THE UNIVERSITY OF
SCRANTON
A JESUIT UNIVERSITY

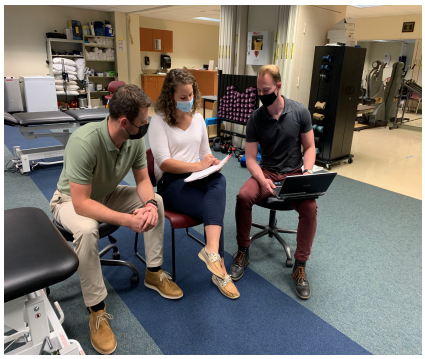
DPT Program
Annual Research Night

Saturday, November 11th, 2023
5:00 PM to 8:30 PM

- DeNaples Center, Moskovitz Theater -
& Live Webinar via Zoom

This course is approved for 3 general contact hours (CEUs). However, you must view the entire session to receive credit. The University of Scranton has pre-approved provider status with the PA State Board of Physical Therapy. The PA State Board of Physical Therapy has ultimate authority of the determination.

University of Scranton Physical Therapy:
http://www.scranton.edu/academics/pcps/physicaltherapy



Do you know anyone who is uninsured or underinsured and needs PT services?

Do know anyone who has exhausted their insurance coverage and would still benefit from skilled PT services?

LEAHY PT CLINIC

Student-Run ~ Pro Bono

The mission of the Leahy PT Clinic is to deliver patient-centered care grounded in the Jesuit tradition of educating "men and women for and with others" by providing pro bono physical therapy services to uninsured and underinsured residents of our local community through collaboration, peer-mentorship, and evidence-based practice. Our student administrative team manages all clinic operations with supervision and guidance from PT Faculty. Practice areas typically include orthopedics, neurology, geriatrics, and cardiopulmonary. Our peer-mentored DPT student groups provide skilled clinical management to address a wide range of issues including (but not limited to): musculoskeletal pain, post-surgical recovery, chronic conditions, balance and gait dysfunction, vestibular disorders, deconditioning, and post-COVID-19 complications.

For more information, please contact us and visit our website: www.scranton.edu/pcps/pt-leahy-clinic.

230 Kressler Court
Scranton, PA
18503

570-941-6112

ptclinic@scranton.edu

Open Tuesdays & Thursdays
3:00pm-6:00pm

Schedule

5:00pm
Introduction: Dr. Renée M. Hakim, Chair/Program Director

Group 1:
Title: Forced Migration Trauma (FMT) Impact on Health Outcomes for Refugee Women: A Systematic Review
Authors: Alexis Long, Megan McDermott, Valeria Oshepkova, Baylee Turetzky, Dr. Lori Walton

Group 2:
Title: Mental Health Factors and Exercise Adherence in Women with Breast Cancer Interventions: A Systematic Review
Authors: Lauren Collela, Erin O'Shaughnessy, Michele Felice Rovaris, Sydney Walters, Dr. Anthony Carusotto, Dr. Renée M. Hakim

Group 3:
Title: Impact of Core Stabilization on Balance and Mobility in Persons with MS: A Systematic Review
Authors: Sarah Coulson, Matthew Kinback, Matthew Moran, Nicole Parello, Dr. Jennifer Schwartz

Group 4:
Title: Home-Based Physical Activity & Cardiorespiratory Capacity in Children with Congenital Heart Defects: A Systematic Review
Authors: Veronica Lenox, Bridget Neal, Pamela Sbarra, Carley Wiseman, Dr. Nicholas Rodio

Group 5:
Title: The Impact of POD0 Mobility on Function for Patients Following Joint Replacement: A Systematic Review
Authors: Haley Donoghue, Colleen Gaffney, Claudia Mattes, Alexis Pagonis, Dr. Dana Maida, Dr. Janette Scardillo

Group 6:
Title: The Effect of Aromatherapy on Anxiety in Patients Who Are Status-Post Myocardial Infarction: A Systematic Review
Authors: Alexander Bracken, Brian Harrison, Jack Ianucci, Andrew Murray, Dylan LeVan, Dr. Anthony Carusotto

---------- **BREAK** (30 minutes) ----------

7:00pm

Group 7:
Title: Clinical Applications of Wearable Technology for Monitoring Sleep in Patients with Parkinson's Disease: A Systematic Review
Authors: Conor Coyle, Ben DeTrempe, Adrianna Duranti, Stefan Pinkston, Dr. Renée M. Hakim

Group 8:
Title: Creative Movement Therapy Impact on Mental and Physical Health Outcomes for Refugees Living with Trauma: A Systematic Review
Authors: John-Paolo Barcinas, Nicholas Daly, Brooke Thomson, Samiel Torres, Dr. Lori Maria Walton

Group 9:
Title: Effect of Functional Electrical Stimulation on Gait in Persons with Parkinson's Disease: A Systematic Review
Authors: William Laughlin, Nicholas Mohr, John Mulligan, Collin Purdy, Dr. Jennifer Schwartz, Dr. Renée M. Hakim

Group 10:
Title: Sociodemographic Factors and Hospital Readmission Rates for Home Health Care Medicare Beneficiaries: A Systematic Review
Authors: Gina Garatino, Shannon Gill, Kyra O'Toole, Ashna Patel, Dr. Tracey L. Collins

Group 11:
Title: Differences in Home Health Hospital Readmission Rates Between Traditional Medicare and Medicare Advantage Beneficiaries
Authors: Dr. Tracey L. Collins, Sarah Coulson

Components of Evidence-Based Practice

Adapted from: APTA Open Access; https://www.apta.org/patient-care/evidence-based-practice-resources/components-of-evidence-based-practice

Evidence-based practice includes the integration of best available evidence, clinical expertise, and patient values and circumstances related to patient and client management, practice management, and health policy decision-making.

All three elements are equally important.

Best Available Evidence

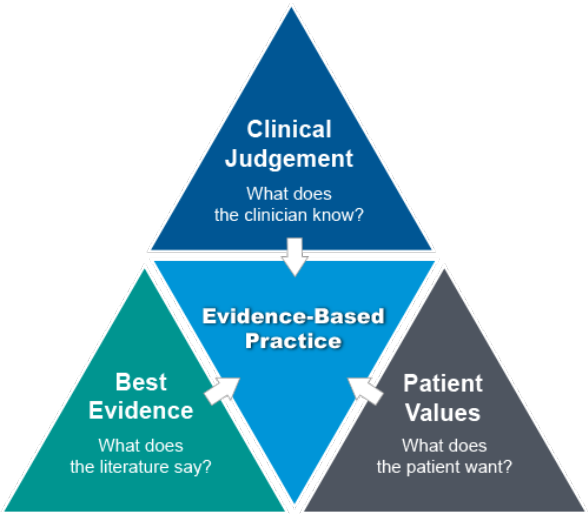
Decision-making is optimized by emphasizing the use of evidence from well-designed and well-conducted research. Although evidence-based practice encompasses more than just applying the best available evidence, many of the concerns and barriers to using evidence-based practice revolve around finding and applying research.

Clinical Expertise

The physical therapist and physical therapist assistant's knowledge and skills are a key part of the evidence-based process. This personal scope of practice consists of activities undertaken by an individual physical therapist that are situated within a physical therapist's unique body of knowledge where the individual is educated, trained, and competent to perform that activity. Using clinical decision-making and judgment are critical.

Patient Values

The patient's wants and needs are a key part of evidence-based care. Incorporating a patient's cultural considerations, needs, and values are necessary to provide best practice services.



https://www.mcg.com/blog/2019/06/28/mcg-certification-and-the-commitment-to-evidence-based-practice/

All Evidence is Not Created Equal

Sackett Levels of Evidence / OCEBM (2009)

Level of Evidence	Description
1A	Systematic review of randomized controlled trials (RCTs).
1B	Individual RCT with narrow confidence intervals
1C	All or none
2A	Systematic review of cohort studies
2B	Individual Cohort study/ Low quality RCT
2C	Outcomes research, Ecological studies
3A	Systematic review of case-control studies
3B	Individual Case-Control study
4	Case series, poor quality cohort or case-control study
5	Expert opinion

Fletcher and Sackett, working for the Canadian Task Force on Periodic Health Examination in 1979, are credited as the first to develop a level of evidence scoring scale. Sackett continued to develop the scale based on his own research with the use of anti-thrombotic agents. http://www.physio-pedia.com/Grades_and_Levels_of_Evidence

Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence

Question	Step 1 (Level 1*)	Step 2 (Level 2*)	Step 3 (Level 3*)	Step 4 (Level 4*)	Step 5 (Level 5)
How common is the problem?	Local and current random sample surveys (or censuses)	Systematic review of surveys that allow matching to local circumstances**	Local non-random sample**	Case-series**	n/a
Is this diagnostic or monitoring test accurate? (Diagnosis)	Systematic review of cross sectional studies with consistently applied reference standard and blinding	Individual cross sectional studies with consistently applied reference standard and blinding	Non-consecutive studies, or studies without consistently applied reference standards**	Case-control studies, or "poor or non-independent reference standard**	Mechanism-based reasoning
What will happen if we do not add a therapy? (Prognosis)	Systematic review of inception cohort studies	Inception cohort studies	Cohort study or control arm of randomized trial*	Case-series or case-control studies, or poor quality prognostic cohort study**	n/a
Does this intervention help? (Treatment Benefits)	Systematic review of randomized trials or *n*-of-1 trials	Randomized trial or observational study with dramatic effect	Non-randomized controlled cohort/follow-up study**	Case-series, case-control studies, or historically controlled studies**	Mechanism-based reasoning
What are the COMMON harms? (Treatment Harms)	Systematic review of randomized trials, systematic review of nested case-control studies, *n*-of-1 trial with the patient you are raising the question about, or observational study with dramatic effect	Individual randomized trial or (exceptionally) observational study with dramatic effect	Non-randomized controlled cohort/follow-up study (post-marketing surveillance) provided there are sufficient numbers to rule out a common harm. (For long-term harms the duration of follow-up must be sufficient.)**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning
What are the RARE harms? (Treatment Harms)	Systematic review of randomized trials or *n*-of-1 trial	Randomized trial or (exceptionally) observational study with dramatic effect			
Is this (early detection) test worthwhile? (Screening)	Systematic review of randomized trials	Randomized trial	Non -randomized controlled cohort/follow-up study**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning

*** Level may be graded down on the basis of study quality, imprecision, indirectness (study PICO does not match questions PICO), because of inconsistency between studies, or because the absolute effect size is very small; Level may be graded up if there is a large or very large effect size.**

**** As always, a systematic review is generally better than an individual study.**

Oxford CEBM Levels (2011) cover the entire range of clinical questions, in the order (from top row to bottom row) that the clinician requires. While most ranking schemes consider strength of evidence for therapeutic effects and harms, the OCEBM system allows clinicians and patients to appraise evidence for prevalence, accuracy of diagnostic tests, prognosis, therapeutic effects, rare harms, common harms, and usefulness of (early) screening.

PEDro Scale is a critical appraisal tool intended to identify methodological flaws in the physical therapy literature providing consumers of research evidence objective data regarding the strength of such evidence.

Study	1	2	3	4	5	6	7	8	9	10	11	Score
Grade												

1. Eligibility criteria were specified.
2. Subjects were randomly assigned to groups.
3. Allocation was concealed 4. Groups were similar at baseline.
5. Subjects were blinded.
6. Therapists who administered the treatment were blinded.
7. Assessors were blinded.
8. Measures of key outcomes were obtained from more than 85% of subjects.
9. Data were analyzed by intention to treat.
10. Statistical comparisons between groups were conducted.
11. Point measure and measures of variability were provided.

Criterion number 1 is not used to generate the total score. Therefore, the total maximum score is 10.

http://www.pedro.org.au/english/downloads/pedro-scale/

Methodological Index for Non-Randomized Studies (MINORS)

Table 2. The revised and validated version of MINORS

Methodological items for non-randomized studies	Score†
1. **A clearly stated aim:** the question addressed should be precise and relevant in the light of available literature	
2. **Inclusion of consecutive patients**: all patients potentially fit for inclusion (satisfying the criteria for inclusion) have been included in the study during the study period (no exclusion or details about the reasons for exclusion)	
3. **Prospective collection of data**: data were collected according to a protocol established before the beginning of the study	
4. **Endpoints appropriate to the aim of the study**: unambiguous explanation of the criteria used to evaluate the main outcome which should be in accordance with the question addressed by the study. Also, the endpoints should be assessed on an intention-to-treat basis.	
5. **Unbiased assessment of the study endpoint**: blind evaluation of objective endpoints and double-blind evaluation of subjective endpoints. Otherwise the reasons for not blinding should be stated	
6. **Follow-up period appropriate to the aim of the study**: the follow-up should be sufficiently long to allow the assessment of the main endpoint and possible adverse events	
7. **Loss to follow up less than 5%**: all patients should be included in the follow up. Otherwise, the proportion lost to follow up should not exceed the proportion experiencing the major endpoint	
8. **Prospective calculation of the study size**: information of the size of detectable difference of interest with a calculation of 95% confidence interval, according to the expected incidence of the outcome event, and information about the level for statistical significance and estimates of power when comparing the outcomes	
Additional criteria in the case of comparative study	
9. **An adequate control group**: having a gold standard diagnostic test or therapeutic intervention recognized as the optimal intervention according to the available published data	
10. **Contemporary groups**: control and studied group should be managed during the same time period (no historical comparison)	
11. **Baseline equivalence of groups**: the groups should be similar regarding the criteria other than the studied endpoints. Absence of confounding factors that could bias the interpretation of the results	
12. **Adequate statistical analyses**: whether the statistics were in accordance with the type of study with calculation of confidence intervals or relative risk	

†The items are scored 0 (not reported), 1 (reported but inadequate) or 2 (reported and adequate). The global ideal score being 16 for non-comparative studies and 24 for comparative studies.

THE JOANNA BRIGGS INSTITUTE

JBI Critical Appraisal Checklist for Qualitative Research

Reviewer_____Date_____

Author _____Year_____Record Number_____.

		Yes	No	Unclear	Not applicable
1.	Is there congruity between the stated philosophical perspective and the research methodology?	☐	☐	☐	☐
2.	Is there congruity between the research methodology and the research question or objectives?	☐	☐	☐	☐
3.	Is there congruity between the research methodology and the methods used to collect data?	☐	☐	☐	☐
4.	Is there congruity between the research methodology and the representation and analysis of data?	☐	☐	☐	☐
5.	Is there congruity between the research methodology and the interpretation of results?	☐	☐	☐	☐
6.	Is there a statement locating the researcher culturally or theoretically?	☐	☐	☐	☐
7.	Is the influence of the researcher on the research, and vice- versa, addressed?	☐	☐	☐	☐
8.	Are participants, and their voices, adequately represented?	☐	☐	☐	☐
9.	Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	☐	☐	☐	☐
10.	Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	☐	☐	☐	☐

Overall appraisal: Include ☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

Mixed Methods Appraisal Tool (MMAT), version 2018

Category of study designs	Methodological quality criteria	Responses			
		Yes	No	Can't tell	Comments
Screening questions (for all types)	S1. Are there clear research questions?				
	S2. Do the collected data allow to address the research questions?				
	Further appraisal may not be feasible or appropriate when the answer is 'No' or 'Can't tell' to one or both screening questions.				
1. Qualitative	1.1. Is the qualitative approach appropriate to answer the research question?				
	1.2. Are the qualitative data collection methods adequate to address the research question?				
	1.3. Are the findings adequately derived from the data?				
	1.4. Is the interpretation of results sufficiently substantiated by data?				
	1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?				
2. Quantitative randomized controlled trials	2.1. Is randomization appropriately performed?				
	2.2. Are the groups comparable at baseline?				
	2.3. Are there complete outcome data?				
	2.4. Are outcome assessors blinded to the intervention provided?				
	2.5 Did the participants adhere to the assigned intervention?				
3. Quantitative non-randomized	3.1. Are the participants representative of the target population?				
	3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure)?				
	3.3. Are there complete outcome data?				
	3.4. Are the confounders accounted for in the design and analysis?				
	3.5. During the study period, is the intervention administered (or exposure occurred) as intended?				
4. Quantitative descriptive	4.1. Is the sampling strategy relevant to address the research question?				
	4.2. Is the sample representative of the target population?				
	4.3. Are the measurements appropriate?				
	4.4. Is the risk of nonresponse bias low?				
	4.5. Is the statistical analysis appropriate to answer the research question?				
5. Mixed methods	5.1. Is there an adequate rationale for using a mixed methods design to address the research question?				
	5.2. Are the different components of the study effectively integrated to answer the research question?				
	5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted?				
	5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?				
	5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?				

JBI Critical Appraisal Checklist for Analytical Cross Sectional Studies

Reviewer_____Date_____

Author _____Year_____Record Number_____.

	Yes	No	Unclear	Not applicable
1. Were the criteria for inclusion in the sample clearly defined?	☐	☐	☐	☐
2. Were the study subjects and the setting described in detail?	☐	☐	☐	☐
3. Was the exposure measured in a valid and reliable way?	☐	☐	☐	☐
4. Were objective, standard criteria used for measurement of the condition?	☐	☐	☐	☐
5. Were confounding factors identified?	☐	☐	☐	☐
6. Were strategies to deal with confounding factors stated?	☐	☐	☐	☐
7. Were the outcomes measured in a valid and reliable way?	☐	☐	☐	☐
8. Was appropriate statistical analysis used?	☐	☐	☐	☐

Overall appraisal: Include ☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

_____

_____

_____

NEWCASTLE - OTTAWA QUALITY ASSESSMENT SCALE
COHORT STUDIES

Note: A study can be awarded a maximum of one star for each numbered item within the Selection and Outcome categories. A maximum of two stars can be given for Comparability

Selection

1) Representativeness of the exposed cohort
   a) truly representative of the average _____ (describe) in the community ✵
   b) somewhat representative of the average _____ in the community ✵
   c) selected group of users eg nurses, volunteers
   d) no description of the derivation of the cohort

2) Selection of the non exposed cohort
   a) drawn from the same community as the exposed cohort ✵
   b) drawn from a different source
   c) no description of the derivation of the non exposed cohort

3) Ascertainment of exposure
   a) secure record (eg surgical records) ✵
   b) structured interview ✵
   c) written self report
   d) no description

4) Demonstration that outcome of interest was not present at start of study
   a) yes ✵
   b) no

Comparability

1) Comparability of cohorts on the basis of the design or analysis
   a) study controls for _____ (select the most important factor) ✵
   b) study controls for any additional factor ✵ (This criteria could be modified to indicate specific control for a second important factor.)

Outcome

1) Assessment of outcome
   a) independent blind assessment ✵
   b) record linkage ✵
   c) self report
   d) no description

2) Was follow-up long enough for outcomes to occur
   a) yes (select an adequate follow up period for outcome of interest) ✵
   b) no

3) Adequacy of follow up of cohorts
   a) complete follow up - all subjects accounted for ✵
   b) subjects lost to follow up unlikely to introduce bias - small number lost - > ____ % (select an adequate %) follow up, or description provided of those lost) ✵
   c) follow up rate < ____% (select an adequate %) and no description of those lost
   d) no statement

Research Abstracts
and
Supplemental Material

Group 1

Title: Forced Migration Trauma (FMT) Impact on Health Outcomes for Refugee Women: A Systematic Review*

Authors: Alexis Long, Megan McDermott, Valeria Oshepkova, Baylee Turetzky, Dr. Lori Walton

Purpose: Refugee women experience various traumas during migration that may impact mental and physical health outcomes. Current literature regarding the impact of forced migration trauma on mental and physical health for refugee women lacks comparative analysis. The purpose of this systematic review was to analyze the impact of forced migration trauma (FMT) on the health outcomes for refugee women.

Methods: A literature search of CINAHL, PubMed, and ProQuest from August 2021 to September 2023 was conducted using search terms: (Trauma OR "Toxic Stress") AND (Health) AND (Refugees OR "Asylum Seekers" OR Displaced OR Migrant) AND (Women OR Female OR Woman OR Females). Search limits included: human subjects, >18 y/o, women, and refugee(s). All qualitative and quantitative study designs were included in the search with comparators of exposure to trauma(s). The selection criteria included all physical and mental health outcomes. Two reviewers independently assessed each study for methodological quality and came to a consensus using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Analytical Cross-sectional Studies.

Results: A total of 596 articles were screened. 9 quantitative, cross-sectional studies met the conclusion criteria. JBI scores ranged from 6-8/8 with an average of 7.1/8. Sample sizes ranged from 76-1335 refugee women (n=4,023) all >18 y/o. Of the articles, 4/9 showed a statistically significant relationship between FMT and anxiety among refugee women. One article reported significant relationships between FMT and chronic pain, anxiety, depression, and PTSD; 6/9 articles found a statistically significant relationship between FMT and depression; 5/9 articles reported significant relationship between FMT and PTSD; 3/9 articles reported a statistically significant relationship between FMT and suicide ideation. One article found a statistically significant relationship between FMT and intimate partner violence. One article found very few statistically significant differences between women with and without traumatic experiences in regard to reproductive health outcomes.

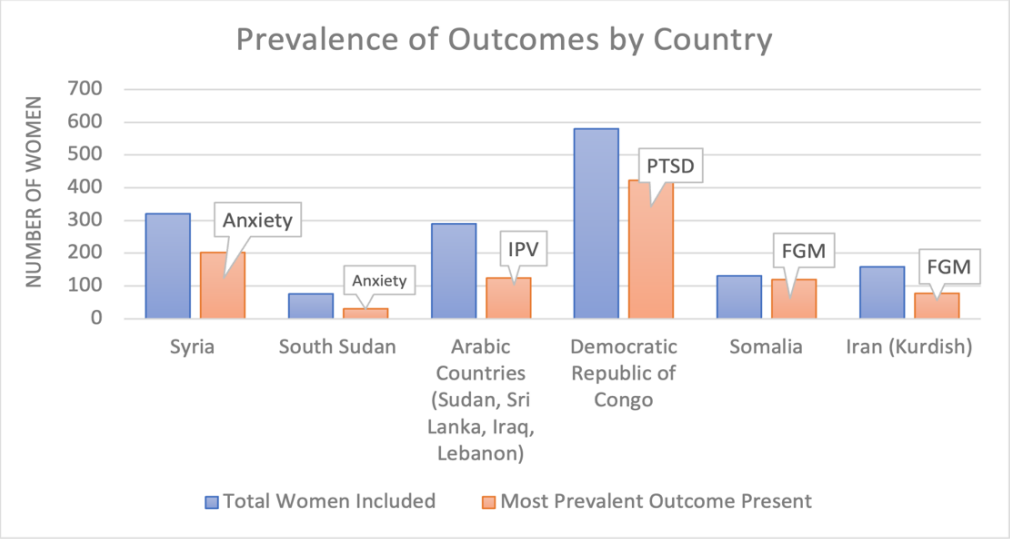
Conclusions: There is strong evidence to support that Forced Migration Trauma (FMT) in refugee women negatively impacts mental and physical health outcomes. Limitations included cross-sectional study designs, decreased reporting of negative outcomes due to sensitive topics and vulnerability of participants, and self-report questionnaires. Further research is needed to determine best screening mechanisms for women who have experienced FMT and provide early prevention and intervention to mitigate the negative health outcomes.

Clinical Relevance: Currently, there are over 108.4 million people displaced globally. Forced Migration Trauma (FMT) is common among refugees and women are especially vulnerable. Physical therapists work with refugee populations in host nations and need to understand FMT and its impact on health outcomes for proficiency of practice, including screening and evaluation for patients from a trauma-informed perspective. As a profession, physical therapists must include screening for trauma and related mental and physical health outcomes, be able to provide trauma-informed physical therapy management and identify the need for referral to other appropriate health care providers.

* Accepted for platform presentation at APTA Combined Sections Meeting (CSM), Boston, MA, February 2024; Academy of Leadership & Innovation.

Study	Type of Trauma	Outcomes	JBI
Kim et al	Physical & Mental	PTSD, Depression, Anxiety, Forced Abortion	7/8
Um et al	Mental	Suicidal Ideation	7/8
Nissen et al	Physical & Mental	Chronic Pain, PTSD, Depression, Anxiety	8/8
Kheirallah et al	Mental	PTSD, Depression, Anxiety, Perceived Social Support, Post-Traumatic Growth	6/8
Tutlam et al	Mental	PTSD, Depression, Anxiety	8/8
Rees et al	Mental	Major Depressive Disorder, Psychological Intimate Partner Violence	7/8
Nam et al[14]	Mental	Suicidal Ideation, Suicide Attempt, Self-Concealment, Perceived Social Stigma	7/8
Familiar et al	Mental	PTSD, Depression, Suicidal Ideation	7/8
Majlander et al	Physical	Births, No Births, Miscarriages, Abortions, Complications During Pregnancy or Birth	7/8

* Indicates statistically significant between group difference ($p<0.05$) **AVERAGE: 7.1/8**



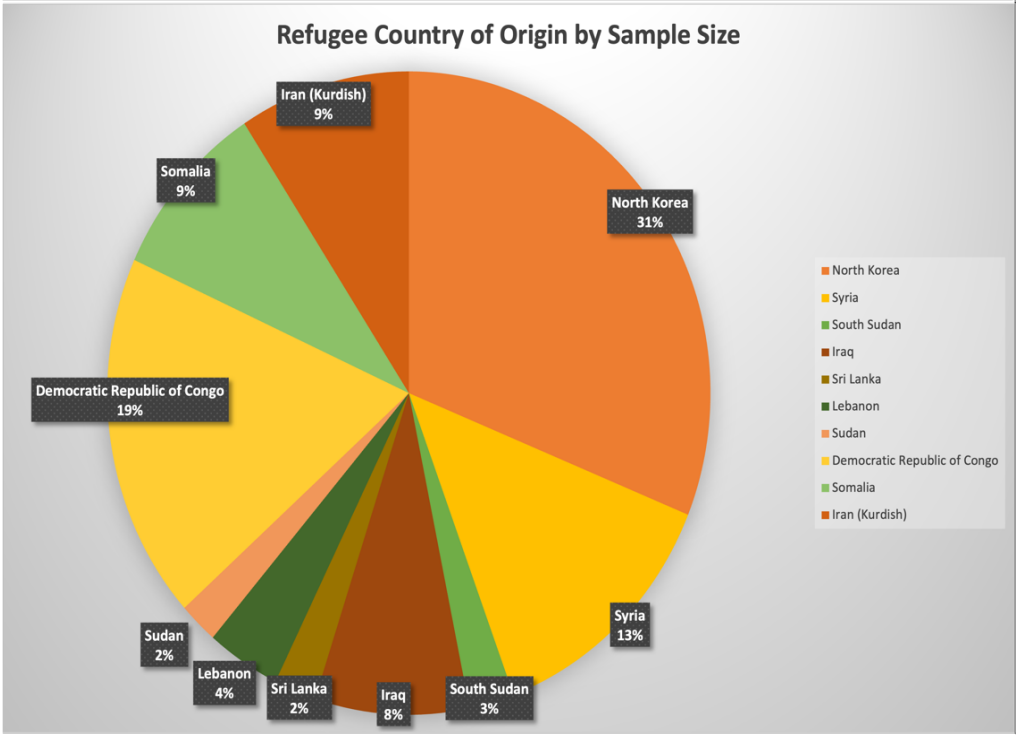
Legend:

IPV: Intimate Partner Violence

PTSD: Post Traumatic Stress Disorder

FGM: Female Genital Mutilation

** North Korea not reported due to measurement inconsistencies



Trauma-Informed Care in PT Practice

- Patient-centered care
- Communication & informed consent
- Safe environment
- Empowerment
- Respect for personal space & boundaries
- Education
- Mind-body approaches
- Collaboration
- Sensitive language
- Screening, referral, and continual assessment
- Cultural sensitivity

Group 2

Title: Mental Health Factors and Exercise Adherence in Women with Breast Cancer Interventions: A Systematic Review*

Authors: Lauren Collela, Erin O'Shaughnessy, Michele Felice Rovaris, Sydney Walters, Dr. Anthony Carusotto, Dr. Renée M. Hakim

Purpose: The purpose of this systematic review was to identify mental health risk factors associated with exercise adherence in women who have received breast cancer intervention.

Methods: A literature search of CINAHL, PubMed, and EBSCO was conducted with search terms ("mental health" OR "mental hygiene" OR wellness OR well-being OR mental OR health) AND (exercise OR "physical activity" OR "regular activity" OR "regular Exercise") AND (adherence OR compliance OR obedience OR consistent OR consistency) AND ("breast cancer" OR "breast neoplasm" OR "breast malignancy"). Search limits: primary research, peer-reviewed, 2012-2023. Selection criteria: females >18 years, breast cancer diagnosis, history of or currently undergoing treatment for breast cancer (including chemotherapy, radiation therapy, surgical procedures, or other alternative therapies). Two reviewers independently assessed methodological quality and came to a consensus using the Mixed Methods Appraisal Tool (MMAT).

Results: 1002 studies were screened for eligibility, 42 met the selection criteria: 15 qualitative, 25 quantitative, and 2 mixed methods. MMAT scores ranged from 60-100% quality criteria met (QCM) (avg=89.21%). Samples ranged from 7-1056 subjects (7,763 total). Six most commonly reported themes and their sub-themes for both barriers and facilitators to exercise adherence were identified. Main themes as barriers to exercise adherence included; lack of motivation (n=13), symptoms of anxiety (n=12), reduced self-image (n=10), depressive symptoms (n=10), lack of social/familial support (n=6), and mental health (n=2). Main facilitators for adherence to exercise included; having self-efficacy (n=12), social support (n=10), perceived psychological and physiological benefits of physical activity (n=10), positive body image (n=3), lack of depressive symptoms (n=2), and lack of symptoms of anxiety (n=2).

Conclusions: Moderate to high levels of evidence suggest mental health may facilitate or hinder exercise adherence in patients with breast cancer interventions. Limitations include lack of clarity on thematic definitions which hindered group classification ability as well as inconsistent intake measurement and assessment tools used across studies. Further research is warranted to elaborate on other potential mental health factors influencing exercise and/or treatment adherence as well as designing comprehensive mental health screening tools specific to the breast cancer population.

Clinical Relevance: Mental health factors are necessary to consider when working with patients undergoing breast cancer interventions. Healthcare professionals should strive to better understand the challenges that these individuals face to better tailor treatment for optimal outcomes. The findings of this systematic review support the necessity of providers implementing mental health screening tools specific to this population to provide education regarding and referrals for existing mental health barriers.

* Accepted for platform presentation at APTA Combined Sections Meeting (CSM), Boston, MA, February 2024; Oncology Section.

Barriers to Physical Activity: ***Main Themes***	***Supporting Studies***	***Subthemes***	
Lack of Motivation	13[7-19]	• Lack of motivation • Lack of self-efficacy • Lack of self-discipline • Laziness	• Lack of enjoyment in PA • Doubtful/Negative attitude toward physical activity • Low mood
Reduced Self-Image	10[13,17-19,22,26-30]	• Embarrassment working out in typical classes • Poor/reduced body/self-image	• Self-conscious of body image • Loss of femininity
Lack of Family/Social Support	6[9,14,16,17,19,30]	• Lack of companionship • Relationship issues/Partner concerns • Lack of social support	• Prioritization of family and friends • Guilty of not delegating time to family
Anxiety Symptoms	12[11,13,15,18,20-27]	• Fear of injury/harming self/lymphedema	• Concerns about physical activity • Anxiety
Depressive Symptoms	10[7,11,15,19,20,21,23,27,31,32]	• Depression • Poor Self-esteem • Negative emotions	• Emotional instability • Reduced sense of belonging
Mental Health	2[33,34]	• Quality of Life	• Mental Health

Facilitators to Physical Activity: ***Main Themes***	***Supporting Studies***	***Subthemes***	
Having Social Support	10[9,12,16,22,23,29,30,39,40,42]	• Social contact and connectedness • Lowered social pressure • Need for social boost	• Family, friend, and peer support • Shared experiences with other breast cancer survivors
Perceived Psychological Benefits of Physical Activity	10[11-13,16,22,22,29,31,41,42]	• Benefited well-being, energy, and mood • Positive psychological benefits • Positive beliefs about physical activity	• Confidence and perceived growth • Personal fulfillment
Lacking Depressive Symptoms	2[9,16]	• Positive emotions	• Emotional well-being
Positive Body Image	3[9,41,42]	• Having a positive body image	
Having Self-Efficacy	12[11,12,18,23,3,35-41]	• Higher self-efficacy • Motivation • Vitality • Personal control	• Perceived control of behaviors and goals • Confidence and ability to exercise when worried and/or busy • Improved confidence
Lacking Anxiety Symptoms	2[37,41]	• Decreased psychological distress	• Decreased stress

Group 3

Title: Impact of Core Stabilization on Balance and Mobility in Persons with MS: A Systematic Review*

Authors: Sarah Coulson, Matthew Kinback, Matthew Moran, Nicole Parello, Dr. Jennifer Schwartz

Purpose: The purpose of this systematic review was to examine the impact of core stabilization training on balance and mobility in persons with multiple sclerosis (MS).

Methods: A literature search of PubMed, CINAHL, ProQuest, and Wiley was conducted using the search terms ("Multiple Sclerosis" OR MS) AND ("core stability" OR "core training" OR "core stabilization" OR "core strength" OR "core exercise") AND (balance OR mobility). Search limits: English language, peer reviewed, randomized controlled trials (RCTs), published in the last ten years (2012-2022). Selection criteria: RCTs, adults 18+ with diagnosis of MS and core stabilization interventions with balance and/or mobility outcomes. Each study was independently assessed for methodological quality by two reviewers who came to consensus using the PEDro guidelines.

Results: A total of 53 articles were screened for eligibility. Following a detailed appraisal, 15 RCTs fulfilled the selection criteria. PEDro scores ranged from 7 to 9/10 (avg=9). Samples ranged from 29 to 100 subjects with 846 total participants aged 20-77 (mean age 42) with a diagnosis of MS (majority with RRMS and ambulatory; EDSS 1-6.5). Interventions included Pilates (n=6), core stabilization exercises (n=7) and CoDuSe exercises (n=2) performed 1-3 days per week (30-90 min/session, avg. 54min) ranging 5-12 weeks in duration (8.5 week avg). 15 out of 15 studies displayed at least one statistically significant improvement in a balance and/or mobility outcomes. Statistically significant between group improvements were reported in balance (BBS 2.81 avg, ABC 4.4 avg, MiniBESTest 3.9 avg, FES 3.1 avg, TIS 2.7 avg, Biodex Postural Sway 1.2 overall avg, AP 1.0 avg, ML 0.9 avg) and mobility (2MWT 13.6m avg, MSWS-12 –6.5 avg, TUG 1.2s avg, 10MWT 1.0s avg, 6MWT 39.8m avg) for core stabilization groups versus controls. Adverse events included 4 falls without injury in 2 studies.

Conclusions: There is moderate to strong evidence that supports the use of core stabilization training to improve balance and mobility outcomes in ambulatory persons with MS when given as a primary intervention or as an adjunct to therapy as compared to usual care alone. Limitations included lack of long-term follow up, primarily female subjects, and varied outcome measures and protocols between studies. Future research should include more uniform outcome measures and participants with varying levels of disability and forms of MS.

Clinical Relevance: Clinicians should consider core stabilization training to improve balance and mobility in ambulatory persons with early to middle stages of MS (EDSS 1-6.5). The most effective training programs were at least 2-3x weekly for 8 weeks at 60 minutes per session. All 3 interventions led to both clinically and statistically significant outcomes in balance and mobility for self-reported walking ability, walking endurance, gait speed and balance via 2MWT, MSWS-12, 10MWT, and BBS which exceeded the minimal detectable change (MDC) values of 19.21m, 8pts, 0.26s, and 4pts respectively. Overall, core stabilization training is a safe and effective method to improve balance and mobility in persons with MS.

* Accepted for poster presentation at APTA Combined Sections Meeting (CSM) Boston, MA, February 2024; Academy of Neurologic Physical Therapy (Degenerative Diseases SIG).

Study Name	Pedro Score	Interventions (Parameters)	Key Findings
Abadi et al (2023)	**9/10**	**Core Stabilization Exercises** 3x/week for 5 weeks, 60-75 min/session	Improved balance* (BBS)
Arntzen et al (2019)	**9/10**	**Core Stabilization Exercises** 3x/week for 6 weeks, 60 min/session	Improved balance* (TIS, MiniBESTest)
Arntzen et al (2019)	**9/10**	**Core Stabilization Exercises** 3x/week for 6 weeks, 60 min/session	Improved mobility* (2MWT ,10MWT)
Carling et al (2016)	**9/10**	**CoDuSe Exercises** 2x/week for 7 weeks, 60 min/session	Improved balance and mobility* (BBS, TUG)
Duff et al (2018)	**9/10**	**Pilates Exercises** 2x/week for 12 weeks. 50 min/session	Improved mobility* (6MWT, TUG)
Fox et al (2016)	**9/10**	**Pilates Exercises** 1x/week for 12 weeks, 30 min/session	Improved mobility* (10MWT, MSWS-12)
Kalron et al (2016)	**9/10**	**Pilates Exercises** 1x/week for 12 weeks, 30min/session	Improved balance and mobility* (BBS, TUG, 6MWT, 2MWT, MSWS-12)
Yasa et al (2022)	**9/10**	**Core Stabilization Exercises** 2x/week for 8 weeks, 60 min/session	Improved balance and mobility* (2MWT, MiniBESTest)
Ali et al (2021)	**8/10**	**Core Stabilization Exercises** 2x/week for 6 weeks, 55 min/session	Improved BBS, and postural stability* (BSS)
Forsberg et al (2016)	**8/10**	**CoDuSe Exercises** 2x/week for 7 weeks, 40 min/session	Improved balance and mobility* (BBS, FGA, MSWS-12, ABC Scale, TUG)
Gheitasi et al (2021)	**8/10**	**Pilates Exercises** 3x/week for 12 weeks, 60 min/session	Improved balance and mobility* (BBS, TUG, and FRT)
Gungor et al (2022)	**8/10**	**Pilates Exercises** 2x/week for 8 weeks, 60 min/session	Improved balance and mobility* (m-CTSIB, BSS, 2MWT, TUG)
Mohamadkhan beigi et al (2022)	**8/10**	**Core Stabilization Exercises** 3x/week for 6 weeks, 30 min/session	Improved mobility* (BBS, TUG, 6MWT)
Amari et al (2019)	**7/10**	**Core Stabilization Exercises** 3x/week for 10 weeks, 50 min/session	Improved balance * (BSS)
Bulguro et al (2017)	**7/10**	**Pilates Exercises** 2x/week for 8 weeks, 60-75 min/session	Improved mobility* (TUG and ABC Scale)

* Indicates statistical significance.
References can be found by scanning QR code.

Group 4

Title: Home-Based Physical Activity & Cardiorespiratory Capacity in Children with Congenital Heart Defects: A Systematic Review*

Authors: Veronica Lenox, Bridget Neal, Pamela Sbarra, Carley Wiseman, Dr. Nicholas Rodio

Purpose: The purpose of this systematic review was to examine the effects of individualized, home-based physical activity (PA) prescriptions on cardiorespiratory outcomes and exercise capacity in children with congenital heart defects (CHD).

Methods: A literature search was conducted (ProQuest, PubMed, ScienceDirect, CINAHL) using search terms: ("physical activity" OR "exercise" OR "cardiac rehabilitation" OR "cardiac rehab") AND (children OR pediatrics OR infants) AND ("congenital heart defects" OR "congenital heart disease"). Search limits: English, 2013-2023, peer-reviewed, completed trial. Selection criteria: subjects ≤20 years old with a diagnosis of CHD, home-based PA intervention and 1+ measure of cardiorespiratory exercise capacity. Studies were assessed by 4 reviewers for methodological quality using the MINORS Scale.

Results: A total of 859 articles were screened for eligibility with 6 meeting selection criteria using the MINORS scale (18-22/24, 12/16). Sample sizes range from 14-163 participants (n=460), ages 5-20 years old. All studies provided an individualized exercise program to be completed independently in the participant's home environment. The primary outcome investigated was cardiorespiratory exercise capacity, which was measured in the forms of VO2max, VO2peak, duration of exercise stress test (EST), maximum metabolic equivalent of task (METs), 6-Minute Walk test (6MWT), and daily moderate-vigorous physical activity (MVPA). Structured exercise interventions varied from 8 weeks to 12 months, 1-4x per week with 30-60 minute sessions. All studies found statistically significant changes in cardiorespiratory exercise capacity with initiation of home-based PA programming with 1 study noting statistical significance exclusively in those who engaged in ≤ 21 min of MVPA at baseline (13.7+/-22.9 improvement from baseline). Improvements in cardiorespiratory exercise among eligible participants were averaged regardless of statistical significance and include aerobic fitness score (+6pts), 6MWT (+48m), VO2max (+1.7 mL/kg/min), VO2peak (+1.39), MVPA (+8.06 min/day), METs (+2.7 MET), and duration of EST (+1.08 min).

Conclusions: Moderate level evidence supports that participation in a home-based PA program can improve cardiorespiratory capacity and PA levels in children with CHD. Limitations included parental concerns, nonadherence, small sample sizes, and season. Review was limited to clinical significance by means of parent/self-reported measures of improvements due to absence of MDC/MCIDs for primary outcomes specific to the pediatric population. Further research into optimal PA parameters, delivery method, and long-term carryover of improvements necessary to establish safe, effective, patient-specific PA programming in this population while considering possible limitations including seasonal constraints, comorbidity, and access to larger patient populations.

Clinical Relevance: Structured, home-based PA programming prescribed by a healthcare professional is both safe and effective in the long-term management of CHD in children and adolescents. The clinical significance of improvements was demonstrated in the literature by increased PA participation, improvements in several measures of cardiorespiratory capacity, and a subjective positive change in fitness and quality of life reported by parents and/or participants. Clinicians should consider implementing home-based exercise programs to increase overall participation in MVPA and improve exercise capacity in children with moderate to severe CHD to increase the likelihood of meeting the PA levels of their age-matched peers.

* Accepted for poster presentation at APTA Combined Sections Meeting (CSM), Boston, MA, February 2024; Academy of Cardiovascular & Pulmonary Physical Therapy.

Title	MINORS Rating	Intervention	Outcome Measures	Key Findings
Callaghan et al. (2021)	Moderate	Attended a 1-day education session and received an individual written exercise plan to be continued at home over a 4-month intervention period.	1. EST duration 2. EST power output 3. Avg daily MVPA 4. Avg daily step count	1. 43 second (or 11%) increase in exercise stress test duration ($p<0.001$) from baseline 2. Increase in maximum power output during EST ($p<0.001$) **Overall trend towards increased daily activity evident by increased steps/day and time spent in MVPA per day
Jackson et al. (2021)	Moderate	CHD-PAL - 8 30-min video conferencing sessions over 20 weeks - Included: web-based instruction, Fitbit, individualized exercise prescription	1. Average daily MVPA 2. Cardiorespiratory fitness (VO2 peak)	1. The CHD-PAL intervention increased MVPA levels among those who engaged in <21 min of MVPA on average at baseline. 2. -Increase of 16 min/day of MVPA more than comparators
Jacobsen et al. (2016)	Moderate	A 12-week moderate/ high intensity home- based cardiac physical activity program -Included: HEP (45 min of exercises depicted on DVD/ paper), 3 in-person sessions	1. Exercise capacity (exercise duration and VO2max) via Shuttle Run Test 2. Physical function HRQOL via PedsQL	1. 22% increase in total exercise time at 6 weeks 2. 2) Mean VO2max improved from 41.8 to 42.3 mL/kg/min
Longmuir et al. (2013)	Moderate	12-month, parent-delivered home programs – "real world" play-based activities.	1. Daily MVPA 2. Gross motor skill via TGMD-2 3. Health related fitness via aerobic step test, grip strength, hamstring flexibility, and BMI	1. No significant difference in MVPA or secondary outcomes by treatment group at any time point. 2. Both rehabilitation programs improved age- and sex-adjusted motor skill percentile scores, peak oxygen consumption by body weight, aerobic fitness, and flexibility. 3. Gross motor skill increased by 23 ± 5 percentiles ($p< 0.001$) after rehabilitation, a 49% improvement
Morrison et al. (2013)	Moderate	Attended an in-person session that included motivational interviewing and individualized discussion/plan with an exercise program.	1. Exercise capacity (duration of EST Average daily MVPA)	1. 1 min 5 sec increase in EST duration ($p< 0.02$) 2. Increased VO2 max ($p< 0.02$) 3. Increased daily MVPA ($p< 0.001$) **$p< 0.05$ accepted as significant
Sutherland et al. (2018)	Moderate	Following a 1:1 pre-intervention assessment, patients received an individualized exercise program. Two 1-hour long training sessions per week for 8 weeks 20-30 min of aerobic exercise at 65-85% HRmax and 20-30 min of BW resistance exercises	1. Exercise capacity (VO2 and 6MWT)	1. Increased distance on 6 MWT ($p<0.001$) 2. 13% increase in VO2 at anaerobic threshold ($p=0.02$) 3. Increased peak oxygen pulse ($p = 0.047$)

Group 5

Title: The Impact of POD0 Mobility on Function for Patients Following Joint Replacement: A Systematic Review*

Authors: Haley Donoghue, Colleen Gaffney, Claudia Mattes, Alexis Pagonis, Dr. Dana Maida, Dr. Janette Scardillo

Purpose: Early mobility has been shown to enhance functional recovery and return to independence following total joint replacement (TJR). The purpose of this systematic review was to analyze the impact of POD0 mobility on function for patients post elective lower extremity (LE) TJR in the acute care setting.

Methods: A literature search was conducted using ProQuest Central, PubMed, ScienceDirect, and EBSCO. Search terms: ("acute care" OR "hospital") AND ("postop* day 0" OR "early mobilization" OR "early ambulation") AND ("arthroplasty" OR "hip replacement" OR "knee replacement"). Selection criteria: 18+, elective LE joint replacement, acute care setting, POD0 early mobilization. Search limits: English, peer-reviewed, 2012-2023. 2 reviewers independently assessed each study for methodological quality using OCEBM Levels of Evidence (2011).

Results: 3,695 articles were screened for eligibility. 7 articles met selection criteria. OCEBM Levels of Evidence ranged from 2-3 (1 RCT, 3 retrospective studies, 1 non-RCT, 2 prospective interventional studies). Sample sizes ranged from 71-687 participants (n=1,480), ages 18-95 years. TJR types included elective anterior total hip replacement (THR, 2), posterior THR (1), total knee replacement (TKR, 3), or both (1). POD0 interventions included: ambulation (4) or weight bearing activities + ambulation (3). 2 studies reported statistically significant within group differences for POD0 mobility via the Barthel Index at discharge (1), 6MWT at 1 and 3 months (1), and TUG at 3 months (1). Between group differences in favor of POD0 mobility included: ambulation distance/total steps POD1 (2), ambulation distance/total steps POD2 and POD3 (1), and FIM-TOT/FIM-MOM/FIM-SC POD3 (1). The Barthel Index, ambulation distance POD2, QoR-15, 10mWT, Harris Hip Score, and WOMAC did not reveal statistically significant between group findings. Further analysis revealed statistically significant between group findings in 2/3 TKR studies and 1 posterior THR study. Neither anterior THR study reported statistically significant findings. No adverse events were directly attributed to participation in POD0 mobility.

Conclusions: Moderate levels of evidence support use of POD0 mobility resulting in mixed statistically significant impact on function following LE TJR. Additionally, type of surgery and approach may influence functional outcomes related to POD0 mobility. No articles directly compared type of POD0 mobility to help determine best practice. Limitations included study designs, variability of outcome measures/mobility protocols, varied lengths of stay, and co-interventions. Future research should directly compare types of early mobility interventions and explicitly analyze standardized mobility assessments to track patient progress.

Clinical Relevance: Based on the available evidence, clinicians should consider implementing any form of POD0 mobilization (ambulation or weight bearing activities) to improve function. This may be especially impactful in patients status-post posterior THR and TKR and can be utilized alongside standard PT interventions in the acute care setting to maximize outcomes in all patients following TJR.

* Accepted for poster presentation at APTA Combined Sections Meeting (CSM), Boston, MA, February 2024; Acute Care Section.

Significant Findings

Article Authors	OCEBM Level	Joint	Key Findings
Castorina et al[4]	3	TKR	• MBI scores showed significant difference in between initial and final scores in both early mobility and control group ($p<0.01$) • No difference in final MBI scores between early mobility (95.0±0.0) and control group (94.86±0.82), ($p>0.05$)
Harikesavana et al[1]	2	TKR	• 3-month post-intervention TUG scores (17.2s) were statistically different when compared to baseline (21.7s), ($p<0.001$). • The 6MWT scores were statistically significant 1-month post-op (236.7ft) and 3-month post-op (308.9ft) when both were compared to baseline (169ft), ($p<0.001$)
Karim et al[5]	3	TKA or Posterior THR	• Early mobility group (162.4ft) ambulated further than control group (118ft) on POD1 ($p=0.019$)
Sarpong et al[7]	3	TKR	• On average, significantly more steps between initial and final measures in comparison to the control group (POD1: 347.6 vs 167.4; POD2: 342.1 vs 203.5; POD3: 190.3 vs 128.9), ($p<0.05$)
Temporiti et al[9]	3	Posterior THR	• HHS scores were statistically different between the early mobility (POD3 49.5±8.1, POD7 51.4±8.8) and control (POD3 48.5±8.1, POD7 49.9±8.8) groups ($p=0.032$) • FIM-TOT showed statistical difference in scores between the early mobility group (POD3 102.5 ± 3.1, POD7 104.9 ± 2.9) and the control group (POD 3 100.4 ± 3.1, POD7 103.7 ± 2.9), ($p < 0.001$) • The FIM-MOT showed statistical difference in scores between the early mobility (POD3 67.5 ± 3.1, POD7 69.9 ± 2.9) and control group (POD3 65.4 ± 3.1, POD7 68.7 ± 2.9), ($p < 0.001$) • The FIM-TL also showed statistical difference in scores between the early mobility (POD3 20 ± 1.1, POD7 20.7 ± 1.7) and control group (POD3 19.5 ± 1.1, POD7 20.7 ± 1.7), ($p < 0.001$)

Non-Significant Findings

Article Authors	OCEBM Level	Joint	Key Findings
Harikesavana et al[1]	2	TKR	• Difference in TUG scores were not statistically significant between baseline (21.7s) and 1-month post-op (20.4s), ($p<0.429$)
Karim et al[5]	3	TKA or Posterior THR	• In patients status post TKA, the early mobility group ambulated further on POD1 (114ft; 94ft) and POD2 (176ft; 148ft), but the differences were not statistically significant
Oberfeld et al[6]	2	Anterior THR	• The WOMAC showed no statistically significant findings between early mobility (12.92±16.31) and POD1 mobility (9±10.48) at 12 weeks post-intervention ($p=0.30$)
Tin Tan et al[8]	3	Anterior THR	• No statistical significance in QoR-15 scores between pre and post early mobility on POD1 (106.13; 103.83; $p=0.154$), POD2 (116.13; 115.04; $p=0.476$) and at week 6 (128.87; 131.14; $p=0.628$) • No statistical significance in 10mWT scores between pre (0.40) and post (0.47) early mobility ($p=0.440$)

References

Abbreviations: Modified Barthel Index- MBI; Timed Up and Go- TUG; 6 Minute Walk Test- 6MWT; post-operative day- POD; Harris Hip Score- HHS; Functional Independence Measure Total- FIM-TOT; Functional Independence Measure Motor- FIM-MOT; Functional Independence Measure Transfer and Locomotion- FIM-TL; Total Knee Arthroplasty- TKA; Western Ontario and McMaster Universities Arthritis Index- WOMAC; 10-meter Walk Test- 10mWT

Group 6

Title: The Effect of Aromatherapy on Anxiety in Patients Who Are Status-Post Myocardial Infarction: A Systematic Review*

Authors: Alexander Bracken, Brian Harrison, Jack Ianucci, Andrew Murray, Dylan LeVan, Dr. Anthony Carusotto

Purpose: The purpose of this systematic review was to determine the effect of aromatherapy on anxiety in patients who are status-post myocardial infarction (MI).

Methods: A literature search of Pubmed, ScienceDirect, Google Scholar, ProQuest, and CINAHL was conducted utilizing the search terms: ("myocardial infarction" OR "MI" OR "heart attack") AND (anxiety OR "anxiety disorder") AND (aromatherapy OR aroma). Search limits included: Studies published between 2012 and 2023, randomized controlled trials, and peer-reviewed publications. Selection criteria included a sample population of adults 18 years of age or older, having a diagnosis of a myocardial infarction (MI). Intervention in the study consisted of aromatherapy, which must be defined as complementary medical treatment used to alleviate emotional and physical symptoms through the inhalation of vapors or absorption oils. All articles must include at least one standardized outcome measure for anxiety. Each study was independently assessed for methodological quality by two reviewers who came to consensus using PEDro guidelines.

Results: 303 articles were screened for eligibility, 8 RCTs met the selection criteria. PEDro scores ranged from 6/10 to 10/10 (avg. 8.5). Samples ranged from 18 to 80 years old (N=602), all having a diagnosis of acute myocardial infarction or acute coronary syndrome. Aromatherapy sessions ranged from 1-7 times daily for 10–120-minute trials over the course of 2-4 days. Aromas assessed were citrus aurantium, lavender, peppermint, geranium, Melissa, and lemon. Essential oils of these scents were placed on or near the patient's collar. The patients were instructed to breathe normally for the duration of the treatment. All 8 studies included a self-reported assessment of anxiety. 7 of 8 studies utilized the State-Trait Anxiety Inventory (STAI) and found a statistically significant change in anxiety scores after intervention. Of the 7 studies, 4 found the MCID for the STAI. 1 of 8 studies utilized the Depression, Anxiety, and Stress Scale (DASS-21) and while they did find a statistically significant difference in scores after intervention, they did not find the MCID for the DASS-21. Secondary outcomes included reduction in SBP and improved regulation of heart rate.

Conclusion: Strong evidence supports the utilization of aromatherapy to decrease anxiety in patients who are status-post MI. Limitations included potential unblinding of the patients, lack of long-term follow up, and studies being performed within an anxiogenic ICU environment. Further research is required to determine the most effective aroma, frequency, and duration of aromatherapy.

Clinical Relevance: It is common for complications to occur within several days after an episode of MI. For this reason, it is of vital importance to keep patient's anxiety levels controlled. Aromatherapy provides a feasible and effective option to all practitioners aiming to reduce anxiety in patients who are status-post MI, thus enhancing their overall wellbeing and rehabilitation.

* Accepted for a platform presentation at APTA Combined Sections Meeting (CSM), Boston, MA, February 2024; Academy of Cardiovascular & Pulmonary Physical Therapy.

Study	Intervention	Key Findings	PEDro Score
Veiskaramian, et al.	Melissa Essential Oil given twice a day for 1 day, 10 minutes per session; Compared to a control group who received a placebo	Significant difference in anxiety found in the experimental group compared to the control group	10
Mirbastegan, et al.	Lavender extract given 3 times per day for 3 consecutive days, 20-30 minutes per session; Compared to a control group who received a placebo	Significant difference in anxiety found in the experimental group compared to the control group	7
Shirzadegan, et al.	Citrus aurantium oil inhaled for 20 minutes daily for 2 consecutive days. Levels of anxiety evaluated 30 minutes before intervention, and 15 and 30 minutes after completion; Compared to a placebo group given 12% sunflower oil	Significant difference in anxiety between the groups after every session of aromatherapy.	10
Solemani, et al.	3 drops of peppermint essential oil poured on a cotton ball and placed on the patient's collar, patients were asked to breathe gently for 1 hour; Compared to a placebo group given water	Intervention group showed significant improvements in state anxiety following intervention. Significant difference in anxiety before and after the intervention in the intervention group.	10
Rambod, et al.	5 drops of lemon essential oil was poured on a cotton pad, given 5 times a day for 1 day; Compared to a control group given paraffin oil	Significant difference in anxiety found in the experimental group compared to the control group	9
Shirzadegan, et al.	Geranium essential oil was placed on an absorbent pad, twice a day for 3 days; Compared to a control group that was given sunflower oil	Significant difference in anxiety found in the experimental group compared to the control group	10
Najafi, et al.	Given 3 drops of lavender oil on a tissue, twice a day for 2 consecutive days; Compared to control group that received no aromatherapy	Significant difference in anxiety found in the experimental group compared to the control group	6
Haddadi, et al.	Given rose essential oil 3 times a day for 3 days; Compared to a control group who received a placebo	Significant difference in anxiety found in the experimental group compared to the control group	6

Group 7

Title: Clinical Applications of Wearable Technology for Monitoring Sleep in Patients with Parkinson's Disease: A Systematic Review*

Authors: Conor Coyle, Ben DeTrempe, Adrianna Duranti, Stefan Pinkston, Dr. Renée M. Hakim

Purpose: Almost two-thirds of persons with Parkinson's Disease (PWPD) report sleep disorders.1 The purpose of this systematic review was to investigate the clinical application of integrating wearable technology into monitoring sleep quality (SQ) in PWPD.

Methods: A literature search of CINAHL, Cochrane Library, MEDLINE/PubMed, and ProQuest Central, was conducted using search terms: (wearable technology OR wearable technologies OR wearable devices OR wearable sensors OR smart watch OR wearables OR wearable electronic devices OR wearable electronics) AND (Sleep OR Sleeping OR Sleeps) AND (Parkinson's Disease OR PD OR Parkinson) NOT (systematic review). Search limits: Adults, human, English, peer-reviewed. Selection criteria: Diagnosed PD and use of wearable sensors to analyze SQ. Methodological quality was assessed by two independent reviewers who came to consensus using Oxford Centre for Evidence-Based Medicine (OCEBM) Levels of Evidence (2011).

Results: A total of 162 articles were screened for eligibility and 16 articles met selection criteria. Levels of evidence ranged from 2 to 4. Sample sizes ranged from 12 to 304 PWPD participants (total of 1,401) with H&Y stages 1-4 (age range >18 to 85 years). All wearable devices (WD) utilized accelerometer-based technology as the primary mechanism to detect sleep with four studies including heart rate monitors. Fourteen studies (levels 2-4) found that WD can be used to detect differences in sleep patterns and duration in PWPD. Common sleep disturbances recorded included reductions in sleep duration (8), rolling speed (7), degree of axial turns (7), turn frequency (5), increased number of times OOB (4), turn duration (6), total number of limb movements (2), and rolling acceleration (6). One study (level 3) linked early-stage PD (H&Y 1-3) with reduced nocturnal movements and greater nocturnal upright time compared with healthy controls. One study (level 3) suggested that the number of turnover movements may be an indicator of disease progression in PWPD.

Conclusions: There is low to moderate strength evidence (levels 2-4) supporting the use of WD in PWPD to objectively evaluate sleep quality and monitor disease progression. Limitations included small sample size, lack of blinding, sensor calibration limitations, and use of varying objective metrics, and approximately 40% of included studies conducted by the same research team. Future studies should compare sensor diagnostics to disease progression and assist with sleep quality management.

Clinical Relevance: Sleep is strongly linked to functional motor and cognitive performance, which may impact patient prognosis during rehabilitation.1-6 Sleep studies, the gold standard for assessing SQ, are invasive, costly, and cannot be conducted at home. WD offer an accessible and commercially available method for PWPD or their healthcare team to monitor day-to-day changes in sleep metrics. Clinicians may consider screening SQ routinely as part of an examination using a standardized tool such as the Pittsburgh Sleep Quality Index (PSQI) to identify PWPD who may benefit from WD usage. WD may detect SQ changes including a decrease in total sleep time or number of nocturnal turnovers, indicating disease progression, and informing clinicians to modify interventions or initiate appropriate referrals.

* Accepted for poster presentation at APTA Combined Sections Meeting (CSM) Boston, MA, February 2024; Academy of Neurologic Physical Therapy (Degenerative Diseases SIG).

Study	Device	Key Findings
Cai G, et al.[4]	Bong Smart Sports Bracelet (Wrist-worn)	Measures: Sleep time, physical activity, daily caloric expenditure, walking frequency Results: Average sleep duration lower in PWPD compared to controls
Madrid-Navarro CJ, Puertas Cuesta FJ, Escamilla-Sevilla F, et al.[2] Madrid-Navarro CJ, Escamilla-Sevilla F, Mínguez-Castellanos A, et al.[9]	Ambulatory Circadian Monitoring (ACM)	Measures: Time in bed, total sleep time, sleep efficiency, and wake after sleep onset Results: Body-worn sensors equally effective compared to PSG for vital sleep metrics (daytime and nighttime sleep, physical activity and exposure to light-dark cycles)
Ko YF, Kuo PH, Wang CF, et al.[6]	ASUS VivoWatch BP	Measures: Light, deep, and REM sleep, abnormal REM behavior Results: Algorithm based on heart rate response and sleep duration used to detect sleep stage and abnormal REM behavior in PWPD
Prusynski RA, Kelly VE, Fogelberg DJ, Pradhan S.[13]	Fitbit Charge HR	Measures: Sleep duration, number of times awakened, wake time after onset, quantity of daytime sleep, nap count, physical activity measurements Results: PWPD sleep duration on average 75 fewer minutes per night compared to controls
Boroojerdi B, Ghaffari R, et.al [14]	NIMBLE wearable biosensor patch	Measures: Sleep movements (rolling, OOB), motor symptoms, "on/off" fluctuations Results: Effective tracking of sleep disturbances
Uchino K, et al.[5] Mirelman A, Hillel I, Rochester L, et al.[1]	Triaxial Accelerometer (Wrist-worn)	Measures: Total time recumbent, total time supine, number of turnover movements, and mean interval between turnover movements Results: Recently diagnosed PWPD displayed greater percent upright time at night compared to controls
Bhidayasiri R, et al.[3] Bhidayasiri R, Sringean J, Chaiwong S, et al.[7] Bhidayasiri R, Sringean J, Thanawattano C.[10] Sringean J, Anan C, Thanawattano C, Bhidayasiri R.[15] Sringean J, Taechalertpaisarn P, et al.[11] Sringean J, Chanawat A, Bhidayasiri R[16]. Bhidayasiri R, Sringean J, Anan C, Boonpang K, Thanawattano C, Ray Chaudhuri K.[10]	NIGHT Recorder (16-bit digital output triaxial integrated microelectromechanical system)	Measures: Rolling over movements' number, velocity, acceleration, degree, and duration, and a reduction in the number of times participants got out of bed Results: Show promise for precise assessment and better management of nocturnal movements in PWPD by effectively detecting and measured these movements
Oz S, Dagay A, Katzav S, et al.[8]	Soft, printed dry electrode arrays via bluetooth	Measures: Sleep stages, presence of atonia (muscle relaxation) during REM sleep Results: Detects REM sleep without atonia, an early predictor of degenerative neurological disease

Group 8

Title: Creative Movement Therapy Impact on Mental and Physical Health Outcomes for Refugees Living with Trauma: A Systematic Review*

Authors: John-Paolo Barcinas, Nicholas Daly, Brooke Thomson, Samiel Torres, Dr. Lori Maria Walton

Purpose: Creative Movement Therapy (CMT) offers a holistic approach to healing trauma through expressive art forms and a therapeutic relationship between movement and emotion. Refugee populations experience high levels of trauma during forced displacement that are linked to negative health outcomes and chronic disease. This systematic review aims to investigate the impact of CMT on mental and physical health outcomes for refugees.

Methods: A literature search of CINAHL, ProQuest, PubMed, and ScienceDirect from August 2022 to December 2023 was conducted using search terms: ("Refugee" OR "migrants" OR "Political Asylum Seekers" OR "asylum seekers" OR "Displaced Persons") AND ("stress" OR "anxiety") AND ("Dance" OR "Creative Movement") Search limits included: human subjects, > 4 years of age, and refugee(s) or migrant(s). All qualitative and quantitative studies involving participants with refugee status that were exposed to trauma (mental or physical violence or forced displacement) were included. Selection criteria included both mental and physical health outcomes. Two reviewers independently assessed methodological quality and came to consensus using Mixed Methods Appraisal Tool (MMAT).

Results: 2,172 studies were screened. Eight studies met the selection criteria: 4 quantitative, 4 qualitative. MMAT scores ranged 40-100% and quality criteria for (QCM) was met (avg=86.67%). All studies involved refugees, > 4 years of age, who experienced forced migration and were living in a host country. Creative Movement Therapy, including both art and dance, showed statistically significant positive impacts on a variety of mental and physical health outcomes for refugees, including: 2/8 articles reported decreased anxiety levels ($p < 0.05$); 2/8 articles reported decrease in pain ($p < 0.05$), 2/8 reported improvements in body awareness ($p < 0.05$), 1/8 reported decreased separation anxiety ($p < 0.05$), 3/8 reported a decrease in PTSD symptoms ($p < 0.05$), and 1/8 reported a decrease in behavioral symptoms ($p < 0.05$).

Conclusion: There is moderate evidence that CMT has a positive impact on both mental and physical health outcomes for diverse refugee populations. Limitations included small sample size, self-report questionnaires, language barriers, and barriers to reporting for sensitive topics. Future research may focus on utilizing standardized outcome measures and increase in sample size to strengthen the research evidence concerning CMT.

Clinical Relevance: It is important to screen for physical and mental health responses to trauma for refugee populations because of the high prevalence of anxiety, separation anxiety, pain, PTSD, and lack of bodily awareness in this population. This systematic review supports the integration of CMT into physical therapy clinical and community-based programs to mitigate the negative health outcomes and provide positive impact for the best in mental and physical health for diverse refugee populations.

* Accepted for poster presentation at APTA Combined Sections Meeting (CSM) Boston, MA, February 2024; Academy of Leadership & Innovation.

Article Authors	Type of Study	CMT Technique Used	Outcome Measured	MMAT Score
Verreault (2017)	Qualitative	Dance (DMT)	Body Awareness	5/5
Dunphy et al. (2014)	Qualitative	Dance (DMT)	Pain	2/5
Rahapsari et al. (2019)	Qualitative	Movement Based Exploration (ME)	Anxiety	5/5
Feen-Calligan et al. (2020)	Qualitative	Art	PTSD, Separation Anxiety	5/5
Burruss et al. (2021)	Quantitative	Art	Behavioral Symptoms	5/5
Quinlan et al. (2016)	Quantitative	Art	Behavioral Symptoms	4/5
Feen-Calligan et al. (2023)	Quantitative	Photovoice	PTSD	2/5
Gever et al.	Quantitative	Social-Media Based Therapy	PTSD, Anxiety	4/5
		Indicates statistically significant between group difference ($p<0.05$)	** Scores are representative of the avg of the 2 reviewers**	Average: 3.75/5

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Group 9

Title: Effect of Functional Electrical Stimulation on Gait in Persons with Parkinson's Disease: A Systematic Review*

Authors: William Laughlin, Nicholas Mohr, John Mulligan, Collin Purdy, Dr. Jennifer Schwartz, Dr. Renée M. Hakim

Background and Purpose: Disturbances with ambulation, particularly freezing of gait (FOG), are among the most incapacitating symptoms in individuals with PD. The purpose of this systematic review was to determine the effectiveness of lower extremity (LE) Functional Electrical Stimulation (FES) on measures of gait in persons with Parkinson's disease (PD).

Methods: A literature search was conducted in CINAHL, ProQuest, PubMed, ScienceDirect, and Wiley (abstracts only) using search terms: ("Functional electrical stimulation" OR "FES" OR "electrical stimulation" OR "peripheral stimulation") AND ("Parkinson's" OR "Parkinson's Disease" OR "PD") AND ("gait" OR "mobility"). Search limits: English language, peer-reviewed, and human subjects. Selection criteria: adults with PD, use of FES, and at least one gait outcome. Each study was independently assessed for methodological quality by two reviewers who reached consensus using the Oxford Centre for Evidence-Based Medicine (OCEBM) Levels of Evidence (2011).

Results: A total of 376 articles were screened for eligibility and 4 articles met selection criteria. OCEBM Levels ranged from 2 to 3. Sample sizes ranged from 7 to 64 adult participants with PD (Total=96; H&Y I-IV; age range 57-80 y/o). Intervention groups received FES to the tibialis anterior muscle or common peroneal nerve. In 3/4 studies, participants received FES (40Hz) for 5-10 min daily progressing to home use PRN for 2-18 wks. One study compared varied FES conditions (2Hz & 40Hz) to controls without FES on a single-day using a force-plate to assess gait initiation. All four studies assessed temporal and distance gait measures, with one study adding kinematics and kinetics. Two studies reported statistically significant within-group improvements in stride length (0.18 m, 0.36-0.42 m), gait speed (0.29 m/s, 0.13 m/s), gait distance (12.3 m), and step cadence (19.8 steps/min) with FES compared to baseline. One study reported greater between-group improvements in stride length (0.06 m), gait speed (0.13 m/s) and New FOG questionnaire (NFOG-Q) scores (-0.89 pts) for the FES group vs. controls. One study reported a significant improvement in gait initiation kinematics by reducing freezing of gait with a significantly shorter step execution phase (d' = 0.62, medium effect size) with FES.

Conclusions: Moderate evidence (LoE 2-3) supports use of FES to improve gait parameters in persons with PD. Limitations included small sample sizes, lack of randomization and control groups, and widely varied FES protocols. Future research should include larger controlled studies with longer duration of treatment/follow-up and standardized training parameters.

Clinical Relevance: Clinicians may consider using FES as an intervention for persons with PD to improve stride length, cadence, gait distance, initiation, and speed. Improvements in gait speed with FES demonstrated clinically meaningful changes exceeding the MDC (10MWT = 0.18 m/s). FES provides a beneficial, low-cost, non-pharmacological intervention that may be integrated into home walking programs to improve gait outcomes for persons with PD.

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Summary of Functional Electrical Stimulation (FES) Intervention Results

Authors	Type of Study (Level of Evidence)	Intervention Parameters	Primary Gait Outcome Measures	Key Findings
Taylor et al.[9]	Quantitative (OCEBM Level II)	18-week intervention FES used daily at home	10MWT, Stride length, New FOG questionnaire	Greater between-group improvements: Stride length (0.06 m) Gait speed (0.13 m/s) New FOG questionnaire scores (-0.89 points)
Delafontaine et al.[10]	Quantitative (OCEBM Level II)	Single-day intervention Series of gait initiation trials at 2 Hz & 40 Hz	Execution phase, Step length, duration of APA's	Significant improvement: Step execution phase (d' = 0.62, medium effect size)
Mann et al.[6]	Quantitative (OCEBM Level III)	16-week intervention FES used daily at home	20MWT, 3-minute walk test, Stride length	Statistically significant within-group improvements: Stride length (0.36-0.42 m) Gait speed (0.13 m/s) Gait distance (12.3 m)
Popa et al.[5]	Quantitative (OCEBM Level III)	2-week intervention FES used with short walks of 5-10 min progressing to unlimited use	10MWT, Stride length, Step cadence, number of steps in 10 meters	Statistically significant within-group improvements: Stride length (0.18 m) Gait speed (0.29 m/s) Step cadence (19.8 m/s)

Figure 1. Lower extremity FES electrode placement to improve gait in persons with PD[5,7]

Group 10

Title: Sociodemographic Factors and Hospital Readmission Rates for Home Health Care Medicare Beneficiaries: A Systematic Review*

Authors: Gina Garatino, Shannon Gill, Kyra O'Toole, Ashna Patel, Dr. Tracey L. Collins

Purpose: To examine the impact of sociodemographic factors affecting hospital readmission rates of home health care Medicare beneficiaries.

Methods: A literature search of Cochrane, EBSCO, ProQuest, PubMed, and ScienceDirect using the following search terms: ("home health" OR "home health care" OR "home care") AND (Medicare OR "Medicare beneficiaries" OR "Medicare recipients") AND "rehospitalization readmission rates" AND ("sociodemographic factors" OR sociodemographic OR "sociodemographic variables"). Selection criteria: older adults (65+) Medicare beneficiaries receiving home health with reporting of sociodemographic factors including employment status, household income/benefits, level of education, marital status, social support, age, race, and ethnicity. Search limits: Age (65+), English language, United States of America, peer-reviewed, 2013-2022. Each study was independently evaluated for methodological quality by 2 blinded reviewers using the Newcastle-Ottawa Scale (2009).

Results: A total of 60 studies were screened for eligibility. Seven met selection criteria. Six of the studies were Level 7 evidence and 1 was Level 8 according to the Newcastle-Ottawa Scale (2009). Sample size ranged from 22,722 to 2,464,387 (total N= 2,765,536). One study did not include the number of participant data as it was analyzed on an agency level only. All participants were 65 years or older and were receiving home health care following a hospitalization. Rehospitalization data was collected for 30-day and/or 60-day periods amongst the studies. Of the 7 studies, 3 reported higher risk of readmission for black patients compared to other races (OR=1.31-1.55; HR= 1.12). One reported higher 30-day readmission rates of dually-enrolled beneficiaries (OR=1.44) and of those living in low income neighborhoods (OR=1.16). One reported women having 16% lower hazard of rehospitalization (HR=0.84) then men while another reported females being 20% less likely to visit the ED then men. One reported an 18.5% lower readmission rate of English-speaking patients compared to any other language. Spanish speaking patients have the highest readmission rate (20.9%). Rural residing patients have an increased readmission rate (37%).

Conclusions: The research data reviewed shows moderate to strong evidence to support that sociodemographic factors, such as race, insurance enrollment status, income, gender, and primary language may impact hospital readmission rates amongst home health care Medicare beneficiaries. Limitations include lack of generalizability, inability to draw a causal relationship, unaccounted confounding factors, and limited availability of personal data and characteristics. Further research could provide more evidence on other populations in which sociodemographic factors may affect hospital readmission rates of home health care recipients.

Clinical Relevance: Clinicians should consider that sociodemographic factors may affect hospital readmission rates of HHC Medicare beneficiaries. Specifically, patients that are black, dually-enrolled, male, rural residing, or Spanish speaking may be more at risk for rehospitalization following discharge to HHC.

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Study	Newcastle-Ottowa Scale (2009)	Findings
Chase et al. (2018)[1]	7	African Americans and Hispanic patients had significantly greater odds of ER visits or rehospitalization during their HHC episode, when compared to Asian and White patients.
Joynt et al. (2017)[2]	7	Medicare beneficiaries who are dually enrolled, living in a low-income neighborhood, or who are black had higher odds of 30-day readmission.
Lohman et al. (2018)[3]	8	Black patients had significantly greater hazard of hospitalization and 11% shorter time until re-hospitalizations compared to white patients. Additionally, women had 16% lower hazard of hospitalization and re-hospitalization compared to men.
Ma et al. (2022)[4]	7	Compared to rural, urban agencies achieved less decrease in hospitalization rate over time.
Mroz et al. (2018)[5]	7	Receipt of any home health aide visit in a rural geographic area was associated with 37% higher odds of hospital readmission.
Squires et al. (2022)[6]	7	Readmission rates for English-preferred patients was significantly lower (18.5%) than for a language-other-than-English preferred patients (20.4%). Additionally, Spanish preferred individuals had the highest readmission rate at 20.9%.
Wang et al. (2022)[7]	7	Dually enrolled beneficiaries have a higher likelihood of 30-day hospital readmission. Results for 60-day outcomes were consistent with those for 30-day outcomes.

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Group 11

Title: Differences in Home Health Hospital Readmission Rates Between Traditional Medicare and Medicare Advantage Beneficiaries*

Authors: Dr. Tracey L. Collins, Sarah Coulson

Purpose: The purpose of this study is to identify the possible differences in home health hospital readmission rates for traditional Medicare (TM) and Medicare advantage (MA)beneficiaries.

Methods: A literature search of PubMed, ProQuest, CINAHL, and Wiley Online Library was conducted using the search terms: "home health" AND "physical therapy" AND "Medicare" for PubMed and search terms: home health" AND "physical therapy" AND "Medicare" AND "Medicare advantage" for ProQuest, CINAHL, and Wiley Online Library. Search limits: published 2014-2023; aged 65+; peer-reviewed (ProQuest, CINAHL); scholarly journal (ProQuest); USA (CINAHL); Physical Therapy (CINAHL), Research Article (CINAHL, Wiley), English Language (CINAHL). Selection criteria included home health use under a Medicare or Medicare advantage plan with rates of hospital readmission. Each study was independently evaluated for methodological quality by two reviewers using the CEBM Oxford Levels of Evidence (2011).

Results: A total 123 of articles were screened for eligibility. After detailed appraisals, four met selection criteria including a retrospective cohort study (n=2), retrospective descriptive design (n=1), cross sectional study (n=1). Levels of evidence were scored based off hierarchy of evidence and all classified as level 3. Studies collected and analyzed data from 1- or 1.5-year period with participants ranging from 1,129 to 941,584. The primary outcome was the number of readmissions to hospital from home health. Statistically significant differences between TM and MA, with MA having lower readmission rates with home health use. TM beneficiaries readmitted at a rate ranging from 14.7 % to 34.8% of the time and MA beneficiaries readmitted at rates ranging from 11.4% to 31.6% of the time.

Conclusions: Evidence suggests enrollment in a Medicare Advantage plan may decrease likelihood of hospital readmissions during home health care and patients should be encouraged to explore the MA plans. Limitations include inability to observe differences in home health use, well-being, and lifestyle factors, unobserved additional care to home health treatment, Primary diagnosis, comorbidities, and missing demographic data from collection.

Clinical Relevance: Medicare beneficiaries have the option to enroll in a Medicare Advantage plan that may impact treatment received for current conditions and likelihood of hospital readmission from home health treatment. Physical therapists should be knowledgeable of the plans available for patients to help educate their patients to make the appropriate decision for their lifestyle.

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Author	Level of Evidence	Method	Readmission Rates		Statistical Significance	
Casebeer, et al.[8]	III	Retrospective Cohort Design	**Within 60 Days** TM 18.05% MA 15.80%	**Within 180 Days** TM 28.34% MA 30.14%	No Statistical Significance Reported	
Park JJ.[7]	III	Retrospective Descriptive Design	TM 35.3 MA 40.7		Significant between groups for hospital readmissions	
Skopec, Huckfeldt, et al.[10]	III	Retrospective Cohort Study	**Joint Replacement** TM 34.8% MA 31.6% **Stroke** TM 15.5% MA 14.9%	**Heart Failure** TM 31.4% MA 27.7%	**Joint Replacement** Mean unadjusted difference -3.4 Mean adjusted difference -3.0 **Stroke** Mean adjusted difference -0.6	**Heart Failure** Mean unadjusted difference -4.2 Mean adjusted difference -3.7
Skopec, Zuckerman, et al.[4]	III	Cross Sectional Study	TM 17.1% MA 15.1%		Unadjusted Difference -2.0 Adjusted Difference -2.3	

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