Addressing Chronic Pain in Marginalized Populations Using Nutritional Education Curricula

Ramona Wallace  D.O. IFMCP
Julia Kwapiszewski MPH
Lisa Graves MD
None
ABOUT US

Ramona Wallace DO IFMCP
Worked in rural Michigan for 17 years with a focus on Amish populations, then worked in FQHC in Muskegon and Battle Creek since 2009. Peer reviewed publication in childhood obesity, systems biology and nutritional deficiencies. Currently on Faculty at WMED in Family Medicine. Certified Practitioner in Functional Medicine

Julia Kwapiszewski MPH
Received her Master’s in Public Health at Western Michigan University. Is currently a 1st year medical student at CMED serving in leadership positions for Research in Medicine, Street Medicine, and Public Health student groups.

Lisa Graves MD MClnSc
Professor in the department of Family Medicine and Community Medicine at WMED. Received her Master’s in Clinical Sciences at Western Michigan University.
“We wish to recognize the Anishinaabe people whose traditional land we are gathered upon today and the land on which the Saginaw Chippewa Indian Tribe have resided for over 200 years. To recognize the land is an expression of gratitude and appreciation to those whose territory you reside on, and a way of honoring the Indigenous people who have been living and working on the land from time immemorial (existing since beyond the reach of memory). It is important to understand the long-standing history that has brought us to reside on the land, and to seek to understand our place within that history.”
CONFERENCE OBJECTIVES

Provide an opportunity for rural health care workers to share and learn from each other

Provide networking and collaboration opportunities

Provide current and relevant information about rural health
Describe, define, identify, and discover the intricate connections between food insecurity, substance use disorder, chronic pain, and malnutrition, particularly in underserved and rural populations.

Compare, discuss, contrast, and apply practical strategies for addressing micronutrient deficiencies within the context of chronic pain and substance use disorders in underserved and rural communities.

Connect, explain, and summarize the significance of comprehensive education and training in nutritional foundations for healthcare professionals, emphasizing the need for policy changes and collaborative efforts to improve the health outcomes of marginalized populations.
Extensive data show persistent health disparities, including: higher mortality and lower life expectancy, decreased or limited access to care, and increased distances to receive care.

Rural Michigan Farmers’ Health Concerns and Experiences: A Focus Group Study - PMC (nih.gov)
2024 HEALTH OUTCOMES
FOOD INSECURITY

• “In 2022, 14.7 percent of households in rural areas experienced food insecurity compared to 12.5 percent of households in metro areas. Geography: The food insecurity rate is highest in the South (14.5 percent), followed by the Midwest (12.4 percent), the Northeast (11.6 percent), and the West (11.2 percent).”
  
  - https://frac.org/hunger-poverty-america

• “In Michigan, the overall food insecurity rate is 11.5%. In the Upper Peninsula, where 100% of the counties are rural, the food insecurity rate is 14%”
  
  - https://www.feedwm.org/2023/01/important-facts-on-rural-hunger-in-michigan/

• The Food Security Council in 2022 made this summary statement:

  **THE SOCIAL DETERMINANTS OF FOOD INSECURITY HAVE THE GREATEST IMPACT ON THE NATURE, SCOPE, AND CAUSES OF FOOD INSECURITY. THERE IS AN INTERCONNECTEDNESS BETWEEN POVERTY, HEALTH, AND FOOD INSECURITY.**

  These social determinants include racial and ethnic inequality; health, age, and disability status; and poverty, income, and unemployment status. There is often a perpetual cycle of income restriction, food insecurity, and adverse health outcomes which is incredibly difficult to break independently and highlights the necessity of federal, state, and charitable food assistance programs. The COVID-19 pandemic has exacerbated these challenges for those disparately vulnerable to food insecurity.
“They lived mainly on dried meat and grains which could be stored without refrigeration, their gums turn black and their teeth fall out. It often killed them.” ~ James Lind 1747

According to Feeding America.org, “Poverty, unemployment and low wages lead to food insecurity. It’s why Feeding America helps people experiencing food insecurity get the food and resources they need by increasing access to food in their communities.”
• Looked at patients who were at risk for nutritional deficiencies with chronic comorbidities that were not responding to conventional treatment
• Took levels for A, B1, B2, B3, B5, B6, B9, C, D, Magnesium, Selenium, Iron, Ferritin when the symptoms and risk factors warranted
• Pulled out the data with populations with deficiencies with a sample size >50
• Compared deficiency with comorbidities and identified patterns and correlations, observational data
# A Look at the Data

**BMI**
- Range: (13–66)
- Average: 29.4

**Sex at Birth**
- Female: 49%
- Male: 51%

**Age**
- Age range: (18–86); Average: 49

**Race – by patient identification**
- White: 78%
- Black/African American: 12%
- American Indian/Alaska Native: 2%
- Hispanic or Latino: 2%
- Unreported: 2%
- Other: 4%
A LOOK AT THE DATA

Vitamin C test (Normal: 0.4 – 2.0 mg/dL)
• 362 people tested
• 171 with low vitamin C levels (<0.4 mg/dL)
• 191 with normal vitamin C levels

Of the individuals with Low Vitamin C levels:
• 68% have current periodontal disease
• 13% have previously reported periodontal disease
• 80% currently smoke
* Indicates p-value < 0.05
CHRONIC PAIN AND MALNUTRITION


  - “An accumulating body of evidence suggests that poor nutrition, such as malnutrition, unhealthy dietary behaviors, and a poor dietary intake can play a significant role in the occurrence, prognosis, and maintenance of chronic non-cancer pain, hereafter described as chronic pain”
  
  [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9571356/]

  - “Unhealthy dietary behaviors and a poor dietary intake is characterized by the limited intake of core nutrient-rich foods and an excessive intake of energy-dense nutrient poor foods”
  
  [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9571356/]
Vitamin C prevents cigarette smoke-induced oxidative damage in vivo.

Panda K, Chattopadhyay R, Chattopadhyay DJ, Chatterjee IB

Author information

Free Radical Biology & Medicine, 01 Jul 2000, 29(2):115-124
https://doi.org/10.1016/s0891-5849(00)00297-5 PMID: 10980400


PMCID: PMC7572147 | PMID: 33132774

Vitamin C, Pain and Opioid Use Disorder

Erica Zelfand, ND

doi: 10.3390/nu12071963
PMCID: PMC7400679 | PMID: 32630245

Factors Affecting Vitamin C Status and Prevalence of Deficiency: A Global Health Perspective

Anitra C. Carr and Sam Rowe

The role of vitamin C in the treatment of pain: new insights

Anitra C Carr, Cate McCall

Affiliations + expand

PMID: 28410599
PMCID: PMC5391567
DOI: 10.1186/s12967-017-1179-7

Impact of vitamin C on the reduction of opioid consumption after an emergency department visit for acute musculoskeletal pain: a double-blind randomised control trial protocol

Raoul Daoust, Jean Paquet, Jean-Marc Chauny, David Williamson, Véribile Huard, Caroline Arbour, Marcel Emond, Dominique Rouleau, Alexis Cournoyer

Affiliations + expand

PMID: 37225265
PMCID: PMC10230879
DOI: 10.1136/bmjopen-2022-069230
MICHIGAN LANDSCAPE MAP HIGHLIGHTS COUNTIES AFFECTED HARDEST BY OPIOID EPIDEMIC (2019)

BACK TO YEAR 1 OF MEDICAL SCHOOL
Collagen Synthesis

Take Away: Vitamin C is important for wound healing
WHY ARE PEOPLE NOT BEING TESTED?
Sample Size – 6740

- Vitamin C Normal – 5738 (77.2%)
- Vitamin C Low – 1002 (13.5%)
- Missing Data – 695 (9.3%)
THE CYCLE OF CHRONIC PAIN: WHERE WE INTERVENE

Decreased ability to recover

Impacted Social Determinants of Health
- Socioeconomic factors
- Access to healthy foods
- Social relationships

Chronic Pain

Impaired Physical Abilities
THE CYCLE OF CHRONIC PAIN: WHERE WE INTERVENE

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Impacted Social Determinants of Health
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Chronic Pain

Impaired Physical Abilities

Common Clinical Intervention Point
THE CYCLE OF CHRONIC PAIN: WHERE WE INTERVEN

Rethinking the Intervention

Impacted Social Determinants of Health
- Socioeconomic factors
- Access to healthy foods
- Social relationships

Decreased ability to recover

Chronic Pain

Impaired Physical Abilities
Each one of these problems is exacerbated by unique challenges faced in rural health.
IDEAS INTO ACTION

Eating Patterns
Metabolic Patterns
Genetic Pre-dispositions
Metabolic Memory
Microbiome?
SPECIAL THANKS TO

• Nate Brookshire
• Tessa Mlinar
• Dr. Neli Ragina
• Dr. Jesse Bakke
• Janet Mindes
• Nate Dickman
HOW TO CONTACT

Ramona Wallace DO IFMCP
ramona.wallace@wmed.edu

Julia Kwapiszewski MPH
kwapi1jt@cmich.edu

Lisa Graves MD MCInSc
lisa.graves@wmed.edu