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## EFAD e-journal

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## Editorial

It gives us great pleasure to write an editorial and welcome you to the “**EFAD e-journal**”. The DIETS2 thematic network launched in 2013 an electronic journal for students in the field of Dietetics entitled “DIETS student e-journal”. DIETS funding ended in December 2013, but the European Federation of the Associations of Dietitians (EFAD) continue to support this important e-journal and renamed it to “**EFAD e-journal**”. This journal was initially conceived for three reasons. First because dietetic students asked how can we know what other students are researching in Europe. Secondly, because dietetics professes to be evidence based profession and where better to look for evidence of future potential than in our Higher Education Institutions, where students are developing their expertise. And, because dietetics and future dietitians do have a significant contribution to make to improve the food choice and nutritional health of European citizens and this needs to be acknowledged and shared.

We have been delighted at the response to calls for projects by undergraduate and students working at master's level. The diversity is outstanding with contributions from Austria, Belgium, Greece, Netherlands, Spain and United Kingdom. Topics covered a wide range of nutrition and dietetics science, e.g. nutritional risk and malnutrition, sports nutrition, clinical nutrition and dietary patterns. Students undertake a variety of projects, but all designed to help them understand the principles of research methodologies and bioethics. Each submission has been reviewed by, members of the editorial team, and external reviewers and we are grateful to them for their commitment to careful reading and subsequent feedback to the students and their supportive academic teams. The EFAD e-journal signifies commitment and, also, acknowledges the research expertise of academic staff that supports their students and the willingness to engage in driving up standards through peer review.

The future plan is to expand the call for submissions to all European Dietitians and to encourage communication and dissemination of research and evidence based practice between Dietitians and students in Dietetics. This will give them the opportunity to present and share their scientific, research and clinical practice activities.

We hope you enjoy, find encouragement and stimulation in this edition.

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### **AN INVESTIGATION INTO THE MOTIVATIONS OF INDIVIDUALS WITH DIABETES TO PURSUE A CAREER IN HEALTHCARE: IS THIS A METHOD OF APPROACH COPING AND DOES IT IMPROVE THEIR DIABETES MANAGEMENT?**

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**Introduction:** Approach coping is a mechanism of disease management suggested in Leventhal's self-regulatory model of illness behaviour (Leventhal, Leventhal, & Contrada, 1998). Patients with diabetes who adopt this coping mechanism have better HbA1c results (Duangdao & Roesch, 2008). Aim 1 investigated if choosing to work in health care was an approach coping mechanism for individuals with diabetes (types 1 and 2). Aim 2 investigated if this choice improved diabetes management.

**Methods:** Participants (n= 24) all had either type 1 or 2 diabetes, worked in healthcare and were recruited online. Questions were adapted from the illness perception questionnaire (IPQ) which was developed for use with Leventhal's self-regulatory model of illness behaviour (Moss-Morris et al., 2002). They completed the online questionnaire responding to statements on a Likert scale ranging from strongly disagree to strongly agree. Two sets of questions were correlated and tested for significance using Spearman's rho at the <0.05 significance level. The questions correlated were specifically chosen in order to assess the extent to which the participant was using an approach coping mechanism, in addition to whether or not their diabetes management improved.

**Bioethics:** All participants gave informed consent to participate in the study and full ethical approval was gained from the Department of Clinical Sciences Ethics Committee at the University of Chester.

**Results:** No significant correlation between the questions "having diabetes influenced my choice to pursue a career in healthcare" and "I feel because of my career my diabetes is better controlled" was found ( $r = .299$ ,  $p = .155$ ). However interestingly the responses to these questions were polarized, with individuals either agreeing or strongly agreeing that having diabetes influenced their career choice or strongly disagreeing. Only 2 participants had no opinion. A similar polarisation was also observed when the questions "I feel because of my career choice my diabetes is better controlled" and "My role in healthcare helps me maintain and improve my knowledge" were correlated ( $r = .314$ ,  $p = .135$ ).

**Discussion:** Although no significant correlations were found the polarizations of the data warrant further investigations in a larger sample size to ascertain if profession choice can be an approach coping mechanism as well as a means to improve knowledge in individuals with diabetes. With the majority of participants indicating their knowledge improved a further understanding of mechanisms which improve diabetic knowledge and control are an important part of enabling individuals to effectively manage their diabetes.

**Conflicts of interest & Acknowledgements:** There were no conflicts of interest however I would like to thank Dr Alison Woodall at the University of Chester for all her support and patience.

**Key References:**

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**Key Words:** Diabetes, Healthcare, Coping, Career

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## BODY COMPOSITION AND SOMATOTYPE IN UNIVERSITY TRIATHLETES

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**Introduction:** Triathlon is a resistance and individual sport which comprises from three different disciplines: swimming, cycling and running. The objective of the study was to describe anthropometric characteristic in university male triathletes. As secondary objectives, the body composition and the somatotype from these triathletes were analyzed and described.

**Methods:** Observational study with descriptive analysis of anthropometric characteristics, body composition and somatotype from university male triathletes. Thirty nine males, aged  $24\pm 4,5$  y, who were participants in the university triathlon championship of Spain, sprint modality (Alicante, 2010), from different Spanish universities, were evaluated. Measurements were taken according to the International Society for the Advancement of Kinanthropometry (ISAK) and the Grupo Español de Cineantropometría (GREC) protocols. A reputable measurer, ISAK level II, performed the required measurements. Body composition was calculated by the model of four components: body fat by Withers's equation (1987), Faulkner's (1968) and Carter's (1982); body skeletal muscle by Lee's (2000) and body bone by Rocha's (1975). To calculate the somatotype, the three components were estimated separately (endomorph, mesomorph and ectomorph) using the method of Heath-Carter (1967) and the classifications according to somatotype categories of Duquet and Carter (1996).

**Bioethics:** All participants gave their consent according to the Declaration of Helsinki (2013) for their voluntary participation in the protocol.

**Results:** The mean of the sum of 8 skinfolds was  $66.77\pm 20.22$  mm. Mean subscapula skinfold was  $8.42\pm 1.83$ mm, supraspinal  $7.42\pm 2.53$ mm, triceps  $7.38\pm 2.43$ mm and biceps  $3.82\pm 1.3$ mm. Mean body fat % was  $10.22\pm 2.92\%$  by Withers's (1987);  $11.07\pm 1.62\%$  by Faulkner's (1968) and  $8.27\pm 1.96\%$  by Carter's (1982), and mean skeletal muscle percentage  $45.27\pm 3.29\%$  by Lee's (2000), and mean body bone percentage  $16.65\pm 1.34\%$  by Rocha's (1975). Regarding the somatotype values, were  $2.18\pm 0.62$  -  $3.63\pm 1.06$  -  $2.75\pm 0.82$  entailing a mesomorphic classification. Triathletes and runners were smaller (1.77m) than cyclists (1.79m) and swimmers (1.85m). Triathletes and cyclists had a similar weight (70kg) being thinner than swimmers background (77.5kg) but heavier than 10km runners (63-67kg). The suprailiac (8.2mm), abdomen (7.1mm) and quadriceps (7.5mm) cyclists' skinfold were lower than the triathletes ( $11.78\pm 4.14$ mm;  $11.38\pm 5.35$ mm y  $11.43\pm 4.25$ mm respectively). The triathletes' body fat percentage (9.6-12.9%) was similar to that of runners' and swimmers' ( $11.07\pm 1.62\%$ ). The triathletes' body skeletal muscle is usually smaller than the cyclists' but, in this case, was similar (45.3 and 44.9%

respectively) being both lower than the other modalities (46.7% runners and 46.8% swimmers). The triathletes' somatotype was similar to that of the cyclists' (mesomorphic). The runners' somatotype was mesomorphic-endomorphic and the swimmers' varied between mesomorphic to ectomorphic.

**Discussion:** Based on the above observations, we can deduce that triathletes and cyclists have a greater muscle skeletal development than some runners and swimmers who tend to be a bit thinner and longer.

**Conflicts of interest & Acknowledgements:** The author declares no conflicts of interest.

**Key References:**

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- Kandel M, Baeyens JP, Clarys P. Somatotype, training and performance in Ironman athletes. *Eur J Sports Sci.* 2014;14:301-8.

**Key Words:** Anthropometry, kinanthropometry, body composition, somatotype, triathlon.

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### THE PREVALENCE OF UNDERNUTRITION OF THE CHILDREN, AGE 7-13 YEARS, AT THE MAXONIA PRIMARY SCHOOL IN GRABOUW, SOUTH AFRICA: A DESCRIPTIVE RESEARCH

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**Introduction:** Child *undernutrition* is still a big health problem in South Africa. A descriptive study is done to assess the prevalence of *undernutrition* of children, age 7-13 years, at Maxonia primary school in Grabouw.

**Methods:** First literature research is done to determine the cause and consequences of undernutrition and to see which measurements can be done to screen for undernutrition. After that research is performed to the anthropometric status of the children and compared with the WHO growth curves for school-aged children and adolescents. *BMI* is used to determine thinness and height-for-age to determine *stunting*. For the children of ten years and younger also weight-for-age is used to determine underweight. A food insecurity questionnaire is performed on the children of grade five and six, to determine the risk of hunger. 87 children were included for the anthropometric measurements and 31 children for the food insecurity questionnaire. Data of the measurements and questionnaire are analyzed with Microsoft Excel 2013 and WHO AnthroPlus.

**Bioethics:** -

**Results:** If a child has an nutritional intake lower than it needs for growth, activities, learning and developing *undernutrition* occurs. There are two manifestations; growth failure and micronutrient malnutrition. Growth failure can result in; *thinness or wasting* (low BMI-for-age/low weight-for-height), *stunting* (low height-for-age) and underweight (low weight-for-age). The cause of *undernutrition* is a complicated combination of basic, underlying and immediate causes all leading to an inadequate food intake or disease. To screen children for *undernutrition* the weight, height, gender and age can be compared with the growth curve of WHO. Because hunger and an inadequate nutritional intake can lead to *undernutrition* it can also be used to determine *undernutrition*. The field research is used to determine the prevalence of undernutrition at the Maxonia school. 87 children were included in the study. The average age was 9.5 years (sd +0.58). 5.7% appear to be too thin, 78.1% have a normal BMI. 11.5% is moderate stunted and 6.9% is stunted. Most of the children, 73.6%, have a normal height-for-age. 31.3% of the children <10 is moderately underweight and 2.1% is severely underweight. After analyzing the questionnaire 24 children of grade five and six are at risk of hunger.

**Discussion:** This shows that undernutrition and food insecurity is a problem at the Maxonia primary school. If you take in account that thinness, stunting, underweight and risk of hunger are all signs of undernutrition, 42.5% (N=37) of the children are undernourished. The outcomes can be used to do further study to undernutrition in

other primary schools in Grabouw or to set up an intervention program to make the community aware of the importance of nutrition for children.

**Conflicts of interest & Acknowledgements:** This research is made possible because of the cooperation of the HAN University of Applied Sciences Netherlands, the University of Western Cape South Africa and the Theewaterskloof municipality.

**Key References:**

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**Key Words:** malnutrition stunting school-aged children food security South Africa

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## THE IMPACT OF PRETRANSPLANT NUTRITIONAL STATUS ON INDICES OF GRAFT DYSFUNCTION IN A SAMPLE OF RENAL TRANSPLANT PATIENTS

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**Introduction:** There is evidence indicating that malnutrition, in terms of either undernutrition or overweight, in chronic kidney disease (CKD) stages 4 and 5 has an impact on renal transplant outcome. The aim of the present study was to examine potential associations between anthropometric and biochemical indices of nutritional status and indices of graft dysfunction or length of hospital stay, in a sample of renal transplant candidates.

**Methods:** One-hundred-and-three patients with CKD stages 4 and 5 receiving graft from a living or a deceased donor were included in this prospective study. Nutritional status was assessed through anthropometric [body mass index (BMI), triceps skinfold thickness (TSF), middle arm muscle circumference (MAMC), corrected middle arm muscle area (cMAMA), waist and hip circumference] and biochemical (albumin, total proteins, total cholesterol, lymphocyte count) indices. During the post-transplant period, data were collected regarding complications [delayed graft function (DGF), acute rejection, hospital infections, surgical complications], the number of dialysis sessions, surgical drainage duration, glomerular filtration rate (GFR) at discharge and length of hospital stay.

**Bioethics:** The study was approved by the Ethics Committee of Harokopio University. All subjects were informed about the aim of the study and signed a consent form.

**Results** Patients were 45±14 years old, 67 (65.0%) patients were male and 56 (54.4%) received graft from a deceased donor. The 49.6% of patients were either overweight or obese, while 56.8% of them were characterized by low muscle reserves based on cMAMA. During the post-transplant period, DGF was the most frequent complication developed in 36.9% of the sample. Compared to patients without DGF, patients with DGF had higher BMI (27.0 vs. 24.2 Kg/m<sup>2</sup>, p=0.001) and TSF (34.7 vs. 28.2 mm, p=0.007). Higher BMI was associated with a higher likelihood of DGF (OR: 1.219, 95%CI: 1.053, 1.411, p=0.009) after adjusting for age, gender, donor group and donor age. Obesity was associated with a higher frequency of DGF (83.3% vs. 25.5%, p=0.001), higher number of haemodialysis sessions (4±4 vs. 1±3 days, p=0.003), longer duration of surgical drainage (20±10 vs. 11±5 days, p=0.006) and longer duration of hospital stay (27±13 vs. 20±11 days, p=0.013) compared to normal weight. In patients receiving graft from a deceased donor, higher TSF was associated with higher likelihood of DGF (OR: 1.064, 95%CI: 1.002, 1.130, p=0.043) after adjusting for age, gender, donor age, donor group and duration of cold ischaemia. GFR at discharge was negatively associated with BMI (B=-0.014±0.005,

p=0.003), overweight (B=-0.135±0.043, p=0.002) and obesity (B=-0.170±0.053, p=0.002), when adjusting for age, gender, donor group and donor age. No significant association was detected between indices of muscle mass as well as biochemical indices and transplantation complications.

**Discussion** BMI and especially obesity are positively associated with the likelihood of DGF. Obese renal transplant patients need more dialysis sessions and have longer duration of surgical drainage and hospital stay. Both overweight and obese patients have worse renal function than normal weight patients at discharge. Therefore, renal transplant candidates are in need of a thorough nutritional assessment, aiming at the early diagnosis and management of overweight and obesity.

**Conflicts of interest & Acknowledgements:** The author declares no conflicts of interest.

**Key references:**

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**Key words:** Renal transplantation, nutritional assessment, obesity, graft dysfunction

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## QUALITY OF LIFE IN GREEK HEMODIALYSIS PATIENTS CORRELATED WITH ANTHROPOMETRIC EVALUATION

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**Introduction:** In hemodialysis patients, an increased % Body Fat( %BF) is associated with a better survival and worse Quality of Life (QoL). The purpose of this study was to investigate if the indicators body mass index( BMI), mid –arm muscle circumference (MAMC), and % BF are correlated with QoL in Greek hemodialysis patients.

**Methods:** In 145 patients on dialysis 90 men and 55 women with mean age (64.20±13.51years) and average age of onset of dialysis (58.71±15.31years) we measured QoL with the Kidney Disease Quality of Life- Sort Form36 (KDQOL-SF36) questionnaire. Only 129 of the patients 80 men and 49 women accepted the anthropometric evaluation, of weight, height, mid-arm circumference and triceps skinfold. The software SPSS version 17.0 was used for statistical analysis. Means and standard deviation were estimated and Pearson's (r) correlation with p- values  $p < 0.005$  or  $p < 0.001$  were considered significant. In addition to correlate anthropometric values with the parameters of age and sex used  $X^2$  test and to estimate data Spearman's Rank correlation was used.

**Bioethics:** All ethical issues of protecting this vulnerable population have been followed and therefore we obtained consent from the patients, ensured them for their privacy and protected them from any harm. Furthermore, individuals had the right to withdraw from the study any time they wanted to. Finally, the study has been approved by The Technological Educational Institute of Crete as well as by the two General Hospitals where this research took place.

**Results** Mean values were BMI=26,1 kg/m<sup>2</sup>, MAMC=50-75<sup>th</sup> percentile, %BF = 23,3%, KDQOL-SF36=65,52% good QoL, 34,48% bad QoL. Anthropometric indicators BMI and MAMC in patients undergoing hemodialysis, are not associated with the general grading scales of different parameters of everyday life KDQOL-SF36, according to the values of the criterion  $X^2$  control. The exception is the fat index where % BF correlated positively only with physical function and emotional well-being, and negatively with general health at a significant level of 5%.

**Discussion** In this study we proved that the indicators of BMI and MAMC had no correlation with the QoL of maintenance hemodialysis patients. BMI is most frequently used in nutritional assessment surveys as a surrogate of nutritional status, it does not precisely reflect body composition, nor does it differentiate between muscle and fat mass. The index of MAMC represents the protein stores in the body found in normal levels. According to bibliography high proteins stores correlated with a decreased mortality, better nutritional status, low levels of inflammations, low

edema of muscle mass but in our study did not correlate with Quality of Life. The percentage of % BF showed correlation in three dimensions of KDQOL-SF36 in physical functioning, general health and emotional well-being. Specifically patients with high fat mass had better physical functioning than patients with low and normal levels. Increased fat mass would not be expected to improve physical functioning and may in fact have a direct negative effect on functioning but it is possible that additional fat stores have protective role against catabolism and inflammation that have been associated with End Stage Renal Disease (ESRD). Poor general health in hemodialysis patients correlated with an increased %BF as an independent risk factor for degraded survival. Patients with an increased %BF are often sick, show probability of diabetes and cardiovascular disease as opposed to patients with low %BF. Counseling might help hemodialysis patients reduce body weight, improve their general health and reduce the risk of the comorbid diseases. Patients with low, normal and high fat mass correlated positive with good emotional well-being. These patients felt happy, calm and peaceful. The fact that in our study the 67.2% of the patients in Greece showed a good QoL may be correlated positively with the good emotional well-being.

**Conflicts of interest & Acknowledgements:** The authors had no conflicts of interest or ethical issue. We would like to thank all the patients in hemodialysis as without their cooperation we could not complete the survey. Additional our Technological Education Institute of Crete and our contributors for their support.

**Key References:**

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- Kontodimopoulos N., et al.: Measuring health-related quality of life of Greek dialysis patients with the KDQOL-SF. *Archives of Hellenic Medicine* 2007, 24(6): 590-599

**Key Words:** %Body fat, KDQOL, hemodialysis, MAMC, physical functioning

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## SYSTEMATIC TYPE REVIEW OF PROSPECTIVE STUDIES ON DAIRY CONSUMPTION AND BREAST CANCER RISK IN WOMEN

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**Introduction:** Breast cancer (BC) is the most commonly diagnosed cancer among women and there is a need to identify modifiable dietary risk factors, to prevent this disease. The association between dairy product consumption and risk of BC has been investigated, but evidence is limited and inconsistent.

**Aim and objectives:** The aim of this review was to conduct a systematic literature research of prospective studies, that investigated the link between dairy consumption among adult women and BC risk; published only after the recent World Cancer Research Fund/American Institute for Cancer Research (WCRF/AICR) Continuous Update Project (CUP) review, in order to update the evidence presented in the WCRF/AICR CUP 2010 report.

**Methods:** Systematic literature searches were conducted using four electronic databases (PubMed, Web of Knowledge, Science Direct and The Cochrane Library) to identify relevant research published between June 2008 and November 2013. Retrieved articles were checked for relevance using predetermined eligibility criteria. Only cohort, case-cohort and nested case-control studies in which data on dairy intake was collected prospectively, before BC occurrence were included to avoid recall bias. The references of studies that fulfilled eligibility criteria were hand searched to identify further relevant studies.

**Bioethics:** This dissertation was approved by the Research Ethics Review Panel of the Faculty of Life Sciences, London Metropolitan University, London, United Kingdom in December 2013.

**Results:** Of 167 articles retrieved, ten studies fulfilled the eligibility criteria: nine cohort studies and one nested case-control study. All studies showed limited or a non-consistent pattern of an increased or decreased BC risk with high compared to low intake of total dairy products (TDP), milk, cheese, yogurt, butter, ice cream, calcium, conjugated linoleic acid (CLA) or fat (from milk), of which, only three studies demonstrated statistically significant associations. One study of the European Prospective Investigation into Cancer and Nutrition (EPIC) project demonstrated that butter increased BC risk in premenopausal women. In two separate studies conducted in Sweden and Norway; TDP and white cheese respectively, demonstrated protection against BC in both premenopausal and postmenopausal women. The seven remaining studies found no statistically significant association between dairy intake and BC risk.

**Discussion:** In the present systematic review there is limited and inconsistent evidence to suggest that a diet high in dairy, or particular dairy products, as compared

to a low or non-dairy diet, influences BC risk in women. This conclusion is in line with findings from the most recent WCRF/AICR CUP 2010 report. Further high-quality large prospective cohort studies that use more consistent methodologies, including detailed and multiple assessment of dairy intake and adjustment for more confounding factors, are needed to clarify the role of both overall dairy intake and specific types of dairy products on BC risk.

**Conflicts of interest & Acknowledgements:** The author declares no conflicts of interest. The author acknowledges Elaine Mealey (RD), academic supervisor, for her guidance and support.

**Key References:**

- WHO. (2012). GLOBOCAN 2012: Breast Cancer Estimated Incidence, Mortality and Prevalence Worldwide in 2012. Available at: [http://globocan.iarc.fr/Pages/fact\\_sheets\\_cancer.aspx](http://globocan.iarc.fr/Pages/fact_sheets_cancer.aspx)
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**Key Words:** Systematic literature review; Breast cancer; Risk; Dairy

**Contributors:** N/A



### **DIETETIC APPROACH TO VEGANISM: THE VEGAN DIET IN DIETETIC TRAINING AND LIFELONG LEARNING. STATUS QUO AND PERSPECTIVES.**

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**Introduction:** Statistical data as well as phenomena such as the increasing number of vegan products for sale, vegan supermarkets and vegan restaurants suggest that there is a rising number of people who go vegan in Austria. Therefore, it can be assumed that veganism is playing a more important role in the field of dietetics. This thesis therefore aims at finding out whether dietitians in Austria feel competent dealing with veganism in their professional lives, and explores how much relevant nutritional knowledge they have gained in their tertiary training, in on-the job training measures, or through non-institutional training. Finally, it addresses the question whether dietitians in Austria presently see a need for more specialized education on veganism.

**Methods:** An online questionnaire with 45 questions (the questionnaire tool was Limesurvey) was developed and a pre-test was conducted. The online questionnaire was sent via e-mail to all members of the Austrian Association of Dietitians who work as dietitians (n=832). Furthermore, dietetic students in their 6th semesters (at three different Universities of Applied Sciences, n=58) were asked to complete the questionnaire. Only students of the 6th semesters were allowed to participate in the survey, in order to make sure that they have already had their lectures regarding the vegan diet. Altogether 260 subjects participated in the survey. However, only 204 completed questionnaires were returned and included in the analysis. Data were analysed with the aid of the Statistical Package for Social Sciences (SPSS). A frequency analysis was performed and contingency tables were constructed. Answers to open questions were categorised according to main content. Additionally, literature was reviewed for relevant information (PubMed, library catalogues, Internet).

**Results:** (n=204) 86.6% have learnt about nutritional aspects regarding veganism during their training. 24.5% gained nutritional knowledge on this topic through further education. However, the range of knowledge that dietitians obtained on the topic of veganism through these various learning opportunities varies widely: 60.8% have read up on veganism in their time off. 71.6% consider it necessary to improve training on veganism in the dietetic academic programmes. According to 56.9% it is necessary to specialize in this field in order to provide adequate dietetic services to vegan clients.

**Discussion:** Although the majority of Austrian dietitians have learnt about veganism in their training or elsewhere, more than 70% see a need for more intensive

education about the topic both at university and in lifelong learning measures. These results corroborate the findings in the literature. It seems to be necessary to specialize in veganism in order to counsel vegans adequately.

**Conflicts of interest & Acknowledgements:** The author declares no conflicts of interest.

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**Key Words** (3-5): veganism, vegan diet, dietetic training, life long learning

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### **EFFECTIVELY COMMUNICATING NUTRITIONAL ASSESSMENT INFORMATION TO CLIENTS, TAKING IN ACCOUNT THEIR LEVEL OF HEALTH LITERACY**

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**Introduction:** The Hague University of Applied Sciences has a Nutritional Assessment Facility (NAF), where clients can undergo classic anthropometric and more advanced technological nutritional assessment methods such as bioimpedance analysis, air displacement plethysmography and indirect calorimetry. Using advanced devices requires a strategy on how outcomes can be effectively communicated to clients. Health literacy, the ability to obtain process and understand health information to improve or maintain good health, is a factor for effective communication. The level of health literacy depends on intrinsic factors such as level of education and culture, as well as extrinsic factors. Health educators can influence extrinsic factors, by adapting the complexity of verbal language and written communication including print materials to the level of their clients. The goal of this study was to gain information about the clarity and applicability of printouts of the devices and the verbal nutritional assessment communication by trained student health educators in the NAF.

**Methods:** A communication training and an instruction manual for health educators was developed. The printouts of the devices were analyzed to develop a results summary for clients. Only voluntary healthy participants were included. The participants ( $n=16$ , 18-29 year, BMI 20-25 kg/m<sup>2</sup>) underwent four types of measurements on body composition and resting metabolic rate at the NAF. A half-structured interview was held with each participant about their opinion on the communication skills of the performing health educator, the result printouts of the devices compared to the developed results summary and the clarity and applicability of the health information that was given both verbally and in writing. Data was analyzed using the grounded theory. Interviews were transcribed, coded, labeled, grouped and analyzed using the software package ATLAS.ti (version 7).

**Bioethics:** N/A

**Results:** Three Nutrition and Health student health educators received a training involving avoiding medical jargon, dialog structure, conceptualizing information and language complexity. The majority of the study population was positive about the communication skills of their health educator, the clarity and applicability of the verbally given health information and the developed result overview. A minority preferred to take the device printout home to re-read, whereas the rest preferred the result overview. Complex terms and parameters, use of foreign language and layout were reasons to dislike the device printouts. For more than half of the participants the outcomes were a confirmation of their health. Six people used the outcomes to direct changes in their lifestyle, by exercising more, counting calories or eating healthier.

**Discussion:** The participants were all Dutch native speakers. Non-native speakers require more and different focus concerning health literacy. The health literacy theory is under discussion by scientists internationally as it appears to be of great influence on public and individual health. For the Dutch government health literacy isn't a policy issue yet. Registered dietitians can optimise their practice and set an example by incorporating health literacy into their communication strategies.

**Conflicts of interest & Acknowledgements:** The author declares no conflicts of interest.

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**Key Words:** Health Literacy, Communication, Health education, Nutritional Assessment

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## THE INFLUENCE OF BUTTER FLAVOUR ON THE PREFERENCE OF FATTY FOOD

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**Introduction:** In Austria butter is a popular type of fat. It is used as a spread as well as for cooking. However, a high consumption of animal fat can increase the risk of cardiovascular diseases, why the use of vegetable fat is recommended. Manufacturers have already tried to simplify the implementation of these recommendations and produced canola oil which is enriched with butter flavour. The aim of this bachelor's thesis is to examine the influence of the taste of butter on the choice of different kinds of food, if vegetable oil with butter flavour is an appropriate alternative to the conventional dairy product and if it should be recommended to patients in the daily consulting activities of a dietician to facilitate a decrease of the consumption of butter.

**Methods:** A sensory test was performed by a panel of untrained volunteers (n=30) in a sensory laboratory. They had to taste a puree made of potatoes and carrots which was enriched either with butter, canola oil or canola oil with butter flavour and then sorted it by individual preference. In addition they filled in a questionnaire with which the habits concerning the use of the different kinds of fat were ascertained. It focused on the preparation of mashed potatoes or vegetables as a warm side dish. The statistical evaluation was done using the "Friedmann-Test", which provides the critical values of the chi-squared test.

**Bioethics:** The procedures followed were in accordance with the Helsinki Declaration as revised in 1983. It was submitted to the Ethics Committee of the Medical University of Graz.

**Results:** The most popular puree was prepared with butter. 73 % of the volunteers preferred this taste. 20 % favoured the canola oil with butter flavour but only 7 % the canola oil. A statistical significance for a preference could only be shown between the butter and the canola oil with butter flavour and between the butter and the canola oil. In both cases the error probability is both less than 5 % ( $p < 0.05$ ) and 1 % ( $p < 0.01$ ). According to the results of the questionnaires butter is also preferred when it comes to the preparation of mashed potatoes or carrots as a warm side dish.

**Discussion:** The taste of fat, especially the taste of butter, plays an important role in the selection of fatty food. However, it is not the only and crucial factor. Despite the fact that one of the vegetable oils contained a butter flavour, the natural butter was preferred more often. It is reasonable to presume that there are other factors, such as texture or mouthfeel, which influence the preference of meals with high fat content.

**Conflicts of interest & Acknowledgements:** The author declares no conflicts of interest.

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**Key Words:** taste of fat and food selection, texture and food selection, preference of butter

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### **VEGANISM AND SOY ALLERGY. COMPOSING A SUITABLE AND BALANCED VEGAN DIET**

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**Introduction:** Vegans don't consume meat, fish, dairy products, eggs or any other products which are derived from animals. Soy beans have a high amount of proteins of high biological quality and are an important ingredient in a vegan diet because they can replace animal based products. However for some people, soy can cause an allergic reaction. In these cases an elimination diet is needed. The aim of the study is to investigate the prevalence of soy allergy in vegans and to examine if it is possible to compose a suitable and balanced weekly vegan menu without soy.

**Methods:** Two hundred forty-five vegans were interviewed in a survey made through google drive. The target group was found via websites, mails and flyers distributed at the Healthpro/Vitasana exhibition, in vegetarian shops and restaurants and via the vegetarian organization EVA vzw. The prevalence of allergies, the consumption of soy foods and alternatives to soy foods and daily food habits were recorded and analysed. Five respondents with soy allergy were contacted and asked to further cooperate. A dietary history was taken from one respondent with soy allergy. Based on information from the dietary history, a weekly vegan menu was composed and the nutritional content was calculated using the food program NubelPro.

**Bioethics:** /

**Results:** The survey showed 3% of the respondents were allergic to soy. This result is higher than the prevalence of soy allergy in the literature where it is estimated to be lower than 0.1 %. According to the dietary history, the weekly diet did not varied much and the amount of food intake was insufficient. Furthermore heated and fermented soy were still tolerated. Therefore a weekly vegan menu without soy was composed for a fictional person with soy allergy. This vegan weekly menu without soy contained all essential nutrients with exception of vitamin B12. This result was obtained by making good combinations of protein sources as legumes or wheat germs with grains, nuts, seeds and kernels. An adequate amount and various types of food were used. Furthermore foods enriched with vitamins and minerals helped achieving a balanced and suitable vegan diet without soy. With the information from the survey, the exhibition and the websites a products list was created, containing sources of proteins, essential fatty acids, minerals and vitamins. Furthermore a brochure was prepared with practical tips based on the results of this study and taking into account the dietary guidelines of VIGEZ.

**Discussion:** There are no data about the method used for the diagnosis of soy-allergy in the respondents. This knowledge is needed to confirm the results of 3% respondents with soy allergy. When soy is eliminated from the vegan diet careful food combinations should be made to prevent malnutrition. The knowledge of vegans about these combinations was not estimated in the survey and therefore not known.

Some vegans (10 % of the respondents) don't eat soy even if they aren't allergic to it. Being well informed about the importance of soy or how to replace soy is important to prevent shortages of nutrients.

**Conflicts of interest & Acknowledgements:** There are no conflicts of interest.

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**Key Words** (3-5): veganism, soy, allergy

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### RESEARCH ON THE (EFFECTIVE) FOOD INTAKE AT THE DEPARTMENT OF ACUTE GERIATRICS OF THE GHENT UNIVERSITY HOSPITAL

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**Introduction:** The problem of malnutrition with geriatric patients increases. The study Nutriaction II, of which the results were announced in august of the year 2013, presents this fact clearly. This study investigated the nutritional status of 3641 Belgian people above the age of 70, living at home or in a retirement home in Belgium. The study Nutriaction II noted that 45 % of the screened seniors above the age of 70, have the potential risk to end up with malnutrition. Actually 12% of the screened elderly were suffering from malnutrition. This problem keeps on rising by the increase of aging.

To bring attention to this problem, the Ghent University Hospital (in Belgium) decided to perform a screening at their geriatrics department. The aim was to use a random check to take a closer look at the food intake of the hospitalized geriatric patients. Besides this research, there was also an examination on the offer of nutritional profiles for the patients of the geriatrics department in the hospital.

**Methods:** For the random food intake check, the food intake of 31 patients over 3 consecutive days was registered by the authors of this study. They weighed everything the geriatric patients did not eat, and this at breakfast, at lunch and at dinner time. Afterwards, they compared those results to the individual needs of each patient, by using "Nubel Voedingsplanner". The individual needs of the patients are based on the general dietary recommendations of Belgium (created by the Belgian government in the year 2009).

As mentioned earlier, the second part of the study was an examination of the nutritional profiles in the Ghent University Hospital. The hospital has a nutritional profile for geriatrics, a nutritional profile for geriatrics with diabetes, a spoonable nutritional profile for geriatrics with diabetes and a liquid nutritional profile for geriatrics with diabetes. The composition of these 4 menus was compared to the needs of the average geriatric patient. Therefore the authors used the same methodology as in the first part of the study.

**Bioethics:** The procedures followed were in accordance with the ethical standards of the responsible committee.

**Results:** The food intake research carried out at the Ghent University Hospital shows that 71% of the patients have an energy intake which is too low as a function of their needs, resulting in a big risk for malnutrition. Besides the frequently noted energy deficiency, there is also a deficiency for a lot of macro- and micronutrients amongst the examined elderly. The 4 geriatric nutritional profiles of the Ghent University

Hospital do not reach the goals. The researchers discovered a lot of shortages in energy, macro- and micronutrients.

**Discussion:** One can conclude that the food intake and the geriatric menus at the acute geriatric department of the Ghent University Hospital are critical improvement areas. Taking into account the actual food intake of this group, it would be advisable to make the nutrient profiles standard nutrient dense. In consultation with the catering service it should be viewed as whether or not it is possible to optimize the food composition.

At the Ghent University Hospital there are more points that require action. The dining environment, the time constraints of staff in the department, the presentation of the food, are among other things, aspects to be leveraged. A crucial point for improvement and focus at the Ghent University Hospital is the screening for malnutrition and the information gathering regarding weight and height.

**Conflicts of interest & Acknowledgements:** We would like to express our sincere gratitude to our external promotor Isabelle Heyens and internal promotor Els Vanfleteren.

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**Key Words (3-5):** Malnutrition, food intake, the elderly

**Contributors:** External and internal promoters

## INTAKE ESTIMATION OF METHYL-GROUP DONORS FOLATE, CHOLINE, BETAINE AND METHIONINE BY THE BELGIAN POPULATION

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**Introduction:** The expression of some genes is influenced by DNA-methylation and therefore depends upon the availability of methyl-groups. For humans, the major sources of methyl-groups in foods come from methionine and choline. Both methyl-group donors show strong metabolic interaction with folate and betaine. Therefore, it is important that all four are assessed when studying diet and DNA-methylation. The aim of this study was to estimate the daily intake of methyl-group donors (folate, choline, betaine and methionine) by the Belgian population, promoting further research on the associations between DNA-methylation and various disorders like cancer.

**Methods:** Daily intake data was available from the most recent Belgian food consumption survey performed in 2004. This survey collected consumption data from a representative part of the Belgian population using two EPIC-Soft guided non-consecutive 24-hr dietary recalls (3200 males and females, age 15+). Before nutritional values of methyl-group donors were linked to food consumption data, the most suitable food composition database for use in this study needed to be selected. The USDA, National Nutrient Database for Standard Reference, uses the most optimal analysis for obtaining nutritional values and also reports the values of the four selected methyl-group donors, making this the best fit for this particular research. Afterwards, all food items reported were linked to the most matching ones available in the American food composition database, taking into account the information related to preparation, use of fat, method of packing, etc. To standardize this linking procedure, guidelines from the International Agency for Research on Cancer (IARC), were used.

Data were analyzed using SPSS version 22.0 for Windows. Two, non-parametric tests, Kruskal-Wallis and Mann-Whitney U, and a significance level of  $p < 0.05$  were used to test assumptions.

**Bioethics:** N/A

**Results:** From the four methyl-group donors, the highest daily intake was seen for methionine (859.7 mg). Choline (149.8 mg) resulted as second highest, followed by betaine (11.0 mg) and folate (164.2  $\mu$ g). Significant differences were found between subgroups. For example, the intake of folate, choline and methionine by women (resp. 173.3  $\mu$ g; 151.4 mg; 875.5mg) was higher compared to men (resp. 155.9  $\mu$ g; 151.4 mg; 844.7 mg). Subjects suffering from hypertension or cardiovascular diseases had higher intakes of folate, choline and methionine compared to subjects without these conditions ( $p < 0.001$ ).

The food group grains and grain products, especially cereals, is the main source for daily folate (204.1 µg) supply. Just like folate is the main food group for daily supply of betaine, grains and grain products (68.0 mg). Choline and methionine are a little different, eggs are the main source for choline (378.8 mg). The food group meat is the most important daily supply source for methionine (582.3 mg).

**Discussion:** The aim of the present study was to estimate intakes of methyl-group donors by the Belgian population. Because of many missing values in the American food composition database, intake results are likely underestimated. The concentration of folate was described in 7330 of the 8463 linked food items (86.6%), making this intake estimation probably the most accurate of all four methyl-group donors. In order to make an accurate estimation of the intake of methyl-group donors, Belgium and other countries, should include those nutrients into their national food composition databases. These presented intake estimations can be used in further longitudinal studies to assess potential associations between methyl-group donor intake and cancer risk.

**Conflicts of interest & Acknowledgements:** There are no conflicts of interest.

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**Key words:** Diet Surveys, Food, Carcinogenesis, One-carbon Metabolism

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## WEIGHT AND WEIGHT GAIN AMONG WOMEN WITH NON-METASTATIC BREAST CANCER IN CYPRUS: A RETROSPECTIVE STUDY

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**Introduction:** It is well established that certain breast cancer treatments are associated with weight gain. This weight gain is associated with an increased risk of breast cancer recurrence and a poor prognosis (Wang, 2014). The study investigates if Body mass index (BMI) of Cypriot women increases during adjuvant chemotherapy (ADJ) for breast cancer and if predictors, such as menopausal status or initial body weight, can be identified.

**Methods:** This retrospective study included 111 female patients diagnosed with non-metastatic BC between 2009–2012 and receiving ADJ. Height and weight measurements were obtained from medical records and BMI was calculated at baseline, 3, and 6 months post diagnosis.

Chemotherapy agent and menopausal status at baseline were also noted. Change in BMI during this time period were calculated and categorized as: weight loss ( $BMI < 0.5 \text{ kg/m}^2$ ); stable weight ( $BMI = \pm 0.5 \text{ kg/m}^2$ ) and weight gain ( $BMI > 0.5 \text{ kg/m}^2$ ). All data was tested for a normal distribution. The difference between BMI at baseline and 3 or 6 months post-diagnosis period was tested using a Wilcoxon matched pair test. Independent t-tests were used to test for significant differences in BMI between pre and post-menopausal women. A one-way ANOVA was used to test initial BMI category and BMI change at 3 and 6 months for significance. All data is presented as mean  $\pm$  S.E. The level of statistical significance for the study was set at  $p \leq 0.05$  and analysis was carried out with SPSS, IBM Corp, 2012, version 21.

**Results:** For all subjects BMI increased significantly over the first three months of treatment,  $0.56 \pm 0.11 \text{ kg/m}^2$  ( $1.2 \pm 2.82 \text{ kg}$ ,  $p < 0.001$ ). At 6 months ADJ, BMI had increased significantly by  $1.23 \pm 0.15 \text{ kg/m}^2$  ( $3 \pm 2.3 \text{ kg}$ ,  $p < 0.001$ ), for all subjects. At 3 months, 53.16% of subjects had increased BMI by  $> 0.5 \text{ kg/m}^2$  (clinically significant; Kroenke et al., 2005); at 6 months ADJ 66.66% of subjects had increased BMI  $> 0.5 \text{ kg/m}^2$ . 48% of the subject population was premenopausal at baseline and 68% subjects postmenopausal. Pre-menopausal women gained significantly ( $p < 0.05$ ) more weight during treatment than post-menopausal women;  $1.53 \pm 0.19 \text{ kg/m}^2$  ( $3.96 \pm 3.25 \text{ kg}$ ) compared to  $0.88 \pm 0.22 \text{ kg/m}^2$  ( $2.5 \pm 3.9 \text{ kg}$ ). Baseline BMI was not predictive of BMI change at 3 or 6 months ADJ.

**Bioethics:** The study protocol was approved by the Department of Clinical Sciences and Nutrition Research Ethics Committee, University of Chester (Appendices 1.1 and 1.2) and was conducted in accordance with the principles of the Helsinki Declaration (1989). Prior to data collection in the center, ethics approval was also obtained from the Office of the Commissioner for personal data protection, Republic of Cyprus and the director of the secondary care site used in this study (Appendix 1.3 and 1.4).

**Discussion:** BMI increased significantly post diagnosis in this sample of Cypriot women, evident at 3 and 6 months ADJ. Future implementation of appropriate weight management strategies in this group is advised to improve long term prognosis and minimise breast cancer recurrence. Pre-menopausal status was associated with the largest increases in BMI. Further investigation is needed to assess the value of premenopausal status as a predictor of increased weight gain in breast cancer.

**Conflicts of interest & Acknowledgements:** There are no conflicts of interest.

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**Key Words** (3-5): non-metastatic breast cancer; weight gain; BMI gain; Cyprus; adjuvant chemotherapy; menopausal status

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