



# BMI optimization Osteoarthritis

Referral for total knee  
or hip Arthroplasty

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By

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Idaho State University



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## Committee Members

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- Chair - Susan Tavernier PhD, APRN-CNS AOCN
- Tanner Mitton MSPA, PA-C
- Melody Weaver PhD, APRN, FNP-BC
  
- To all my committee members:
- Dr. Tavernier, Tanner Mitton, and Dr. Weaver
- And to everyone at Idaho Sports and Spine

*Thank You!*

# Introduction and Background

- Incremental increase in BMI can increase the risk of the development of knee or hip osteoarthritis
- Incremental increase in BMI can increase the risk in perioperative risks for patients with end stage hip or knee osteoarthritis and who are seeking total hip or knee arthroplasty
- While no concrete standard for a BMI cut-off has been set by orthopedic surgeons, it is generally agreed that patients who are planning to undergo total knee or hip arthroplasty and who are overweight should undergo BMI optimization prior to surgery
- Weight loss helps decrease risk for perioperative complications for total knee and hip arthroplasty
- Referral to a dietitian and to a physical therapist concurrently with a referral to an orthopedic surgeon will help speed up the process for weight loss in patients with increased BMI

(Abdulla et al., 2020; American Society of Anesthesiologists, 2020; DeMik et al., 2018; Zhang et al., 2017)





# Problem Statement, PICOT, & Theoretical Framework

People who are obese and are seeking surgical treatment for end stage hip or knee osteoarthritis are at higher risk for peri-operative complications

Will the distribution of an educational pamphlet on the evidence supporting BMI optimization and accompanying resource list increase the frequency of primary care providers' referrals of obese or morbidly obese patients who have hip or knee osteoarthritis to dietitians and physical therapists six weeks post educational pamphlet distribution?

Exchange Theory (Shortell & Anderson, 1971)



# Project Purpose

**Influence primary care providers'  
referral practices**

Physical Therapy Referral  
Dietitian Referral  
Orthopedic Referral

## Ethical Considerations

The project was deemed exempt by ISU's IRB  
and approved by Idaho Sports and Spine



# Methods

Distribute questionnaires to all new patients for three specialty providers at an orthopedic clinic

Educational flyers with a list of local Physical Therapists and Dietitians were sent via postal mail to primary care providers within a 25 mile radius of the orthopedic clinic

Distributed questionnaires to all new patients for three specialty providers at the same orthopedic clinic

A six week time period for each step of the project



# Participants

New patients referred to three providers who specialize in hip, knee and shoulder pathologies at an orthopedic clinic in Pocatello, Idaho

## Idaho State University

Filling out this questionnaire is optional. It is an invitation to take part in a project that is being conducted by Elizabeth Combs DNP FNP student at Idaho State University. All information in this questionnaire is for data collection purposes only. No private information will be collected or retained. This questionnaire will not be retained in your personal chart.

This project is not a part of your medical care and declining to participate will not affect your treatment or your relationships with any medical providers in any way. Completion of this questionnaire should take no longer than 5 minutes. There will be no follow up as there is no private information attached to this questionnaire. Questionnaires will not be kept with any private information, but will be kept separately in a secure area where there will be no way to connect questionnaires with any private information.

This project is being conducted to assess primary care providers referral behavior for body mass index optimization for people with knee or hip osteoarthritis. No private information will be attached to this form. Again, completion of this questionnaire is optional.

If you have questions about this study/project, contact information is:

Elizabeth Combs DNP FNP student, 208-705-4630 or [elizabethcombs@isu.edu](mailto:elizabethcombs@isu.edu)

Idaho State University's Human Subjects Committee, [humsbj@isu.edu](mailto:humsbj@isu.edu)

ISU's HSC Coordinator, Tom Bailey, 208-282-2179

Both pre- and post- intervention questionnaires were completely anonymous and optional



1. Is your visit today concerning knee or hip pain possibly caused by osteoarthritis or arthritis?
  - a. Yes
  - b. No
  - c. Unknown
  - d. Not applicable
2. If applicable, did your primary care provider discuss a referral or treatment with a physical therapist for aid in treatment of knee or hip pain caused by arthritis?
  - a. Yes
  - b. No
  - c. Unknown
  - d. Not applicable
3. If applicable, did your primary care provider discuss a referral or treatment with a dietitian nutritionist for aid in treatment of knee or hip pain caused by arthritis?
  - a. Yes
  - b. No
  - c. Unknown
  - d. Not applicable
4. What are the barriers that would prevent you from seeing a physical therapist?
  - a. Time/scheduling issues
  - b. Insurance coverage or cost
  - c. Other
  - d. Not applicable.
5. What are the barriers that would prevent you from seeing a dietitian or nutritionist?
  - a. Time/scheduling issues
  - b. Insurance coverage or cost
  - c. Other
  - d. Not applicable.

Thank you so much for your time and help!



# Pre-Intervention Questionnaire





# Intervention

217 primary care providers were identified within a 25 mile radius of the orthopedic clinic through a search in DocSpot.com

--164 in Pocatello, Idaho

--14 in Chubbuck, Idaho

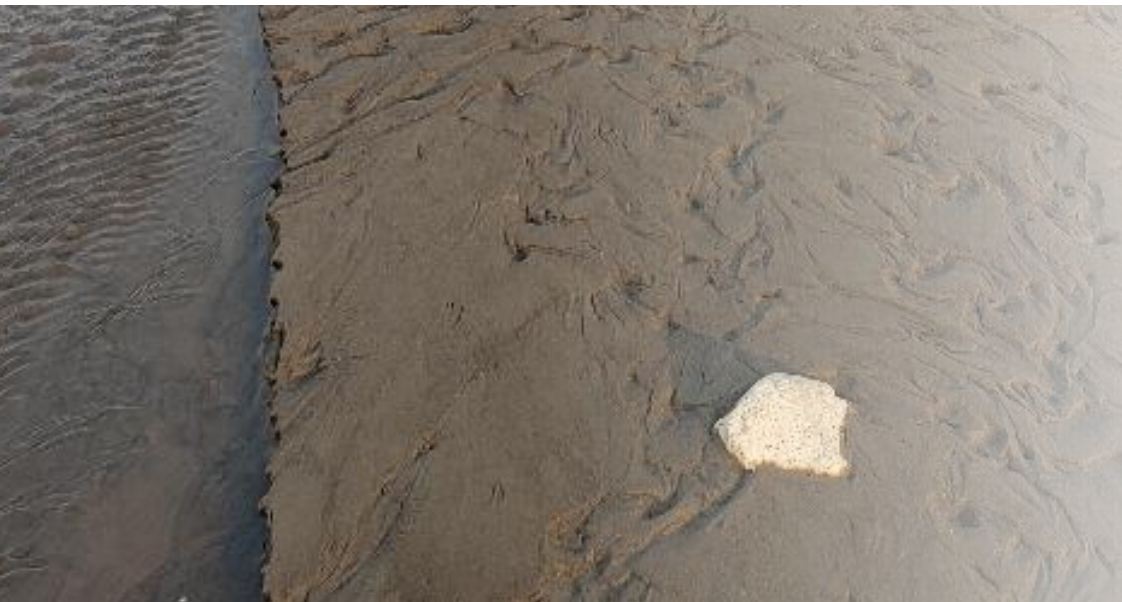
--30 in Blackfoot, Idaho

--9 in American Falls, Idaho

One page educational fliers were sent to primary care providers  
On opposite side of educational flier was a list of local physical therapists and dietitians



# Educational Pamphlet



## Help Us Get Started - BMI Optimization

Through the supervision of a primary care provider, ACA dietitians can provide weight loss counseling for obese patients. ICD-10 code 97802 for the first dietitian visit and 97803 can be used for subsequent visits and are covered by Medicare.

Obese and morbidly obese patients are at higher risk for developing hip and knee osteoarthritis at a younger age than patients who are not obese

BMI optimization should be considered in patients with osteoarthritis of the hip or knee who have a BMI of  $>35$  kg/m<sup>2</sup>

In morbidly obese patients, a preoperative weight loss of approximately 20 pounds was associated with a decrease length of stay at a hospital post total joint replacement surgery

Keeney, B. J., Austin, D. C. & Jevsevar, D. S. (2019). Preoperative Weight Loss for Morbidly Obese Patients Undergoing Total Knee Arthroplasty: Determining the Necessary Amount. *The Journal of Bone and Joint Surgery. American Volume*, 101(16), 1440-1450. <https://doi.org/10.2106/JBJS.18.001136>

Research has shown that patients can be successful in losing weight through a collaborative approach that includes dietitians

Lingamfelter, M., Orozco, F. R., Beck, C. N., Harrer, M. F., Post, Z. D., Ong, A. C., & Ponzio, D. Y. (2020). Nutritional counseling program for morbidly obese patients enables weight optimization for safe total joint arthroplasty. *Orthopedics*, 43(4), e316-e322

Mitchell, L. J., Ball, L. E., Ross, L. J., Barnes, K. A., & Williams, L. T. (2017). Effectiveness of Dietetic Consultations in Primary Health Care: A Systematic Review of Randomized Controlled Trials.

Local dietitians may also have more insight to insurance coverage for their services

Sastre, L. R., & Van Horn, L. T. (2021). Family medicine physicians' report strong support, barriers and preferences for Registered Dietitian Nutritionist care in the primary care setting. *Family Practice*, 38(1), 25-31. <https://doi.org/10.1093/fampra/cmaa099>

**Dietitians and physiotherapists can help in weight loss, and referrals to a dietitian and physiotherapy will help get the ball rolling for weight loss in patients who may need surgical treatment for their knee or hip osteoarthritis**

1. Is your visit today concerning knee or hip pain possibly caused by osteoarthritis or arthritis?
  - a. Yes
  - b. No
  - c. Unknown
  - d. Not applicable
2. If applicable, did your primary care provider discuss a referral or treatment with a physical therapist for aid in treatment of knee or hip pain caused by arthritis?
  - a. Yes
  - b. No
  - c. Unknown
  - d. Not applicable
3. If applicable, did your primary care provider discuss a referral or treatment with a dietitian or nutrii in treatment of knee or hip pain caused by arthritis?
  - a. Yes
  - b. No
  - c. Unknown
  - d. Not applicable
4. What are the barriers that would prevent you from seeing a physical therapist?
  - a. Time/scheduling issues
  - b. Insurance coverage or cost
  - c. Other
  - d. Not applicable.Please Describe \_\_\_\_\_
5. What are the barriers that would prevent you from seeing a dietitian or nutritionist?
  - a. Time/scheduling issues
  - b. Insurance coverage or cost
  - c. Other
  - d. Not applicable.Please Describe \_\_\_\_\_

Thank you so much for your time and help!



# Post-Intervention Questionnaire



# Results

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Visit concerning hip or knee pain  
possibly caused by arthritis

G1 - 44.4%

G2 - 47.8%

Of those whose visit was marked as  
for treatment for knee or hip pain  
possibly caused by arthritis

G1 - Yes PT Referral - 75%

G2 - Yes PT Referral - 82%

G1 - Yes DT Referral - 25%

G2 - Yes DT Referral - 9.1%

(PT - Physical Therapy)

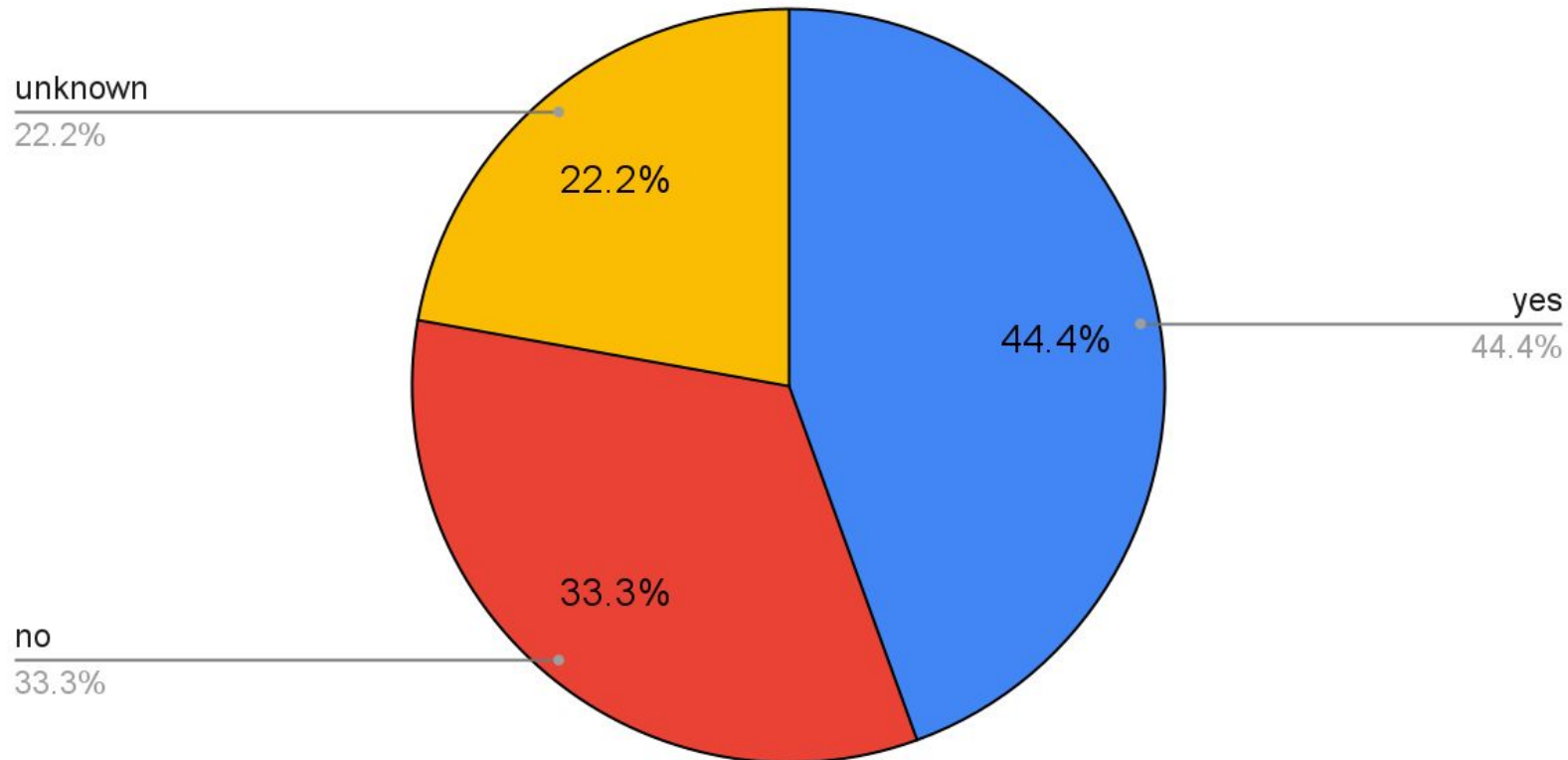
(DT - Dietary Therapy or dietitian)



# Group 1 - Pre-Intervention

## What is your visit concerning?

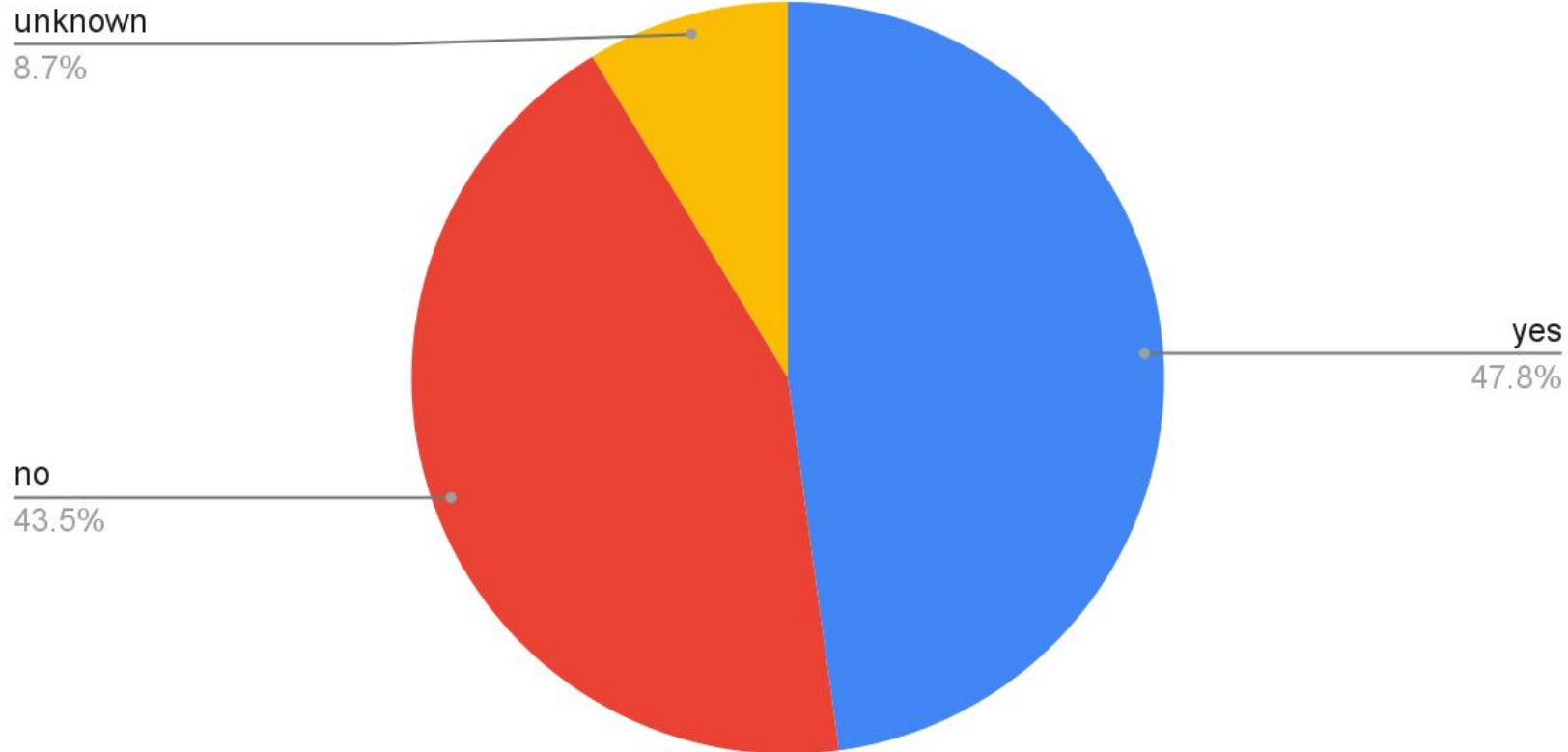
Group 1; Is your visit concerning knee or hip pain possibly caused by osteoarthritis or arthritis?



# Group 2 - Pre-Intervention

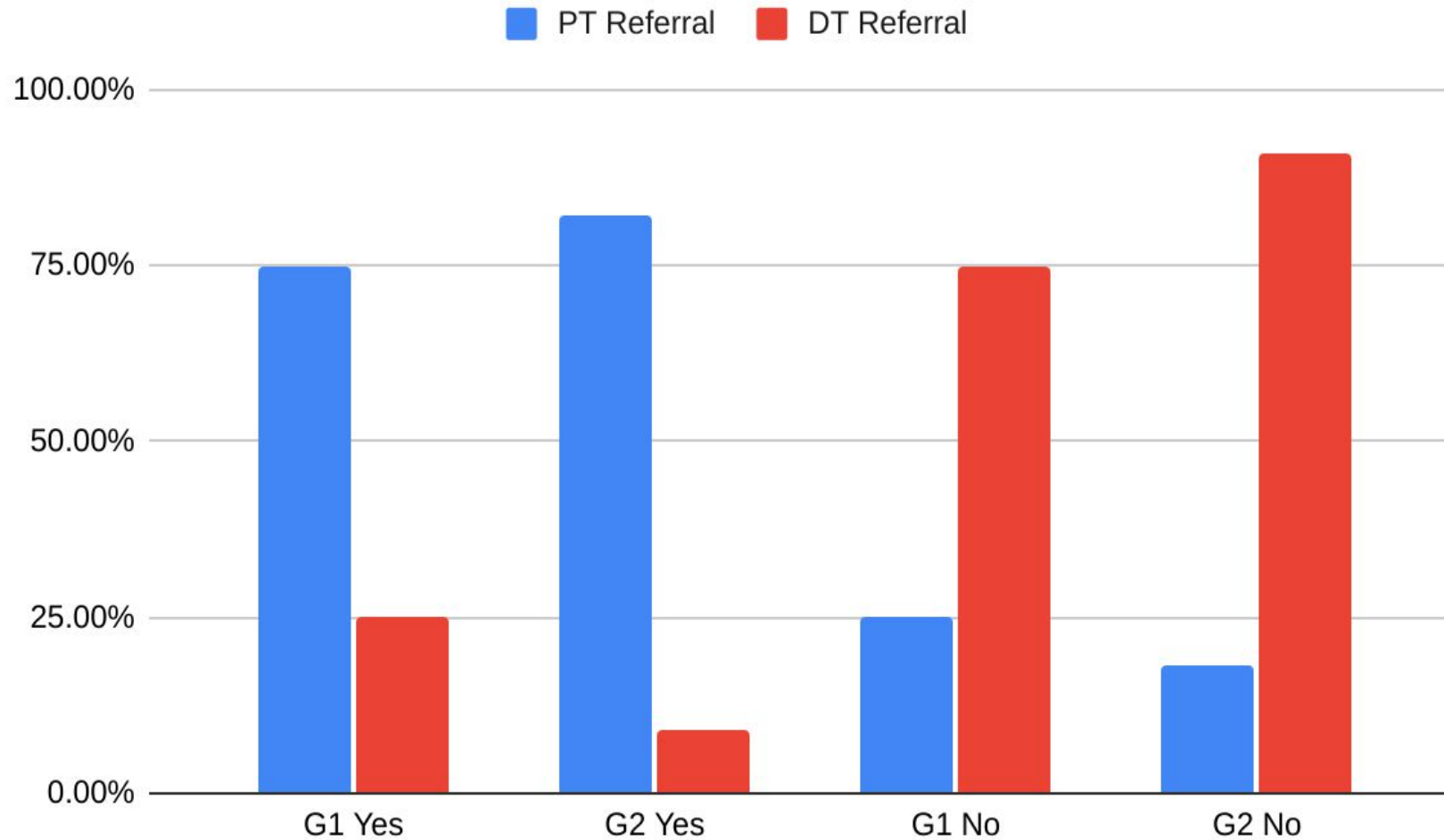
## What is your visit concerning?

Group 2; Visit concerning knee or hip pain possibly caused by osteoarthritis or arthritis?



# Respondents Whose Visits Were Concerning Hip Or Knee Pain

*Hip or Knee Pain Visits*





# Results

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Pre-intervention respondents -  
Group one (G1) = 9 respondents

Of the 217 fliers sent to primary  
care providers, 40 were returned to  
sending address

Post-intervention respondents -  
Group two (G2) = 23 respondents



# Results

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All Responding Participants

G1 - 9

G2 - 23

All Responding participants

G1 - Yes PT Referral - 66.7%

G2 - Yes PT Referral - 47.8%

G1 - Yes DT Referral - 11.1%

G2 - Yes DT Referral - 4.4%

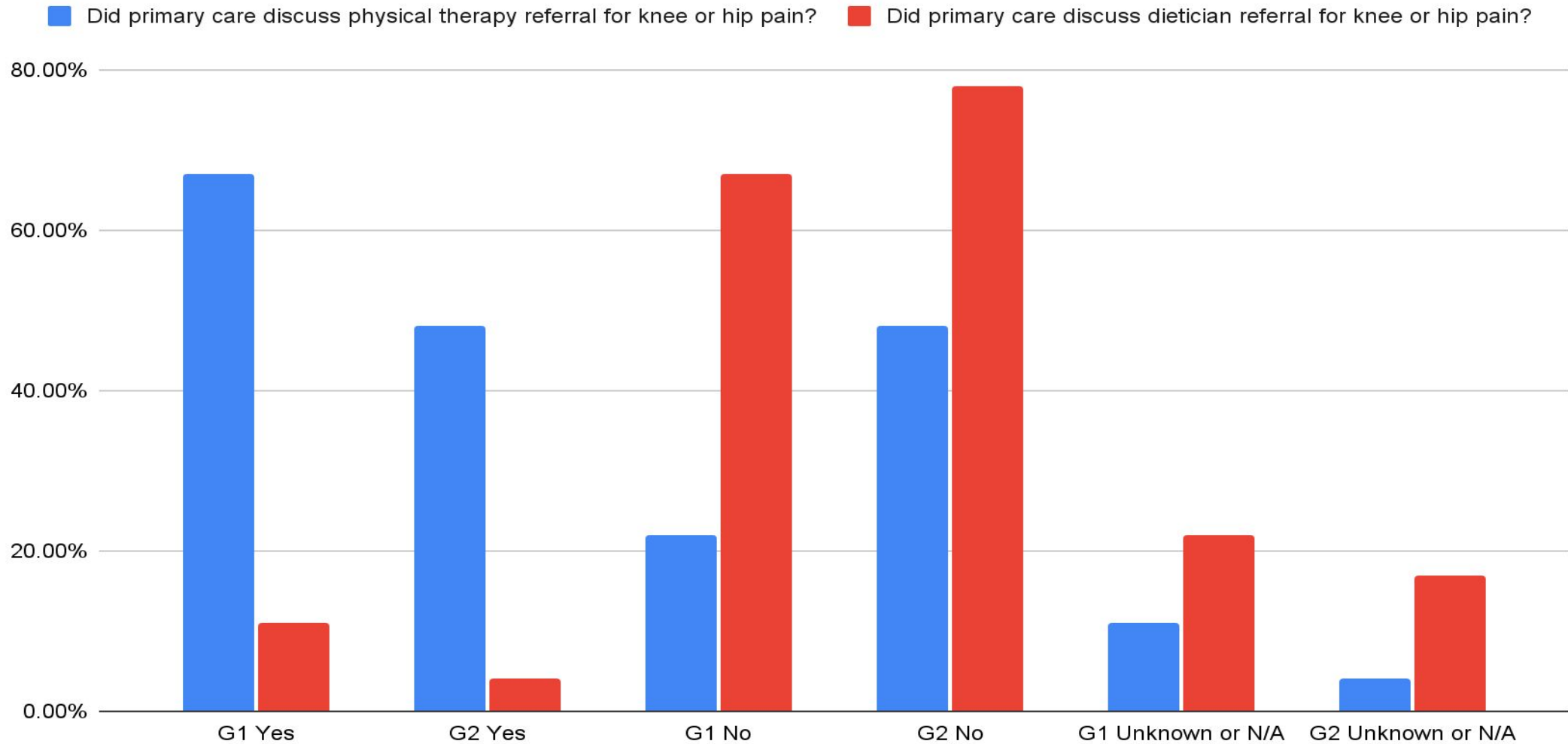
(PT - Physical Therapy)

(DT - Dietary Therapy or dietitian)



# All Responding Participants

*All Respondents*



# Results & Interpretation

Respondents whose visit was concerning hip or knee pain

- A change of 0.09% for physical therapy referrals
- A change of 0.64% for dietitian referrals

All Respondents

- A change of 0.28 % for physical therapy referrals
- A change of 0.61% for dietitian referrals

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No Statistical Significance  
Between the Pre- and Post-  
Intervention Questionnaire  
Responses



## Physical Therapy

1. Time/scheduling issues
2. Insurance coverage or cost
3. Other
4. Not applicable

### Group 1

$$1 = 5/10 = 50\%$$

$$2 = 4/10 = 40\%$$

$$3 = 1/10 = 10\%$$

$$4 = 0/10 = 0\%$$

### Group 2

$$1 = 4/25 = 16\%$$

$$2 = 3/25 = 12\%$$

$$3 = 4/25 = 16\%$$

$$4 = 14/25 = 56\%$$

## Dietary Therapy

1. Time/scheduling issues
2. Insurance coverage or cost
3. Other
4. Not applicable

### Group 1

$$1 = 1/9 = 11\%$$

$$2 = 3/9 = 33\%$$

$$3 = 2/9 = 22\%$$

$$4 = 3/9 = 33\%$$

### Group 2

$$1 = 3/26 = 11.54\%$$

$$2 = 4/26 = 15.38\%$$

$$3 = 2/26 = 7.69\%$$

$$4 = 17/26 = 65.38\%$$

# Barriers Results

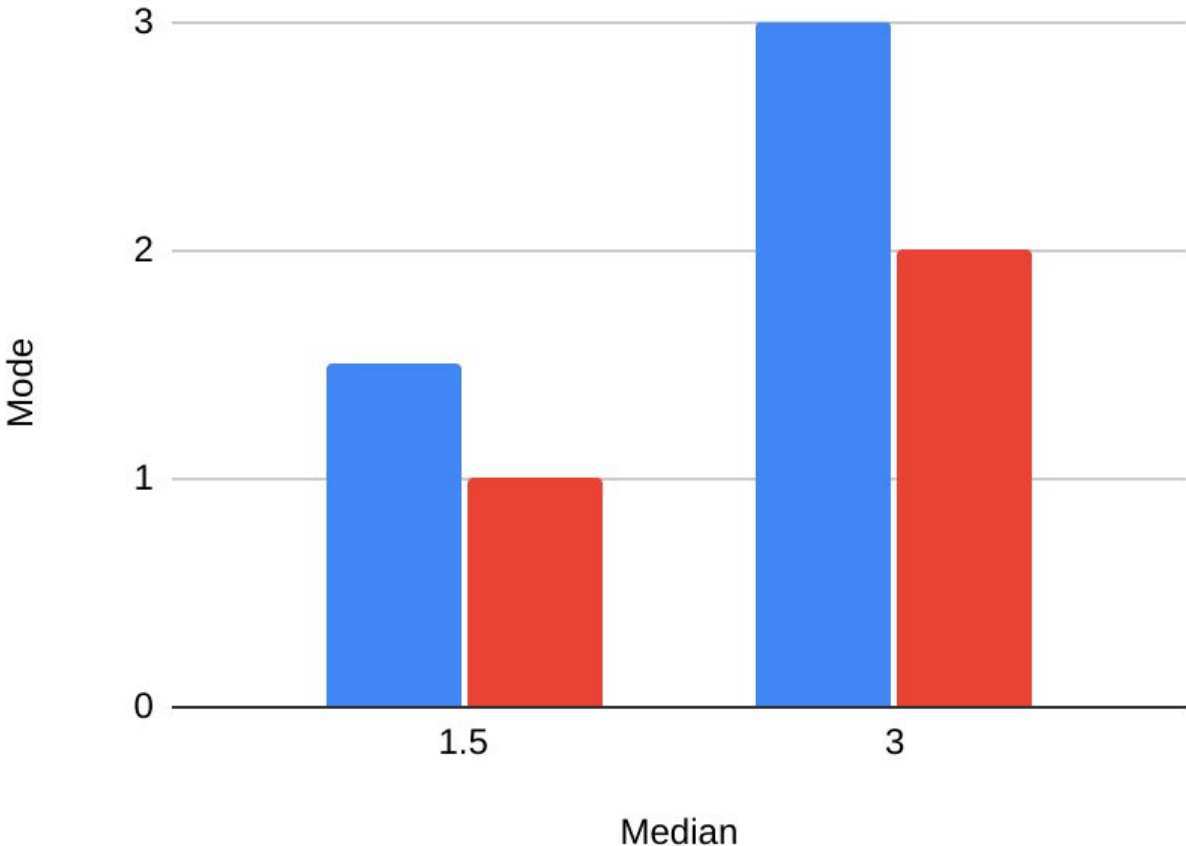


# Barriers Results

## Group 1 - Barriers

Time/scheduling issues = 1 Insurance coverage or cost = 2 Other = 3 Not applicable = 4

- Barriers for physical therapy
- Barriers for dietary therapy

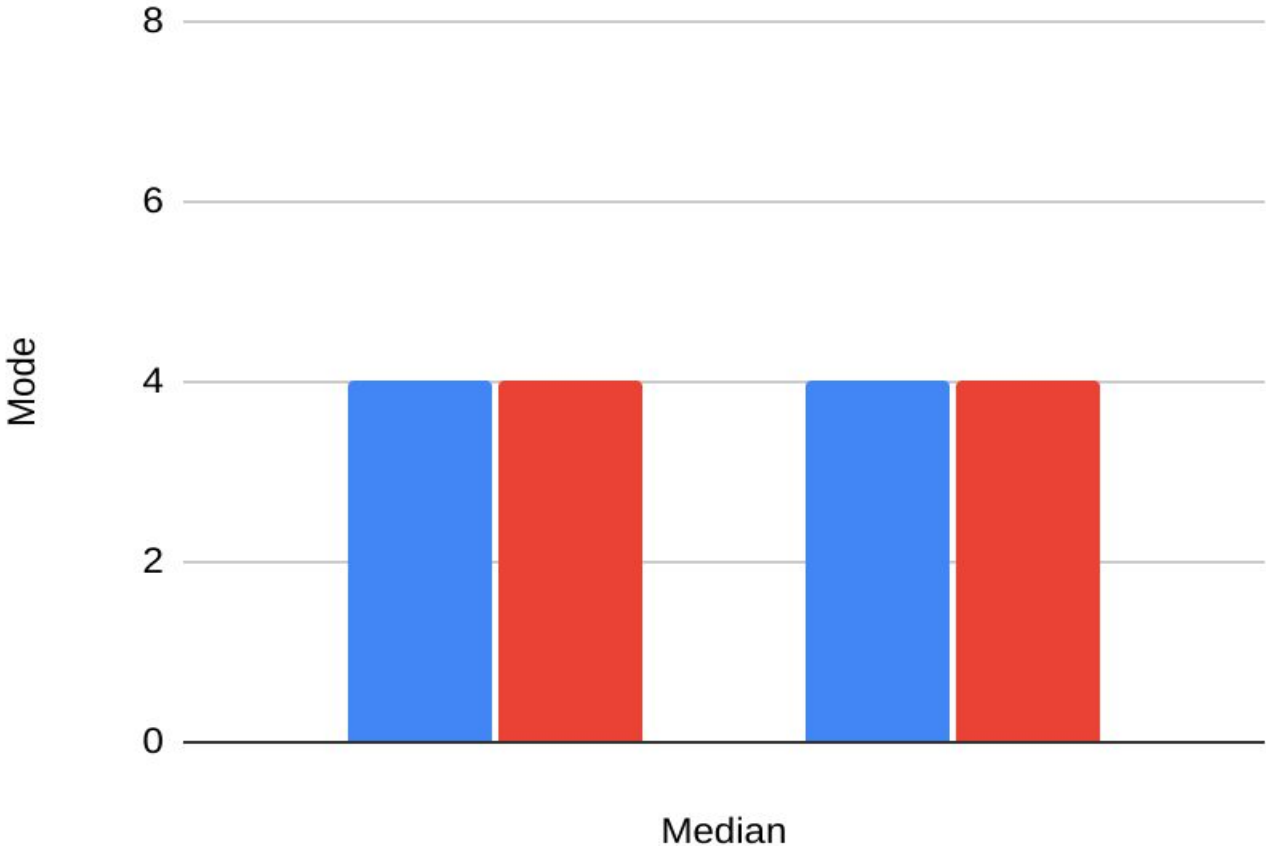


# Barriers Results

## Group 2 - Barriers

Time/scheduling issues = 1 Insurance coverage or cost = 2 Other = 3 Not applicable = 4

- Barriers for physical therapy
- Barriers for dietary therapy



# Results

## Group 2

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9/23 respondents hand wrote responses in the “Please describe” section for barriers to physical therapy

5/23 respondents hand wrote responses in the “Please describe” section for barriers to dietary therapy





# Written Responses

## Physical therapy barriers

None

I live 2 hrs from nearest P. T.–

Didn't Help

I am seeing a PT

Don't like Physical Therapist

None

Will go after surgery

WASN'T REFERRED

wasn't referred

## Dietary therapy barriers

None

(same as above)

None

WASN'T REFERRED

wasn't referred

## Interpretation:

- Distance
- Perception of effectiveness
- Other variation of barriers
  - Further research needed to accurately interpret barriers



# Limitations

- Distribution to all new patients
- Unknown BMI of participants
- Six week time period
- Small sample sizes
- COVID-19 - Omicron variant
- Returned fliers
- Unknown if fliers were read by primary care providers

# Discussion

BMI optimization can help reduce risks for surgical intervention in patients with end stage hip or knee osteoarthritis and who are obese

Providers take into account many factors when referring patients and providing collaborative care (Shortell & Anderson, 1971)

Co-morbidities, cost, and scheduling can be barriers for patients to treatment (Law et al., 2019)

Primary care providers have a general willingness to provide collaborative care for complex patients (Geramita et al., 2020)



# **Recommendations**

**A more interactive intervention to ensure fliers were received & read**

**Longer time periods to collect questionnaires and to ensure intervention is received**

A scenic autumn landscape featuring a calm pond. The water reflects the surrounding trees and foliage, which are in various stages of autumn color, including bright yellow, orange, and some green. Two ducks are swimming in the middle of the pond. The overall atmosphere is peaceful and serene.

*Thank You*

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