Chronic constipation is a common condition that is characterized by infrequent stools, sensation of incomplete defecation, and straining to have a bowel movement. National statistics indicate that approximately 63 million individuals suffer from constipation in North America (US Dept. of Health and Human Services, 2013). However, the majority of individuals who experience constipation do not seek medical advice. Additionally, chronic constipation is most notably higher in women than men. It is theorized that women are more prone to constipation due to pregnancy, complications from vaginal delivery, exposure to more stress, increased hormonal modulations, and societal pressures/experiences in public restrooms (Choung, 2007).

The etiology of constipation can involve poor nutrition, lack of physical activity, inadequate sleep, stress, gender, and certain diseases (Nelms, 2014).

Nutritional treatment for constipation has historically centered on ensuring adequate fiber intake. Currently, no data available to determine an Estimate Average Requirement (EAR) to a Recommended Dietary Allowance (RDA) for total fiber. The Adequate Intake (AI) for total fiber has been based on the observed median fiber intake level to achieve the lowest level of observed risk of coronary heart disease (CHD). Thus, the fiber recommendation of 14g/1000kcal/day may help decrease constipation and diverticular disease. However, the benefit of decreasing constipation was not used as the basis for the AI recommendation (Position of the American Dietetic Association: Health Implications of Dietary Fiber, 2008).

Fluid intake is equally important to gastrointestinal health. Fluid helps with increasing motility and absorption of nutrients. There is limited evidence that constipation can be successfully be treated by increasing fluid intake, unless there is evidence of severe dehydration (Muller-Lissner, Kamm, Scarpignato, & Wald, 2005). There is limited research to suggest that inadequate physical activity alone is the cause of constipation.

Magnesium is of concern because it interacts with a number of other nutrients in the body including vitamin D, calcium, phosphorus, and potassium (Grupper & Smith, 2013). Over the past couple of decades, the quality of our crops in the U.S. has decreased due to over farming of soil. Magnesium declined an average of 21% in the U.S. since the 1950s across fruits and vegetables that were studied (Davis, 2011; Nelms, Sucher, Lacey, & Sucher, 2014). In regards to constipation, certain individuals are more susceptible to developing a magnesium deficiency including individuals with gastrointestinal (constipation, IBS, etc.) disorders (Higdon, Drake, Delage, & Volpe, 2014). Furthermore, magnesium chloride and magnesium hydroxide supplements such as Milk of Magnesia are often used to help individuals with constipation (National Institute of Diabetes and Kidney Diseases, 2014).

The most common definition used by researchers for chronic constipation (National Institute of Diabetes and Digestive and Kidney Diseases, 2005) is: "...characterized by infrequent stools, sensation of incomplete evacuation at least 25% of the time; and (4) feeling of incomplete evacuation at least 25% of the time; (3) straining with defecation at least 25% of the time; (2) hard or lumpy stools at least 25% of the time; (3) feeling of incomplete evacuation at least 25% of the time; (4) feeling of incomplete evacuation at least 25% of the time; (3) straining with defecation at least 25% of the time; and (4) less than three bowel movements per week (at least 25% of the time) or sometimes on perceived constipation in the past 12 months."

The purpose of this study was:
- To investigate the relationship between nutrient intake and bowel health.
- Specifically, this study examined the relationship between constipation (defined as <3 bowel movements per week) and overall dietary intake of magnesium, fiber, fluid intake and physical activity in American women aged 20 to 50 years old.

**Methods**

Sample:
1658 female participants from the National Health and Nutrition Examination Survey (NHANES) were selected using a random sampling method through a four stage sampling process to select a representation of the U.S. population.

**Institutional Procedures:**
A combination of interviews and physical examinations. The interviews include demographic, socioeconomic, dietary, and health-related questions. The physical examination consists of medical, dental, physiological measurements, and laboratory tests.

A 1-year survey cycle from 2009 to 2010 was reviewed with a total possible sample size of 10,537 male and female respondents. A sub-sample from this group was chosen and included (1) female, (2) 20 to 50 years of age, and (3) successfully completed all dietary recall interviews. Additional exclusions will be made for women who are currently pregnant, and any individual who selected “refused” do not know or have any missing data.

An average intake from two days for dietary fiber intake, magnesium intake and plain water consumption were used in combination with physical activity outside of work. Bowel health questions regarding number of bowel movements per week, perceived constipation frequency and common stool type were used to assess constipation.

**Cohort:**
1. Constipation was defined as (1) <3 bowel movements per week, (2) a response of type 1 or type 2 on the Bristol Stool Chart (BSC) or (3) a response of always, most of the time or sometimes on perceived constipation in the past 12 months.
2. Participants were selected using a random sampling method based study 1988–2003.
4. As nutrition professionals, it is necessary to address all aspects of a patient when treating constipation. This includes determining if the patient is consuming adequate fiber, magnesium, and fluid.

**Results**

- Data suggest there was a statistically significant difference in fiber intake, magnesium intake, and fluid intake with irregular bowel movements (<3 per week) compared to regular bowel movements of ≥5 per week.
- There was a statistically significant difference in perceived constipation frequency between participants with the BSC Type 1 & 2 and Type 3 & 4.
- There was no statistically significant difference in physical activity outside of work (moderate & vigorous) with irregular bowel movements (<3 per week) compared to regular bowel movements (≥3 per week).

**Conclusions**

- As nutrition professionals, it is necessary to address all aspects of a patient when treating constipation. This includes determining if the patient is consuming adequate fiber, magnesium, and fluid.

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