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Diastasis Recti Abdominis: A Survey of Women's Health Specialists for Current Physical Therapy Clinical Practice for Postpartum Women

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ABSTRACT

Objective: The purpose of this study was to determine and describe intervention techniques used by physical therapists to address diastasis recti abdominis (DRA) in postpartum women.

Study Design: Descriptive survey.

Background: Diastasis recti abdominis is defined as a separation of the rectus abdominis muscle as a result of partitioning at the linea alba, and it occurs in 60% of postpartum women. Despite this high prevalence, information regarding therapeutic approaches for DRA is scarce.

Methods and Measures: The survey was distributed to 2200 members of the Women's Health Section of the American Physical Therapy Association. The survey contained 18 multiple-choice questions on clinician experience, patient presentation, evaluation, interventions, and estimated success. The survey was distributed via Survey Monkey. Descriptive statistics were collected.

Results: The response rate was 16.4% with 13.45% used in the final data analysis. All of the 296 respondents incorporated therapeutic exercise into their plan of care, such as general transverse abdominis (TA) training (89.2%), TA training with functional activities (82.8%), and the Noble technique (62.5%). Fifty-nine percent of the physical therapists use manual therapy techniques, and 81.2%

use therapeutic modalities. The average number of visits per week was 1.56. The most common length of treatment was 4 to 6 weeks. Sixty-nine percent of the respondents reported a success rate of 41% to 100%.

Conclusion: The focus of conservative treatment for postpartum women with DRA is therapeutic exercise, specifically TA training. Current practice for postpartum DRA includes multiple intervention techniques. Future studies should assess the effectiveness of individual interventions to refine and advance treatment on the basis of evidence.

Key Words: abdominal muscles, postpartum, women's health

INTRODUCTION

Diastasis recti abdominis (DRA) is defined as a separation of the right and left rectus abdominis muscle bellies within their respective sheath as a result of partitioning at the linea alba.¹⁻³ Severity ranges from mild, 2.5 to 3.4 cm wide and up to 12 cm long with or without bulging, to severe, greater than 5 cm wide and up to the entire length of the rectus muscles.^{1,4-8} Fifty-two percent of DRA cases occur at the umbilicus, 36% arise above the umbilicus, and 11% occur below the umbilicus.³ Diastasis recti abdominis is not gender specific and is associated with increasing age, activities including regular lifting of heavy weights or performing full-excision sit-ups, a history of midline abdominal surgery, or significant hormonal changes due to replacement therapy or menopause.⁹⁻¹² Diastases can be congenital, as well as present with conditions that increase intra-abdominal pressure such as chronic obstructive pulmonary disease and obesity.^{9,11,13} Although all of these may contribute to DRA, this condition is most often seen secondary to pregnancy and after major weight loss.^{1,2,5-7,10,12,14}

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The focus of this research is on DRA in postpartum women. Diastasis recti abdominis occurs in 60% of postpartum women, with the rectus abdominis elongating as the fetus grows.^{6,7,12} In this population, many factors can contribute to the development of a divarication (≥ 2 cm wide) including successive pregnancies, carrying a large baby, multiple-birth pregnancy, excess uterine fluid, obesity, and overuse of the abdominal musculature against resistance during pregnancy.^{2,5,7,15} There is a steady increase in incidence as pregnancy advances, with a peak in the third trimester, and remaining high immediately postpartum.^{2,3} Seventy percent of pregnant women are affected, 60% immediately postpartum with DRA being evident up to 8 weeks postpartum in 30% of women.^{1,2,16} Although this patient population is likely to receive physical therapy (PT) for musculoskeletal problems such as low back pain, pelvic girdle pain, or abdominal muscle control, there is little evidence regarding the prevalence or rehabilitation of DRA.^{15,17}

The gold standard for measurement of DRA is a computed tomographic scan. Computed tomography has been shown to be a very reliable method, although it is not commonly used because of risks of radiation and expense.^{6,13,14,18} Vernier and Nylon dial calipers are also used to measure the inter-recti distance.¹ Ultrasound is used to measure inter-recti distance after abdominoplasty for postpartum DRA to determine whether a patient needs additional surgery.^{6,14} Intraoperative diastasis measurements are also taken primarily for people with recurrent DRA secondary to abdominoplasty.^{13,18} The procedure that is most commonly utilized in clinical practice and reported in the literature is the finger width measure.^{1,18} Any separation located at, above, or below the umbilicus of greater than 2 finger widths constitutes a DRA.³ This measurement technique has been proven reliable between raters, with an intraclass correlation coefficient of 0.84.⁷ Although patient positioning and finger placement can be standardized between raters, other variables such as differences in width of fingers among raters and subjective interpretation of pressure compromise interrater reliability.⁷

A large DRA may jeopardize any of the functions of the abdominal wall including its role in posture, trunk stability, respiration, delivery of a fetus, trunk flexion, rotation, and side bending.^{3,5,15} Low back pain may occur as a result of the incorrect posture and biomechanics attributed to abdominal muscle weakness.^{1,3,19} Abdominal hernia, stress urinary incontinence, pelvic pain, and fecal incontinence can be additional complications.^{10,20,21} Cosmetic defects may also result.^{3,19} It is imperative that DRA be diagnosed and treated to reduce its negative impact on function and quality of life.

Surgical intervention is an option for individuals if they have low amounts of subcutaneous abdominal fat, good skin elasticity, and striae present in the skin.^{18,22} However, surgical intervention is not the only answer. Physical therapy has been identified in the research as the chosen conservative treatment for DRA in peripartum and postpartum women. However, the specifics of PT treatment are not well defined in the literature.¹⁶

An extensive literature review was performed from 1987 to present to determine the information available and level of evidence for PT treatment of DRA. The Table lists the exercise protocols found in the research. Most of the research assessing the effectiveness of PT for DRA was weak on the hierarchy of evidence. However, exercise in general appears to be an important intervention and may even prevent DRA among pregnant women.¹⁶ Exercise protocols should address the abdominal muscle activity, specifically the transverse abdominis (TA) muscle, while avoiding the use of the rectus abdominis until the patient is able to recruit the TA properly.¹⁷ Exercise has also been shown to be beneficial for women with chronic DRA who typically present to clinics with other functional disabilities as a result of the diagnosis. By addressing a patient's DRA, resolution of the secondary impairments can be achieved.¹⁷

The evidence for conservative intervention for the treatment of DRA is compelling but not strong. Before determining the effectiveness of treatment protocols, it is important to have a full understanding of the current treatment protocols. The literature search and conversations with clinical experts indicate that multiple techniques are used for the treatment of DRA, yet the specifics of treatment protocols are not readily available. The purpose of this study was to determine and describe the specific treatment techniques, including home exercise programs (HEPs), used in PT practice to address DRA in postpartum women. With this information, the objective was to promote awareness among health care professionals, postpartum women, and other high-risk populations, as well as to provide a framework for future studies to determine the effectiveness of treatment and prevention of DRA and its secondary impairments.

METHODS AND MEASURES

After reviewing information from research literature, the authors developed a survey to determine and describe the specific treatment techniques that are currently used in PT to treat DRA among the postpartum population. The content validity of the survey was evaluated by a focus group of 4 physical therapists with at least 5 years of experience in

physical therapists had completed at least 1 DRA or postpartum specialty course such as Elizabeth Noble or Herman and Wallace. In addition to courses in women's health, 51.7% of clinicians had additional specialty certifications as described in Figure 1, with more detail given in Appendix 2. Finally, it was important to understand how often the survey respondents treated patients with DRA. For 90.3% of the respondents, 1% to 30% of their patient caseload included individuals with DRA. Only 5 respondents' caseloads (1.7%) consisted of 61% to 75% of patients with DRA.

Primary Diagnoses, Chief Complaints, and Comorbidities

Because it is common for DRA to go unnoticed by the patient and undiagnosed by a physician, these patients may seek PT treatment with another musculoskeletal or neuromuscular diagnosis. Respondents were asked which primary diagnoses were most common for patients they treat for DRA. Low back pain was the most common primary diagnosis (80.7%). Pelvic floor dysfunction (62.0%), pelvic pain (59.5%), and urinary incontinence (59.4%) were also common diagnoses for referral (Figure 2). Less than half of the respondents (41.6%) stated that DRA was the primary diagnosis for PT referral. Other primary diagnoses not specified as options but included as comments were abdominal pain, fecal incontinence, hip pain, gross muscle weakness, painful bladder syndrome, prolapses, vulvar vestibulitis syndrome, and interstitial cystitis.

Participants were also asked, for those patients who are not referred primarily for DRA, what their chief

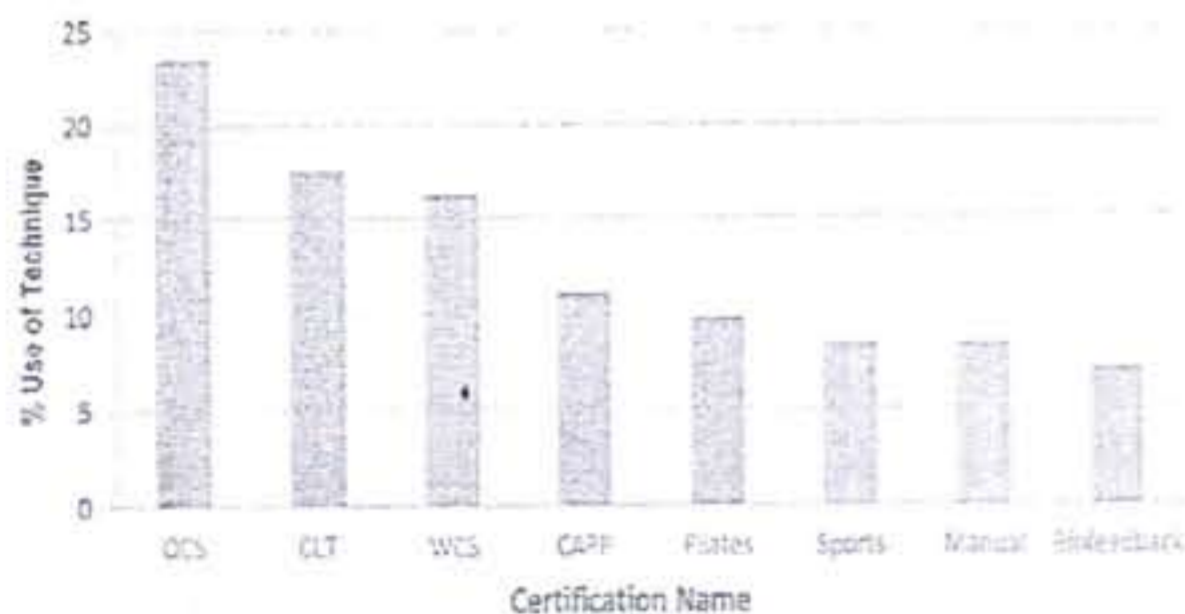


Figure 1. Common specialty certifications held by respondents. Abbreviations: Biofeedback, board certified in biofeedback for pelvic muscle dysfunction, Biofeedback Certification International Alliance; CAPP, certificate of achievement in pregnancy and postpartum physical therapy; CLT, certified lymphedema therapist; Manual, certification in orthopedic manual therapy, certification in manual physical therapy, manual therapy certified, fellow of the American Academy of Orthopedic Manual Physical Therapists; OCS, orthopedic clinical specialist; Sports, certified athletic trainer, personal trainer, certified strength and conditioning specialist, certified strength training specialist, WCS, women's health clinical specialist.

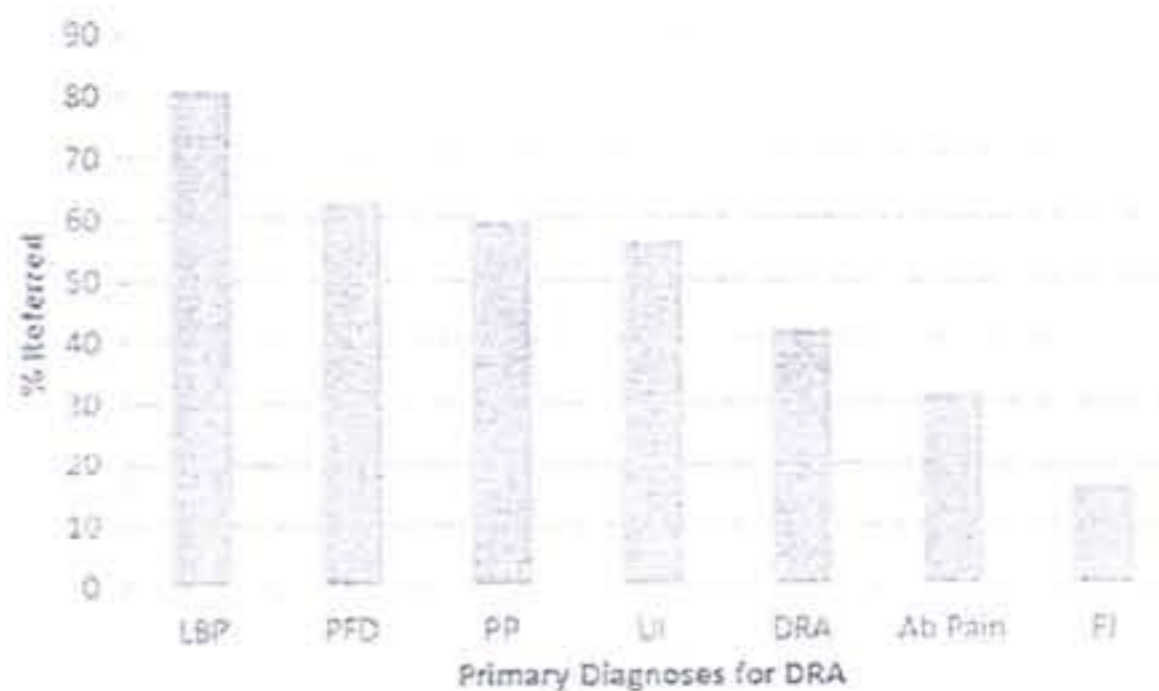


Figure 2. Common primary diagnoses among women with DRA. Abbreviations: FI, fecal incontinence; LBP, low back pain; PFD, pelvic floor dysfunction; PP, pelvic pain; UI, urinary incontinence.

complaints upon initial evaluation were. The majority answered that pain (75.9%) and/or muscle weakness (69.7%) were of great concern to these patients. More than half (56.9%) indicated that urinary incontinence was a problem and 45.2% answered that the cosmetic abdominal bulge causes distress to these individuals. Other chief complaints were pelvic organ prolapse, general fatigue and deconditioning, fecal incontinence, abdominal swelling, inability to or difficulty with exercise, poor posture, muscular imbalances and pain in the pelvis, lower extremities, back, or sacroiliac joint, and pain with intercourse. Because patients are not always referred to physical therapists for treatment of the diastasis, DRA may be a comorbidity discovered and treated by the clinician in addition to management of the individual's primary medical diagnosis. These conditions and chief complaints may also be comorbidities of DRA.

Examination and Measurement

Physical therapy preference for assessing and measuring DRA is found in Figure 3. Almost all (96.6%) of the clinicians use the finger width technique. Seventeen percent use a tape measure, 4.4% use real-time ultrasound, and 1.7% use a caliper. Other preferences include palpation, abdominal strength, visual inspection, and active straight leg raise with abdominal bracing.

Therapeutic Exercise

Participants were given therapeutic exercise techniques used to treat DRA and asked to select all of the techniques they use (Figure 4). General TA muscle training was preferred by 89.2% of the physical therapists. Eighty-seven percent use pelvic floor training and 82.8% incorporate TA training into functional tasks. The Elizabeth Noble technique was selected by 62.5% of the respondents. This technique involves manual approximation of the rectus muscle bellies,

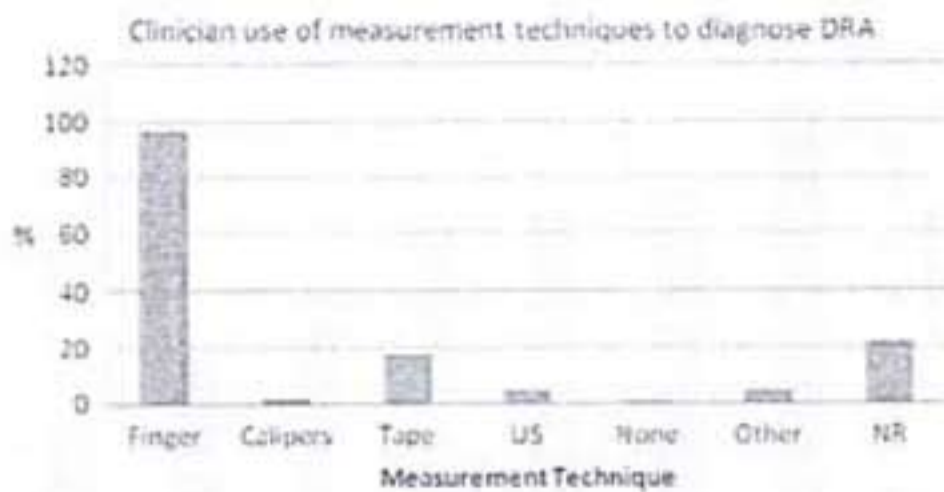


Figure 3. Reported use of measurement techniques used by women's health specialists for DRA. Abbreviations: NR, no response; US, ultrasound.

while performing a partial sit-up.^{7,23} General abdominal training was selected by 34.8% and the Tupler technique was selected by 29.4%. Julie Tupler's technique includes a progressive series of transverse abdominus contraction with or without abdominal splinting.²⁴ The use of Pilates training with specialized equipment was selected by 7.1% of the respondents. Other therapeutic exercise techniques that respondents added in the comments section included diaphragmatic breathing, multifidus muscle training, proprioceptive neuromuscular facilitation, Shirley Sahrmann abdominal exercises, Pilates mat exercises, rectus abdominis isolation exercises, pelvic girdle strengthening, and whole-body vibration techniques.

Manual Therapy

Two hundred seventy-four participants responded to the question about the use of manual therapy

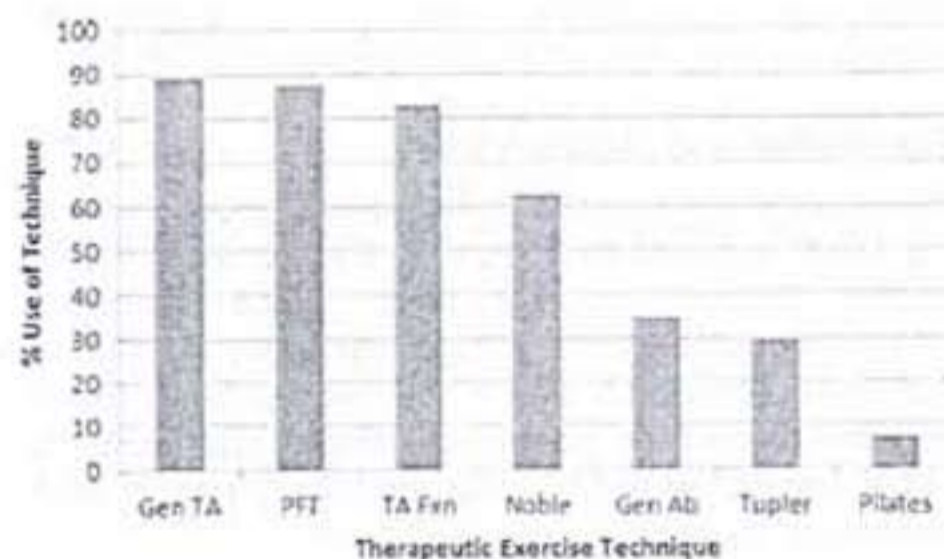


Figure 4. Therapeutic exercise preferences for women's health physical therapists for treatment of diastasis recti abdominus. Abbreviations: Gen Ab, general abdominal training; transverse abdominis, rectus abdominis, external oblique, internal oblique; Gen TA, general transverse abdominis training; transverse abdominis isolation and strengthening in neutral spine; PFT, pelvic floor training; Kegel exercises; TA Fxn, transverse abdominis training with functional tasks; ie, household chores, community ambulation; Noble technique: rectus abdominis approximation with chest lift; Tupler technique, transverse abdominis training; Pilates training: with the use of reformer or Cadillac.

techniques. Manual therapy techniques used to treat patients with DRA include myofascial release (46%), trigger point release (35.8%), muscle energy techniques (33.2%), and visceral manipulation (21%). Other manual therapy techniques used include manual facilitation for abdominal contraction, soft tissue mobilization, connective tissue manipulation, and joint mobilization at the sacrum, innominate, lumbar spine, coccyx, and pubic symphysis. Forty percent do not use manual therapy techniques at all with these patients.

Therapeutic Modalities

Two hundred eighty-seven participants responded to the question about the use of therapeutic modalities. The most common responses were abdominal bracing or splinting (58.5%), abdominal taping (40.8%), and biofeedback (33.1%). Nineteen percent do not use modalities at all with this patient population. Of the options provided, heat, cryotherapy, treatment ultrasound, and real-time ultrasound were used infrequently (Figure 5). Additional modalities included modalities for pain management, Russian electrical stimulation, neuromuscular electrical stimulation, and cold laser.

Abdominal Binder

It was hypothesized that the use of an abdominal binder would be a common treatment technique implemented by many of the Women's Health clinicians being surveyed. Thus, a question regarding the exact instructions for the use of an abdominal binder or splint was included in the survey. Fifty-six percent of the 257 respondents instruct their patients with DRA to wear the abdominal binder with strenuous activities, 39.7% instruct patients to wear the abdominal binder while performing exercises, 38.5% recommend the binder for use during activities of daily living. Thirty-two percent do not recommend abdominal binders as a treatment option for this patient population.

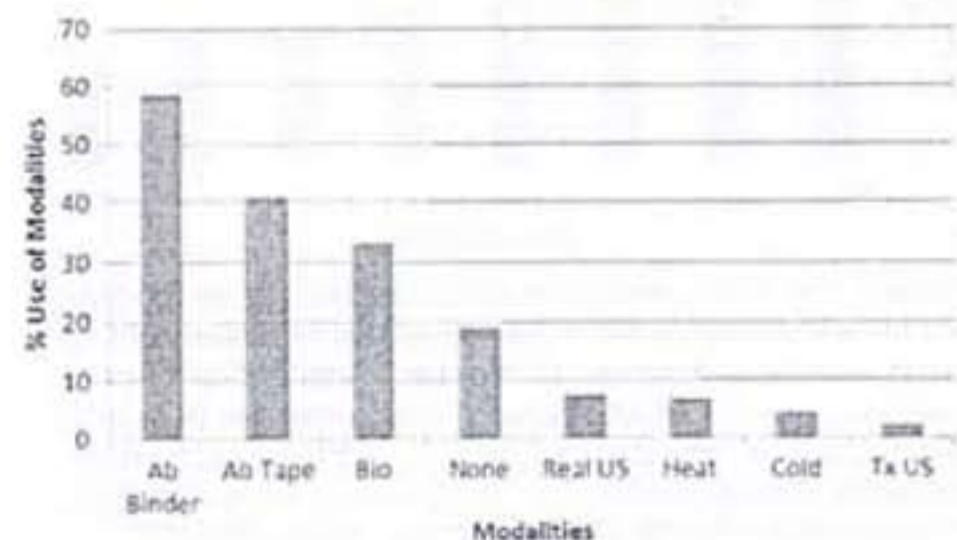


Figure 5. Therapeutic modality preferences for women's health physical therapists for treatment of diastasis recti abdominus. Abbreviations: Bio, biofeedback; real US, real-time ultrasound; Tx US, treatment ultrasound.

Home Exercise Program

Participants were asked how frequently they recommended that their patients with postpartum DRA perform a HEP. Two hundred ninety-seven respondents answered this question and 36% recommend that these patients participate in a HEP 2 times per day. One time per day was selected by 28.6% and 19.5% recommend a HEP 5 days per week. Ten percent selected the option of 6 days per week, and 5.7% indicated less than 5 times per week to be sufficient. Clinicians' comments regarding their recommendation of a HEP included the importance of patient education with self-progression. In addition, respondents stressed the importance of a HEP being a lifelong commitment to see and maintain results.

Treatment Frequency, Duration, and Outcomes

The preferred frequency of PT treatment for postpartum DRA was once per week (58% of 271 respondents). Thirty-eight percent recommended 2 sessions per week and 3% recommended 3 sessions per week. None of the respondents recommended 4 sessions per week.

The treatment duration most often chosen by 274 respondents was 4 to 6 weeks (38%). Ten percent stated that less time would be sufficient and 12.4% felt that 10 weeks or longer was required. Many respondents commented that this question was difficult to answer as it depended on many subjective factors. Forty-eight percent of 278 respondents indicated that their patients with a significant DRA reduced their diastasis to 2 finger widths or less 41% to 80% of the time.

Beliefs Concerning Management of DRA

Respondents were asked to comment on the questionnaire and make further recommendations regarding the PT management of DRA in postpartum women (Appendix 3). Many of the respondents emphasized the importance of individualizing the patient's plan of care. Clinicians also felt that patient education was important and should emphasize the HEP with self-progression. Prevention of DRA for prenatal women through posture training, abdominal muscle use in isolation, and with functional activities was also mentioned.

Overall, the comments provided at the end of this survey indicate the importance of communication between the various members of the interdisciplinary team. This is important when surgical intervention is being considered, to refer out to other various health care providers as appropriate, and to increase the general awareness among referring providers that conservative management exists. Many of the respondents agreed that DRA is an undertreated diagnosis and that the consequences are great when left untreated.

DISCUSSION

The purpose of this research was to determine the specific treatment techniques and HEPs women's health physical therapists implemented to manage DRA in postpartum women. In this survey, many of the responses are consistent with the current literature regarding DRA. However, because research on this topic is limited, the responses provide valuable insight into the main concepts and focuses of treatment for a patient with DRA.

The results of this survey indicate that many patients with DRA are referred to PT with a different diagnosis. Individuals may present to PT with a chief complaint of low back or pelvic pain, or pelvic floor dysfunction, and present with secondary impairments that impact their rehabilitation as well, including a diastasis. These results are consistent with previous literature that found that many women with DRA present with lumbopelvic pain and dysfunction.⁸ These findings support the need for a comprehensive physical examination and evaluation to uncover the impairments related to a patient's complaints. This also reinforces much of the literature that suggests that a single disruption in the abdominal/pelvic wall can create a multitude of impairments and functional limitations.

The technique used most often to diagnose DRA was the finger width technique. This may be due to the fact that it is easy to perform and requires no equipment. Other more reliable techniques such as real time ultrasound might not be used as often secondary to cost and convenience.

One of the most important aspects of the treatment of DRA is the therapeutic exercise taught in the clinic that translates to the patient's HEP. Because of the paucity of experimental research regarding conservative treatment for DRA, a common protocol does not exist for PT treatment of these patients. It has been shown, however, that exercise is beneficial for women who have acute and chronic DRA.¹⁷ The results indicate that the strengthening of the TA muscle is most commonly used by clinicians for therapeutic exercise. This supports the research by Sheppard,² suggesting that TA training and integration into an exercise program is beneficial in treating DRA. Sheppard² also found that training the TA musculature can address patients' symptoms of concurrent low back pain.

For this survey, respondents were instructed to "check all that apply" for the question pertaining to preferred therapeutic exercise interventions. Because of this, it is difficult to make assumptions regarding the success of techniques used in isolation versus multiple techniques implemented concurrently. However, the TA strengthening is integrated into multiple methods such as Pilates, TA functional training, and Julie Tupler's specific exercise protocol.²⁴ Multiple

therapeutic exercise techniques were included in the survey, even if they had a similar focus, because clinicians may recognize these techniques under different protocol names. From this information we have a better understanding of the treatment methods being used to treat DRA. This information allows clinicians to begin the discussion of the rationale for each method being used. Further research may point to the effectiveness of these methods for the patient population with DRA so clinicians can better utilize evidence-based practice.

Manual therapy and other modalities were used by clinicians in conjunction with therapeutic exercise. However, 40.6% of respondents reported that they do not use manual therapy with this population. Only 1 of the articles reviewed before conducting this study discussed manual intervention as a part of the treatment.¹⁷ They used a multi-intervention approach with exercise, modalities, and manual therapy including soft tissue mobilization of the rectus abdominis to promote tissue healing and myofascial release to the abdominal scar.¹⁷ This also suggests that there is a void in research regarding the use of manual techniques for treatment of DRA. Furthermore, abdominal bracing and taping are being used frequently in the clinic and as part of patients' HEPs, specifically using the binder when performing strenuous activity. Because of the lack of integrity in the abdominal wall, it is thought that the increase in pressure in the abdominal cavity when performing such activities can cause further damage to or increase the severity of the diastasis or even result in herniation.^{9,11} Interestingly, one-third of clinicians did not prescribe an abdominal binder for patients with DRA. It is hypothesized that this may be due to the fact that the exercises performed in the HEP would target the strengthening of the TA muscle preventing any further damage; thus, the binder would not be necessary.

The duration and frequency of treatment are a very subjective question to answer because of the variability of the patient population. Individual patients will present with differences in severity and secondary impairments or comorbidities associated with DRA, thus requiring different courses of treatment.

The results indicate that clinicians are able to help patients with a significant DRA reduce their diastasis to 2 finger widths or less 41%–80% of the time. The literature has shown that although there may be some degree of spontaneous resolution over time, many of the significant DRA cases persist if not treated.²⁵ It is difficult to distinguish the ultimate cause of the resolution found by the clinicians who responded to this question. A clear connection between treatment technique or combination of techniques, treatment frequency and duration, and DRA resolution cannot be made because of the multitreatment approach. For example, clinicians in this survey could choose more

than 1 answer for each question and list their own comments. The survey also has no way of measuring patient adherence to the HEP, which can have a significant impact on their recovery.

A limitation of this study was the low response rate that affects the external validity of the results. A request to complete the survey was sent 3 times before the survey was closed. Additional limitations concern the organization of the survey. First, many of the questions did not yield a full response rate out of the 296 participants who treated DRA. This was reported in the results when any percentages were taken from a number other than 296. We did not require that all questions be answered before the survey could be submitted. This should be required in future surveys to obtain complete results. The survey was retrospective; thus, clinicians had to remember specifics about their treatment and success from experience. The reliability of recalling information can be a limitation.

An interesting topic for future research would be to survey patients with DRA about their participation in therapy and adherence to their HEPs to better assess the effectiveness of therapeutic exercise on reducing a diastasis. The results of this study can also help guide clinicians to look at the success of individual treatment protocols for postpartum DRA. This survey confirmed that a large population of postpartum women in the United States goes undiagnosed and then presents with more significant impairments to physical therapists. It would be interesting to survey physicians about their experience with postpartum DRA and their treatment recommendations. It would also be beneficial to survey health care practitioners outside the United States to get a more global understanding of DRA presentations, diagnosis methods, and treatment choices.

CONCLUSION

The results of this descriptive survey of experienced women's health PTs suggest that strengthening of the TA in isolation and with functional activities is a key element in the current treatment of DRA. Treatment success is believed to be linked to patient compliance with the HEP and understanding of self-progression; the abdominal binder was also suggested to be beneficial in the reduction of DRA, although not recommended by all clinicians postpartum. The overall results of this survey can help guide further studies to look at the specific success of individual treatment protocols. Also, an idea that was strengthened through the results of this study is the importance of recognizing DRA as an impairment and treating it early to avoid more serious consequences. This requires communication between health care professionals to help reduce impairments that accompany DRA and improve the lives of women postpartum. ○



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