Health Professional Advice and Adult Action to Reduce Sodium Intake

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Introduction: Excessive sodium intake is a key modifiable risk factor for hypertension and cardiovascular disease. Although 95% of U.S. adults exceed intake recommendations, knowledge is limited regarding whether doctor or health professional advice motivates patients to reduce intake. Our objectives were to describe the prevalence and determinants of taking action to reduce sodium, and to test whether receiving advice was associated with action.

Methods: Analyses, conducted in 2014, used data from the 2013 Behavioral Risk Factor Surveillance System, a state-based telephone survey representative of non-institutionalized adults. Respondents (n=173,778) from 26 states, the District of Columbia, and Puerto Rico used the new optional sodium module. We estimated prevalence ratios (PRs) based on average marginal predictions, accounting for the complex survey design.

Results: Fifty-three percent of adults reported taking action to reduce sodium intake. Prevalence of action was highest among adults who received advice (83%), followed by adults taking antihypertensive medications, adults with diabetes, adults with kidney disease, or adults with a history of cardiovascular disease (range, 73%−75%), and lowest among adults aged 18−24 years (29%). Overall, 23% of adults reported receiving advice to reduce sodium intake. Receiving advice was associated with taking action (prevalence ratio=1.59; 95% CI=1.56, 1.61), independent of sociodemographic and health characteristics, although some disparities were observed across race/ethnicity and BMI categories.

Conclusions: Our results suggest that more than half of U.S. adults in 26 states and two territories are taking action to reduce sodium intake, and doctor or health professional advice is strongly associated with action.

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Introduction

Cardiovascular disease (CVD) results in nearly 800,000 deaths each year in the U.S.,[1] and elevated blood pressure is a major risk factor for CVD.[2] Sodium intake reduction is a key strategy for lowering blood pressure,[3] with an estimated 9.5% of deaths from CVD worldwide attributable to excess sodium intake.[4] Given that about 95% of U.S. adults exceed sodium intake guidelines,[5] current recommendations encourage healthcare providers to counsel all patients with and without hypertension regarding sodium reduction.[6] Although data exist on health professional advice given to hypertensive patients to reduce sodium intake,[5,6] few studies have examined medical advice given to all patients to reduce sodium intake and the association of this advice with taking action.

One previous study reported that 24% of U.S. adults received doctor or other health professional advice to cut down on dietary sodium; the likelihood of receiving advice varied by sex, age, race/ethnicity, and household income.[7] Of those who received medical advice, 87% reported taking action to cut down on sodium. This study was based on a consumer market panel, and did not

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provide data on the prevalence of taking action among the total sample or among those who did not receive advice. Thus, it is unclear whether health professional behavior influenced patient action to reduce sodium intake.

Data from the 2013 Behavioral Risk Factor Surveillance System's (BRFSS's) new Sodium or Salt-Related Behavior optional module allowed us to examine doctor or other health professional advice and self-reported action to reduce sodium intake in a multistate, representative, probability-based sample. The main objectives of these analyses were to determine the prevalence and determinants of action to reduce sodium intake among U.S. adults and to investigate the association between receiving advice and taking action.

Methods

Study Population

We used data from the 2013 BRFSS survey, a state-based survey that uses a stratified multistage probability sampling design to produce a sample representative of the non-institutionalized population aged ≥18 years of each state. A subset of 26 states (Arkansas, Connecticut, Hawaii, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Jersey, North Carolina, North Dakota, Ohio, Oklahoma, Tennessee, Utah, Virginia, Washington, West Virginia, and Wisconsin), the District of Columbia, and Puerto Rico implemented a new optional sodium-related behavior module. For these areas, the median response rate, defined as the number of complete and partial interviews divided by an estimate of the number of eligible units in the sample, was 48.1%, with a range of 31.1%–60.3%.[8] The median cooperation rate (the number of complete and partial interviews divided by the number of contacted, eligible respondents) was 66.9%, with a range of 51.8%–75.9% (American Association of Public Opinion Research, www.aapor.org/AAPORKentico/default.aspx). BRFSS uses a sophisticated weighting methodology to improve representation based on sex, age, race/ethnicity, county, region, telephone service (landline, cell phone, or both), tenure (renting or owning a home), marital status, and education.[9]

Unlike in previous years in which sodium-related questions were asked only of BRFSS respondents with self-reported hypertension, the new 2013 sodium questions were asked of all respondents in participating states. Of 187,426 participants offered the sodium module, we excluded 13,648 with missing data (7.3%), leaving 173,778 participants.

Measures

We examined self-reported action to reduce sodium intake (*Are you currently watching or reducing your sodium or salt intake?*) as our primary outcome of interest. In addition, we calculated duration of action to reduce sodium intake among those who reported taking action (Appendix, available online). Our primary exposure of interest was doctor or health professional advice to reduce sodium intake.[10] During survey development, BRFSS conducted three rounds of cognitive testing to modify and improve these questions.

Participant characteristics potentially associated with sodium-related behavior or reported advice were sex; age; race/ethnicity; education; having a healthcare provider considered a "personal doctor" (none, one, or more than one); self-reported hypertension (no hypertension, hypertension without medications, or hypertension with medications), diabetes, or kidney disease; CVD history (including heart attack, coronary artery disease or angina, or stroke); and BMI category.[10] Household income also is potentially associated with sodium-related behavior or medical advice, and we reported categories of household income in the descriptive results in Table 1. However, many respondents were missing income data (14%). Removing income from the regression model did not lessen the amount of variation in outcome explained by the model or affect relationships in the model (no confounding or interaction). Thus, we chose not to include household income in further analyses.

Statistical Analysis

We examined characteristics of people taking action to reduce sodium intake and of those reporting advice. We used multiple logistic regression to examine which characteristics were significantly associated with reported action or advice to reduce sodium. We also used multiple logistic regression to assess the association between reported advice and action to reduce sodium, and assessed interactions to determine whether this association differed among subgroups. In all models, we estimated model-adjusted prevalence ratios (PRs) on average marginal predictions.[11] Because of the large sample size, small differences in behaviors were likely to be statistically significant. For this reason, in addition to calculating statistical significance, we set a meaningful difference level of PR <0.80 or >1.25. All analyses, conducted in 2014, used SAS, version 9.3 and SAS-callable SUDAAN, version 11, with sampling weights to account for the complex survey design.

Results

In this population, sampled from non-institutionalized U.S. adults in 26 states, the District of Columbia, and Puerto Rico, 53% of adults reported taking action (i.e., currently watching or reducing their sodium or salt intake in 2013) (Table 1). The prevalence of taking action was highest among adults who reported receiving advice (83%), followed by adults taking antihypertensive medications (75%), with a history of CVD (75%), with diabetes (74%), or with kidney disease (73%), and lowest among adults aged 18–24 years (29%). Among individuals who reported taking action to reduce sodium, the majority reported undertaking this behavior for at least 1 year (Table 2), and 40% reported ≥10 years. Older respondents reported a longer duration of taking action to reduce sodium, with more than half of the oldest respondents (aged ≥65 years) reporting watching or reducing sodium intake for ≥10 years. In sensitivity