



Posters

Abstract ID: 34869

TITLE: The Integral Role of the Pelvic Physical Therapist in the Care of Patients With Transverse Myelitis

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Background and Purpose: There is support for multidisciplinary neurorehabilitation for patients with transverse myelitis (TM). Symptoms of TM include paresis, sensory impairment, somatic and autonomic dysfunction that can manifest as bowel, bladder (B/B) or sexual impairment. Pelvic floor (PF) dysfunction includes sphincter weakness or loss of control, sensory changes to the perineum and sexual dysfunction. This case study highlights the care and insight that pelvic physical therapists (PFPTs) offer for patients with TM.

Case Description: The subject was a 54 year old male, diagnosed with TM one year before start of PFPT. Imaging taken just prior to start of PFPT care demonstrated an unchanged lesion at T6. He reported stress urinary incontinence (SUI) with change of position, post-void dribble, nocturia, difficulty controlling bowel urge (without overt fecal incontinence), vibration sensations to genitalia and bilateral inner thighs. He noted general body hypersensitivity with prolonged walking, reduced sexual activity with his monogamous partner due to fear of hypersensitivity and discomfort with arousal and climax, and frequent abdominal rashes in the evening. Initial outcome score on the NIH-Chronic Prostatic Symptom Index Male (NIH-CPSI M) indicated total score of 27. On evaluation, there was decreased lumbar and thoracic curve in standing, sitting and with sleeping position. Pronounced lumbar and thoracic flexion with minimal hip flexion observed during movement testing. Hamstring length was limited bilaterally. Hip range of motion, squat and single leg stance abilities were all normal. PF findings were largely unremarkable: no palpable tenderness; isolation of PF muscles with contraction; no sensory impairment of light touch; reflexes normal. As exception, inconsistent quickness of relaxation of PF muscles was present on exam. Seventeen treatment sessions over seven months included urge suppression, education for liquid intake across day/evening, B/B positioning, education for B/B and urge deferment strategies. Also discussed were modifications and education for sleeping, sitting

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position (including desk ergonomics), and forward bending, adjustments to footwear and return to walking progression. External biofeedback was performed to promote complete and immediate PF relaxation.

Outcomes: The patient noted near resolution of SUI and bowel urge, less intense and frequent unwanted arousal, less frequent nocturia and post-void dribbling. When the patient modified sitting posture on his couch, he noted immediate reduction of the abdominal rash. Final score on the NIH-CPSI M was 15. A six-point decline in the NIH-CPSI total score is the minimal threshold to suggest a treatment response; this change was evident.

Discussion: Outcomes possible with PFPT are even more robust than traditional physical therapy, especially related to QoL. Patients with TM can achieve greater freedom from urinary, bowel and sexual dysfunction. As PFPTs have a strong background in musculoskeletal impairments, this serves as an even greater advantage passed on to clients.

Abstract ID: 35063

TITLE: An Exploratory Study on the Barriers to Pelvic Health Knowledge in Rehabilitation Clinicians and Students

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Purpose: Pelvic floor rehabilitation is a form of therapy that is often underutilized and overlooked, even by clinicians and students. Our research aimed to explore the barriers clinicians and students face regarding awareness and access to knowledge of pelvic health.

Number of Subjects: 286 rehabilitation clinicians and students.

Materials and Methods: Participants were recruited through social media platforms, word of mouth, and e-mail to complete a survey regarding barriers to this specialty that rehabilitation clinicians and students encounter. Researchers obtained permission from forum moderators prior to survey distribution.

Results: Participants consisted of 83.22% females, 15.38% males, and 1.4% non-binary individuals and were between the ages of 18-69 with the majority in the age range of 18-25 (40.21%). Most participants identified as white (88.74%); others identified as Asian (5.12%), Black or African American

(3.41%), other (1.71%), prefer not to say (0.68%) and American Indian or Alaskan Native (0.34%). Participants comprised of 39.15% as current students, 18.51% had 0-5 years of clinical experience, 15.66% had 6-10 years, 8.9% had 10-15 years, and 17.79% had 15 or more years. With regard to the title of this specialty, 39.21% of participants originally knew it as “Women’s Health”; however, 97.48% believed that it should be referred to as “Pelvic Health”. The top 5 barriers to learning about pelvic health included a lack of time (23.15%), lack of experienced educators (16.46%), lack of educational resources available (12.84%), lack of finances for continuing education (12.48%), and a lack of comfort interacting with patients (8.32%). After analyzing the participants’ ratings of comfort with screening, treating, and referring patients who present with pelvic health disorders, it was found that those with lowest confidence also had the lowest interest in learning more about the specialty. Additionally, increased pelvic-specific education time was associated with increased comfort levels with screening and treating patients with pelvic health disorders.

Conclusions: Results of this study identified the need for further education surrounding the benefits of pelvic floor rehabilitation in clinicians and students. We strive to promote the name of “Pelvic Health” compared to “Women’s Health” as it is more inclusive to all genders. It was shown that 75% of research participants wanted more information regarding pelvic health. This may suggest that educational institutions should increase pelvic health content to meet the needs of clinicians.

Clinical Relevance: The questionnaire was designed to not only understand barriers to pelvic health knowledge, but to spread awareness of its importance in collegiate and continuing education courses and encourage inclusion and opportunity within pelvic rehabilitation regardless of gender and race. Improvements in the quality and equality of pelvic floor rehabilitation patient care begins with changes made to develop experienced and knowledgeable rehabilitation clinicians in the community.

Abstract ID: 35072

TITLE: A Systematic Review: The Reported Efficacy of Available Treatment Interventions for Pediatric Giggle Incontinence

AUTHORS/AFFILIATIONS: Marsha L. Bowman, PT, DPT; Stephanie Deines, SPT, Jordon Greer, SPT; Ann Hajec, SPT; Sean Harper, SPT; Taylor Tolleson, SPT; Tennessee State University, Nashville, TN. UNITED STATES.

Purpose/Hypothesis: Giggle incontinence (GI) is a relatively rare and unique form of daytime urinary incontinence (DUI) seen most often in pediatric patients. GI, unlike other incontinence related pathologies, is only triggered in response to laughter resulting in a complete and uncontrolled emptying of the bladder. The etiology of GI is not fully understood and there is not an established gold standard for treatment. Current research has focused on three physiological components that take place during laughter, with each component being treated with a different intervention. The aim of this study was bifold: determine the current reported efficacy of treatment interventions for GI and to evaluate their effectiveness in relieving or reducing the incontinence.

Materials and Methods: A systematic literature search of PubMed and Google Scholar, Tennessee State University Library, and JSTOR was performed using the following keywords or terms: children, diurnal enuresis, giggle micturition, laughter, adrenergic alpha-antagonists, day-time urinary incontinence, urination disorders, dysfunctional voiding, pediatric urinary incontinence, lower urinary tract dysfunction, idiopathic situational incontinence. Inclusion criteria for peer reviewed articles included randomized controlled trials, clinical trials, retrospective reviews, or case studies with a pediatric/adolescent patient population diagnosed with lower urinary tract disorder (LUTD), DUI, and/or GI.

Results: Twenty-six articles met the criteria and were included in this systematic review: eleven directly related to giggle incontinence, four related to overactive bladder, three related to voiding dysfunction, two related to other forms of urinary incontinence, six lower urinary tract dysfunction. Seven studies investigated urotherapy, eleven investigated pharmacotherapy, six investigated combined urotherapy and pharmacotherapy, and one investigated the effects of Kinesio taping on urinary incontinence.

Conclusion: Favorable results were found with 76.98% of patients reporting partial or complete resolution of giggle incontinence after receiving interventions. Reported patient responses to all interventions were 55.33% complete response, 21.65% partial response, and 34.34% no response. The ICCS recommendation for measuring and reporting clinical outcomes is defined as follows: complete response: 100% effective; partial response: 50% to 99% effective; and no response: less than 50% effective. While specific urotherapy (SpU) treatment approaches were associated with the highest percentage of complete responses, followed by pharmacotherapy and standard urotherapy (StU), the overall efficacy of any single intervention or the dominance of one intervention over another could not be concluded.

Clinical Relevance: Physical therapists treating patients with giggle incontinence need to strongly consider specific urotherapy interventions based on this current systematic review. Specific urotherapy interventions include pelvic muscle training, biofeedback, and neuromodulation and are frequently part of comprehensive pelvic physical therapy.

Abstract ID: 35077

TITLE: Physical Therapy Interventions to Improve Quality of Life and Lumbopelvic Pain in Pregnant Women

AUTHORS/AFFILIATIONS: Meredith Porteous, SPT; Katy Ranes, SPT; Samantha Ferraro, SPT; Mindy Brummett, PT, DPT, OCS; University of North Texas Health Science Center, Fort Worth, Tx. UNITED STATES.

Purpose: The purpose of this literature review was to answer the following question: Which evidence-based physical therapy interventions are used to improve quality of life and lumbopelvic pain in women who are pregnant? This review addressed the following: (1) exercising effects on Quality of Life (QoL), (2) Pelvic Girdle Pain (PGP), and (3) Low Back Pain (LBP). Clinicians can use the information provided to improve pain and decrease the likelihood of having a complicated birth in women who are pregnant.

Subjects: Pregnant women during their second or third trimester with no complications and a single fetus pregnancy.

Methods: Three independent authors searched databases, including PubMed and EBSCOhost. Inclusion criteria for this review were articles with a publishing range between 2011-2021, articles relating to the pregnancy period only, and the pelvic-girdle pain articles limited to only pelvic girdle pain. Exclusion criteria were studies that were not in the English language or those that did not grant access to the full article.

Results: As medical professionals, we should encourage pregnant women to remain physically active during pregnancy to help improve QOL, decrease LBP and PGP intensity and functional disability.

Conclusion: The purpose of this review was to determine which evidence-based interventions can help improve QoL, PGP, and LBP in pregnant women. The literature supports the benefits of exercising during pregnancy to decrease the severity of these factors. Additionally, this paper finds that when QoL, PGP, and LBP are left untreated, it can lead to labor complications. These complications can have long-lasting effects on the infant and the mother. There are several screening tools that can be used to assess whether a pregnant woman is feeling depressed, anxious, or having insomnia such as the Short-Form Health

Survey (SF-36), Insomnia Severity Index, and the Zung Self-Rating Depression Scale. It should be noted that any symptoms related to depression, anxiety, and insomnia should always be reported to a medical professional as early as possible to decrease the chances of complicated labor and positively influence the baby's development. Lastly, physical therapists can encourage pregnant women to remain physically active during pregnancy to help decrease PGP and LBP intensity.

Clinical Relevance: Incorporating evidence-based interventions into clinical practice is essential for quality patient care. Symptoms related to insomnia, anxiety, or depression should be screened by a medical professional as early as possible. In addition to screening, there is evidence to support exercise as an effective intervention. Prescription of general and stabilizing exercises can be used to improve QoL, PGP, and LBP in pregnant women. In conclusion, screening for QoL, and incorporating general and stabilizing exercises are evidence-based interventions that healthcare providers should consider incorporating into their practice to decrease emotional and functional disability experienced by women during pregnancy.

Abstract ID: 35501

TITLE: Getting to the Point of Perception: Dry Needling Beyond Just Trigger Points- A Case Series

AUTHORS/AFFILIATIONS: JaAsha Peña, PT, DPT; Stephanie Bush, PT, DPT, MEd, WCS, Brooks Institute of Higher Learning, Jacksonville, FL, UNITED STATES.

Purpose: Pelvic organ prolapse (POP) occurs when one or more of the pelvic organs is displaced into the vaginal canal. Women with POP have been shown to have reduced sensitivity to thermal and vibratory sensation in the genital region. These changes in awareness and sensitivity may be the result of damage to the peripheral mechanoreceptors in the pelvic floor muscles (PFM) and related connective tissue impacting the cortex's ability to accurately detect the pelvic organs' and/or PFM location in space preventing adequate support to the pelvic organs. Current literature suggests that PFM training has a significant impact on POP stage and symptoms, but there is limited evidence on the effectiveness of dry needling (DN) for this condition. Needle manipulation may stimulate a variety of sensory mechanoreceptors and nociceptors via connective tissue matrix deformation that could contribute to improved PFM support to the pelvic organs. The purpose of this case series was to investigate non-trigger point-based DN to the osseo-tendinous junctions of the superficial genital

muscles as a part of a multimodal approach in the management of POP symptoms.

Case Description: Three Caucasian females presented to outpatient physical therapy with POP and lower urinary tract symptoms. The patients' average age was 65.3 years old. Positive examination findings for all patients included positive perineal descent and increased anterior vaginal wall laxity with organ displacement consistent to the level of the hymen. All patients had reported symptoms of heaviness in the vaginal region that they considered at least somewhat bothersome based on the Pelvic Floor Distress Inventory- 20 (PFDI-20) scoring system; however, they each declined use of a pessary at the time of physical therapy treatment.

Results: The patients in this case series were treated one to two times a week for an average of ten weeks. Each patient demonstrated improved perineal descent immediately following DN intervention, improved left/right discrimination during the treatment session following DN intervention, and improved PFM strength, endurance, and coordination after eight visits. All three patients demonstrated positive change in their PFDI-20 scores. These changes demonstrate decreased perceived dysfunction and reduced symptom impact on quality of life.

Clinical Relevance: Women with POP have been shown to have reduced somatosensation in the genital region which may be related to changes in cortical mapping due to injuries sustained in childbirth or detachment from the genital region. The results of this case series suggest that the neurophysiologic effects of DN may assist in improvement of PFM function for patients with POP, particularly those who cannot tolerate use of a pessary. Most of the studies examining the effects of DN focus on trigger point DN, and there is a paucity of research on the use of DN for pelvic floor dysfunction. The outcomes of this case series suggest more research should be performed regarding the effects of non-trigger point-based DN on pelvic floor function.

Abstract ID: 35520

TITLE: Multigestation and exercise: A Case Report
AUTHOR/AFFILIATION: Cassandra Vietas, PT, DPT, CLT, Ohio State University, Columbus, Ohio, UNITED STATES.

Background/Purpose: This case followed a patient who was pregnant with triplets and remained highly active throughout her pregnancy. There is strong evidence supporting exercise throughout singleton pregnancy to reduce the risk of gestational diabetes, preeclampsia, pelvic pain, urinary incontinence

and depression. Additionally, exercise is an effective pain modulator; it reduces the pain threshold and improves pain coping. There is limited research on multi-gestation pregnancies and exercise. The literature that does exist primarily focuses on twins. This leaves providers with limited ability to provide evidenced-based recommendations for the type, intensity and frequency of exercise that is safest and most beneficial for higher order pregnancy. The purpose of this case was to demonstrate exercise supervision during a higher order pregnancy.

Case Description: A 30-year-old patient, who was 18 weeks pregnant with triplets, was referred to Pelvic Floor Physical Therapy (PFPT) for pelvic pain and exercise supervision. Her prior level of activity was running, high intensity training, swimming, and biking. Upon evaluation, she demonstrated decreased deep core activation, positive provocation tests, disrupted sleep, and decreased sitting tolerance. Her primary goal was to maintain an active lifestyle throughout her pregnancy. Visits were focused on modifying her exercise for safety and to reduce her pain throughout the pregnancy. She participated in biking, swimming, and weightlifting until her 33rd week of pregnancy. Modifications included duration changes, intensity and resistance reduction, adding functional breath with deep core activation and initiating water-based exercise to reduce pain. In addition to exercise management, cesarean delivery preparation was provided to effectively transition into the fourth trimester and lay groundwork for returning to exercise.

Outcomes: Back pain outcomes were measured with both the Oswestry Disability Index (ODI) and the Patient Specific Functional Scale (PSFS). The ODI and PSFS did not change clinically throughout the plan of care. This outcome demonstrated clinical maintenance. Based on this, the plan of care was successful as it demonstrated continued ability to exercise throughout a progressive, higher order pregnancy.

Discussion: Antepartum PFPT allowed this patient to improve pelvic discomfort and maintain an exercise routine throughout pregnancy safely. The patient appreciated her course of PT as it allowed her to maintain good mental health throughout pregnancy and it accelerated her postpartum recovery. When she returned to PT postpartum, she was able to initiate PT focused on abdominal core strength and returning to running immediately. This case report demonstrates the importance of antepartum exercise supervision for patients with higher order pregnancies as it allows patients to maintain healthy physical, emotional and mental health as they transition into parenthood.

Abstract ID: 35754

TITLE: Patterns of Physical Therapy Screening for Urinary Incontinence in Arizona

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Purpose/Hypothesis: This study aimed to explore the screening patterns of physical therapists in Arizona regarding urinary incontinence. Additionally, we explored reasons physical therapists do not screen regularly to direct future discussions on thorough examination practices.

Number of Subjects: 449

Materials and Methods: An online survey was developed based on a previously used survey tool exploring a similar construct. The survey included 19 closed-ended, 5-point Likert scale-type, and demographic questions. There were 5,621 surveys sent to Arizona licensees via email.

Results: There were 512 responses received with 449 complete data sets. American Physical Therapy Association members were significantly more likely to screen for urinary incontinence than non-members ($p = 0.011$). Clinicians who felt confident in their screening practices screened more often than clinicians who did not feel confident ($p < 0.001$). Clinicians who worked in rural areas did not screen more frequently than those in urban settings ($p = 0.181$). Female physical therapists screened more often than male physical therapists ($p = 0.047$). There was no correlation between the highest degree earned and the frequency of screening ($p = 0.250$). For those physical therapists who choose not to screen, the most common reasons were: "It is not relevant to patient treatment," "I do not feel that I have the knowledge or skills to appropriately screen," and "I am unsure how to manage urinary incontinence."

Conclusions: Clinicians confident in their screening practices are more likely to screen for urinary incontinence. Factors such as years in practice, highest earned degree, and practice setting is not associated with screening practice confidence or frequency. These findings differ from the prior research, which indicated that improved screening practices were correlated with clinicians' entry-level degrees and women's health specialty.

Clinical Relevance: Urinary incontinence is an under-reported yet pervasive problem, and improved

screening frequency by physical therapists will benefit a wide variety of patient populations. Strategies to improve the confidence of clinicians to screen for incontinence could benefit patients by identifying issues earlier so that referrals to the appropriate providers can be made.

Abstract ID: 35829

TITLE: Applying Sensory Discrimination Testing to the Pelvic Floor Musculature: A Case Report

AUTHORS/AFFILIATIONS: Jessica Finney, PT, DPT; Stephanie Bush, PT, DPT, MEd, Brooks Rehabilitation, Jacksonville, Florida, UNITED STATES.

Background/Purpose: Sensory discrimination testing is a type of objective measure used to determine the sensitivity of the sensory system to discriminate inputs in a certain area of the body. There is currently a lack of scientific research on the application of sensory discrimination testing to the pelvic floor musculature, despite it often being a source of chronic pain and coordination dysfunction. The purpose of this case report was to describe the implementation and results of sensory discrimination testing in patients with pelvic floor dysfunction via left and right discrimination testing.

Case Description: The two patients in this case report were females, aged 46 and 69, who presented to physical therapy with symptoms of urinary incontinence. A left and right discrimination testing protocol of the pelvic floor musculature (PFM) was developed and utilized to assess the relationship between PFM coordination and sensory discrimination improvements.

Outcomes: After approximately six weeks, each of the patients had improved left and right PFM discrimination accuracy and coordination as evidenced by perineal body mobility testing. Both patients had clinically significant improvement in urinary incontinence severity, as evidenced by the International Consultation on Incontinence Questionnaire- Urinary Incontinence (ICIQ-UI) self-report outcome measure.

Discussion: There is limited research on the use of sensory discrimination testing in the pelvic floor musculature. Left and right discrimination testing is a proposed option for this area when testing such as two-point discrimination is not feasible. Based on the two cases presented, there could be a correlation between improved PFM coordination and left and right discrimination accuracy.

Abstract ID: 36025

TITLE: Multi-Modal Pelvic Floor Physical Therapy to Facilitate Successful Return to Work as a Standardized Patient

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Background and Purpose: High-tone pelvic floor dysfunction (HTPFD) results in increased tone and pelvic floor dyskinesia, including paradoxical contraction and incomplete relaxation. These symptoms can lead to dyspareunia, vaginismus, chronic pain, constipation, and other gastrointestinal symptoms. This case describes an individual who experienced symptoms of HTPFD with direct impacts on her ability to participate in employment as a standardized patient.

Case Description: The patient described in this case was a female in her 5th decade who presented to physical therapy with complaints of chronic constipation and dyspareunia. She worked part-time as a paralegal and part-time as a standardized patient undergoing 30 vaginal exams in a year. At the time of the physical therapy evaluation, she was unable to perform her duties as a standardized patient due to a recent increase in pain with vaginal insertion. The patient also complained of chronic constipation and occasional straining with bowel movements (BM). She reported that she became anxious if she “missed the opportunity” to have a BM in the morning, particularly as her paralegal position was transitioning from a “work from home” position to an in-office position. Upon examination, this patient presented with globally increased muscular tone on internal vaginal examination. The left obturator internus (OI) demonstrated hypertrophy and increased pain during palpation. During verbal cuing to simulate a BM, the patient demonstrated contraction of the pelvic floor with no relaxation. The patient participated in pelvic floor physical therapy (PFPT) sessions for 35-50 minutes, once a week, for 9 weeks, with a 2-week and a 4-week follow-up. PFPT interventions included education on the role of pelvic floor relaxation, education on abdominal massage in preparation for BMs, collaborative discussion of management of stress triggers, meditation, and diaphragmatic breathing. Additionally, manual therapy to the internal pelvic floor muscles, thoracic spine, and ribs was provided. The patient performed pelvic floor relaxation exercises in the clinic with tactile and verbal cues and was instructed on performing these exercises on her own.

Outcomes: After 9 visits, the patient returned to work as a standardized patient, including 6 pelvic examinations with minimal pain. The patient reported a 25% reduction in pain (visual analog scale) during vaginal penetration. She was able to demonstrate volitional pelvic floor relaxation and descent. The patient was also able to have daily BMs without straining, with a 50% reduction in use of laxatives. At two-week

follow-up, improvements were maintained. At four-week follow-up she reported a recurrence of constipation that she managed with techniques learned in PFPT.

Discussion: PFPT that incorporated a combination of internal and external manual therapy, patient education, behavioral therapy, and pelvic floor relaxation exercises was able to successfully facilitate this patient’s return to work as a standardized patient receiving frequent vaginal examinations.

Abstract ID: 36366

TITLE: Dry Needling in Management of Chronic Pelvic Pain in a Female With Facioscapulohumeral Muscular Dystrophy

AUTHORS/AFFILIATIONS: JaAsha Peña, PT, DPT; Stephanie Bush, PT, DPT, MEd, WCS, Brooks Institute of Higher Learning Jacksonville, FL, UNITED STATES.

Purpose: Facioscapulohumeral muscular dystrophy (FSHD) is an autosomal dominant disorder with a prevalence between 1/8,000 and 1/20,000. FSHD is characterized by muscle weakness that typically progresses from proximal to distal and includes musculature of the face, shoulder girdle, trunk, pelvic girdle, and lower extremities. Musculoskeletal pain and postural changes are common features of FSHD. The postural changes and muscle imbalance associated with FSHD could predispose those with the disease to an increased incidence of pelvic floor dysfunction (PFD). Chronic pelvic pain (CPP) is defined as noncyclic, persistent pain in structures related to the pelvis lasting six months or more and can involve one or more body systems. Dry Needling (DN) is a minimally invasive, cost-effective treatment technique used to treat myofascial pain. Despite evidence that DN is useful in managing chronic myofascial pain, there is limited research on the effectiveness of DN for CPP. This case aimed to describe the effectiveness of DN in a 37-year-old female with FSHD and a primary complaint of chronic pelvic pain.

Case Description: The patient was a multiparous 37-year-old female with complaints of chronic constipation, chronic bilateral hip pain, dyspareunia, and double incontinence. The patient had prior pelvic floor physical therapy with successful resolution of urge urinary incontinence, but her pain symptoms persisted. Due to minimal improvements in the patient’s pain, DN was used for pain reduction as a part of an evidence-based multimodal treatment approach in management of her physical therapy diagnosis of intra-abdominal pressure regulation impairment with overactive PFM.

Results: At the eighth visit, the patient reported no constipation, no fecal smearing, 1/10 pain in bilateral posterolateral hips, no pain with intercourse, and a reduction in symptoms of urinary incontinence from two to three times a day to three to four times a week. Her overall Numeric Pain Rating Scale score improved from 8/10 to 1/10, exceeding the MCID. The patient's Pelvic Floor Distress Inventory-Short Form 20 score improved from 146.88 to 61.5, with the most significant changes noted in the colorectal anal domain. Her Lower Extremity Functional Scale score improved by 15 points, exceeding the MCID and MDC. The patient demonstrated a positive change in her Incontinence Impact Questionnaire-7 score which decreased from 42.85 to 14.33. She also met the MCID for the ICIQ-UI at visit four, improving by 4 points.

Clinical Relevance: This case demonstrated that DN, as an adjunct to traditional pelvic floor rehabilitation interventions, was associated with positive outcomes, including improvement of chronic pelvic pain. This case also highlights the possible impact of FSHD on PFM function and the need for thorough screening of the urogenital and colorectal symptoms in this patient population. Further investigation regarding incidence of pelvic floor dysfunction among the population with FSHD is warranted. Future research is also recommended to determine the long-term effectiveness of DN in patients with CPP.

Abstract ID: 36380

TITLE: Strength Training Combined With Pelvic Floor Muscle Training to Improve Urinary Incontinence: A Case Study

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Purpose/Hypothesis: Stress Urinary Incontinence (SUI) is defined as the involuntary and sudden loss of urine secondary to increased intrabdominal pressure. Up to 15.7% of women worldwide suffer from SUI. This problem can occur in a variety of individuals and is often a common complaint of those following vaginal or caesarian deliveries. Studies report that exercises involving the pelvic floor can improve symptoms of SUI by 70%. There is a lack of literature to support specific interventions for SUI in women outside of pelvic floor muscle training (PFMT). There is limited evidence that the hip and trunk musculature are involved in the improvement of SUI, however these muscle groups are shown to co-activate with

pelvic floor contractions. Therefore, the purpose of this case study was to demonstrate the use of strength training in combination with PFMT to improve the symptoms of SUI.

Case Description: The patient was a 36-year-old female who has undergone 3 caesarian births. Her children were 14, 11 and 7 years old. Patient reported urinary incontinence with coughing, sneezing, and laughing since the birth of her last child. Strength was assessed via the Laycock-Modified Oxford Score for Power (PERFECT score) and an 8-repetition maximum (8-RM) of two compound movements, a row and a squat. Her baseline PERFECT score was a 2/5 power contraction and a 3 second endurance hold. Her strength began at 34lbs for her 8-repetition standing cable row and 15lb dumbbells in a front racked position for her 8-repetition squat. The SUI was measured via the Pelvic Floor Disability Index (PFDI-20) and her initial score was 25%. Therapeutic interventions outside of the row and squat focused on additional compound movements targeted at 4 sets of 6-8 repetitions, with the aim to activate lower extremity and trunk musculature. PFMT was also used throughout treatment and given as a home program.

Results: The patient completed 13 sessions of physical therapy over nine weeks. She demonstrated improved strength, reduced leakage, and improved symptoms. Her PFDI-20 score went from 25% to 8% disability. Her mid-row 8-RM improved by 21lbs and her squat improved by 40lbs. Her PERFECT scoring for an isolated pelvic floor contraction went from a 2/5 for power contraction and a 3 second endurance hold to 3+/5 and a 6 second endurance hold.

Conclusions: This study demonstrated improvements in daily symptoms, isolated pelvic floor muscle strength and functional strength in this 36-year-old patient with SUI. These outcomes suggest that functional strength training of the proximal hip and trunk musculature may be beneficial for the treatment of SUI.

Clinical Relevance: Functional Strength training is not a traditional form of PFMT that should be considered for women experiencing pelvic floor dysfunction. Improving proximal hip, lumbar and abdominal strength along with PFMT could help to improve pelvic floor function in the long-term. More research is needed to continue to understand the benefits of functional strength training for treatment of SUI.

Abstract ID: 36493

TITLE: Pelvic Floor Physical Therapy for a Collegiate Pitcher With Urinary Incontinence and Pelvic Girdle Pain

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Background/Purpose: Over half of female athletes report lower urinary tract symptoms (LUTS). Pelvic girdle pain (PGP) in female athletes is under-reported with a prevalence of 18% in female triathletes. The presentation of both LUTS and PGP in female athletes is absent in the literature. Studies utilizing pelvic floor physical therapy (PFPT) programs for LUTS and PGP have been conducted in postpartum populations. This case report adds to a lack of studies on LUTS and PGP in nulliparous female athletes. The purpose of this case report was to describe the effects of a movement-based PFPT program on LUTS, dyspareunia, and PGP in a collegiate female athlete.

Case Description: The patient was a 19-year-old female Division 1 (DI) collegiate softball pitcher who presented with urinary urgency, frequency, incontinence, and dyspareunia with pain at the pubic symphysis (PS) and posterior pelvis. Symptoms worsened with sport participation and were present for 6 months. Medical history included kidney stones and decreased bladder capacity. Urinary consult was negative for infection, and the patient was provided medication for overactive bladder. Physical therapy (PT) examination revealed habitual lumbar extension with rotation and hip adduction/medical rotation during functional activities and decreased strength in bilateral hips, abdominals, and pelvic floor (PF) muscles. Palpation of the PS and posterior pelvis on the right (R) was positive for pain. Special tests including the Ober, FABER, FADIR, and Stork were positive on the R side. Sacroiliac compression and distraction were positive at the PS. Internal PF examination revealed absent voluntary and involuntary relaxation and pain to touch to all muscles. Consent was obtained for this report.

Outcomes: The patient completed 4 PT sessions over 3 months. Intervention included education, movement pattern training for the spine and hip, hip and trunk strengthening, coordination training for PF muscle activation and timing, pelvic belt use with exercise and sport, vaginal icing for dyspareunia, and modifications to functional movements and pitching mechanics. PF, hip, and abdominal strength improved by one muscle grade. The NIH-CPSI Female total scores in all categories improved from 27 to 3 at discharge, exceeding the 6-point minimal detectable change (MDC). The patient returned symptom-free to competitive collegiate pitching with a pelvic belt and intercourse.

Discussion: This is the first report to describe PFPT for LUTS, dyspareunia, and PGP in a female athlete. Interventions for LUTS and PGP reported in postpartum literature are similar to this report. Clinically meaningful outcomes of reduced urinary incontinence and improved function were identified in 1/3 duration of treatment time reported in literature. Results may be explained by interventions focusing on pelvic girdle stabilization, movement patterns with functional activities, and timing and recruitment of PE, hip and abdominals during load transfer. PTs should consider transferring knowledge from other populations with LUTS and PGP in the management of female athletes.

Abstract ID: 36819

TITLE: Putting It on the Map: Pelvic Health Delivery Creates Safety-net for Region's Underserved

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Purpose: Evidence shows that 1 in 4 US women have pelvic floor dysfunction (PFD). Pelvic health physical therapy (PHPT) has been shown to cure or improve symptoms. Despite the evidence for PHPT in treatment of PFD, access to this is extremely lacking. In the city of St. Louis, there are only 2 clinics that have PHPT, representing a disproportionate burden on access for the un/underinsured. Regional data suggest that only 0.4% of the total number of PHPT patients seen were charity based, while 5% were covered by Medicaid. About 11% of St. Louis City residents are uninsured and 15% of Missouri residents carry Medicaid. The purpose of this report was to highlight limitations in access to PHPT in underserved populations and illustrate the implementation of a unique and innovative pro bono clinic. This successful collaboration of pelvic health specialists assists the underserved, enhances awareness of pelvic health physical therapy to the inter-professional team, and prepares future doctorate of physical therapy (DPT) students to provide quality care.

Description: The inaugural class of Saint Louis University (SLU)-SSM Health Physical Therapy Women's Health Physical Therapy Residency created a pro bono PHPT clinic. This free clinic, alongside the OBGYN clinic, enhances inter-professional teamwork and education. A patient screening form was created to identify appropriate patients and streamline referrals. This design promotes early education and visibility of PHPT to SLU DPT, nutrition, and medical students, promoting the profession's growth.

Sessions allow for 1 on 1 care with the physical therapist and DPT students take lead as appropriate. Since conception of the PHPT clinic, 40 patients have been screened with greater than 30% entering treatment for PFD.

Summary of Use: Based on physical therapist presence and screening, 35% of patients received PHPT care. The successful implementation resulted in improved access to the underserved, enhanced pelvic health education, and created a roadmap for others to follow. Clinic success is due to the established pro bono clinic model and referral sources, the familiarity of the OBGYNs in clinic with the co-residents who established the clinic, and the strong support of residency and university faculty. Educational modules and opportunities are being created for DPT students to complete before attendance to improve their experience. Pro bono care such as this can serve the Academy of Pelvic Health to encourage members to make a meaningful impact in their communities.

Abstract ID: 37037

TITLE: Pelvic Floor Rehabilitation of a Female With Chronic Postpartum Stress Urinary Incontinence

AUTHOR/AFFILIATION: Christina Booth, PT, DPT, Virginia Commonwealth University, Richmond, VA, UNITED STATES.

Background and Purpose: The prevalence and impact of pelvic floor dysfunction (PFD) has become increasingly apparent in postpartum women, affecting nearly 50% of cases. PFD can present in a variety of ways including but not limited to stress urinary incontinence, fecal incontinence, hypertonic pelvic floor musculature, pelvic pain, pelvic organ prolapse, vulvodynia, and dyspareunia. Stress urinary incontinence is common following childbirth and can significantly impact patients both physically and emotionally. Although pelvic floor physical therapy (PFPT) is well supported for women experiencing stress urinary incontinence, there is minimal evidence on specific parameters for chronic pelvic floor dysfunction. The purpose of this case study was to describe a structured rehabilitation approach from chronic postpartum stress urinary incontinence.

Case Description: A 21 year old female presented with stress urinary incontinence with functional activities including lifting, running, squatting, sneezing, laughing, and jumping. History included one vaginal delivery 12 months prior to initial evaluation, with no complications. The patient reported a history of pelvic pain, urgency, constipation, or fecal incontinence. Pelvic floor strength was assessed via the Laycock assessment of 3/4/3//6. Treatment included progressive functional exercise incorporating diaphragmatic breathing and pelvic floor contractions, using gravity

to increase demand on pelvic floor musculature. Throughout her plan of care, the patient was able to progress from supine and hook lying exercises to functional squatting, lifting, running, and jumping activities with no reports of stress urinary incontinence. Gravity and deep breathing techniques were used to progress demand on pelvic floor musculature.

Outcomes: The patient completed 22 sessions over four months. Discharge findings included ability to perform deep squat and lift #20 from floor with no stress urinary incontinence, translating to improved ability to lift her daughter from the ground. Pelvic health functional status score improved from 52 to 87. Pelvic floor strength via Laycock assessment improved to 4/8/8//8. Frequency of stress urinary incontinence improved from initially 10-12 incidents of leakage per day to 0 incidents of leakage per day for over one month. Patient was able to perform her physical training test for her active duty military occupation consisting of running 1.5 miles, 1 minute of push ups, and 1 minute of situps, with no incidents of stress urinary incontinence.

Discussion: The successful outcomes of this case study contribute to advancement in clinical decision making for women with stress urinary incontinence following childbirth. Deep breathing techniques and pelvic floor activation during functional exercise, while using gravity as a progression, can significantly decrease frequency of stress urinary incontinence in females and improve quality of life.

Abstract ID: 37053

TITLE: Evidence for Increased Tone of Pelvic Floor Muscles in Pelvic Health Conditions: A Systematic Review

AUTHORS/AFFILIATIONS: Rachel S. Worman, PT, DPT, University of Queensland, Brisbane, QLD, AUSTRALIA; Ryan E. Stafford, PhD, University of Queensland, Brisbane, QLD, AUSTRALIA and University of Western Australia, Perth, WA, AUSTRALIA; David Cowley, B.Phty, University of Queensland, Brisbane, QLD, AUSTRALIA; Caroline Baldini Prudencio, PhD, Botucatu Medical School, São Paulo State University (Unesp), Universidade Estadual Paulista, Botucatu, São Paulo, BRAZIL; Paul W. Hodges, PhD, University of Queensland, Brisbane, QLD, AUSTRALIA.

Purpose/Hypothesis: Pelvic floor muscle (PFM) tone includes active and passive components and is argued to be greater than “normal” in some pelvic health conditions. Despite considerable attention in clinical literature it is unclear how convincingly this is supported by evidence. This study aimed to systematically review evidence for increased tone of PFM in pelvic

health conditions with consideration of study methods, outcomes and terminology. For methods we addressed: (i) whether the study design enabled interpretation of greater tone for participants with a pelvic health condition than a reference value or a control group based on study quality, design, comparison group/data, and (ii) quality and interpretation of measures used to assess tone. For outcome we assessed: (i) evidence for greater tone in pelvic health conditions, and (ii) evidence for differences between age, sex/gender, and conditions. For terminology we aimed to: (i) document diversity and thematic grouping of terms used to describe increased tone; and (ii) consider the accuracy of application of terms.

Materials and Methods: Electronic databases (PubMed, CINAHL and EMBASE) were searched up to May 31st 2021. The search strategy included variants of pelvic and/or floor, muscle and tone using keywords and MeSH terms. Included papers investigated increased tone of the PFM and reported measures of active or combined active and passive properties in any pelvic health condition. Data were extracted using a standardized form. Study quality was analyzed using a modified ROBINS-I tool and a score was allocated to determine whether the paper provided “convincing” interpretation.

Results: In total, 151 papers were included, reporting 103 outcomes measures from 8 tools. The most common condition was pelvic pain (n=16 conditions). Most papers were cross-sectional (57% of papers). Healthy controls were infrequently included for comparison (27%). Methods that precluded convincing interpretation were common (94%). Fifteen measurement tools provided convincing evidence; 10 demonstrated greater tone in pain conditions than in control participants. Eighty percent of papers studied adult females, 11% of participants were male, <1% were transgender and 6.1% were pediatric. Terminology was often inaccurate.

Conclusions: Despite the large literature, few studies provide convincing evidence for increased tone of PFM in pelvic health conditions. Interpretation is hampered by design and measurement issues. Few studies investigate male, transgender and pediatric groups.

Clinical Relevance: Clinically relevant key points include the: (i) importance of using measures that provide convincing evidence of tone; (ii) limited convincing evidence of increased tone is primarily in pain conditions and in females; and (iii) use of terminology that considers the measured muscle property and neurologic conditions.

Abstract ID: 37110

TITLE: Relationship Between Estimates of Puborectalis Stiffness Using Shear Wave Elastography and Electromyography in Healthy Males

AUTHORS/AFFILIATIONS: Rachel S. Worman, PT, DPT, University of Queensland, Brisbane, QLD, AUSTRALIA; Ryan E. Stafford, PhD, University of Queensland, Brisbane, QLD, AUSTRALIA and University of Western Australia, Perth, WA, AUSTRALIA; David Cowley, B.Phty, University of Queensland, Brisbane, QLD, AUSTRALIA; Paul W. Hodges, PhD, University of Queensland, Brisbane, QLD, AUSTRALIA.

Purpose/Hypothesis: Increased tone or stiffness of pelvic floor muscles (PFM) is considered to be involved in many pelvic health conditions but few studies have provided convincing evidence because of limitations to interpretation of measures. In males, tone of deep PFM (e.g., puborectalis muscle [PRM]) are limited to electromyography (EMG; active tone) or indirect measures (e.g., imaging measures that infer combined passive/active tone). Shear wave elastography (SWE) provides non-invasive estimates of muscle stiffness (combined active/passive tone). No study has investigated the validity of SWE as a measure for tone of the PRM in men. This study aimed to: (i) develop a method to measure the PRM with SWE to estimate muscle stiffness; and (ii) investigate the relationship between changes in SWE measures and changes in EMG PRM (left and right using a novel electrode) during contractions between 0%-75% maximum voluntary contraction (MVC).

Subjects: Ten healthy male participants (age - 36[8] years, body mass index - 24.5[2.0]) were recruited. Participants were excluded if they had a history of pelvic, urologic or bowel complaints using the ICS MaleSF, Rome IV criteria and NIH-CPSI pain subset.

Materials and Methods: A novel EMG electrode with two recording sites was placed per rectum to record the PRM and external anal sphincter muscle. The electrode was stabilized with suction. SWE was recorded with transperineal ultrasound imaging (US) at a location that enabled visualization of parallel fibres of the PRM. EMG and SWE video data were recorded simultaneously at rest and during contractions with EMG feedback (10%, 20%, 30%, 50%, 75% MVC). EMG amplitude and shear modulus calculated from SWE were normalized. Data were averaged over 3 s. EMG and SWE was compared using Pearson’s correlation (r^2).

Results: As participants contracted their PRM to match targets, normalized shear modulus values increased with increasing normalized EMG. Group data showed a strong relationship between measures for the left $r^2 = 0.66[0.19]$ (range 0.28-0.94), and right $r^2 = 0.59[0.33]$ (range 0.01-0.96) sides for most but not all participants. No difference was observed between the left and right sides ($P = .58$).

Conclusions: These data provide evidence of validity of SWE to estimate changes in muscle stiffness with changes in muscle activity.

Clinical Relevance: Objective methods are required to evaluate elements of muscle tone of individual PFMs bilaterally. SWE is a relatively new method that shows promise in quantifying the combined (active and passive) contributors to tone of PFMs. The transperineal imaging method used for SWE is non-invasive, which would limit any potential confounding from pain provocation that is possible with invasive per rectum recording methods.

Abstract ID: 37181

TITLE: Influence of Pregnancy-Related Musculoskeletal Pain on Satisfaction With Prenatal Care

AUTHORS/AFFILIATIONS: Katelyn Hickey SPT; Rita Deering PT, DPT, PhD, Carroll University, Department of Physical Therapy, Waukesha, WI, UNITED STATES.

Purpose/Hypothesis: Musculoskeletal (MSK) pain, especially lumbopelvic pain, is common during pregnancy. Nonetheless, MSK pain during pregnancy often goes untreated. Physical therapy is an effective treatment for perinatal MSK pain, yet referrals from birth providers are rare. Untreated MSK pain may negatively influence the health of pregnant and postpartum people. This international study inquired about MSK pain experiences during pregnancy and satisfaction with prenatal care. We hypothesized that people with MSK pain during pregnancy who didn't receive treatment for pain would report (1) lower satisfaction with prenatal care and (2) impairments in activities of daily living (ADLs).

Subjects: Females who were 18 years of age or older and gave birth up to 24 months prior to survey completion ($n=268$, 33.0 ± 3.5 years).

Materials/Methods: An online survey was developed, reviewed by content experts (1 board certified women's health specialist, 1 board certified sports specialist with pelvic health training, and 1 obstetric nurse), piloted in a small sample of participants who were more than 2 years postpartum, translated into Spanish by a professional translation service (then piloted by two native Spanish-speaking physical therapy students), and finally distributed internationally in both English and Spanish. Participants were recruited by flyers in the community and via social media. Responses were collected and analyzed using Qualtrics.

Results: MSK pain during pregnancy was reported by 90.3% of participants and 63.7% of participants with pain reported impairment of one or more ADLs and/or participation in physical activity. Despite the high

prevalence of MSK pain in pregnant individuals, 60.7% of participants were never asked about pain by their prenatal care providers, and only 20.7% of respondents with pregnancy related MSK pain were referred to physical therapy during pregnancy. Among the participants, 18.3% reported that having their pain ignored by their prenatal care provider decreased their satisfaction with prenatal care, while 67.6% of participants (some of whom sought care independently for their MSK pain) reported that having their pain addressed improved prenatal care satisfaction.

Conclusions: Most females have MSK pain during pregnancy; however, the majority are never asked about pain by prenatal care providers. Many pregnant people with MSK pain have difficulty with ADLs or avoid tasks (such as exercise) completely, yet few are referred to physical therapy. Failure to address MSK pain during pregnancy may negatively influence patient satisfaction, while acknowledging and appropriately managing MSK pain may improve patient satisfaction with prenatal care.

Clinical Relevance: MSK pain during pregnancy is common. Prenatal care providers should routinely ask perinatal patients about pain and refer patients with MSK pain to physical therapy. Physical therapists should be part of standard perinatal care, as multiple sources have described the important role they play in maternal health.

Abstract ID: 37270

TITLE: Hip Abduction Strength is not Different Between Continent and Incontinent Female Runners

AUTHORS/AFFILIATIONS: Heather M. Hamilton, PT, DPT; Mira Mariano, PT, PhD, Old Dominion University, Norfolk, Virginia, UNITED STATES; Runit Singh Kakar, PT, PhD, Oakland University, Rochester, Michigan, UNITED STATES.

Purpose/Hypothesis: Hip muscle strength has been considered to play a role in continence because of the anatomical and biomechanical relationships with the pelvic floor. Women with urinary incontinence (UI) have been reported to have decreased hip abduction (HABD) strength compared to continent women, and strengthening the hip muscles improves pelvic floor muscle strength. UI is prevalent among female runners, but HABD strength has not been investigated among runners with UI. The purpose of this study was to determine if there is a difference in HABD strength between female recreational runners with and without UI. The hypothesis was that incontinent runners would demonstrate decreased HABD strength compared to continent runners.

Number of Subjects: Thirty-seven female recreational runners, 11 self-reporting UI during running (age = 44.6 ± 8.7 years), and 26 continent female runners (age = 40.2 ± 7.5 years). Exclusion criteria included any lower extremity injury or surgery in the past 6 months, pain affecting running, current pregnancy, or less than 1 year postpartum.

Materials and Methods: Isometric and isokinetic ($120^\circ/\text{sec}$) HABD strength of the dominant limb was measured in side-lying using a Biodex dynamometer. Isometric testing was performed at 0° hip abduction. Participants performed 3 repetitions of a 5-second maximum voluntary isometric contraction with 30 seconds of rest in between repetitions, followed by 5 repetitions of isokinetic contractions (concentric/eccentric). Peak force of the isometric and isokinetic contractions was normalized to body mass and used in the analysis. Multivariate analysis of variance (MANOVA) was used to determine if there was a difference between groups in HABD strength (independent variable: UI vs. continent, dependent variables: isometric, isokinetic concentric, and isokinetic eccentric HABD, $P < .05$).

Results: There was no significant difference in HABD strength between incontinent and continent runners on MANOVA ($P = .616$, $\Lambda = .95$, $F(3,33) = .601$). Exploratory posthoc between group comparisons demonstrated no significant differences between groups in any measure of HABD strength (P 's $> .409$). Isometric HABD strength in UI group = $1.14 \pm .29$ Nm/kg, continent group = $1.14 \pm .29$ Nm/kg (Cohen's $d = 0$). Concentric HABD strength in UI group = $1.11 \pm .30$ Nm/kg, continent group = $1.02 \pm .34$ Nm/kg (Cohen's $d = .28$). Eccentric HABD strength in UI group = $1.61 \pm .35$ Nm/kg, continent group = $1.60 \pm .37$ Nm/kg (Cohen's $d = .03$).

Conclusions: Incontinent runners did not have decreased HABD strength compared to continent runners. One potential reason for a lack of difference between groups is that most participants in both groups (82% in UI, 78% in continent) reported participating in generalized strength training at least 1x/week in addition to running.

Clinical Relevance: There may be other important factors to consider for incontinent female runners besides HABD strength, such as running biomechanics, hip external rotation strength, weekly mileage and training volume, and childbirth history.

Abstract ID: 37422

TITLES: Low-Rate TENS as an Effective Treatment for Pelvic Pain: A Retrospective Case Study

AUTHORS/AFFILIATIONS: Michelle Allyn, PT, DScPT; Ryan Kamieneski, SPT, Andrews University, Berrien Springs, MI, UNITED STATES.

Introduction/Background: Gynecologic-related pelvic pain is a common problem in women that may lead to a decrease in quality of life. Chronic pelvic pain affects an estimated 26% of the world's female population. Specifically, the prevalence of dysmenorrhea is as high as 97%. The purpose of this case study was to investigate using transcutaneous electrical nerve stimulation (TENS) for pain relief in a female with chronic pelvic pain. TENS is an inexpensive and portable treatment for chronic pelvic pain. There is limited research on the effects of TENS on gynecologic-related pelvic pain, and further limited research on "low-rate" TENS. There is a substantial need for further study on the effects of "low-rate" TENS on gynecologic-related pelvic pain.

Case Description: A 21-year-old female presented with a five-month history of chronic lower abdominal/pelvic pain. The past medical history included dysmenorrhea and polycystic ovarian syndrome (PCOS). Daily gynecologic pain led to a decrease in quality of life. Persistent pain led the patient to seek treatment from physical therapy.

Outcomes: Single-channel "low-rate" TENS for chronic pain was provided at 5-hertz, 250 microseconds, on continuous mode for 30 minutes daily for 67 days at the maximum tolerated intensity. The configuration included two, 2-inch electrodes placed on the low back bilaterally, 1-inch from the second lumbar spinous process. The pain intensity was assessed on the verbal numeric rating scale (VNRS) with a range of 0-10 (0/10 being no pain and 10/10 being the worst pain possible). The patient reported VNRS levels of 4/10 that were reduced to 0/10 to 1/10 with the application of TENS. This substantial reduction in pain lasted 24 hours after each TENS treatment (give or take one to two hours). The pain was completely resolved after 2.5 months of TENS use.

Discussion: "Low-rate" TENS is an affordable treatment for gynecologic-related pelvic pain. Portable TENS units are inexpensive, possibly making TENS an option for patients with lower income or no health insurance. TENS is a safe alternative to pain medications with no side effects. The results of this study showed that "low-rate" TENS was effective in resolving chronic pelvic pain in a 21-year-old female. The positive outcomes in this case study suggest that "low-rate" TENS may be a viable option to consider for treating chronic pelvic pain in females.

Abstract ID: 37515

TITLE: The Impact of Exercise on Physical Health Outcomes in Incarcerated Women: A Systematic Review

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Purpose/Hypothesis: Current research indicates a lack of physical activity programs available for female inmates, contributing to reduced physical health outcomes and decreased quality of life. The purpose of this systematic review was to assess exercise interventions that promote physical wellness for women in prison.

Number of Subjects: N/A

Materials and Methods: A literature search was conducted of CINAHL, Cochrane, ProQuest, PTNow, Pubmed, and ScienceDirect using the search terms: (exercise AND "physical activity") AND (prison OR prisoner OR jail OR inmates) AND health AND intervention. Search limits were English, peer-reviewed, humans, adults (18+), 2009-2021. Selection criteria were women in prison; exercise interventions; outcomes: primary physical health/wellness, secondary mental health. Two reviewers independently assessed each study for methodological quality based on the Oxford Levels of Evidence 2011 (OCEBM) or Joanna Briggs Institute (JBI).

Results: A total of 3,632 studies were screened for eligibility. Five studies met selection criteria (1 RCT, 1 non-randomized control cohort, 1 case control, 1 pilot study, and 1 qualitative study). OCEBM scores ranged from 2-4 for quantitative studies and the qualitative study scored 8/10 on the JBI. Sample sizes ranged from 12-33 subjects (n=119). Programs took place over 6-12 weeks consisting of structured (mindfulness activities, aerobic exercise programs, and sports; 4 studies) or continuous recreational monitoring formats (pedometer self-reporting; 1 study) plus nutritional content (2 studies). Physical health outcome measures: body mass index, waist-to-hip ratio, bust and waist circumference, and overall physical health. Statistically significant reductions were seen in body mass index ($\bar{x} = -0.4$, $p = 0.042$, 1/3 studies) and bust size ($\bar{x} = -2.5\text{cm}$, $P = .002$, 1 study). Statistically significant improvements were found in secondary health outcomes using Likert-scales for sleep (0.96, $P = .01$, 1/2 studies), mental health (guilt: -0.94 , $P = .002$; hopelessness: -0.72 , $P = .006$; nail biting: -0.35 , $P = .002$, 1/2 studies), and outlet for anger and frustration (-0.35 , $P = .007$, 1 study). One qualitative study reported improved overall physical

and mental health, energy level, mood, anger management, and decreased stress/anxiety. No adverse events were reported.

Conclusions: Varied levels of evidence support using exercise interventions to improve physical and mental health outcomes in incarcerated women. Limitations included small sample sizes and variable interventions, parameters, and outcome measures. Further research is needed addressing women's health concerns in prison, specifically measuring the impact of exercise on physical and mental health.

Clinical Relevance: A well-rounded interdisciplinary program is necessary to address the complex health and wellness needs facing incarcerated women. Such programs should include structured or unstructured physical activity to address health outcomes and quality of life. Physical therapists are uniquely qualified to develop and provide exercise programs and educate on the benefits of regular physical activity which may contribute to improving life-long physical health in this population.

Abstract ID: 37607

TITLE: Effect of Recumbent Versus Alternative Labor Positioning on Birthing Parent Outcomes: A Scoping Review

AUTHORS/AFFILIATIONS: Rachel Verrill, DPT; Vivian Bui, SPT; Marissa Chiauzzi, SPT; Rebecca Collette, SPT; Rachel Pfeiffer, SPT; Emma Stock, SPT, Simmons University, Boston, MA, UNITED STATES.

Purpose/Hypothesis: This scoping review examined the recumbent position versus alternative position on adverse birthing parent outcomes. We believe that alternative positioning during the 1st stage of labor will decrease adverse outcomes such as increased pain, length of 1st stage labor, rate of fetal head descent, and cesarean section (C-SECTION) rates, compared to recumbent positioning.

Subjects: Six articles with a total of 1,209 nulliparous or primiparous participants were included.

Materials and Methods: Databases used were MEDLINE, Academic Search Ultimate, and CINAHL between 2014 and 2021. Articles were examined by five independent researchers. The studies were included based on the following inclusion criteria: nulliparous or primiparous individuals, use of alternative labor positions, and 1st stage of labor. The exclusion criteria were multiparous; second stage of labor; and lack of examination of one of the following variables: fetal head descent, adverse birth outcomes, rate of cervical dilation, duration of 1st stage labor, use of epidural, or rates of C-sections. The quality of studies were evaluated using the JBI (Joanna Briggs Institute) for quasi-experimental studies and Cochrane for risk of bias.

Results: Six articles met the inclusion criteria and described adverse outcomes on the birthing parent, including: prolonged rate of fetal head descent/cervical dilation, and duration of 1st stage of labor; and increased pain/discomfort. Visual Analog Scale (VAS) and Faces Pain Scale were commonly used measures across studies to document pain. Four of the studies reported time to achieve full cervical dilation and the length of the 1st stage of labor. In addition, three reported perceived birthing parent satisfaction and comfort through self-reporting. Rates of C-sections and epidural use were also reported. Findings across the studies suggest that alternative positioning decreases rates of adverse events compared to recumbent positioning during the 1st stage of labor.

Conclusions: The use of alternative positioning during the 1st stage of labor, specifically frequent position changes with a peanut ball, dancing, and ambulation may decrease pain and increase comfort of the birthing parent. The analgesic effect of these positions can be enhanced by integrating lower back massage to the birthing parent by a partner or clinician. Use of alternative positions may also significantly decrease the duration of the 1st stage of labor and decrease the incidence of C-sections. Performance of additional trials are necessary to draw definite conclusions regarding the effect of alternative positioning in the 1st stage of labor on birthing parent outcomes.

Clinical Relevance: A recumbent position may ease healthcare provider examination, but evidence shows many adverse birthing parent outcomes are associated with this commonly used position. Alternative positioning facilitated by a physical therapist is an effective method to improve pain and discomfort, reduce the duration of the 1st stage of labor, and decrease the likelihood of a C-section.

Abstract ID: 37990

TITLE: Physical Therapy Management of Chronic Constipation in a Case of Ehler's-Danlos Syndrome.

AUTHORS/AFFILIATIONS: Jillian W. Miller, PT, DPT; Stephanie Bush, PT, DPT, MEd, Brooks Rehabilitation Institute of Higher Learning, Jacksonville, FL, UNITED STATES.

Purpose/Hypothesis: Ehlers-Danlos syndrome (EDS)—hypermobility type (HT) manifests with global joint instability and soft tissue overuse injury. Areas of concern commonly occurring in the EDS population requiring attention from a physical therapist that specializes in pelvic health include recurrent urinary tract infections, urinary incontinence, chronic constipation, and gynecological symptoms

such as pain or prolapse. Pelvic dyssynergia is also prevalent, and its treatment involves biofeedback training, in which patients learn to coordinate their pelvic floor muscles (PFM) and anal sphincters to reverse paradoxical contractions. Additional interventions include patient education for improved toileting posture, dietary recommendations, and PFM relaxation in cases of muscle over-activity. In this case, the patient was referred to outpatient physical therapy with a diagnosis of constipation. Additional complaints included “soreness” throughout the abdominal region, pain with bowel movements, and dyspareunia. Past medical history included recent arthroscopic hip surgeries, postural orthostatic tachycardia, and chronic neck pain. Positive examination findings included increased perineal descent, decreased PFM coordination, and PFM over-activity supporting a physical therapy diagnosis of Pelvic Floor Muscle Coordination Impairment due to over-active pelvic floor musculature. The purpose of this case report was to describe multi-modal physical therapy interventions implemented in the treatment of a Caucasian female with a primary complaint of chronic constipation and a history of EDS-HT.

Number of Subjects: 1 (age: 29 years; BMI: 18.2 kg/m²).

Materials and Methods: A psychosocial screening tool, Four-Item Patient Health Questionnaire for Anxiety and Depression (PHQ-4,) was administered at evaluation along with the Constipation Scoring System (CSS), the Colorectal Functional Outcome (COREFO) questionnaire, and the Numeric Pain Rating Scale (NPRS). Treatment consisted of patient education on healthy bowel habits and toileting posture, manual and surface EMG biofeedback to promote PFM relaxation during defecation, and manual therapy to promote elongation of the PFM.

Results: The CSS score at evaluation was 20/30 and by the third visit was 10/30. The COREFO score improved from 62 to 42. The patient also reported a decrease in rectal pain with bowel movements from 8/10 to 3/10 on the NPRS and decreased time spent evacuating bowels. Objective tests of PFM performance improved significantly.

Conclusions: This case highlights the necessity for clinicians to address all impairments and body systems involved in female patients with a diagnosis of EDS. Multiple interventions and strategies may be required to achieve effective motor learning and functional implementation of improved defecation mechanics.

Clinical Relevance: Future recommendations include RCT's comparing manual biofeedback to surface EMG PFM training to improve coordination in cases of dyssynergic defecation, as well as, longitudinal studies following early intervention for bowel dysfunction in cases of EDS-HT.

Abstract ID: 38103

TITLE: Multimodal Physical Therapy Interventions for a 35-year-old Woman With Primary Vaginismus

AUTHORS/AFFILIATIONS: Jennifer T. Gentile, PT, DPT; Marisa Autera, SPT; Jessica Angowski, SPT, Kean University, Union, New Jersey, UNITED STATES.

Purpose/Hypothesis: Vaginismus is a disorder in which women are unable to achieve vaginal penetration, despite the wish to do so. Women who present with vaginismus report difficulty with both sexual and non-sexual activities including tampon use for menstrual care or speculum insertion for gynecologic exams. There is no known cause of vaginismus, which is found in approximately 5-15% of women presenting for clinical examination. Treatments for vaginismus include dilator therapy, physical therapy, sex counseling, botulinum injections, and psychotherapy. The purpose of this case presentation was to report the outcomes of specialized pelvic floor physical therapy treatment for a 35-year-old nulliparous female patient diagnosed with primary vaginismus.

Subject: The subject was a 35-year-old nulliparous female with symptom presentation of primary vaginismus.

Materials and Methods: Physical therapy interventions for this patient included patient education, diaphragmatic breathing, desensitization, vaginal dilators, and manual therapy. These intervention strategies were chosen based on the patient's objective findings and are supported in the literature. The patient did not receive any other interventions addressing her vaginismus during the physical therapy treatment period.

Outcomes: The patient improved in pelvic floor mobility and proprioception and her superficial and deep pelvic floor muscles were able to lengthen. These changes led to her achieving her personal goals which included having a pelvic ultrasound as recommended by her physician which she was previously unable to have due to the inability to insert the transducer and she was able to have pain-free intercourse with her husband.

Conclusion: Multimodal physical therapy interventions of patient education, diaphragmatic breathing, desensitization, vaginal dilators, and manual therapy can be an effective conservative treatment for women with primary vaginismus.

Abstract ID: 38208

TITLE: Psychometric Comparison of Computer-Adaptive Test and Condition-Specific Quality-of-Life Questionnaires in Patients With Pelvic Floor Dysfunction

AUTHORS/AFFILIATIONS: Cade Mooney, SPT; Hina Garg, PT, MS, PhD, NCS; Megan Pratt, PT, DPT, Rocky Mountain University of Health Professions Provo, UT, UNITED STATES.

Purpose: Computer-Adaptive Tests (CAT) offer several advantages over standard disease-specific tests due to fewer question items minimizing patient burden, enhanced use and precision by risk-factor adjustment, and computer-estimated scoring, which allows better utilization and communication of results. However, a CAT has never been directly compared to commonly used self-reported functional or quality-of-life scales in patients with pelvic floor dysfunction (PFD). This study, therefore, retrospectively compared the floor and ceiling effects, concurrent validity, and sensitivity of the PFD CAT with a frequently used self-report measure in individuals with PFD.

Methods: Retrospective data from 33 individuals with PFD [age mean (SD) = 50.8 (17.8) yrs, gender = 36F/2M] who received usual care at an outpatient clinic was extracted. The individual urinary and bowel domains of the PFD CAT and the Pelvic Floor Dysfunction Index (PFDI) were obtained from the Focus On Therapeutic Outcomes, Inc. (FOTO) and subsequently compared. Items for PFD CAT were developed by FOTO developed from the following measures: Urinary Functional Status, Bowel Functional Status, Bowel Constipation Functional Status, Pelvic Prolapse Distress Inventory, Pain Disability Index, and Pelvic Floor Impact Questionnaire. The PFDI, on the other hand, assessed urinary or bowel-related symptom distress and included questions on difficulty with household chores, physical activities, entertainment activities, traveling, social activities, or sexual activities. Floor and ceiling effects were defined as percentage of scores within 1-10 and 90-100 score ranges, concurrent validity was assessed by Pearson product-moment correlations between the individual urinary and bowel subdomains of CAT and PFDI, and sensitivity to change was determined by mean comparisons between pre- and post-intervention scores with a dependent t-test. This study provides preliminary results on the retrospective analysis of these 2 measures.

Results: No floor or ceiling effects were noted for the CAT functional status scores, while 31.3% and 0% for PFDI-urinary and 34.8% and 0% for PFDI-bowel were found, respectively. Low-to-moderate correlations ($p < 0.05$) were found between the urinary and bowel domains of both scales, and similar improvements in both scales were found over time.

Conclusions: This study highlights the psychometric properties of a time-efficient and precise CAT in comparison with standard pelvic floor dysfunction scales. The CAT demonstrated no floor or ceiling effects,

low-to-moderate concurrent validity with PFDI, and high sensitivity indicating acceptable clinical utility; however, further investigation of CAT is still warranted in larger samples.

Clinical Relevance: A CAT can prove to be a timesaving and critically useful alternative to usual paper-based surveys in the clinic due to a reduced but comprehensive number of question items, computerized scoring, and risk-factor predictions allowing the user to anticipate the number of visits and functional change appropriate for establishing patient goals and plan of care.

Abstract ID: 38276

TITLE: Experiences of a Mother Living With the Pelvic Girdle Pain: A Qualitative Study

AUTHORS/AFFILIATIONS: Khushali Trivedi, PT, DPT, MS; Noralyn Pickens, OT, PhD, FAOTA, Texas Woman's University, Denton, TX, UNITED STATES.

Purpose: Pelvic girdle pain (PGP) is pain experienced between the posterior iliac crest and the gluteal fold, particularly around the sacroiliac joints. It is common in women during and after pregnancy, with the prevalence rate varying from 7% to 84%. Women with PGP demonstrate a significant reduction in their activity participation and functional mobility. Despite these findings, there is little known about the lived experience of PGP. The purpose of this study was to describe the experiences of a mother in conducting daily activities with postpartum PGP.

Number of Subjects: One (age 34 years)

Materials and Methods: A qualitative case study using a phenomenological-hermeneutical approach with triangulation of data sources, including photographs, observation, and 1 semi-structured interview to obtain in-depth knowledge of a mother's daily experiences living with postpartum PGP. The participant was a mother of 2 who had not received physical therapy for postpartum PGP selected from a gynecologist clinic. The participant selected four activities captured in photos by her family member and sent them to a researcher with captions explaining the tasks and difficulties. After review of the photographs, the researcher observed the participant in her home taking a peripheral role by witnessing and documenting activities performed. Following preliminary analysis of the images and observational data, the participant was interviewed for 53 minutes, and audio recorded. Data were imported into NVivo9 and analyzed in 3 steps: naïve reading, structural analysis, and comprehensive understanding of the text.

Results: The woman identified her life with PGP as painful with limited activity participation, reporting she could not do much about the pain due to the

priority shift from 1 to 2 children after delivery. From the observation data, the researcher understood that she required help from her husband to complete specific tasks with frequent rest breaks to deal with her pain. The participant-generated captions accompanying 4 photographs gave the researcher an understanding of the difficulty in lifting the baby from the floor, managing stairs, lifting things from the floor, and getting up from low surfaces. The structural qualitative analysis revealed 2 main themes to understand the experiences of a mother with PGP: 1) Pain and 2) Activity limitation/modification.

Conclusions: The study demonstrates how postpartum PGP affects participation in activities of daily living. The pain causes activity limitations and restricts a mother from participating in her choice of activities. Compared to other studies about PGP, this study brings new insights into understanding a woman's lived experience as a mother.

Clinical Relevance: The importance of these findings is understanding the challenges of a mother with PGP to develop a holistic public health approach to postpartum women's health. The result of this study will help improve rehabilitation strategies for patients with PGP.

Platforms

Abstract ID: 35130

TITLE: Hypertrophy or Neuromuscular Adaptation: Adaptation Timeline in the Pelvic Floor Musculature With Hip Strengthening Exercises

AUTHORS/AFFILIATIONS: Jordan Boehning, SPT; Brooke Boron, SPT; Hannah Heimer, SPT; Devon Pierre, SPT; Kristin Savage, SPT; Brianna Wambold, SPT; Lori J. Tuttle, PT, PhD, San Diego State University, San Diego, CA, UNITED STATES.

Purpose/Hypothesis: Evidence suggests that strength training of the external rotator muscles of the hip can increase intravaginal squeeze pressure. It is unknown the amount of time required to see a significant increase in intravaginal squeeze pressure and whether these changes are due to neural adaptations or muscular hypertrophy. The purpose of this study was to determine the minimal amount of time required to observe a significant increase in intravaginal squeeze pressure when participating in a 12-week hip external rotator strengthening program and thereby determine whether the change in intravaginal squeeze pressure was due to muscle hypertrophy or neuromuscular adaptation.

Number of Subjects: Forty nulliparous women, aged 18 to 35 years old (21 ± 2.9).

Materials and Methods: Participants were randomly assigned to exercise (N=20) or control group (N=20). In the exercise group, 3 sets of 10 reps of

clamshells, isometric hip ER, and ‘monster walks’ were performed 3 times per week for 12 weeks. Hip ER strength and pelvic floor muscle (PFM) strength were measured at 4 time points for each group—initial, 4, 8, and 12 weeks. PFM strength was measured by assessing peak vaginal squeeze pressure via Peritron perineometer (cmH₂O) and hip external rotator strength (lbs) was measured using a digital manual muscle dynamometer. Repeated measures ANOVA was used to determine differences in values over time and Pearson correlation coefficients were used to determine association between variables.

Results: At 12 weeks, the exercise group displayed a significant increase in vaginal squeeze pressures ($P < .05$) and hip ER strength ($P < .05$) while the control group did not display any statistically significant changes ($P > .05$). The entire 12 week protocol was necessary to demonstrate a statistically significant increase in vaginal squeeze pressure ($P = .037$) and a significant change in hip strength. Change in hip strength was correlated with change in squeeze pressures ($r = .547, p = .013$). Vaginal squeeze pressure at the start was correlated with higher squeeze pressures at the end ($r = .672, p < .001$). Squeeze pressures at visit 1 were negatively correlated with change in squeeze pressure ($r = -.550, p = .012$). Hip strength at visit 1 was negatively correlated with change in hip strength ($r = -.623, P = .003$).

Conclusions: Strengthening the hip external rotators resulted in increased intravaginal squeeze pressure after 12 weeks, suggesting that strength changes within the pelvic floor musculature are due to muscle hypertrophy rather than neuromuscular adaptations. Changes in hip strength were correlated to changes in vaginal squeeze pressure. Individuals who had lower vaginal squeeze pressures and lower ER strength at the beginning of the program showed greater improvements, which provides insight into those most likely to benefit from these exercises.

Clinical Relevance: Hip ER exercises may be easier to implement in a clinical setting than exercises requiring a voluntary contraction of the PFM. Further research is needed to determine whether this timeline would remain true for women who are diagnosed with PFD or for women who are unable to achieve a voluntary contraction of the PFM.

Abstract ID: 35843

TITLE: Considering Intra-Abdominal Pressure Management for Stress UI in the Recreational Athlete: A Case Series

AUTHORS/AFFILIATIONS: Jessica Finney, PT, DPT; Stephanie Bush, PT, DPT, MEd, Brooks Rehabilitation, Jacksonville, Florida, UNITED STATES.

Background and Purpose: Prevalence of stress urinary incontinence (SUI) is common during exercise, impacting approximately 25% of women during acute exercise, with rates as high as 80% during high impact sports such as trampolining. Pelvic floor muscle training is the primary evidence-based intervention for treating SUI, but not all patients experiencing SUI have a primary impairment of pelvic floor muscle (PFM) weakness. Despite intra-abdominal pressure (IAP) impairment being a human movement diagnosis commonly diagnosed by pelvic floor physical therapists, targeting this impairment in physical therapy treatment is not widely discussed in the literature as a primary treatment option for SUI. The purpose of this case series was to emphasize the use of neuromuscular coordination between respiratory and pelvic diaphragms in order to address IAP impairment leading to SUI in the treatment of four postpartum recreational athletes.

Case Description: The patients in this case series were four postpartum women aged 29 to 39 years old, who presented to outpatient physical therapy with complaints of SUI and goals to return to recreational athletic activities such as running and weightlifting. All were found to have the diagnosis of IAP management impairment using the following diagnostic criteria: subjective reports of SUI with cough, sneeze, or high-pressure activity, presence of Valsalva with PFM contraction, and absence of involuntary PFM contraction upon observation and palpation. Pelvic floor muscle strengthening is the primary treatment supported in the literature for treatment of SUI. While one of these patients exhibited a decrease in power of the PFM, the remaining three had PFM power scores of $\frac{3}{4}$ or more. Initial interventions involved coordination of diaphragmatic breathing with PFM, with PFM relaxation with inhalation and PFM contraction with exhalation. This intervention laid the groundwork throughout the plan of care. With progressive resisted exercise training, breath management was a consistent focus with exhalation and PFM contraction occurring on the concentric and effortful movement in each exercise or activity.

Outcomes: All patients were seen over the course of 8 weeks. All patients had clinically significant improvements in Incontinence Impact Questionnaire and Incontinence Questionnaire- Urinary Incontinence scores indicating improved urinary incontinence symptoms. All patients were able to resume their recreational athletic activities with no SUI symptoms.

Discussion: Though force production deficits did exist, they were not deemed the primary impairment for the patients in this case series. Due to the patients’ goals of returning to high-impact activities such as running and weightlifting, the coordination of the respiratory and pelvic diaphragms was pertinent for carry over and avoidance of potential SUI with IAP. All the patients

found success with this treatment strategy and were able to return to their recreational activities. Breath management has the potential to play a vital role in the management of SUI, particularly in the athlete.

Abstract ID: 36157

TITLE: Online Protocol Based Treatment for Stress Urinary Incontinence in Postpartum Women

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Purpose/Hypothesis: The postpartum period is correlated to the onset or aggravation of pelvic floor dysfunction (PFD). Of those PFDs, the prevalence of stress (SUI) incontinence 6 years to 23 years after first vaginal delivery is 30%. By 2050 it is expected that 43.8 million women will have at least one PFD and parity is associated with increased prevalence rates of urinary incontinence. With a predicted 42.7% increase in the demand for care for PFD by 2050; this leaves an unmet demand that will require a novel approach to quality care. While both in-person and online pelvic floor muscle training has been shown to be effective for curing SUI, there lacks substantial evidence of telehealth’s effectiveness. This study assessed the effectiveness of a 4-week online program for treating SUI in postpartum women who were guided by a pelvic health physical therapist (PHPT) either in-person or by telehealth.

Number of Subjects: N = 24 average age: 37.4 years (95%CI: 35.9-38.8 years), average years postpartum: 1.7 (1.2-2.2), average BMI: 26.3 kg/m (24.1-28.5).

Materials and Methods: A randomized controlled trial was conducted with participants randomized to two groups: the 4-week sessions guided by the PHPT in-person or by telehealth. All participants followed the same 4-week online program, with a PHPT’s guidance. The in-person group were provided both tactile and verbal cueing while following the video protocol and the telehealth group were provided only verbal cueing. All PHPTs followed a standardized written protocol and program. Questionnaires evaluated SUI related symptoms at baseline and at 5 weeks post intervention. Wilcoxon signed-rank test, Chi-square

analysis, and Paired-samples Wilcoxon signed-rank test, and Quade’s nonparametric analysis of covariance were used for comparisons.

Results: Of the 24 participants there was an average of 1.5 (95%CI: 1.1-1.8) vaginal deliveries, (0.2;0.02-0.45) caesarian deliveries, and an overall average of live births of (1.7; 1.4-2.0). At 5 weeks post intervention compared to pre-treatment, participants had significantly less self-reported: urinary leakage (Pre-treatment (median [IQR]): 2 (1), Post-treatment (median [IQR]): 3 (1); $p = .003$, during coughing/sneezing (3 (2) to 4 (1); $P < .001$, during bending/lifting (5 (1) to 6 (1); $P = .007$, with walking quickly/jogging/exercise (4 (2) to 5 (2); $P = .002$, with undressing to use toilet (5 (2) to 6 (1); $P = .004$, frequency of leakage before reaching toilet (5.5 (2) to 6 (1); $P = .020$, and rushing to bathroom due to urge (6 (2) to 6(1); $P = .039$. There was no significant reduction in self-reported urine volume lost pre and post treatment ($P = 0.088$) and no significant difference in SUI outcomes between the in-person and telehealth guided PHPT groups.

Conclusions: Telehealth within PHPT lacks substantial evidence for its effectiveness in treating SUI in postpartum women. Overall participants in this study significantly improved in their SUI symptoms with no difference seen between the in-person and telehealth groups.

Clinical Relevance: A PHPT guided 4-week online program for treating SUI in postpartum women had significant improvements in symptoms.

Abstract ID: 36207

TITLE: Resistance Biofeedback Training for the Treatment of Fecal Incontinence: Mediators and Predictors of Program Success

AUTHORS/AFFILIATIONS: Jessica L. Swartz, PT, DPT; Rowena M. Tam, PT, DPT; Lori J. Tuttle, PT, PhD, San Diego State University, San Diego, CA, UNITED STATES.

Purpose/Hypotheses: Fecal incontinence (FI), or involuntary discharge of stool, affects up to 15% of women. Biofeedback (BFB) therapy is the gold standard non-surgical treatment for FI, targeting strength of the anal sphincter (AS) and pelvic floor muscles. A limitation of BFB is that it is performed without resistance, which is a key element in other muscle strengthening programs. The purpose of this study was to compare two different types of resistance exercise BFB protocols (isometric (ISO) and concentric (CON)) on AS strength and FI symptoms, to identify features of participants who successfully completed the BFB program versus those who did not, and to assess home exercise program (HEP) adherence (defined as completion of HEP

$\geq 75\%$ of assigned days) as a mediator between BFB groups and outcomes. We hypothesized that resistance BFB would improve muscle strength and FI symptoms, HEP adherence would mediate outcomes, and there would be differences in features between participants who completed the program and those who did not.

Subjects: Female participants over the age of 21 with FI and ability to voluntarily contract the pelvic floor ($n=67$) were randomized to CON ($n=46$) or ISO ($n=21$) BFB.

Materials/Methods: Participants completed a 12-week BFB program and a daily HEP. Participants met with a PT once per week for BFB with visual feedback and progression of the HEP as appropriate. The CON protocol utilized the EndoFLIP system with a fluid-filled balloon to provide resistance. The ISO protocol utilized a solid 10-mm anal probe with surface electrodes to measure muscle activity. Outcomes of interest included muscle strength (pressure in mmHg), symptom severity (FISI score), and symptom distress (PFDI20 score). Two-way t-tests and ANCOVAs were calculated to assess the impact of the program. Completer (those who completed all 12 weeks of BFB and post-test) and non-completer features were compared via two-way t-tests. A logistic regression mediation analysis tested the effects of HEP adherence between group assignment and outcomes.

Results: Though both training groups improved as a whole (FISI: -5.27 ± 8.01 , $P < .01$, PFDI20: -22.9 ± 25.3 , $P < .01$, HDAM 10.29 ± 14.48 , $P < .05$), there were no differences between groups in symptom frequency or distress after completing the program ($P > .05$). The ISO group displayed gains in strength (mean change in pressure $11.92 \text{ mmHg} \pm 22.54$, $P < .05$). There were no differences in selected features between completers and non-completers ($P > .05$) and no mediating effects of HEP adherence ($P > .05$).

Conclusions: BFB was effective for improving strength and symptoms, but there were no differences between BFB types. There was no evidence that HEP adherence mediates outcomes nor were there differences in features between completers and non-completers. Future studies must use a larger sample size to determine differences in patient features and to identify mediators of success.

Clinical Relevance: Optimizing BFB therapy, understanding predictors of program success, and establishing HEP adherence standards is vital to streamlining the treatment selection and referral process as well as producing the best outcomes for patients.

Abstract ID: 36297

TITLE: Postural Control in Pregnant Individuals With and without Low Back or Pelvic Girdle Pain

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Purpose: Falls during pregnancy are the most common reason for emergency room visits and account for 60-70% of fetal losses. In other populations such as older adults, low back pain (LBP) is associated with increased fall risk. Because LBP and/or pelvic girdle pain (PGP) occur during more than half of pregnancies, it is important to understand if postural control is altered in pregnant individuals with LB/PGP, potentially increasing fall risk. The purpose of this study was to assess center of pressure (COP) characteristics during single leg stance (SLS) between pregnant individuals with high and low LB/PGP scores during and after pregnancy with eyes open (EO) and closed (EC).

Number of Subjects: 19 pregnant participants.

Materials and Methods: Participants performed 3 trials of SLS_EO and SLS_EC on each leg on a force plate for up to 20 seconds on 3 occasions (second trimester (2T), third trimester (3T), and 4-6 months postpartum (Post)). Mean SLS time, sway, sway velocity, median frequency, and sample entropy mediolateral and anteroposterior (SampEnML and SampEnAP) were calculated from COP averaged across limbs. Quebec Back Pain Disability Scale (QBPDS) during 3T was used to classify participants into high (QBPDS > 15) and low pain groups (QBPDS < 15). 3×2 repeated measures ANOVAs (trimester by group) were used to compare across the 3 timepoints and between participants with high and low pain separately for SLS_EO and SLS_EC with a Bonferroni correction for assessing 2 visual conditions ($\alpha = 0.05 / 2 = 0.025$).

Results: 8 participants met the pain group cut-off and 11 did not. For SLS_EO there were no main effects of pain group. There was a main effect of trimester on sway, mean sway velocity, SampEnML, and SampEnAP (all $P < 0.002$) with all greater post than 2T and 3T (all $P < 0.003$); however 2T and 3T did not differ from each other. For SLS_EC there was a main effect of group on total sway ($P = 0.001$) with the pain group demonstrating reduced sway compared to the low pain group. There was a main effect of trimester on total sway ($P < 0.001$) and SampEnAP ($P = 0.01$). Sway was greater post than 2T and 3T ($P < 0.001$ and $P < 0.001$), but did not differ between 2T and 3T. SampEnAP was greater post than 2T ($P = 0.002$), but did not differ between other time points.

Conclusion: Pregnant participants with pain had reduced sway during SLS_EC potentially indicating increased rigidity without visual input and greater changes in postural control in pregnant individuals with pain. Across groups pregnant participants demonstrated smaller sway, sway velocity, and SampEn during 2T and 3T compared to post potentially indicating that guarding and more repetitive postural strategies are adopted early during pregnancy.

Clinical Relevance: There is a need to assess postural control during pregnancy, particularly in people who have pain. Assessment or interventions should occur early in pregnancy as postural strategies differed during 2T. Future research should investigate if pregnant individuals with pain are more likely to fall and the role of balance training during pregnancy.

Abstract ID: 37637

TITLE: Measuring Pelvic Floor Muscle Response to Voicing in Women With Pelvic Floor Symptoms and Controls

AUTHOR/AFFILIATION: Aliza Rudavsky, PT, DPT, PhD Pennsylvania State University, State College, PA, UNITED STATES.

Purpose/Hypothesis: Coughing, sneezing, or laughing provokes urine leakage for one in three women. These are events that induce high, quick intra-abdominal pressure. Speaking and shouting also produce a range of intra-abdominal pressures, though these events have not been investigated for how they affect the pelvic floor muscles or could be contributing to urine leakage or even treatment. This study aimed to identify how pelvic floor muscles responded to speaking and shouting events in healthy women and those with stress urinary incontinence (SUI). The hypothesis was that women would strain/lengthen their pelvic floor muscles during voicing, with greater strain seen during louder voicing (shouting). Those with pelvic floor symptoms would either have minimal pelvic floor strain or excessive movement/strain during voicing tasks.

Number of Subjects: 58 women, ages 20-68 (mean 40.3 years). Symptom allocation: 20 women without SUI, 29 with occasional SUI, 6 with frequent SUI, 3 with daily SUI.

Materials and Methods: To measure pelvic floor response to voicing, this study used b-mode, 2-dimensional transperineal and transabdominal ultrasound (TPUS and TAUS) to measure bladder neck displacement. For TPUS the change in the angle between the pubic bone, anorectal angle and bladder neck was calculated, whereas for TAUS the distance between the most superior/anterior and the most inferior/posterior portion of the bladder was measured before and after each task. The tasks included pelvic floor contraction, pelvic floor strain, counting to 4 on

one exhale with: deep voice/speaking volume, deep voice/shouting volume, high voice/speaking volume and high voice/shouting volume. Each task was performed three times. Angle and length change were measured from the start to maximal displacement for each task and averaged over three trials. Analysis included repeated measures analysis of variance (ANOVA) and one-way ANOVA.

Results: To date, only the TAUS has been analyzed. Repeated measures ANOVA with a Greenhouse-Geisser correction determined that mean bladder neck displacement differed statistically between tasks ($F(2.84, 162.01) = 77.87, P < 0.001$). Post hoc analysis with a Bonferroni adjustment revealed that bladder diagonal length increased for all tasks relative to contraction. There was no significant difference between bladder diagonal length change for low and high speaking or low and high shouting though both speaking tasks differed significantly from shouting tasks for low and high voicing ($P < 0.001, P = 0.05$ respectively).

Conclusions: Speaking and shouting tend to lengthen/strain the pelvic floor with greater effects seen for louder voicing. There was no difference between symptomatic and asymptomatic women in their response to voicing, however TPUS have not yet been analyzed.

Clinical Relevance: Those at risk of urine leakage should be mindful of shouting as a potentially provocative activity, and those with difficulty lengthening pelvic floor muscles may incorporate voicing to help perform this task.

Abstract ID: 38020

TITLE: Genitofemoral Neuralgia of a Long Distance Male Cyclist: A Case Report

AUTHORS/AFFILIATIONS: Jillian W. Miller, PT, DPT; Stephanie Bush, PT, DPT, MEd, Brooks Rehabilitation Institute of Higher Learning, Jacksonville, FL, UNITED STATES.

Purpose/Hypothesis: Pelvic neuropathies are among the more frequently reported types of injuries in the cycling population. Pudendal neuralgia is a common culprit and usually results from the nerve being compressed between a narrow seat and the ischial tuberosity. One other cause of neuropathic pain associated with cycling is Genitofemoral Neuralgia, and a cyclist will report symptoms of groin pain, a burning sensation from the lower abdomen to the medial thigh and potentially paresthesia along the distribution of the nerve. In this case, an avid male cyclist presented to outpatient physical therapy with primary complaints of groin pain and transient scrotal paresthesia. Additional complaints included lateral thigh and knee pain that resulted in the cyclist being unable to continue riding. Positive key findings at

initial evaluation included a positive Tinel's Sign at the R genital branch of the genitofemoral nerve at the pubic tubercle, a positive leg length discrepancy (based upon observation palpation, measurement, and an anteriorly tilted pelvic position while seated on a bicycle) which all supported a primary physical therapy diagnosis of Right Genitofemoral Nerve involvement and Congenital Leg Length Discrepancy. Therefore, the purpose of this case report is to determine the effectiveness of physical therapy interventions, combined with recommendations for pelvic repositioning on a bicycle, to address Genitofemoral nerve pain in an avid male cyclist.

Number of Subjects: 1 (age: 76; BMI: 25.1 kg/m²).

Materials and Methods: The patient was seen for a total of five visits over 3 weeks. The Lower Extremity Functional Scale, Numeric Pain Rating Scale, and Functional Pelvic Pain Scale were administered at Initial Evaluation, as well as, at the fifth and final visit. A multi-modal treatment plan was implemented including therapeutic exercise, manual therapy, and an emphasis on extensive education for improved pelvic positioning while cycling. Patient education included recommendations for adjusting distances between the cyclist's seat, handlebars, and pedals.

Results: The Lower Extremity Functional Scale score improved from 38.00/50.00 to 48.00/50.00 and the Functional Pelvic Pain Scale improved from 9/32 to 2/32. The Numeric Pain Rating Scale improved from a score of 6 to a score of 2.

Conclusions: The patient reported at discharge that he only experienced slight pain when cycling for more than seventy-five miles, and he was able to resolve them by correcting the position of his pelvis on the bicycle seat. Cooperation between a bicycle mechanic and physical therapist was beneficial in this case to resolve symptoms of pelvic neuralgia with improved pelvic positioning and cycling biomechanics.

Clinical Relevance: This case report highlights the evaluative process to differentiate between genitofemoral and pudendal nerve pain in a male cyclist with primary complaints of groin pain and scrotal paresthesia. Future recommendations include research identifying at what relative amount of leg length discrepancy artificial leg lengtheners or "shims" should be recommended.

Abstract ID: 38249

TITLE: Psychometric Evaluation of the Pelvic Floor Distress Inventory (PFDI) - Focus On Therapeutic Outcomes (FOTO) Version

AUTHORS/AFFILIATIONS: Cade Mooney, SPT; Hina Garg, PT, MS, PhD, NCS; Megan Pratt, PT, DPT, Rocky Mountain University of Health Professions Provo, UT, UNITED STATES.

Purpose: The psychometric properties of the Focus On Therapeutic Outcomes, Inc. Pelvic Floor Dysfunction Index (FOTO-PFDI), a pelvic quality-of-life measure, has not been previously examined. The FOTO-PFDI measure includes four subscales to assess symptom distress and difficulties with urinary, bowel, pelvic pain, and pelvic organ prolapse functions. Due to its capacity to address a broad spectrum of pelvic complaints, this study retrospectively evaluated the internal consistency reliability and responsiveness of FOTO-PFDI in patients with Pelvic Floor Dysfunction (PFD).

Methods: Retrospective data from 88 individuals with PFD [age mean(SD)= 50.8(17.8) yrs, gender= 36F/2M] who received usual care at an outpatient clinic was extracted. Data from 6-items each for the urinary, bowel, pain, and prolapse domains of the FOTO-PFDI was included. The six items included: Because of your problem, do you or would you have any difficulty at all with (a) doing household chores (cooking, cleaning, laundry), (b) doing physical activities such as walking, swimming, or other exercises, (c) participating in entertainment activities, such as going to a movie or concert, (d) traveling by car or bus for a distance greater than 30 minutes away from home, (e) participating in social activities, (f) maintaining sexual activities with your partner? Reliability of the four subscales was examined using Cronbach's alpha, while sensitivity to change for each subscale was determined by mean comparisons between pre- and post-intervention scores using dependent t-tests. This study provides preliminary results on the retrospective analysis of this measure.

Results: The four subdomains of FOTO-PFDI demonstrated high reliabilities, Cronbach's $\alpha = 0.778-0.894$. Only the urinary subscale demonstrated high sensitivity to change, as seen by significant improvements across pre- and post-intervention scores ($p < 0.05$), while the bowel ($p = 0.20$), pelvic pain ($p = 0.13$), and prolapse ($p = 0.39$) subscales did not change.

Conclusions: The FOTO-PFDI subscales demonstrated high internal consistency reliabilities; however, their sensitivity to change is questionable in patients with PFD except for the urinary subscale. Further studies need to be conducted in larger and more diverse samples to determine the clinical use of the FOTO-PFDI outcomes instead of the commonly utilized short-form 20-item PFDI tool.

Clinical relevance: This study is one of the first to provide clinically useful information on a widely used pelvic measure provided within the FOTO database systems, the FOTO-PFDI. Although the FOTO-PFDI tool is a reliable and comprehensive measure of pelvic symptom distress, its ability to detect treatment-based differences is limited, hindering its use in the clinic.