Nutrition status and its relationship with health status in individuals with spinal cord injury: a scoping review

Jia Li, Devin Drummer, Thomas Hoover, Christian Sidebottom, Rachel Cowan, John-Paul Tortorich, Cindy Cai, Elizabeth Scalia, Ceren Yarar-Fisher

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Title of the review

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Background

Spinal cord injury (SCI) leads to immediate and drastic physiological and lifestyle changes to those who survived and puts them at risk of accelerated morbidity and mortality over the course of a lifetime (DeVivo, Krause, & Lammertse, 1999). Individuals with SCI, while often young, are at increased risk for metabolic disorders soon after the injury due to severe skeletal muscle atrophy and extreme inactivity (Bauman and Spungen 1994, 2001; Bauman et al. 1999). As a result of inactivity, body composition drastically deteriorates, including significant loss of muscle mass below the level of injury (Castro et al. 1999) and increased total fat mass (Spungen et al. 1995). Extensive research in able bodied populations has shown many benefits of proper nutrition on health, including weight control, improvements of metabolic health, and preservation of lean mass during weight loss (Agriculture., 2015). Thus, targeting nutrition in SCI may be an effective tool to combat SCI-associated secondary health conditions, such as muscle atrophy, increased adiposity, increased risk of pressure ulcers and metabolic disorders (Chen, Henson, Jackson, & Richards, 2006; Gorgey, Mather, Cupp, & Gater, 2012; Li et al., 2018). However, there is a lack of nutrition research in SCI and no report has systematically reviewed and outlined the landscape of the current literature on nutrition in the acute or chronic stages of SCI and its relationship with health status in adults with SCI. Therefore, this review aims to map the existing evidence on nutrition in SCI and identify key concepts and gaps in nutrition research in the SCI population.

Policy relevance

There is a paucity of research in nutrition and spinal cord injury to guide evidence-based nutrition practices this population. Our proposed scoping review will provide a landscape of existing literature and identify gaps in knowledge, thereby providing evidence for policy makers to make decisions in shaping the future of spinal cord injury and nutrition research, as well as health care policies for better nutrition practices.

Objectives

1. What is the nutritional status of adults with acute or chronic SCI?
2. What is the relationship between nutrition status and various health outcomes (e.g., neurological, metabolic, etc.) among adults with acute or chronic SCI?
3. What is the effect of dietary modification on health outcomes (neurological, metabolic, and other) among adults with acute or chronic SCI?

Existing reviews

Farkas GJ, Pitot MA, Berg AS, Gater DR. Nutritional status in chronic spinal cord injury: a systematic review and meta-analysis. Spinal Cord. 2018. doi: 10.1038/s41393-018-0218-4. PubMed PMID: 30420688.

The review above investigated nutrition status in individuals with chronic SCI and compared macronutrient and micronutrient intake to the recommended values by the United States Department of Agriculture (USDA) 2015-2020 Dietary Guidelines for Americans. Our scoping review expands the published review by mapping out the landscape of existing research on nutrient intake among individuals with chronic SCI including not only intervention studies but also observational studies, case studies, and prospective and retrospective chart evaluation. In addition, our scoping review will summarize existing literature on nutrition status of patients with acute SCI, as well as the relationship between nutrition status and health outcomes in individuals with acute or chronic injuries. Moreover, we will evaluate if dietary modifications are associated with improved health outcomes in adults with SCI. Thus, our review is expected to identify key concepts and gaps in nutrition research in the SCI population and serve as a valuable resource for investigators who are interested in developing new research in this field.

Intervention

The proposed scoping review will collect and provide a summary of existing literature on nutrition and SCI. Thus, it will include an extensive list of study designs, such as observational studies that assessed nutrition status and/or its relationship with health outcomes in adults with SCI, as well as prospective or interventional studies that examined the effects of dietary modifications on eating behaviours and/or health outcomes.

For interventional studies, eligible studies include the following

1. Dietary education or consultation (in person or remote-based, caregiver education)
2. Provision of study meals or food items
3. Combination of the above interventions
4. Macronutrient or micronutrient modifications, dietary pattern modifications, or any dietary education that would elicit changes in dietary intake among adults with SCI.

Studies that are randomized, non-randomized, or evaluated changes pre- and post-intervention of a single arm trial will be included. Lastly, our review will focus on whole food-based nutrition interventions, thus studies that use supplements in the form of tablets, drop, syrup or powder will not be eligible.

Population

Eligible studies must include adults with acute (within 12 months of injury) or chronic (after 1 year of injury) SCI. Exclusion criteria include professional athletes, pregnant/nursing women, and children under 18 years old.

Outcomes

The overarching goal of the proposed scoping review is to summarize existing research on nutrition status and its relationship with health status in SCI. Thus, we will include studies that 1) assessed nutritional status which reported dietary intake and/or measured biomarkers in the blood that reflect the intake of certain macro- and micro-nutrients in adults with acute and chronic SCI, 2) evaluated the relationship between nutrition status and health outcomes in adults with acute and chronic SCI, and 3) investigated the impact of dietary modifications on dietary intake and health outcomes in adults with acute and chronic SCI.

Study designs

The proposed scoping review will include observational, case, prospective, retrospective chart evaluation, and interventional studies. Quantitative evidence regarding nutritional status (nutrient intake, and/or biomarkers in the blood), the correlation between nutrition status and health outcomes, and changes in health outcomes upon dietary modifications will be collected and summarized to address our objectives. To answer the broad research questions of our review, we proposed the scoping review methodology. Comparing to systematic review and meta-analysis, which tend to have a narrow focus, scoping review is typically used to map evidence on a topic, identify knowledge gap, and examine the size, range and nature of the evidence.

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Add the references I added to background, these should be in the endnote file I sent you on Friday.

Review authors

Lead review author:

Name:	Jia Li
Title:	PhD
Affiliation:	University of Alabama at Birmingham
Address:	1825 University Blvd, Rm 571
City, State, Province or County:	Birmingham
Post code:	35233
Country:	US
Phone:	2059750618
Email:	jiali@uabmc.edu

Co-authors:

Name:	Devin Drummer
Title:	M.S.
Affiliation:	University of Alabama at Birmingham
Address:	1720 2nd Ave S Birmingham, AL
City, State, Province or County:	Birmingham, AL
Post code:	35294
Country:	USA
Email:	drummerd@uab.edu

Name:	Christian Sidebottom
Title:	
Affiliation:	Union University
Address:	287 Hughes Cove
City, State, Province or County:	Collierville, TN
Post code:	38017
Country:	US
Phone:	901-651-6016
Email:	Christiantsidebottom@gmail.com

Name: Thomas Hoover	Thomas Hoover
Title:	M.S.
Affiliation:	University of Alabama at Birmingham
Address:	1720 2nd Ave S
City, State, Province or County:	Birmingham, AL
Post code:	35294
Country:	USA
Email:	thoover1@uab.edu

Name:	John-Paul Tortorich
Title:	Doctor of Osteopathic Medicine
Affiliation:	The University of Alabama at Birmingham
Address:	1717 6th Ave S
City, State, Province or County:	Birmingham, AL
Post code:	35233
Country:	USA
Email:	jptortorich@uabmc.edu

Name:	Xinsheng “Cindy” Cai
Title:	PhD
Affiliation:	American Institutes for Research
Address:	1400 Crystal Drive, 10th floor
City, State, Province or County:	Arlington, Virginia
Post code:	22202
Country:	USA
Email:	ccai@air.org

Name: Thomas Hoover	Elizabeth Scalia
Title:	MLIS
Affiliation:	American Institutes for Research

Address:	6003 Executive Blvd, Ste 3000
City, State, Province or County:	Rockville, MD
Post code:	20852
Country:	USA
Email:	Escalia@air.org

Name:	Rachel E. Cowan
Title:	Research Assistant Professor
Affiliation:	University of Alabama Birmingham School of Medicine
Address:	SRC 515, 1717 6th Ave S
City, State, Province or County:	Birmingham, Al
Post code:	35249
Country:	US
Phone:	2059345034
Email:	recowan@uabmc.edu

Name:	Ceren Yarar-Fisher
Title:	Assistant Professor
Affiliation:	University of Alabama Birmingham School of Medicine
Address:	1825 University Blvd, Rm 503
City, State, Province or County:	Birmingham, AL,
Post code:	35233
Country:	US
Phone:	2059966896
Email:	cyarar@uab.edu

Roles and responsibilities

Jia Li, Ceren Yarar-Fisher have content expertise. Cindy Cai and Elizabeth Scalia have methodological and information retrieval expertise, Jia Li have statistical expertise. All other team members will receive training in systematic review methods.

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Potential conflicts of interest

The authors are not aware of any conflicts of interest arising from financial or researcher interests.

Preliminary timeframe

- Date we plan to submit a draft protocol: 28 April 2019
- Date we plan to submit a draft review: 30 July 2019