculations
    - Ethical Review Board (ongoing monitoring for safety)
    - Adaptive Designs (Interim review and analysis)
  - **Improve Data Collection and Management**
    - Electronic Data Capture (EDC)
    - Standardizing Protocols
    - Dietary Measurement (Use validated tools, softwares)
    - Advanced Statistical Techniques
  - **Secure Adequate funding**

- Public-Private Partnerships
- Crowd funding
- Efficient Resource Allocation

- **Bioavailability Optimization of Functional Ingredients by Dr. Milind Patole**
  - Predicting the nutritional quality of newer foods, information on the it's digestibility is of utmost importance.
  - In vivo feeding methods, using animals or humans, usually provide the most accurate results.
  - However, are time consuming, poor repeatability due to individual variations, costly and ethically non-feasible, which is why much effort has been devoted to the development of in vitro procedures.
  - Human studies involve advanced and expensive instruments, such as NMR and ultrasonic scanner. Intubation techniques including gastric barostat and intra-luminal manometry needed to study gastric motility and emptying.
  - The invasive protocols are poorly tolerated leading to possible disturbances of the normal physiology and motility patterns.
  - Therefore, there was a need to develop and obtain reliable *in vitro* digestion systems that can closely mimic the human digestion.
  - Compared to the human clinical trials, *in vitro* approaches are more efficient, straightforward, cheaper, and do not have ethical restrictions.
  - Inherent complexity of the human digestive tract like complicated motility, anatomical structures, numerous digestion-related enzymes and hormones and microbial activity make it difficult to simulate completely *in vitro*.
  - The *in vitro* systems are widely applied in the past decades for investigating the fates of foods during digestion and their physiological effect on human health.
  - Designing and making of an ideal *in vitro* digestion system that is able to fully reproduce what is going on in the real human GI tract is difficult and challenging task.

Session 4: Panel discussion & Valedictory address

- **Protein Supplements: Myths, Science, and Innovations by Sheryl Salis**
  - Understanding the facts about protein supplements can help individuals make informed decisions about their nutrition and fitness routines.

- While supplements can be beneficial, it's essential to choose high-quality products, consume them within recommended limits, and maintain a balanced diet rich in whole foods.
- Consulting with a healthcare provider or nutritionist can also provide personalized guidance based on individual health needs and goals.

Common Myths About Protein Supplements

- Protein Supplements Are Only for Bodybuilders: While protein supplements are popular among bodybuilders, they can benefit anyone aiming to meet their daily protein requirements, including athletes, busy professionals, vegetarians, and individuals recovering from illness.
- Protein Supplements Are Harmful to Kidneys: For healthy individuals, consuming protein within recommended limits is safe and does not harm kidney function.
- All Protein Supplements Are the Same: Protein supplements vary in source, bioavailability, and added ingredients. It's important to choose high-quality products from reputable brands to ensure safety and efficacy.
- Protein Powders Cause Weight Gain: Protein supplements themselves don't lead to weight gain; excess calorie consumption does. In fact, protein can aid in weight management by promoting satiety and supporting lean muscle growth.
- Natural Food Is Always Better Than Protein Powders: While whole foods are essential, protein powders offer a convenient way to meet protein needs, especially for those with busy lifestyles or increased protein requirements.

🔹 **Valedictory Address: Spices as Nature’s Pharmacy: Unlocking Their Therapeutic Potential by DR. G. Bhanuprakash Reddy**

- The therapeutic potential of spices in preventive health
- It reminded us that while innovation is key, traditional knowledge still holds immense value.

- Food supplements are food components that provide health benefits due to their bioactive components and essential oils, carotenoids, dietary fibre which are collectively regarded as nutraceuticals
- Since ancient times, conventional food and herbal extracts have been recognized as a fundamental part of the holistic approach to health, especially in the traditional Indian (Ayurveda), Chinese, Roman, and Greek medicine.
- We have screened functional foods/spices and characterized novel molecules with ALR2 inhibition and antiglycating activity
- Studies with diabetic animal models indicated the potential of these molecules in preventing and arresting the progression of diabetic complications
- Ingredients of spices/functional foods could to be translated for their utility against diabetic complications in humans
- Polyspice formulation: studies with animal models
- The science of nutraceuticals has been growing- functional foods have various health benefits due to several active ingredients.
- Finding novel therapeutic options by utilizing new technologies and scientific methods
- There is a necessity of conducting more high-level, clearly evidenced clinical trials for further investigation regarding the long-term effects and public safety.
- It is necessary to broadly exploit the medicinal properties and nutritional values of those compounds separately.
- Because nutraceuticals still lie in the grey zone; being confused by many whether they should be administrated as medicine, or if they are a basic nutrient need.
- The advanced exploration of their safety, bioactivity, and bioavailability is crucial because it will contribute to translate these hypothetically potential natural nutraceutical compounds into implementable, validated, regulated, and approved effective medicinal products.
- More studies with scientific evidence are needed to provide these products with health claims in their labels.

A Balanced Approach to Health

An important theme that emerged was the need for targeted nutritional strategies for different populations. With **International Women's Day just behind us**, it was fitting to discuss the **growing market and critical need for targeted nutrition solutions for women** that Dr. Geeta Dharmatti highlighted. However, today's sessions also underscored the importance of comprehensive nutrition for all, including men's health, aging populations, and athletes. The goal remains personalized, science-backed nutrition solutions that cater to diverse needs.

Where Do We Go from Here?

Conferences like these are not just about gathering information; they are about building connections, sparking ideas, and igniting change. Whether you are a researcher, a policymaker, a clinical nutritionist, or a student, the real impact begins now—when we take these insights and apply them in our respective fields.

We encourage you all to continue these conversations, seek new collaborations, and contribute to evidence-based advancements in this exciting domain.