

CHAPTER 25

HOME SCIENCE

Doctoral Theses

01. ANURADHA
Early Enteral Feeding with Supplemented Mother's Milk in Post-Operative Paediatric Cardiac Surgical Patients: A Randomized Controlled Trial.
Supervisors: Prof. Bani Tamber Aeri and Manoj Kumar Sahu
Th 26722

Abstract

Congenital heart disease is a life-threatening anomaly that affects most infants in their early life and can be seen in adults as well. In the past few decades the survival rate has improved in developed countries with advanced surgical and medical therapies and technologies. However, most infants remain undiagnosed and untreated until late adulthood in developing countries like India due to a lack of awareness and resource constraints. They are prone to malnutrition in two accounts resource and cardiac failure or hypoxia related. The delayed correction of the cardiac defect increases the risk of malnutrition and may lead to cardiac cachexia. As early diagnosis and treatment remain a major concern to deal with nutritional adequacy is neglected among these infants. Despite knowing the fact that malnutrition is a systemic consequence of CHD no such guidelines have been generalized to feed these infants appropriately. Therefore, a systematic feeding algorithm is required to feed these infants and to improve their survival and overall wellbeing. The literature has shown that children with CHD are malnourished in the pre and postoperative phases. Several physiological and mechanical changes are responsible for their poor nutritional status. The incidence of malnutrition increases with growing age due to inappropriate feeding and increased energy requirements. The energy expenditure of children with CHD is higher compared to healthy children possibly due to the increased workload of the heart and respiratory system. Increased energy expenditure increases their increased nutritional requirements. However these infants are unable to meet their increased nutritional requirements due to feeding difficulties poor dietary intakes fluid restrictions mal absorption. The persistent dietary inadequacy leads to growth failure which is linked with an increased risk of mortality among these infants.

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02. AGARWAL (Ruchira)
Approaches for Low Salt Dyeing of Silk with Heterobifunctional Reactive Dyes.
Supervisors: Dr. Deepali Rastogi
Th 26721

Abstract

Silk fibre is well known for its favourable aesthetic, mechanical and biological properties, which are responsible for its use in the apparel, home, medical and other technical textile sectors. The silk industry of India holds world prominence by contributing 18% of the world's raw silk production. The Indian silk industry has a large domestic user base. The successful colouration of silk has the potential to add to the immense value it holds. Silk is capable of being dyed with various dyes. Most of these dyes are not able to impart the desired wet fastness, which, in turn, gives rise to consumer concerns in the use, care and maintenance of silk articles. The application of reactive dyes on silk lacked acceptance due to not-so-favourable dyeing conditions and the environmental concerns associated with the use of high levels of electrolytes. It is believed that improved colouration practices of silk will improve the consumer experience, strengthen the silk industry, and address environmental concerns. The present work studies the various aspects of silk colouration, specifically in India. The study was divided into four parts: (i) determining the status of silk colouration in India with respect to the industry and consumer feedback, (ii) evaluating the characteristics of coloured silk available in the markets, (iii) optimising the parameters for dyeing with heterobifunctional reactive dyes so as to maximise colour output and minimise electrolyte consumption, and (iv) developing approaches to reduce the dependence on salt while dyeing silk with heterobifunctional reactive dyes. Ten silk dyeing units were interviewed to understand the current silk dyeing practices. It was found that acid dyes were exclusively being used for silk dyeing, except for one fully export-oriented unit, where heterobifunctional reactive dyes were also being used. Drawbacks reported with acid dyes were lower wash fastness, especially with some colours. Apprehensions regarding the use of reactive dyes were loss of strength and long dyeing times. A survey of women consumers' experiences with silk made-ups revealed consumer apprehension in the frequent use of silk, limiting it to only occasional wear. The most highlighted reason cited was that silk required dry cleaning, which was inconvenient and incurred a higher cost. Twenty coloured silk samples were tested to determine their dye class and colour fastness properties. It was found that all samples, except one, were dyed with either acid or direct dyes. The evaluation of colour fastness showed low levels of wash fastness. The crock, perspiration and light fastness were also found to be unsatisfactory. This led to the recognition of the need to develop processes with reactive dyes to impart better colour fastness, which would make home laundering possible and reduce environmental hazards. CI Reactive Red 194 was selected to optimise the parameters of dyeing silk with heterobifunctional reactive dyes. The Box and Behnken type response surface design was used for the purpose of optimisation of the three dyeing factors, pH, temperature and salt concentration, based on three response variables, K/S, exhaustion and fixation. Multiple regression analysis and analysis of variance were performed with the help of Design Expert software to propose a relationship between the dependent and the identified independent variables. A linear and quadratic multiple regression model was found to be significant for the prediction of K/S and exhaustion, while a linear regression model was found to be significant for the prediction of fixation. The optimising function of the software was used to obtain the optimal conditions for the dyeing of silk. The goal of optimisation was maximising K/S, exhaustion and fixation while minimising the salt concentration of the dye bath. The final optimal conditions for dyeing silk with heterobifunctional reactive dyes were identified as the following: pH – 9, temperature – 90 °C and salt concentration – 60 gpl. After this, the dyeing time was optimised to be 90 minutes. Two approaches were taken to develop low-salt dyeing of silk. Firstly, using two-stage dyeing with pH control, and secondly, surface modification of silk using chitosan to enhance its dyeability and, thus, reduce dependence on the electrolyte.

The two-stage dyeing process at pH conditions of pH 3.5 (Stage 1) – pH 9 (Stage 2) with 30 gpl salt yielded promising results. Experiments were carried out to determine the optimum chitosan concentration, method of application, and electrolyte requirement to obtain desirable results. The pre-treatment of silk with chitosan at a concentration of 1.5% w/v, applied through padding at a 100% expression, followed by drying at room temperature and without washing prior to dyeing, was successful in providing desirable colour uptake at only 30 gpl salt. Tensile strength and stiffness were found to be satisfactory after chitosan application. The crease recovery was slightly impaired. The anti-bacterial property was significantly enhanced after chitosan treatment and subsequent dyeing. Structural analysis of silk after chitosan treatment was performed using SEM and FTIR spectroscopy. SEM images did not show any noticeable surface deposition. FTIR spectra showed noteworthy changes in the molecular structure of silk after pre-treatment with chitosan. The colour fastness of the chitosan-treated silk, dyed with various reactive dyes, was found to be comparable to the untreated dyed silk.

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03. AGARWAL (Tarubhi)
A Study on Dietary Behaviour and Nutritional Status among Adolescents (15-18 Years) with Autism Spectrum Disorder in Delhi: Counselling Intervention.

Supervisors: Prof. Neelima Asthana
Th 26719

Abstract

Autism spectrum disorder is a neurodevelopmental disorder characterized by persistent challenges in social and communication skills and having restricted and repetitive behaviours and interest. Exact cause of autism is still unknown. However, genetic and environmental factors might be responsible for its occurrence. Centre for Disease Control and Prevention, 2018, reported that 1 in 44 children were identified with autism spectrum disorder globally. Noteworthy, limited literature on adolescents with autism spectrum disorder exhibited a dire need to study this area for identifying the diet related needs of the adolescents and provide counselling intervention to parents for managing the condition. The study was thus carried out to assess the parents' awareness, to investigate the mealtime behaviour and nutritional status of the subjects, observe the mealtime behaviour of subgroup of the subjects intensively, to provide general and need-based counselling to parents to help them in handling the diet related problems and then assess the efficacy of the counselling. A total of 100 adolescents with autism spectrum disorder aged 15-18 years were selected from different NGOs and special schools using purposive sampling. The data regarding socio-economic profile, awareness of parents about autism and its management, mealtime behaviour and nutritional status of the subjects was collected by using pretested self structured and standardized interview schedules and observation checklists. The present study was divided into 3 phases namely phase I in which baseline survey was conducted, phase II where different cases (n=10) were studied intensively for about one month each using nonparticipatory observation method and phase III was planned for managing the condition by providing counselling intervention to the parents of the subjects. The results of baseline survey depicted that parents of the subjects were not much aware about autism spectrum disorder, nutritional aspects and management of the

disability. Major mealtime behaviour challenges were neophobia (89%), rigidity in mealtime's routines (98%) and limited variety in food (98%). Impression of sensory disintegration was also reflected. Moreover, the subjects were found to be more comfortable in school environment with peer group as they were able to indicate the feeling of hunger and aggressive behaviour during mealtimes was also found to be less, as also disruptive behaviour in a social environment. A 24-hour recall revealed that their diets were repetitive and restricted with limited variety and evidence of nutrient inadequacy. None of the subjects were consuming even the basic four food groups in their daily diet, reflecting that the diets were unbalanced due to limited variety in the diet. The data indicated that further and more research is needed to reach any conclusion, particularly with large sample size that must be representative of the entire population. Phase II sub group of samples was observed intensively to understand the factors that might be responsible for the idiosyncratic behaviour of the subjects. Impaired social and communication skills, restricted and repetitive behaviour patterns, high intake of carbohydrate and less intake of fibre, aggression, gut dysbiosis, disruptive behaviour, sedentary life style, lack of diversity in diet, busy schedule of parents or unwillingness to accept the disability and sensory and vestibular difficulties were some of the common factors that were found among the ten children followed up for a month. In phase III, parents of the subjects were divided into different groups based on convenience sampling to provide counselling intervention. The counselling module was focussed on general and need-based information about autism with emphasis on strategies to minimise mealtime difficulties and dietary guidelines for adolescents with autism. Feedback was obtained after first 15 days of counselling followed by another after 15 days. Feedback revealed that parents were more aware about the autism and ways to minimise mealtime difficulties after counselling intervention. After two months of counselling some of the strategies were reported to be entirely useful in managing the mealtime behaviour whereas some were partially useful or not at all useful. Moreover, parents expressed that such kind of nutrition-based programmes should be organized more frequently to get updated information for managing the condition. The online counselling proved to be effective also, as due to Covid face to face counselling could not be done. Thus, it is concluded from the present study that increasing awareness about autism spectrum disorder, nutritional aspects and its management is vital for parents/caregivers to help them in managing the condition and to improve the quality of life, including the diet-related problems faced by adolescents with autism and their parents. Nutrition based intervention programmes need to be organized frequently for the parents of the individuals with autism spectrum disorder as soon as possible after diagnosis. Simultaneously, the suggested strategies must be continued with patience for bringing up the change among the participants.

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04. CHAWLA (Deepa)nee (Deepa Gupta)
Young Children's Prosocial Behaviour in Multiple Caregiver Home Settings.
 Supervisors: Dr.Punya Pillai and Nandita Chaudhary
Th 26728

Abstract

To understand anything you must live with it you must observe it you must know all its content its nature its structure its movement. Have you ever tried living with yourself. Needless to mention to make meaning of the interactions occurring between

social partners it was important to pay attention to their social context. The precise location of the study was an important determinant for me. My study examined familial contexts for the development of prosocial behaviour in two-year-old children in the two distinct ecological settings. I chose Gurugram as the urban setting and village nohra from Panipat district as the rural setting. Both the settings were from the state of Haryana. Further sampling of the location was convenience based as I was closely associated with both the locations and was familiar with both communities. The literature reviewed for cultural contexts and ecological settings compelled me to explore the uniqueness each setting offers in the development of social behaviours. My focus was to be attentive to such nuanced variations. However the intent was not to underline the contrasts between the two settings. Therefore categorical comparisons between the urban and rural settings have been underplayed but not overruled.

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05. CHOPRA (Sakshi)
Predictors of Successful Weight Loss Outcome Amongst Adults with Obesity Undergoing Comprehensive Obesity Management at a Tertiary Care Hospital.
 Supervisors: Prof. (Dr.) Anita Malhotra and Prof (Dr.) Piyush Ranjan
Th 27233

Abstract

Obesity is a growing public health epidemic. The cornerstone of obesity management is behavioural lifestyle modification which aims at achieving a successful weight loss outcome (5-10% reduction from baseline weight). Most adults enrolled in obesity management programs find it difficult to achieve and sustain successful weight loss outcome. Limited weight loss success can be attributed to individual led variability in response to obesity management. The individual centric aspects including behavioural psychosocial and environmental factors have shown to predict the variability experienced in achievement of successful weight loss outcome. There is paucity of evidence to understand the interplay of pre existing behavioural psychosocial and environmental factors in predicting successful weight loss outcome amongst Indian adults. The primary objective of the study was to assess the association between predictors of weight loss with the outcome of a comprehensive obesity management program as decided by clinically significant weight loss. The secondary objectives were to analyse time dependent predictors drop out rate and associated predictors and perceived barriers during obesity management. This mixed method study was conducted in two phases. Phase I was a cross sectional survey and phase II was a longitudinal follow up.

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06. FATIMA (Andleeb)
Clothing Styles and Preferences Among Urban Muslims in Four Metropolitan Cities of India.
 Supervisor: Prof. Simmi Bhagat
Th 27230

Abstract

Clothes indicate the cultural as well as religious values people hold. Through their clothing choices people may reveal a set of beliefs about themselves and the values that are reflected in their style of dressing in turn is related to their specific clothing choices interests and behaviour in the selection and use of clothing. The current study is related to the clothing style and choices of urban Muslims in India and is an attempt to explain how their preferences in clothing reveals about the cultural social and religious values they hold. In the late section while drawing out a comparative analysis between the four aforesaid metropolitan cities it was found that clothing styles at these places are more or less similar except at certain occasions like weddings lehnga and gown was preferred choice among the brides of Delhi, Lehnga, saree and gown was preferred by Mumbai's brides and saree by the brides of Kolkata and khada duputtas reserved for a Hyderbadi bride. The groom's dresses however remained almost same for all the locales. The Muslims of Kolkata and Hyderabad were found to be more tilted towards the traditional wear as compared to Delhi and Mumbai. The men of all the four cities adopted western attire in their lifestyles while the women still continues to dress more traditionally than man. The study also highlights the significant use of colours and patterns in the clothing worn by urban Muslims while emphasizing its socio-cultural significance.

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07. GUPTA (Lovely)

Efficacy of Carbohydrate Counting Educational Intervention on Diabetes Management Among Adults with Type I Diabetes Mellitus.

Supervisor: Dr. Priti Rishi Lal and Dr. Yashdeep Gupta

Th 26723

Abstract

Absolute insulin insufficiency in T1DM occurs due to autoimmune beta-cell destruction (Roep et al., 2021). India has the highest incidence and prevalence rates in the world for this disease burden (Verma et al., 2023). Its management poses challenges for both patients and HCPs (Wangnoo et al., 2013). MNT is a crucial component of its management plan in addition to lifelong insulin therapy for survival. The knowledge of diabetes management, SMBG, and an active lifestyle are equally important for its management (Rani & Bhadada, 2017). The carbohydrate counting is a meal planning technique of counting the amount of carbohydrate ingested at each meal and calculating the mealtime insulin dose based on the ICR and insulin sensitivity. This technique increases a person's dietary flexibility and, when practiced properly, can potentially lead to better glycemic control, decreased risk of hypoglycemia, and may improve a variety of metabolic parameters (Gupta et al., 2017a, 2017b). Carbohydrate counting, although beneficial among all types of diabetes, is essential for people with T1DM. It is not effectively and extensively practiced in South Asian countries, primarily due to lack of awareness, knowledge, attitude, practices and/or motivation, variable cooking practices, inconsistent diet intakes, inability to learn the technique, and carbohydrate counting inaccuracy (Gupta et al., 2021). A structured programme for DSME enhances glycemic control, encourages self-care, and prevents complications associated with diabetes (Chatterjee et al., 2018; Ernawati et al., 2021). In the context of South Asia, there is a need for such a structured programme, particularly focused on carbohydrate

counting. The primary clinical need and interest of this study is to determine the efficacy of carbohydrate counting educational intervention for improving glycemic control and other variables associated with diabetes management in Indian subjects with T1DM.

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08. GROVER (Bhanvi)

Association of Cardio Metabolic Risk Factors with Non-Alcoholic Fatty liver Disease-a Population Based Case Control Study.

Supervisors: Dr. Seema Puri and Dr. Nikhil Tandon

Th 26720

Abstract

Non-Alcoholic Fatty Liver Disease (NAFLD) is one of the most common chronic liver diseases increasing in prevalence worldwide. This population-based case-control study was conducted in six districts of urban Delhi, to determine association of NAFLD with several metabolic risk factors (blood pressure, waist circumference, fasting blood glucose, high density lipoprotein, and triglycerides), morbidity profile, metabolic health, nutrition, and lifestyle parameters. An attempt was also made to evaluate the progression of these metabolic risk factors in the subjects over the last 8 years, based on retrospective data. The sample size comprised of 134 cases and 134, age and gender matched, controls, both males and females, aged 30-60 years. Cases were the participants diagnosed with grade II or III fatty liver while controls were the participants diagnosed with normal liver on ultrasonography grading. The participants enrolled were part of a CARRS (Cardio Metabolic Risk Reduction Strategies) cohort, which is a 13-year-old, population-based cohort of South Asian adults designed to address existing and emerging questions related to cardio-metabolic disease. Ethical clearance was obtained from Institutional Ethics Committee of Institute of Home Economics. A structured questionnaire-cum-interview schedule was used to gather information on socio-demographic, morbidity profile, metabolic health, and lifestyle parameters. Physical activity patterns were assessed by Global Physical Activity Questionnaire (GPAQ), sleep patterns by Sleep Habits Questionnaire and depression by Patient Health Questionnaire (PHQ-9). Dietary information was elicited using 24-hour dietary recall for 3 days (2 weekdays and one weekend) and food frequency questionnaire. Anthropometric profile based on weight, height, waist, hip, mid-upper arm circumference, skinfold thicknesses, Body Mass Index (BMI), Waist-to-Hip Ratio (WHR), and Waist-to-Height-Ratio (WHtR) was assessed. The fasting plasma glucose (FPG), glycosylated haemoglobin (HbA1c), lipid profile (Total Cholesterol, HDL, LDL, VLDL, TGs), serum urea, creatinine, and liver enzymes (AST, ALT, ALP), insulin resistance were measured using standardised procedures. Ultrasound scan, Fibroscan, bio-impedance analysis and blood pressure were also measured. The retrospective data on metabolic risk factors since 2010 was obtained from the data repository of the CARRS Cohort. Most of the respondents i.e., 55.9% cases and 57.5% controls were 46-60 years of age. Nearly half the participants (49.3%) in both the groups were females. Significantly higher number of cases as compared to controls were educated up to graduation and had higher monthly incomes.

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09. JAIN (Radhika)
Development of Good Protein Quality Multi-Purpose Extruded Products and Study Its In-Vitro Protein Digestibility.
 Supervisors: Dr. Sangeeta Goomer
Th 26715

Abstract

In the present investigation experiments were conducted to formulate and process extruded product with good protein quantity and quantity. To accomplish this objective raw material were selected and different formulations were designed & processes were optimized. Mung Dhal: mung bean is considered to be one of the promising sustainable agricultural crops as it can utilize atmospheric nitrogen and is valuable in present times of energy crisis (Shahrajabian 2019). It is rich in starch 50% (Dahiya 2015) protein 24.5% (Dahiya 2015) Nutritive value of Indian foods 2011) mung bean is a valuable source of proteins especially essential amino acids, is relatively economical and therefore sometimes referred to as poor man's meat. Amino acids profile indicates that it is deficient in methionine and cysteine whereas it has ample amounts of lysine. Oat proteins constitutes of a balanced amounts of amino acids composition especially it is a rich source of sulphur containing amino acids. The unique composition and excellent nutritional profile help oats to outshine among other cereal grains. Oat proteins are well balanced combination of protein concentration amino acids and digestibility.

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10. JUNEJA (Sabhya)
Mobile-Based ICTs and Community Health Workers: A Case of Sangini Supportive Supervision (Sangini) App, Uttar Pradesh (U.P.), India.
 Supervisor: Dr. Archana Kumar
Th 26725

Abstract

It is important to understand that CHWs play a crucial role in delivering last mile services to the community thereby improving their work performance is an important aspect to strengthen delivery of health services in order to achieve universal healthcare coverage under SDGs 2030. ICTs have a significant role to play in improving CHWs performances. It can facilitate creation of digital capital which can improve mechanisms of healthcare delivery in developing countries. However. It is crucial to comprehend that CHWs are women belonging to a low resource setting wherein along with digital divide prevails the digital gender divide which deepens the gap of prospects of technology adoption. Even if mobile ownership and trainings are provided there will be consequential issues of providing field support maintenance and essentially CHWs capacities to benefit it to for their meaningful use.

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11. MALLA (Hima Bindu)

Energy Availability of Elite Indian Adolescent Athletes: Association with Insulin Like Growth Factor-1, Testosterone, Fasting Insulin, T3 and BMD.

Supervisor: Dr. Priti Rishi Lala and Dr. Mantu Saha

Th 27059

Abstract

Energy availability (EA) is the new method of assessing energy deficiency in athletes. Inadequate EA is associated with series of health concerns amongst athletes culminating into relative energy deficiency in sports (REDS). There is paucity of data on the EA of elite Indian athletes who have considerably higher training loads to maintain high level of performance. Hence this study was planned with the following objectives. To assess the energy availability amongst elite Indian adolescent athletes and its association with select health variables: IGF-1 testosterone fasting insulin T3 and BMD amongst kabbadi players. Three sports centres of India: The Udhav Das Mehta centre, Bhopal, Central regional centre of SAI Chaudhary Devi Lal. Centre Sonapat northern regional centre of SAI and the JD Kabbadi Academy a private academy training kabbadi players comprised the locale for the study. 255 elite adolescent athletes were recruited using a predetermined criterion as per the sample size calculated for phase-1. 40 elite Kabbadi players training in the JD academy comprised the sample for phase-2. The saturation sampling method was employed for recruiting the requisite sample for both phases.

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12. MEHTAB (Wajiha)

Development and Validation of a Tool for Assessment of Adherence to Gluten Free Diet in Patients with Celiac Disease.

Supervisors: Prof. (Dr.) Anita Malhotra and Dr. Govind R. Makharia

Th 26716

Abstract

Introduction: Celiac disease (CeD), an autoimmune enteropathy, which occurs in genetically susceptible individuals and is triggered by dietary gluten. Life-long adherence to gluten-free diet (GFD) is the only definitive treatment for patients with CeD and is effective in disease remission and improvement of nutritional status. Assessment of adherence to GFD in a standardized manner is essential to monitor treatment efficacy. Currently, standard dietary evaluation (SDE) by a trained dietitian is considered as a novel method for assessing adherence. Other dietary tools for assessing adherence do not cover the problems faced by patients while following GFD such as cross contamination, non-availability of GF-food while eating out & travelling, label reading, lack of GF-flour mill, high cost of GF-food, etc. In view of lack of celiac expert dietitians globally and lack of a cultural-specific adherence tool, the need of the hour is to develop a tool for monitoring adherence to GFD in

Indian patients with CeD which can be used by both physicians and dietitians. Further, understanding the compliance rates and barriers in adherence to GFD is also necessary to improve the education strategies for effective treatment of patients with CeD. Objectives: The primary objective of the study was to develop and validate a tool for the assessment of adherence to GFD in patients with CeD. The secondary objectives of the study were: to assess the socio-demographic, diagnostic, clinical, anthropometric, biochemical, histological and dietary profile of patients with CeD; to evaluate the level of adherence to gluten free diet in patients with CeD; to identify the barriers and facilitators associated with adherence to GFD; and to assess the quality of life (QoL) of patients with CeD. Methodology: This was a three year long, prospective, cross-sectional, single center study conducted to develop and validate a tool for assessing adherence to GFD. The study was conducted on adult patients with CeD in a tertiary care hospital in North India. The work flow of the study was divided into two phases. Phase I involved the systematic process of development, content validation and assessment of reliability of the tool being developed (Celiac disease compliance assessment test: CD-CAT). Phase II involved the validation of the adherence tool (CD-CAT) against the SDE, serological parameter (antitissue transglutaminase antibodies {IgA-tTg}), histological parameter (duodenal biopsy) and biochemical parameter (gluten immunogenic peptides in urine) {GIP in urine}). A total of 310 patients (19-55 years; n=100 in Phase I and n=210 in Phase II) with biopsy proven CeD were recruited as per inclusion and exclusion criteria. Outcomes of the study comprised of a valid and reliable tool (CD-CAT) with sufficient sensitivity and specificity (CD-CAT) for assessing adherence to GFD in patients with CeD. Secondary outcomes of the study were diagnostic, clinical, anthropometric, biochemical, histological and dietary profile of patients, level of adherence to GFD, barriers and facilitators to adherence to GFD and QoL of patients with CeD. Reliability of the tool was assessed using internal consistency (Cronbach's alpha [α]) and test-retest (Cohen's kappa [k]) method. Concurrent, convergent, and divergent validity was assessed through Spearman correlation test and two sample t-test for equal variance. Principal component analysis and varimax rotation were employed to assess the structural (factor analysis) validity of the tool. Receiver operating characteristics (ROC) curve was used for assessing the sensitivity and specificity of the tool. Chi square test/Fisher exact test was used to find association between categorical variables. Pearson correlation or Spearman rank correlation was used to measure correlation among continuous variables. T-test was used to measure difference between continuous variables. P-value of less than 0.05 was taken as statistically significant. Results: In phase I, after detailed review of literature and group discussions with expert panel, a question bank of 90 items was generated. Content validation by experts and pilot testing with target population revised the initial item pool to 84 items (CD-CAT version 1). The 84-item tool was administered on 100 patients with CeD for assessing its reliability. The developed CD-CAT Version 1 was found to have acceptable internal consistency (Cronbach's $\alpha = 0.78$). Items having k_1 year of following GFD (Marsh grade >2). One-third (32.3%) and onesixth (16.7%) of patients were found to have hyperglycemia and hypertriglyceridemia, respectively. Among vitamin deficiencies, vitamin B12 deficiency was observed in 12% of patients and nearly half of the patients (46.7%) had moderate to severe deficiency of vitamin D. Both men and women were consuming more than the recommended intake of fat while the intake of iron, zinc and B-vitamins was inadequate among both genders. The percentage adequacy of cereals and grains was nearly 50% across both genders. Further, 67-73% of participants were found to have excellent or good adherence to GFD while 41% (n=127) of patients were found to be exposed to gluten (intentional or unintentional) in past 24-72 hours. Many barriers to adherence to GFD were observed such as poor knowledge about GFD, lack of separate GF-flour mill, lack of motivation and support, non-membership in celiac support groups, lack of referral to dietitian and irregular follow-up visits. Patients with CeD were found to

have poor quality of life. Conclusion: The CD-CAT is a reliable and valid tool and has 80% sensitivity and 91% specificity. It correlated highly with SDE, IgA-tTg and GIP in urine. Unlike other tools measuring adherence to GFD, CD-CAT considers the difficulties faced by patients with CeD such as eating out and travelling, non-availability of GF-flour mill, label reading and intentional gluten intake due to various reasons. This tool is non-invasive and is likely to be used in clinical and research settings by both physicians and dietitians. It requires very little time (5-6 minutes) to complete and is easy to administer, score, and interpret. This tool can be used alone or in combination with biological and serological markers to assess dietary adherence and disease activity in patients with CeD. Proper knowledge of a GFD, social-awareness, membership in celiac support groups, increased availability of GF-food, availability of certified GF-flour mills, reduced cost of processed GF-foods and regular follow-up with both physician and dietitian will lead to improved adherence to GFD and better QoL among adult patients with CeD

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13. MEDIRATTA (Srishti)
Nutritional Quality of Diets and Determinants of Food Choices Among Adults (20-40 Years) Belonging to Upper Middle and High Income Groups Residing in Delhi .
 Supervisor: Prof. (Dr.) Pukit Mathur
Th 26726

Abstract

The increase in consumption of foods high in fat sugar and salt which are often low in micronutrients raises many public health concerns. Poor diets are associated with micronutrient deficiencies and diet related non communicable diseases. Hence the present study focussed on evaluating the nutritional quality of individual foods along with overall diets and assessing factors influencing healthy food habits among 589 adults (20-40 years) belonging to upper middle income group and high income group residing in Delhi. The study had a cross sectional survey design with non probability purposive snowball sampling. Major supermarkets and quick service restaurants from each of the four geographical zones of Delhi were surveyed for packaged ultra processed food items and freshly prepared food. The healthfulness of individual foods was assessed using selected nutrient profiling models food standards Australia New Zealand (FSANZ) Pan American health organization. Choices programme traffic light scheme and WHO model for South East Asia region. Another objective of the study was to assess diet quality using the international diet quality indices diet quality index international score and global diet quality score. The also assessed food group and nutrient adequacy and the contribution of ultra processed foods to macronutrient intake and its association with risk of micronutrient inadequacy. Dietary intake was assessed using 24 hour dietary recall method repeated on 2 days. Semi quantitative food frequency questionnaire was used to assess the consumption of high fat sugar and salt foods. The knowledge attitude and practices regarding healthy eating habits along with the factors influencing food choices and understanding of nutrition information on food labels by adults was also assessed using pre tested questionnaires and focus group discussions.

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14. NEGI (Bhavna)

Contextualizing Childhood and Child Rights in Indian Families.

Supervisors: Prof. Shraddha Kapoor and Prof. Nandita Chaudhary

Th 26718

Abstract

Childhood is a relative term that draws its meaning from a social context. The social construction of childhood is diverse and multiple. Decontextualized academic approaches have little or no relevance in understanding ground realities and local concepts and have limited application in conceptualizing childhood in context. There needs to be more research on contextualizing child rights in the family. The overall objective of the research was to contextualize childhood and children's rights in Indian families. Three socio cultural contexts were studied: rural urban street and urban upper class. Exclusion and inclusion criteria were set purposefully to located 30 families with children aged 6 to 14 years. The study included ten families from each setting for a total of 61 participants. The data were collected using five tools. The study utilized an ethnographic grounded approach to analyse interpret and present the findings. The findings for each setting were organized into four major themes eco-cultural factors community resources household and family and children's everyday experiences. Based on the contextual interpretation of childhood across three settings an understanding of children and their rights was arrived at. During the research memos were written to maintain consistent way of analysing and reporting the overall data. Three layers of understanding that emerged from the research were interlinked with the context of childhood context driven socialization goals and everyday routines and practices that define childhood. The study found the core categories of children's rights in the family domain to be negotiability bounded rationality instrumentality and accountability. These were interlinked with family dynamics and the familial selves of children. The study recommends a situational model to unfold a contextually meaningful and culturally relevant approach to bridging multiple childhoods with children's rights.

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15. POOJA AKSHAY

ICTs for Health: Community Radio as an Enabler for Promoting Mother and Child Health (MCH).

Supervisors: Dr. Sarita Anand

Th 27060

Abstract

The importance of mother and child health can be understood by its inclusion in the sustainable development goals the 2030 agenda for sustainable development which all the United Nations Member States adopted in 2015 for peace and prosperity for people. Maternal health and child health are closely linked with each other and that is why the period of crucial first thousand days that provides a window of

opportunity for the optimal growth and development for the child starts from conception. However with maternal mortality rate of 211 and 830 women dying every day from pregnancy and childbirth related complications globally achieving the sustainable development goal of 70 maternal deaths per 100,00 live births does not seem very easy. And the effects of poor and compromised maternal health are furthermore detrimental to the child. Poor in utero nutrition and lack of required care during pregnancy result into the birth of low birth weight infants who may face several physical or mental health challenges throughout their life. The issue of infant and maternal morality can be dealt by generating awareness amongst women and their families about safe motherhood practices and encouraging them to adopt health seeking behaviours. It can be done through various mediums of communication. This research was intended to examine the role of community radio as a medium to encourage health seeking behaviour amongst the community women by increasing their knowledge about the MCH issues during the period of first 1000 days starting from conception till the time child becomes two years of age. The study also intended to understand the prevalent socio-cultural norms and practices related to pregnancy, childbirth and childcare along with identifying the information needs amongst local women in the mewat region of Haryana. The study included the co creation of a series of radio programmes on identified MCH issues with the participation of community women and other stakeholders using the narrative creation approach and ADDIE model along with comparing the difference in knowledge of listeners after listening to the radio programmes through the narrowcasting approach of community radio.

Contents

1. Introduction. 2. Review of literature. 3. Methods. 4. Findings and discussion. 5. Summary. Conclusion and Recommendations. Bibliography. Annexures, Glimpses from the field. List of Publications.

16. RAWAT (Chanda)

A Study on Emotional Maturity of Adolescents in Uttarakhand and its association with Parenting style and Peer involvement.

Supervisors: Dr. Renu Gulati

Th 27061

Abstract

Child grows through the different phases of life one of these phases is adolescence. The word adolescence is acquired from the Latin word *adolescere* which indicates to grow up rapid changes take place physically and psychologically which may lead to identity confusion and emotional imbalance. It is a crucial period because in this stage the first step from childhood to adulthood is taken. The step taken towards the outer world leads to emotional upheavals because of the constant struggle to represent themselves and understand their surroundings. Parenting styles used by parents to rear their adolescents and the peer group pressure play an important role in shaping the personality of the adolescents. This further determines the level of emotional balance adolescents acquire in order to face the challenges of life. Emotional maturity is essential to accomplish happiness in life ahead. Under excessive peer pressure adolescents may indulge in behaviours which may not be socially acceptable and may be counterproductive in their lives and may lead to manipulative behaviour is to establish a strong bond and positive relationship with them.

Contents

1. Introduction. 2. Review of literature 3. Research methodology. 4. Results and discussion. 5. Summary and conclusion. References. Appendices. Curriculum vitae. List of publications. List of conferences and national seminar.

17. SACHDEV (Niharika)

Technology Development for the Production of Millet and Pules Based Protein Concentrate and its Applications in Value Addition.

Supervisors: Dr. Sangeeta Goomer

Th 26727

Abstract

Millets produced in tonnes by millet farmers particularly from a conserved landrace cultivar is powerhouse of macronutrients micronutrients and phytochemicals. Since ages variety of millets were consumed as a staple food in traditional diet in meal form along with pulses and other vegetables. However, in early 1950 s. introduction of high yielding varieties of wheat and rice crops to alleviate hunger and poverty green revolution consequently led to greater production processing and utilization of these seeds. Nutrient needs began to meet by shifting to these grains. Wheat and rice become staple crop across the world including India. Surplus amount of millet crops was used to be grown in the period before green revolution and eventually it become a fodder crop over the decades. Millet crop cultivation was given less preference and this led to loss of millet landraces from cereal basket. Presently thought food productions sufficient for everyone yet there are large number of concerns associated with sustainability of agricultural system nutrition and health of people. Also, the rising demand for proteins enforcing industries to look for new alternative and sustainable sources. Importance of plant foods such as millets particularly maximizing nutrient supply. Better climate resilience low energy requirement less demand for water. Reduced greenhouse gases financial outcome has renewed interest in these crops. An ample amount of gluten free protein with suitable amino acid composition is naturally distributed in various tissues of foxtail millet seed. Foxtail millet have been used as functional ingredient to prevent and manage diseases in various mice model studies. Therefore, the research study was focused on an idea to generate market avenue for millet industry by developing technology for production of protein concentrate from these grains.

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1. Introduction. 2. Review of literature 3. Materials and methods. 4. Results and discussion. 5. Summary and Conclusion.

18. SINGH (Ritu)

Exploring the Lived Experiences of Adults with Physical Disability.

Supervisors: Dr. Geeta Chopra

Th 26724

Abstract

The lived experiences of the participants showed they experienced substantial impairment effects affecting the functioning and quality of life. Besides they described encountering many barriers present in structures and as social attitudes which not just restricted their participation in the society but also undermined their emotional well being through structural inaccessibility and negative social attitudes.

Further they internalized the dominant prejudices and myths that the non disabled people held where they began to devalue themselves and viewed disability in negative light. Also they tried concealing the disability markers. The development of positive disability identity got affected due to these negative social experiences and besides these participants did not know of anyone else living with similar condition in the immediate context.

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1. Introduction. 2. Review of literature. 3. Methodology. 4. Results and discussion. 5. Summary and Conclusions. Bibliography. Annexures. List of Publications.

19. SHARMA (Akshima)

Effectiveness of ICT Enabled Maternal and Child Health Program from the User's Perspective in Rural India: Impact of Digital Literacy Training.

Supervisors: Dr. Savita Aggarwal and Dr. Geeta Punhani

Th 27062

Abstract

Women perform the triple roles of production reproduction and community work and despite putting in long hours of work within and outside the home they are given a secondary status due to traditional patriarchal norms. The life cycle of an Indian women depicts multitude of problems such as sex based selection low literacy malnutrition early marriage abuse repeated childbirth little or no medical care financial dependence and domestic violence in addition to poverty. All these challenges drastically impact women's overall health financial status education and political participation. As a result India ranks low in various gender related indices. In gender inequality index India ranks 123 out of 189 countries. In the gender gap index which measures the gender gaps in education health economic and political domains India is placed as low as 135 position out of 146 countries. Despite various efforts made by the government of India over the last six decades as part of the five year national plans and plans to meet the SDGs though these problems have reduced in magnitude but still continue to exist and are a stumbling block in the nation's development. Therefore it is very important to address health issues of women for greater gender equality and participation in all domains.

Contents

1. Introduction. 2. Review of literature. 3. Methodology. 4. Results and discussion. 5. Summary and conclusions. References. Annexures. List of Publications.

20. SHUKLA (Prachi)

Effect of Different Bariatric Procedures on Type 2 Diabetes Till One Year Follow UP.

Supervisors: Prof. (Dr.) Anupa Siddhu and Prof.(Dr.) Atul N.C. Peters

Th 27063

Abstract

In India people suffering from type 2 diabetes mellitus (T2DM) are rising. The non surgical treatment strategies for T2DM like diet physical activity behavioural therapy and pharmacotherapy focus on the prevention and management of associated complications. Bariatric surgery has better weight loss and diabetes remission outcomes than conventional diet exercise and medication regimes. It is emerging as the treatment of preference for obesity and associated comorbidities in India for those

who can afford it .The present study aimed to assess the impact of bariatric surgery on T2DM at one year. The present study also assessed changes in anthropometric biochemical clinical dietary parameters and compliance to standard recommendations. The longitudinal observational study included two bariatric procedures duodena jejuna bypass with sleeve gastrectomy and laparoscopic sleeve gastrectomy. The total sample comprised 64 patients and enrolled through purposive sampling. Data was collected at baseline and post surgery at 3,6, 12 months. Clearance was obtained from the ethics committee of Lady Irwin College University of Delhi and Indraprastha Apollo Hospital Sarita Vihar Suitable questionnaires were formulated for collection of data on socio demographic information baseline related information lifestyle and diet related information medications supplement sand compliance to standard recommendations.

Contents

1. Introduction. 2. Review of literature. 3. Methodology. 4. Results and discussion. 5. Summary and conclusions. References. Annexures.

21. UPADHYAY (Aakanksha)

Climate and Gender Smart Agriculture: Impact of Capacity Enhancement of Women.

Supervisor: Dr. Savita Aggarwal and Dr. Geeta Punhani

Th 27232

Abstract

Women play a multi-dimensional role in agriculture not only in crop production but also in horticulture livestock post-harvest activities fisheries forestry floriculture and sericulture. They contribute to agriculture as paid labor family labor as well as managers of farming and allied activities. In South Asia on an average 43 per cent of farmers are women (Asian Development Bank 2015). In India, the participation of women in agriculture and allied activities is even higher and is placed at 54.6 per cent of the total work force (Census of India 2011). On a typical day women can spend on an average about 300 minutes performing unpaid work on the farm home and homestead which is nine times more than men (Charmes 2015). Global trends point towards increasing feminization of agriculture due to several reasons such as male out migration to cities for jobs diminishing size of land holdings climatic stresses and extremes leading to loss of livelihoods and consequent economic stresses. This well lead to creation of more female headed households in future. It is ironic to note that despite women contributing significantly to farming operations the typical farmer is still considered a male and most extension activities bypass women farmers. Research studies conducted across different countries provide evidence that the female headed farms have much less productivity and output as compared to male headed households. Closing all these gender related gaps including those in agriculture is indeed a herculean task but is extremely essential not only for increased productivity but also for achieving the national goals of gender equality and equity. It is also mandatory for realizing the sustainable Development goals especially goal numbers 1,2 and 5 pertaining to no poverty no hunger and achieving gender equality.

Contents

Introduction. 2. Review of literature. 3. Methodology. 4. Results and discussion. 5. Summary and Conclusion. References.

22. VIDISHA
Development and Evaluation of Food Photograph Series Software for Portion size Estimation.
 Supervisors: Prof. Ravinder Chadha
Th 26717

Abstract

The present study envisaged to develop and evaluate a food photograph series software for portion size estimation. The development of the software was based on a preliminary food consumption survey conducted among 60 North Indian urban adults residing in Delhi, India. Databases comprising standardized portion sizes and recipes for different commonly consumed food items along with their photograph series were included in the software. The evaluation of the software was done by assessing error in portion size estimation using digital food photograph series. In this chapter summary of the entire research work is presented along with conclusions.

Contents

1. Introduction. 2. Review of literature. 3. Methodology. 4. Results and discussion. 5. Summary and Conclusions. References. Annexures. Research Publications & Conference Presentations.

23. WADHWA (Arshiya)
Gender Responsive Budgeting in Adolescent Girls Education: A Micro-Implementation Analysis of Kasturba Gandhi Balika Vidyalayas.
 Supervisors: Dr. Sarita Anand
Th 27064

Abstract

Gender inequalities interlock with several other forms of social inequalities particularly caste class ethnicity geographical location disability and religion leading to a major population of dropout and out of school girls belonging notably to scheduled castes scheduled tribes, and other minority communities. Sustainable development goals 4 and 5 urge building a system that ensures equitable access and quality education irrespective of a child's socio-economic status. This research aimed to scrutinize present efforts by understanding the gaps in policy design and implementation of a targeted gender budget initiative Kasturba Gandhi Balika Vidyalayas were introduced as gender budget initiative in 2004 to provide access and quality education to adolescent girls predominantly belonging to marginalized communities through residential schooling. The scheme envisaged reducing the socio cultural barriers in adolescent girls education specifically challenges of covering long distance to school safety and security and investing major time in domestic work post school hours. The research primarily focused on four aspects assessing KGBV scheme through a gender responsive lens analysing budget in terms of allocation release and expenditure examining perceived benefits by adolescent girls and documenting stakeholders perspective which triangulated good practices while highlighting the bottlenecks of implementation at school level. The analysis involved adaptation of Debbie Budlender's gender budget framework which emphasized on situation analysis gender responsive policy analysis cost and budget analysis output analysis and outcome analysis. A mixed method approach was adopted in 18 KGBVs across Rajasthan to understand the budget disparity in accordance with gender budget guidelines.

Contents

1. Introduction. 2. Review of literature. 3. Methods. 4. Findings and discussion. 5. Summary, Conclusion and Recommendations. Bibliography. Annexures. List of publications.

24. ZINGKHAI (Masot)

Role of Women Food Vendors in Augmenting Income and Food Availability to Their Families: A Study in Tribal Regions of Manipur.

Supervisor: Prof. (Dr.) Sarita Anand

Th 27231

Abstract

In the tribal regions of Manipur, women food vendors play a pivotal role in augmenting household income and ensuring food availability within their families. These women often marginalized and residing in remote areas engage in food vending as a means to support their households financially and contributed to the overall well being of their communities. Understanding the socio-economic contributions and challenges faced by these women vendors is essential for devising strategies to enhance their economic empowerment and improve food security in these regions. The tribal regions of Manipur are characterized by their unique cultural heritage and distinct socio economic dynamics. Many families in these areas face economic hardships limited employment opportunities and inadequate access to resources. Women in particular are disproportionately affected by these challenges and are often constrained by traditional gender roles and limited educational opportunities. Engaging in food vending has emerged as a vital avenue for these women to generate income and improve the quality of life for themselves and their families. This study aims to explore the multifaceted roles of women food vendors in the tribal regions of Manipur focusing on how their economic activities contribute to household and food availability. By examining the factors influencing women's decision to engage in food vending the study seeks to uncover the motivations challenges and aspirations of these women entrepreneurs. Three tribal inhabited districts of Manipur namely Ukhrul Kamjong and Senapati were selected for the study. To gain comprehensive insights this research adopts a mixed methods approach combining quantitative surveys qualitative interviews and on-site observations. The study uses random sampling to select respondents. By employing a multidimensional framework. The study will provide a holistic understanding of the socio-economic dynamics surrounding women food vending in tribal regions.

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1. Introduction. 2. Review of literature. 3. Methodology. 4. Analysis and interpretation. 5. Findings and discussion. 6. Summary, Conclusion & recommendations. Bibliography. Annexure.