Science of Salt Weekly is a publication of weekly Medline searches related to dietary sodium. This is an initiative of the Canadian Institute for Health Research & Heart and Stroke Foundation Chair in Hypertension Prevention and Control. Funding has been provided by the Canadian Stroke Network and the George Institute for Global Health.

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METHODOLOGY


Researchers in the USA conducted a one-year dietary intervention study among people with metabolic syndrome (MetS) to assess the association between sodium intake and meal consumption patterns. MetS is characterized by central obesity, hypertension, dyslipidemia, and insulin resistance, and is strongly associated with risk for type 2 diabetes and CVD.

Two hundred and forty participants (173 male and 67 female) with MetS were recruited at the University of Massachusetts Medical School and randomized to either a high fibre diet (HF intervention group) or the American Heart Association (AHA) diet (control group). Participants following the HF diet received instructions on eating 30gm or more of dietary fibre/day, whilst those in the control group followed the AHA 2006...
A randomised control trial was conducted in the USA among a sample of 117 heart failure (HF) patient and family members to assess a HF patient–family partnership intervention designed to reduce dietary sodium and improve medication adherence (MA) when compared with a patient–family education intervention and usual care. Authors randomized 117 patient and family members to three groups: Usual Care (n=38), Patient Family Member Education (n=42), or Family Partnership Intervention (n=37). Patients in the usual care (UC) group received information brochures and usual care from their health care providers and Patient Family Member Education (PFE) and Family Partnership (FPI) groups attended long-term education sessions and received telephone calls by nurses and registered dieticians. In addition, the FPI group patients received two 2-hour group sessions reinforcing dietary and medication education.

All patients’ dietary sodium intake was measured using a 3-day food record, urinary sodium was measured by 24-hour urinary sodium excretion and MA (Medication Events Monitoring System) was measured at baseline before randomization, and at 4 and 8 months. Results indicated that FPI and PFE reduced urinary sodium intake at 4 months, and FPI differed from UC at 8 months (6.7gm/day and 9.6gm/day respectively). The findings showed that dietary sodium decreased from baseline to 4 months in both PFE and FPI participants (5gm and 5.1gm salt/day respectively) which was guidelines to consume less than 5.75 salt/day. Three 24-hour dietary recalls were collected at each visit which provided meal patterns and nutrient data, including sodium intake at both baseline and one-year visits. Results indicate that at the one-year follow-up for the dietary intervention participants who consumed greater than 5.75gm salt/day declined from 75% at baseline to 59%, and those who consumed higher than 3.75gm salt/day declined from 96% at baseline to 85%. Authors found that overall average sodium intake decreased from 7.4gm salt/day at baseline to 6.3gm salt/day at the one-year follow-up. The findings showed that the sodium intake per meal varied significantly by meal type, location and weekday, with sodium intake higher on weekends, at lunch and dinner and when meals were consumed in restaurants and fast food chains. Thus, authors state that findings support actions to encourage low–sodium food preparation at home and encourage public health policies to decrease sodium in restaurants and prepared foods.

In a study investigating the most recent estimates and trends in excess sodium consumption among a United States population, Centers for Disease Control and Prevention (CDC) analysed data from the National Health and Nutrition Examination Survey (NHANES) conducted from 2003–2010 which used a sample of 34,916 participants aged ≥ 1 year. Investigators reviewed 24-hour dietary recall data from the sampled population to estimate sodium intakes. Results indicate that during 2007–2010, the...
lower than that of the UC group (7.2gm salt/day). Authors found that the proportion of participants adherent to low sodium intake (<6.25gm salt/day) was higher at 8months in PFE and FPI than in UC. Authors summarized that reduced dietary sodium intake was improved by PFE and FPI compared with UC and conclude that greater efforts to study and incorporate family-focused education and support interventions into HF care are required. Link to article


Researchers in Japan conducted an observational study at a manufacturing worksite in Kanagawa, Japan to examine whether subjective evaluation of salty food intake can predict future development of hypertension among a sample of 970 non-hypertensive participants aged between 35–63 years. Authors collected anthropometric, blood pressure and lifestyle data at baseline including subjective frequency of salty food intake (seldom, sometimes or always) using a self-report questionnaire. Authors measured blood pressure in an annual follow-up for a maximum period of 4 years. Results indicated no significant differences in the 4-year cumulative incident rate of hypertension among the 'seldom', 'sometimes' and 'always' groups (15.8%, 14.3% and 10.3%, respectively). Thus, the findings did not show any significant association between the subjective evaluation of the frequency of salty food intake and the risk of incident hypertension during a 4 year period. Authors suggest that further investigations with longer follow-up periods are needed to clarify whether these results are maintained for more than 4 years. Link to article


A systematic review as part of the 2010 Global Burden of Diseases, Injuries and Risk-Factor Study was undertaken to provide comprehensive evidence on global, regional (21 regions) and national (187 countries) sodium intake levels and patterns of sodium consumption in adults in 1990 and 2010. Authors searched and obtained published and unpublished data from 245 surveys, including 142 surveys of 24-hour urinary sodium and 103 of dietary sodium, with 26 of each forming urine/diet survey pairs. These surveys were conducted between 1980 and 2010 across 66 countries comprising 74% of the global adult population. Bayesian hierarchical modelling was used to estimate the mean sodium intake across the world by sex, age and country in 1990 and 2010. The primary outcome measure was mean sodium intake (gm/day) as estimated by 24-hour urine collections, without adjustment for non–urinary losses. The findings of the review indicate that in 2010, global mean
A study was undertaken to review the evidence on the reduction of dietary sodium for the prevention and management of chronic diseases, including hypertension, cardiovascular disease (CV), and chronic kidney disease (CKD). Authors identified the Dietary Approaches to Stop Hypertension (DASH) and the Trial of Hypertension Prevention (TOPH) trials as the two major sodium-lowering therapy studies which showed the benefits of decreasing sodium intake on blood pressure and CV events. The review found that small studies in patients with proteinuric CKD also showed that reducing sodium intake is an effective adjunctive therapy to angiotension–converting enzyme inhibitor (ACEi) or angiotensin receptor blockers (ARBs) in reducing proteinuria.

Furthermore, public health initiatives to reduce population sodium intake in Finland and Japan had similar benefits in blood pressure and stroke reduction. In this review, authors indicated that recent follow-up data from several long-term cohort studies, such as the Framingham Heart Study among others, have shown increased mortality among individuals with lower urinary sodium excretion which have generated controversy regarding the optimal sodium intake. Authors suggest that continuing efforts to educate food manufacturers, patients, and clinicians on the benefits of dietary sodium reduction will prevent and manage chronic diseases, including hypertension, CV disease, and CKD. Link to article

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