

not been sufficiently studied. Sectional analyses were conducted among menopausal employees (n=486), participating in a longitudinal study (the Pró-Saúde Study). Data on insomnia complaints (IC), menopause characteristics, self-report of physical morbidity medical diagnosis, common mental disorders (CMD), social support and stressful life events (SLE) were collected. Insomnia complaints were analysed as polytomic outcome (frequent, occasional and absent), and crude and adjusted ORs were calculated by multinomial logistic regression. Prevalences of frequent and occasional IC among women in menopause were 25.7% and 32.7%, respectively. Menopause characteristics were not associated with IC. Presence of CMD (GHQ-12) was strongly associated with frequent IC [OR=6.14 (95% CI 3.24 to 11.65)]. For occasional IC, values were lower [OR=2.98 (95% CI 1.59 to 5.57)], but still significant. All social support dimensions were associated with occasional IC, after adjustment, except for the intermediate tercile of total social support. The social support dimension associated with frequent IC after adjustment was "to have low total social support" [OR=2.46 (95% CI 1.33 to 4.56)], "to have low emotional support/information" [OR=2.31 (CI 95% 1.27 to 4.19)], and "to have low affective support/positive social interaction" [OR=2.21 (CI 95% 1.22 to 4.02)]. Our results warn of an important association among insomnia complaints and CMD and social support. These psychosocial factors can contribute to the onset of primary insomnia, a symptom that in general is not taken into consideration when the patient seeks for medical help.

P1-503 MENOPAUSE AND INSOMNIA IN THE PRÓ-SAÚDE STUDY: ASSESSING THE ROLE OF PSYCHOSOCIAL, SOCIO-ECONOMIC AND DEMOGRAPHIC FACTORS

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Studies show that insomnia in menopause may be associated with psychological symptoms, which would reflect its association with depression and high levels of tension and stress. To estimate the prevalence of insomnia and to assess its association with menopausal status in a population of women, a cross-sectional study was conducted among employees of a university in Rio de Janeiro, participating in a longitudinal study (the Pró-Saúde Study) (n=2189), using a self-administered questionnaire to evaluate insomnia, menopausal status and other variables. Non-pregnant women who reported absence of menstruation were considered "in menopause". Insomnia was ranked as difficulty initiating sleep (DIS), difficulty maintaining sleep (DMS) and general insomnia complaints (GIC). Crude and adjusted ORs were calculated by multivariate logistic regression. Among women in menopause, prevalence of insomnia was 20.8% for difficulty initiating sleep, 21.8% for difficulty maintaining sleep, and 25.7% for general insomnia complaints. In the final model, adjusted by socio-economic and demographic variables, common mental disorder (CMD), stressful life event (SLE) and social support, all insomnia categories were associated with menopause. ORs were the following: for DIS OR=1.58 (95% CI 1.07 to 2.34); for DMS OR=1.61 (95% CI 1.08 to 2.41); and for GIC OR=1.68 (95% CI 1.15 to 2.43). These results are consistent with other studies, and show that menopause is significantly associated with the presence of insomnia, is independent of age, income, education, CMD, SLE and social support. The results of our study can help highlight the importance of managing/treating insomnia associated with menopause.

P1-504 DIETARY INTAKE AND ADEQUACY TO NUTRITIONAL RECOMMENDATIONS IN PREGNANT WOMEN IN A MEDITERRANEAN AREA. INMA-VALENCIA COHORT

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Introduction Maternal diet may be an important determinant of maternal and infant health outcomes. However, the nutritional status of pregnant women in the Spanish Mediterranean region has been scarcely studied.

Methods We studied 822 women from the INMA-Valencia cohort. Intakes from food and supplements in early pregnancy as well as adequacy to dietary recommendations were assessed according to maternal characteristics. Adequate intakes for food groups were estimated based on Spanish dietary guidelines. Intake inadequacy for nutrients was assessed using the Dietary Reference Intakes of the Institute of Medicine. Descriptive statistics of dietary intakes were reported. We contrasted the distribution and the adequacy of intake according to maternal characteristics by means of ANOVA, post-hoc tests and logistic regression.

Results Overall, more than 50% of the population studied had deficient intakes of cereals and legumes, carbohydrates, n-3 and n-6 fatty acids, and exceeded the recommendations for total fat intake. Prevalence of inadequacy for folate, iron and vitamin E from foods ranged from 99% to 70%. Younger and less educated women had lower intakes of vegetables, proteins and n-3 fatty acids and higher intakes of trans-fatty acids along with a greater prevalence of inadequacy for micronutrients. Spanish women showed lower intakes of fruits and carbohydrates and higher intakes of proteins, total fat, saturated fatty acids, MUFA and n-3 fatty acids compared to their foreign counterparts.

Conclusion Women in the studied area have inadequate intakes of several nutrients relevant during pregnancy. Besides age and education, origin is an important determinant of dietary intake and adequacy.

P1-505 CURRENT DIET VS DASH DIET ASSESSED BY FOOD FREQUENCY QUESTIONNAIRE USING FOOD GROUPS: AGREEMENT AMONG HYPERTENSIVE PATIENTS

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Introduction Dietary guidelines for hypertensive patients require methods able to identify food patterns and monitoring adherence, which could be based on a simplified Food Frequency Questionnaire (FFQ) for food groups.

Objective To develop a FFQ for food groups in order to easily recommend the DASH (Dietary Approach to Stop Hypertension) diet for hypertensive patients.

Methods A cross-sectional study was conducted among adults, aged 20 to 69 years, from a Hypertension clinic of a reference centre (Hospital de Clínicas de Porto Alegre), in southern Brazil. Data gathering using two sequential 24 h recalls (RA 24 h) were adopted to assess dietary intake. A list of food groups was generated, based on the DASH diet adapted to the southern Brazil population. A pilot study, including 30 individuals, was conducted to test the FFQ structure, consumption of food groups, two periods of recall, and pictures and wording for food items identification.

Results A sample of 127 hypertensive patients were interviewed at seven and 30 days, using a qualitative FFQ with 40 items aggregated

into eight food groups, based on the DASH diet. The pictures of food items were useful to remind patients of the components of food groups. As a result, FFQ was quickly applied, in approximately 20 and 16 min for FFQ at 30 and for 7 days, respectively.

Conclusion This first step allowed detecting that the FFQ for food groups was feasible at seven and 30 days, and no major issues were detected during the testing.

P1-506 MULTILEVEL MODELLING OF SURVEY DATA

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Introduction Presently, about five million people worldwide die yearly from tobacco related diseases. The WHO currently estimates that there are 1.3 billion people who are regular smokers.

Objectives of data analysis To develop two level random effects logistic regression model for the analysis of clustered binary responses to identify factors associated with smoking among school going male adolescents. To assess if the variability between schools is different for the public and private schools using a random coefficient model. Two random effects will account for the variability between public and private schools respectively. To fit a contrasting Generalising Estimating Equation model to deal with two level clustered data for binary outcome. To compare and evaluate the results from the above mentioned models with a conventional logistic regression model as used in the original study.

Methods A two-stage cluster sampling with stratification based on school type was employed for the selection of schools and students. We interviewed 772 male secondary school students. The outcome variable is smoking status of the students. We have two level data with a single level of clustering.

Results Final multilevel random effect model showed that between cluster variance is significantly different from zero (*p* value of likelihood ratio test =0.01), which indicates that there is variability between schools and we need to take between cluster variation into account by using multilevel modelling. The Intra-class Correlation quantifies consistencies among observations within each cluster and it is also greater than zero (*ICC* =0.15).

P1-507 POLYMORPHISMS IN GENES RELATED TO SEX STEROID TRANSPORT AND SIGNALLING MODULATE MENOPAUSAL HORMONE THERAPY EFFECT ON RISK OF COLORECTAL CANCER

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Introduction Menopausal hormone therapy (MHT) has been associated with reduced colorectal cancer (CRC) risk. Since the underlying biological mechanisms of MHT effects on CRC are unknown, we investigated whether single nucleotide polymorphisms (SNPs) in genes related to sex steroid metabolism, transport and signalling modify MHT-associated CRC risk.

Methods 47 SNPs in 16 candidate genes related to sex steroid transport (ABCB1), metabolism (COMT, CYP1A1, CYP1A2, CYP1B1, CYP2C9, CYP2C19, CYP3A4, CYP17A1, GSTP, HSD17B1) and signalling (ESR1, ESR2, SHBG, PGR, NR1I2) were genotyped using genomic DNA samples from 685 female postmenopausal CRC patients and 684 controls without CRC of a German population-based case-control study (DACHS). Unconditional multivariate

logistic regression was performed and effect modification was assessed using a multiplicative interaction term.

Results CRC risk associated with ever MHT use as well as with duration was significantly modified by rs1202168 in ABCB1 (*p* interaction =0.04). The MHT-associated risk reduction was no longer significant in homozygous non-carriers, while homozygous carriers of the minor T allele had a 57% lower risk with ever use of MHT and a 22% lower risk per 5 years of MHT use. Significant effect modification was also observed for rs910416 in ESR1, whereby the decreased CRC risk was attenuated in carriers of the minor C allele (*p* interaction =0.03 for ever use and 0.07 for duration of use).

Conclusion Our results provide the first evidence that polymorphisms in sex steroid-related genes may modify CRC risk associated with MHT. Our findings warrant replication in independent study populations.

P1-508 OESTROGEN RECEPTOR β EXPRESSION IN COLORECTAL CANCER

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Introduction The oestrogen receptor β (ER β) is the primarily expressed ER in the large intestine and has been found to have inhibitory effects on colon cancer cells. We therefore investigated, whether the ER β expression in tumour tissue from colorectal cancer (CRC) patients is associated with tumour/clinical characteristics.

Methods We used tissue micro arrays consisting of paired normal and tumorous tissue samples from 1262 CRC cases of a German population-based case-control study (DACHS). ER β expression was measured via immunohistochemistry. Multinomial logistic regression was used to assess the association of ER β expression with tumour/clinical characteristics.

Results Measurement of ER β expression was successful in 1101 patients. ER β was strongly expressed (>50% positive cells) in normal intestinal tissue, whereas high ER β expression was found in 16%, moderate expression in 29% and no expression in 42% of tumour samples. Strong vs no expression of ER β was inversely associated with higher UICC stages (stage II OR=0.42, 95% CI (0.26 to 0.66); stage III OR=0.40, 95% CI (0.25 to 0.65); stage IV OR=0.52, 95% CI (0.29 to 0.92); *p* trend=0.01). Furthermore, cases with strong ER β expression had a significantly smaller tumour extent (T2 OR=0.51, 95% CI (0.24 to 1.10); T3 OR=0.24, 95% CI (0.11 to 0.49); T4 OR=0.24, 95% CI (0.10 to 0.60); *p* trend<0.001) than cases with no expression. No significant associations were seen with histopathological grading, nodal status, distant metastasis, tumour localisation, neoadjuvant treatment, age or sex.

Conclusion We observed an association between high ER β expression and smaller tumour extent and confirmed previous reports of an association between high ER β expression and less advanced tumour stages.

P1-509 STUDY AETIOLOGY OF LACTATION FAILURE IN NEONATAL AFFECTED BY HYPERNATREMIC DEHYDRATION: A CASE CONTROL STUDY

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Background Inadequate milk supply in exclusively breastfed neonates can lead to neonatal hypernatremic dehydration in the first