DOWNLOAD PDF REPRINTS OF SELECTED METHODS FOR THE ANALYSIS OF VITAMIN A CAROTENOIDS IN NUTRITION SURVEYS

Chapter 1 : - NLM Catalog Result

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Vitamin A supplementation VAS programs targeted at children aged 6â€”59 months are implemented in many countries. By improving immune function, vitamin A VA reduces mortality associated with measles, diarrhea, and other illnesses. There is currently a debate regarding the relevance of VAS, but amidst the debate, researchers acknowledge that the majority of nationally-representative data on VA status is outdated. To address this data gap and contribute to the debate, we examined data from 82 countries implementing VAS programs, identified other VA programs, and assessed the recentness of national VA deficiency VAD data. Fifty-one VAS programs were implemented in parallel with at least one other VA intervention, and of these, 27 countries either had no VAD data or data collected in or earlier. At the same time, the coverage of VA interventions can also be measured. We identified three countries that have scaled down VAS, but given the lack of VA deficiency data, this would be a premature undertaking in most countries without appropriate status assessment. While the global debate about VAS is important, more attention should be directed towards individual countries where programmatic decisions are made. Introduction Vitamin A deficiency VAD is considered one of the most prevalent micronutrient deficiencies worldwide, mainly affecting children in developing countries [1]. VAD is also a major cause of preventable childhood blindness [1]. Supplementation with high doses of preformed VA is currently one of the most widely-used interventions delivering VA. At present, more than 80 countries worldwide are implementing universal VA supplementation VAS programs targeted to children 6â€”59 months of age through semi-annual national campaigns. A high-dose of VA improves VA status for only up to three months in children who have low dietary intake [9]. For this reason, while VAS provides a protective dose in the presence of VAD, complementary interventions are needed for VAD control such as VA bio- fortification, micronutrient powders, dietary diversity, nutrition education, and prevention and control of infectious disease. VAS programs began in the s in response to evidence demonstrating the association between VAD and increased childhood mortality [10 , 11]. Between and , more than 40 efficacy studies of VAS in children 6â€”59 months of age were conducted, and two systematic reviews and meta-analyses have concluded that VA supplements can considerably reduce mortality and morbidity during childhood [12 , 13]. In , following the publication of these reviews, Awasti et al. In , Fisker et al. In , Mason et al. In response, the article by Mason et al. In line with the Global Alliance for Vitamin A GAVA recommendations [21], these researchers [18] also suggested that countries should only consider scaling back VAS programs in populations where there is evidence that VAD is no longer a public health problem i. Researchers on both sides of this debate in the literature have acknowledged that more data on VA status are needed so that countries can make informed programmatic decisions. Moreover, Stevens et al. To address this data gap and contribute to the debate about VAS, we examined countries with a routine VAS program and within these countries identified nationally-representative VA status surveys. We identified the most recent survey to determine if data are current or outdated. Amongst these countries, we also examined the presence of VA fortification and biofortification, and micronutrient powder programs. By identifying concretely what data exist in each country, and what programs exist alongside VAS, we aim to assist national programmers and other stakeholders to identify their place in the wider debate. What countries need data, or more-current data, to better implement and target their VAS program? Where do data show that VAS should be scaled up? Where should it be scaled back based on recent data and other programs in place? Materials and Methods 2. The set of countries included in the VAS coverage database was updated in , and includes countries that had: The data related to VAD were based on nationally representative data from the grey literature as well as data in the WHO Micronutrients Database [23]. The proportion of children 6â€”59 months of age that were fully protected with two annual doses in one calendar year is estimated by taking the

lower of the two annual semester-wise coverage estimates. This employs an assumption that children who received a dose in the semester with the lower coverage were also reached in the semester with higher coverage. In cases where the VAS in both semesters was only delivered through events i. VA-fortified sugar programs were identified in two separate publications: VA-fortified wheat flour and maize flour programs were identified in a publication by Klemm et al. MNP pilot and emergency programs were not included in our analysis. Countries currently testing biofortified crops were not included as part of our review. Lastly, the co-authors used their respective organizational networks to identify any surveys not identified using the previous search approaches. We included nationally-representative surveys of children 6â€”59 months of age as the primary target age range, but were flexible by including surveys with slightly older children and children with a smaller age range e. We excluded surveys and studies that: Survey results were included regardless of whether ROH or RBP were adjusted for inflammation, but inflammation-adjusted results were prioritized, and were presented if available. Of all 82 countries explored, 54 were implementing at least one other VA program. Forty-one implemented programs mass fortifying vegetable oil, sugar, margarine, or wheat flour with VA, and 33 of these countries have mandatory fortification of at least one food. Vegetable oil fortification programs were the most commonly implemented VA-fortification program, and were conducted in 35 countries. Of the countries explored, provitamin A-biofortified crops have been released in 21 countries, 17 of which were also fortifying a staple food e. Recentness of Vitamin A Deficiency Data When examining countries by the recentness of the VAD prevalence data, we found 14 countries with data collected after , 13 countries with data from to , seven countries with data from to , and 16 countries with data collected in or prior to For 32 countries, no nationally-representative data on VAD prevalence could be found. In Central Africa, some data have been collected, but are largely outdated. In total, only one-third of the countries explored collected VAD in the past 10 years. Twenty surveys accounted for inflammation in some manner, either by excluding all children with inflammation or adjusting ROH or RBP concentrations.

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Chapter 2 : Human Papilloma Virus (HPV): Why Clinical Nutrition is Imperative

Download Citation on ResearchGate | Microdetermination of plasma or serum vitamin A and carotene | A micromethod for the determination of carotene and vitamin A is described.

Copyright notice This is an open-access article distributed under the terms of the Creative Commons Public Domain declaration, which stipulates that, once placed in the public domain, this work may be freely reproduced, distributed, transmitted, modified, built upon, or otherwise used by anyone for any lawful purpose. This article has been cited by other articles in PMC. Abstract The associations between nutritional biomarkers and measures of sleep quantity and quality remain unclear. We selected 2, adults aged 20â€”85, with complete data on key variables. Five sleep measures were constructed as primary outcomes: Main analyses consisted of multiple linear, logistic and multinomial logit models. Results Among key findings, independent inverse associations were found between serum vitamin B and sleep duration, 25 OH D and sleepiness as well as insomnia , and between folate and sleep disturbance. Serum total carotenoids concentration was linked to higher odds of short sleep duration i. Conclusions A few of the selected serum nutritional biomarkers were associated with sleep quantity and quality. Longitudinal studies are needed to ascertain temporality and assess putative causal relationships. For CNS conditions, studies have linked cognitive and affective disorders e. Despite this trend, and the known association between sleep and cognitive as well as affective disorders [15] , [16] , [17] , limited epidemiological research has explored how sleep quantity and quality may be related to serum nutritional biomarkers [18] , [19] , [20] , [21] , [22] , [23] , [24] , [25] , [26]. Among those biomarkers, carotenoids were inversely related to metabolic syndrome and depressive symptoms and positively related to cardiovascular health [4] , [27] , [28]. Serum carotenoid concentrations are considered both markers of antioxidant capacity [29] and of total fruit and vegetable intake [28]. Folate, vitamin B and tHcy are often grouped as 1-C metabolism micronutrients as both folate and vitamin B are needed to reduce the level of tHcy through methylation reactions in the CNS [30]. Finally, serum 25 OH D, main sources: Recent research has evaluated relationships between inadequate sleep and adiposity or obesity-related metabolic disorders [39] , [40] , [41] , [42]. Given that eating patterns are key determinants of serum nutritional biomarker concentrations e. Several studies have observed an association between dietary intakes of macro and micronutrients and various measures of sleep such as sleep duration, sleep onset, number of awakenings, wake after sleep, sleep medication use, total napping, obstructive sleep apnea, insomnia [44] , [45] , [46] , [47] , [48] , [49] , [50] , [51] , [52]. A recent review also discusses the possible mechanisms by which diet may influence sleep [53]. Unlike our present study, much of the previous research, has typically used dietary assessment methods that are prone to inaccurate recall of individual dietary behavior or measurement error which, in turn, may be differential by outcome status and thus bias the final measure of association possibly away from the null. In our present study, we aimed at examining the cross-sectional associations between several nutritional biomarkers and measures of sleep quantity and quality, controlling for dietary intake of specific nutrients and supplement use as well as other potentially confounding socio-demographic, lifestyle and health-related factors, using a nationally representative sample of US adults. Written or verbal informed consent was obtained from all participants; verbal consent was witnessed and formally recorded [54]. NHANES consist of cross-sectional surveys providing nationally representative data on the health and nutritional status of the U. Among the initial sample of 4, adults 2, men and 2, women with complete basic demographic data Sample 1 , 3, had complete serum biomarker status. Among those in Sample 1, 2, participants had complete data on diet, physical activity, smoking status, supplement use, weight, height and serum cholesterol Sample 2. Among those in Sample 2, complete data on sleep quality variables was available for 2, participants Sample 3. Sample 3 differed from Sample 1 on some basic demographic variables: This information allowed adjustment for selection bias beyond the oversampling of certain groups which was adjusted by using sampling weights See statistical analysis section. The sleep questionnaire included items on

sleep habits and disorders. Moreover, a subscale of eight questions, related to general productivity from the Functional Outcomes of Sleep Questionnaire [55] , was also included See Method S1 of File S1. In total, we considered 28 questions for sleep indices. An exploratory factor analytic approach was used on scale items that were measured on a 5-point Likert scale reflecting poorer sleep quality with the higher score. See Tables S1 and S2 of File S1 Three factors were extracted, rotated using varimax orthogonal rotation and predicted using the regression method. Those were labeled as: The fit of the model is presented also in Table S3 of File S1 [56]. Nutritional Biomarker assays Using high performance liquid chromatography HPLC with photodiode array detection, serum concentrations of key biomarkers were measured. In this study, retinol and retinyl esters defined as the sum of retinyl palmitate and retinyl stearate were analyzed both separately and summed vitamin A. A similar grouping of serum antioxidant exposures was done elsewhere [4] , [27]. Correlations between the key serum nutritional biormarkers are presented in Table S4 of File S1. Physical activity was measured using individual leisure-time activities that were elicited from participants in an open-ended manner. Those were coded for their intensity as assessed by metabolic equivalent MET , which was then multiplied by duration of the activity and frequency per week. Previous studies found an inverse relationship between current smoking status and serum concentrations of folate and carotenoids among others [2] , [27]. The first recall was administered during MEC exams, and the second 3â€”10 days later by telephone interview. To estimate nutrient intake in the diet, we utilized the average of the two hr dietary recalls and a revised nutrient database that estimated nutrient composition per gram of USDA food code [67]. Energy-adjusted associations between nutrients and outcome were obtained by entering total energy intake as a covariate. Using the MyPyramid Equivalents Database [68] , cup equivalents of fruits and vegetables were estimated per individual, averaged over two hr recalls. We excluded participants with only one hr recall. Dietary supplement use over the past 30 days was categorized as follows: Body mass index BMI, kg. As a sensitivity analysis, total cholesterol was added as a covariate due to its high correlation with many of lipophillic micronutrients included in our analyses e. Because co-morbid chronic conditions were associated with worse sleep [70] , [71] , [72] , we adjusted for self-reported type 2 diabetes, cardiovascular disease i. Statistical analysis Using Stata Second, we conducted multiple OLS regression models with socio-demographic, lifestyle and dietary factors as predictors of serum nutritional biomarkers, to test associations between various covariates with the key exposures of interest. Third, we tested the main associations between serum nutritional biomarkers standardized z-scores and the five sleep quality measures, adjusting for all covariates entered simultaneously , using multiple OLS and logistic regression models. Four different types of models were ran for each of the outcomes of interest, specifycing main exposure variables in different ways e. Finally, multinomial logit regression models with very short, short, and long sleep durations were compared to normal sleep duration in their association with serum nutritional biomarker levels. Moreover, we also applied multinomial logit models to obtain distinctive associations between various sleep disorders and serum nutritional biomarkers. In all analyses, to provide an unbiased estimate for the standard errors, given sampling design complexity, masked variance units were used to estimate variances utilizing the Taylor series linearization method. MEC exam weights were incorporated in the analysis to correct for unequal probability of sampling for certain population groups and obtain population estimates of means, proportions and regression coefficients [74]. This was done by using Stata survey commands and specifying weights, strata and primary sampling units PSU [73]. Given missing data particularly in sleep measures, we constructed a two-stage Heckman selection model [75] , [76] , as was done previously in another study using a similar sample [2] , to account for potential selection bias in all main analyses. The latter was done using a familywise bonferroni procedure, with a family of hypotheses defined by the sleep outcome, assuming content independence [77]. A similar approach was adopted in a previous study with cognitive decline outcomes [78]. Results Study sample characteristics Table 1 presents the distribution of sample characteristics by sleep duration categories. Generally, participants with very short or short duration of sleep were less likely to be non-Hispanic Whites compared to those with normal sleep duration They were also less likely to be married Similarly, the prevalence of current smoking was

significantly higher among very short and short sleepers compared to normal duration sleepers Very short sleep duration was also associated with lower mean physical activity compared to normal sleep 5. The prevalence of type 2 diabetes, cardiovascular disease and cancer was also the lowest among normal sleepers. Compared to normal sleepers As expected, Factors 1 and 3 as well as higher prevalence of sleep disorders were directly linked to shorter sleep duration. A very short sleep duration was associated with a higher tHcy level.