

Misreporting of Dietary Intake Affects Estimated Nutrient Intakes in Low-Income Spanish-Speaking Women



Jinan C. Banna, PhD, RD; Marie K. Fialkowski, PhD, RD; Marilyn S. Townsend, PhD, RD

ARTICLE INFORMATION

Article history:

Submitted 12 June 2013

Accepted 16 June 2014

Available online 12 August 2014

Keywords:

Misreporting
Plausibility
Dietary recall
Minority
Hispanic

2212-2672/Copyright © 2015 by the Academy of Nutrition and Dietetics.

<http://dx.doi.org/10.1016/j.jand.2014.06.358>

ABSTRACT

Misreporting of dietary intake affects the validity of data collected and conclusions drawn in studies exploring diet and health outcomes. One consequence of misreporting is biological implausibility. Little is known regarding how accounting for biological implausibility of reported intake affects nutrient intake estimates in Hispanics, a rapidly growing demographic in the United States. Our study explores the effect of accounting for plausibility on nutrient intake estimates in a sample of Mexican-American women in northern California in 2008. Nutrient intakes are compared with Dietary Reference Intake recommendations, and intakes of Mexican-American women in a national survey are presented as a reference. Eighty-two women provided three 24-hour recalls. Reported energy intakes were classified as biologically plausible or implausible using the reported energy intakes to total energy expenditure cutoff of <0.76 or >1.24 , with low-active physical activity levels used to estimate total energy expenditure. Differences in the means of nutrient intakes between implausible ($n=36$) and plausible ($n=46$) reporters of energy intake were examined by bivariate linear regression. Estimated energy, protein, cholesterol, dietary fiber, and vitamin E intakes were significantly higher in plausible reporters than implausible. There was a significant difference between the proportions of plausible vs implausible reporters meeting recommendations for several nutrients, with a larger proportion of plausible reporters meeting recommendations. Further research related to misreporting in Hispanic populations is warranted to explore the causes and effects of misreporting in studies measuring dietary intake, as well as actions to be taken to prevent or account for this issue.

J Acad Nutr Diet. 2015;115:1124-1133.

ACCURATE SELF-REPORTED DIETARY INFORMATION is essential in studies exploring the connection between diet and development of chronic disease.¹ Misreporting of dietary intake refers to inaccurate reporting of foods consumed, and is one of the main sources of error in dietary assessment.² Misreporting includes both over- and underreporting, and affects the validity of the data collected and conclusions drawn.² To estimate the occurrence of misreporting, biological plausibility of reported intake may be determined. The result indicates whether the reported dietary intake level is biologically plausible given physiological status and physical activity level. There are several ways to account for biological plausibility during analysis. One possibility is to exclude extreme values based on data distribution or subjective assessment.³ Alternatively, reported energy intake (rEI) may be compared with total energy expenditure (TEE), and implausible reports may be screened out using cutoffs.^{3,4} TEE may be either predicted or measured using relatively inexpensive methods such as self-report questionnaire or more costly techniques such as doubly-labeled water.^{3,4} Determination of biological plausibility using these

methods to estimate misreporting is an important step in ensuring the validity of dietary data.

In considering misreporting, it is important to note the potential threats to the validity of self-reported dietary information. Measurement error is introduced when 24-hour recalls are conducted, resulting in a list of consumed foods that may not accurately reflect all food types and amounts.⁵ Baranowski and colleagues^{6,7} identify “intrusions” in 24-hour recalls as foods reported but not eaten, “matches” as foods reported and eaten, and “omissions” as foods eaten, but not reported. Food omissions and inaccurate portion size estimates have been found to be two major sources of error.⁸ Respondents’ ability to estimate portion size may be compromised if portion size measurement aids are inadequate or if respondents are not accustomed to using them,⁹ if the foods are amorphous (without a specified shape, such as fruit salad),¹⁰ or if foods eaten in small portions are not ascertained (ie, spreads).¹¹ In addition to these threats, social desirability might be the source of invalidity for systematic misreporting of dietary intake.¹² The accuracy of the data collected in an interviewer-conducted 24-hour recall also

depends on an interviewer's ability to probe for details about foods reported, and to record intake correctly and completely.⁶ Also, in studies examining dietary intake of ethnic groups, systematic biases may be introduced due to lack of appropriate food composition data for these groups and substitution of nutrient values for other "similar" foods.¹³ The traditional Mexican diet, for example, may contain items such as *atole*, a corn-based gruel, *chilaquiles*, a dish composed of tortillas and sauces, and *aguas frescas de fruta*, homemade fruit-based drinks, which may not be contained in many food composition tables.¹⁴ Finally, lack of motivation is a potential source of error for both subjects and interviewers.¹⁵ If a participant does not perceive the study to be important and applicable, he/she may not be motivated to provide complete information, producing results that are inaccurate.¹⁶ The interviewer plays an important role in motivating participants to provide accurate information, and must convey enthusiasm to the participant while establishing rapport and creating an atmosphere of trust.¹⁵ Misreporting error may be systematic or random. The latter affects the population variance, but not the mean intake. Systematic error, in contrast, alters the mean intake.¹⁷

Underreporting has been found to be more common than overreporting across adult population groups.¹ Recent literature reviews indicate that substantial underreporting occurs in most adult populations, with greater underreporting occurring in women, those with less education, and those with a higher body mass index (BMI).^{1,2} Although substantial underreporting in women has been observed in a number of studies,¹⁸⁻²⁰ studies in women of minority populations have indicated that patterns of misreporting and contributing factors may differ among population subgroups. For example, unexpected results were found in 418 male and female Native American adults on the Pacific northwest coast of Washington State, with $\geq 85\%$ being overweight or obese and more than half (56%) reporting plausible energy intake.²¹ Overreporting was also more common in this population than in others previously studied, with 7% of women classified as overreporters and 32% as underreporters.²¹ These trends warrant further investigation in other diverse populations.

Although numerous studies have examined misreporting in non-Hispanic populations, only two studies using 24-hour dietary recalls have focused exclusively on Hispanics,^{22,23} and explored rates and correlates of underreporting. In the first, rates of underreporting in a random sample of 357 Mexican/Mexican-American women aged 21 to 67 years in California ranged from 11.9% to 81.3% depending on underreporting detection methods used to determine these rates.²² Physical activity level (PAL) was measured using a questionnaire, and cutoff values were adjusted in the different detection methods based on these levels. Underreporting detection methods were as follows, and differed by adjustment for sample size and PAL, as well as cutoffs selected: adjusted for sample size but not PAL; adjusted for sample size and PAL; used a conservative form of the Goldberg cutoff assuming a sample size of $n=1$, not accounting for PAL; calculated the cutoff value based on a sample size of $n=1$ and all PAL; compared participant energy intake (EI) to basal metabolic rate (BMR) ratio to the sample's median EI:BMR. In the second study, BMR multiplied by an activity factor was compared with rEI to calculate number of calories

underreported in 215 Caribbean Hispanics aged 26 to 79 years.²³ Participants underreported an average of 254 kcal/day; the proportion of participants determined to have plausible intake was not reported. In reviewing these findings, it is important to note that the generalizability is limited, because these two studies were conducted in select segments of the Hispanic population, which is composed of many diverse subgroups.

Because the aforementioned studies are the only two using 24-hour dietary recalls focused on the topic of misreporting in Hispanics exclusively, and because nearly one in three US residents is projected to be Hispanic in 2060,²⁴ further exploration of the accuracy of reporting in Hispanics is warranted. In particular, it is important to determine how accounting for plausibility of reported intake affects nutrient intake estimates to enable comparison with other racial/ethnic groups.^{25,26} Previous studies in underserved minorities have indicated that accounting for plausibility, determined by comparing rEI with predicted energy requirements or expenditure,^{3,4} significantly influences nutrient intake estimates.^{21,27} In the aforementioned study in Native-American adults in which most individuals were overweight or obese, accounting for plausibility had a significant effect on whether participants were categorized as meeting recommendations for macro- and micronutrients, with a larger proportion of plausible reporters meeting recommendations whenever there was a significant difference.²¹

In interpreting study results, it is essential to consider the validity of dietary data. The simplest and most readily available method is to use reference methods for calculating biological plausibility.^{4,28} Determining plausibility of rEI, as well as the difference in nutrient consumption estimates in plausible vs implausible reporters, is important for several reasons. First, in studies examining the relationship between dietary intake and health outcomes, plausibility must be considered to obtain an accurate picture of intake and determine whether individuals meet recommendations to ensure that relationships are not obscured or confounded.² Second, findings from studies involving rEI are often used to identify possible behaviors to target for promoting healthful dietary change and to develop consumer health messages.²⁹ Finally, dietary data reflecting actual intake is necessary to identify populations at risk, as well as to provide baseline data from which one could assess the effectiveness of interventions.

The goal of this study was to explore the accuracy of reported dietary data in a convenience sample of Mexican-American women in northern California. The first objective of this study was to determine whether reported nutrient intakes differ between individuals classified as having plausible compared with implausible rEI. The nutrient intakes of Mexican-American women who participated in the National Health and Nutrition Examination Survey (NHANES) 2007-2008 are presented as a reference. In comparing estimated nutrient intakes with current Dietary Reference Intake (DRI)³⁰ recommendations, the second objective was to determine whether accounting for plausibility of rEI influences the assessment of whether the population is meeting dietary recommendations. It was hypothesized that estimated nutrient intakes would be significantly higher in plausible reporters than implausible,

Download English Version:

<https://daneshyari.com/en/article/2653012>

Download Persian Version:

<https://daneshyari.com/article/2653012>

[Daneshyari.com](https://daneshyari.com)