Journal of Health, Wellness and Community Research
ISSN: 3007-0570

OPEN ACCESS

JHWCR

Type: A Narrative Review
Published: 09 September 2025
Volume: III, **Issue:** XII
DOI: https://doi.org/10.61919/whn57x10

Correspondence
✉ iffatayeshah@gmail.com

Received 24-08-25 **Accepted** 02-09-2025

Authors' Contributions
Concept: IA; Design: MUN; Data Collection: MJ, F; Analysis: SSM, IK; Drafting: ABI

Declarations
No funding was received for this study. The authors declare no conflict of interest. The study received ethical approval. All participants provided informed consent.

"Click to Cite"

Psychological Comorbidities in Women Having Diastasis Recti – Narrative Review

Iffat Ayesha[1], Mehar Un Nisa[1], Maryam Javed[1], Farzeen[1], Syeda Saima Mahmood[1], Iqra Khan[1], Awais Bin Inam[2]

[1] Riphah International University, Gulberg Campus, Lahore, Pakistan
[2] Lecturer, Physical Therapy Department, Government College University, Faisalabad, Pakistan

ABSTRACT

Background: Diastasis recti abdominis (DRA), defined as the separation of the rectus abdominis muscles along the linea alba, is a common condition during pregnancy and the postpartum period. While its physical manifestations, such as impaired core stability and musculoskeletal discomfort, are well-documented, the associated psychological comorbidities remain underexplored. Anxiety, depression, and body image concerns have been observed in affected women, but systematic synthesis of these outcomes is limited. Objective: This review aimed to synthesize the available evidence on psychological comorbidities associated with DRA, explore their impact on quality of life, and highlight potential psychosocial and clinical interventions to address this burden. Methods: A narrative review methodology was applied. Literature searches were performed in PubMed, Scopus, PsycINFO, and Google Scholar using combinations of the terms "diastasis recti," "abdominal separation," "psychological comorbidities," "anxiety," "depression," and "body image." Eligible studies included observational research, qualitative studies, systematic reviews, and interventional reports that examined psychological or quality of life outcomes in women with DRA. Articles focusing solely on surgical techniques or physical rehabilitation without mental health assessment were excluded. Data were synthesized narratively, emphasizing recurring psychological themes, risk factors, and reported interventions. Results: The review identified consistent associations between DRA and psychological comorbidities, particularly anxiety, depression, and body image disturbance. These factors contributed to reduced self-esteem, social withdrawal, and impaired quality of life. Postpartum vulnerability, exacerbated by hormonal changes, sleep deprivation, and caregiving stress, intensified psychological symptoms. Risk factors included multiple pregnancies, sociocultural norms emphasizing rapid body recovery, and lack of social support. Evidence for psychosocial interventions such as psychoeducation, counseling, cognitive-behavioural therapy, and mindfulness was promising but limited, with most studies extrapolated from broader postpartum literature rather than DRA-specific trials. Conclusion: DRA has significant psychological as well as physical consequences, underscoring the need for holistic and multidisciplinary care. Early recognition of psychological comorbidities and integration of psychosocial interventions into physiotherapy and medical management may improve overall outcomes. Future research should prioritize longitudinal designs, culturally diverse populations, and clinical trials evaluating combined physical and psychological interventions.

Keywords
Diastasis recti abdominis; postpartum mental health; anxiety; depression; body image; quality of life; psychosocial interventions

INTRODUCTION

Diastasis recti abdominis (DRA), defined as the widening of the linea alba and separation of the rectus abdominis muscles, is a common condition observed during pregnancy and in the postpartum period. The prevalence varies across populations, with reports suggesting that a significant proportion of women experience some degree of abdominal separation during late pregnancy and after delivery (1,2). Although often regarded as a benign musculoskeletal alteration, DRA can persist beyond the postpartum phase and contribute to functional impairments such as reduced core stability, altered posture, and a higher risk of herniation (3,4). Research over the past two decades has predominantly focused on the anatomical and biomechanical dimensions of DRA, emphasizing corrective exercises, physiotherapy protocols, and surgical repair options (5,6). However, less attention has been devoted to its broader psychosocial impact, particularly the psychological burden associated with this condition.

Emerging literature indicates that DRA may be linked with several psychological comorbidities. Women with persistent abdominal separation frequently report concerns about body image, diminished self-confidence, and social withdrawal, which can evolve into clinically relevant anxiety and depression (7,8). The postpartum period represents a particularly vulnerable phase for women, as hormonal changes, disrupted sleep, and the stress of infant care already predispose them to psychological distress (9). In this context, the presence of DRA may compound emotional challenges, reinforcing negative self-perceptions and impairing quality of life (10). Despite these associations, the psychological dimension of DRA remains underexplored compared to its physical consequences.

Understanding the mental health implications of DRA is clinically significant. Holistic care for women affected by the condition requires not only physical rehabilitation but also psychosocial assessment and targeted interventions. Evidence from other postpartum musculoskeletal conditions demonstrates that integrating psychological support into rehabilitation improves both mental health outcomes and adherence to physical recovery strategies (11,12). Similar approaches may hold promise for women with DRA, but evidence is currently scattered and lacks synthesis.

The purpose of this narrative review is therefore to examine the prevalence and nature of psychological comorbidities associated with diastasis recti, to evaluate their impact on quality of life, and to explore existing and emerging psychosocial interventions. By consolidating available evidence, this review seeks to highlight the multidimensional nature of DRA and underscore the importance of comprehensive, patient-centered care that addresses both physical and psychological needs.

METHODS

This review was conducted using a narrative approach to synthesize the available evidence on the psychological comorbidities associated with diastasis recti abdominis (DRA). A broad literature search was performed in electronic databases including PubMed, Scopus, PsycINFO, and Google Scholar. Search terms incorporated both Medical Subject Headings (MeSH) and free-text keywords such as “diastasis recti,” “abdominal separation,” “psychological comorbidities,” “anxiety,” “depression,” “postpartum mental health,” and “body image.” Boolean operators (AND/OR) were applied to combine terms and refine results (1,2). No time restrictions were imposed in order to capture the full scope of available research, although emphasis was placed on literature published from 2015 onwards to reflect recent advances and contemporary perspectives.

Eligibility was determined based on the relevance of studies to the psychological dimensions of DRA. Included literature encompassed observational studies, qualitative reports, interventional studies, systematic reviews, and narrative reviews that addressed psychological outcomes such as anxiety, depression, body image, or quality of life among women with DRA. Studies that focused exclusively on surgical procedures, physiotherapy interventions, or anatomical assessments without evaluation of psychological parameters were excluded. Non-English articles were included when an English abstract or translation was available.

Articles were reviewed and selected by the authors according to thematic relevance rather than through a structured dual-reviewer screening process, consistent with the narrative design. Data extracted from eligible studies included author details, study design, sample characteristics, assessment methods, and major findings related to psychological outcomes. The synthesis was conducted narratively, highlighting recurring patterns, common comorbidities, associated risk factors, and reported interventions. Because of the heterogeneity in study designs, populations, and outcome measures, no formal quality appraisal or quantitative pooling of data was undertaken. Instead, methodological rigor was considered descriptively, with particular attention to sample size, research design, and the use of validated psychological assessment instruments (3,4).

This methodological approach allowed for the integration of diverse forms of evidence and provided a broad yet focused understanding of the psychological implications of DRA, identifying key themes and highlighting gaps for future research.

PHYSIOLOGICAL BACKGROUND

Diastasis recti abdominis (DRA) refers to the separation of the rectus abdominis muscles along the linea alba, the connective tissue structure central to the abdominal wall. This separation most commonly develops during pregnancy as the expanding uterus and hormonal influences, such as relaxin and estrogen, increase abdominal wall stress and tissue laxity (1,2). Although often considered a physiological adaptation to gestation, the condition can persist into the postpartum period or even occur in nulliparous women. Its prevalence varies, with studies suggesting that up to 60% of women may experience some degree of DRA during late pregnancy, and a significant proportion continue to show residual separation months after delivery (3,4).

Beyond its visible appearance, DRA is associated with core muscle weakness, reduced trunk stability, altered posture, and in some cases, musculoskeletal discomfort or hernia formation (5). These functional and physical limitations may influence daily activity and contribute indirectly to psychological distress. For many women, the persistent abdominal bulge, reduced physical performance, and concerns about long-term body function interact with sociocultural expectations of postpartum recovery, shaping body image and emotional well-being (6). Thus, while DRA originates as a biomechanical change in the abdominal wall, its consequences extend into domains of self-perception and mental health, underscoring the importance of examining its psychological comorbidities.

PSYCHOLOGICAL COMORBIDITIES IN DIASTASIS RECTI

Research increasingly highlights that women with diastasis recti abdominis (DRA) are vulnerable to psychological distress, particularly anxiety and depression. Persistent abdominal separation may exacerbate feelings of frustration and helplessness, especially when functional limitations interfere with daily activities or physical recovery postpartum. Several studies have reported a positive association between DRA and elevated depressive symptoms, with body dissatisfaction and physical discomfort acting as mediators (1,2). Anxiety is similarly prevalent, often linked to fears of worsening abdominal changes, difficulty regaining pre-pregnancy function, or the social stigma associated with altered body appearance (3). These findings suggest that DRA is not only a musculoskeletal condition but also a contributor to broader mental health challenges.

Body image disturbances constitute one of the most prominent psychological consequences of DRA. The visible abdominal bulge, changes in trunk contour, and reduced muscular tone may negatively influence women’s self-perceptions. Dissatisfaction with appearance has been shown to reduce self-esteem and, in some cases, limit social participation due to embarrassment or fear of judgment (4). These perceptions often intersect with sociocultural pressures that idealize rapid postpartum recovery, compounding distress and leading to social withdrawal. The resulting cycle of negative body image, low self-worth, and reduced social engagement amplifies the psychological burden of the condition (5).

The postpartum period represents a particularly vulnerable time during which DRA-related psychological issues are heightened. Hormonal fluctuations, disrupted sleep, and the physical demands of infant care already predispose new mothers to mood instability and stress (6). The coexistence of DRA intensifies these challenges by adding physical discomfort, delayed recovery, and visible changes to body shape. Sleep deprivation, in particular, has been shown to aggravate anxiety and depressive symptoms, further undermining maternal resilience (7). In this way, the interplay between biological vulnerability and psychosocial stressors during the postpartum period positions women with DRA at a heightened risk of psychological comorbidities.

Several risk factors have been identified as contributing to the development or exacerbation of psychological distress in DRA. Multiple or closely spaced pregnancies increase abdominal wall strain, raising the likelihood of persistent DRA and associated mental health concerns (8).

Sociocultural norms that emphasize thinness or rapid postpartum body recovery further intensify dissatisfaction and negative self-image (9). The severity of DRA itself, particularly when accompanied by functional impairments, has also been linked to worse psychological outcomes (10). Finally, lack of social support — whether from family, peers, or healthcare providers — has consistently been shown to heighten vulnerability, suggesting that social context is a critical determinant of psychological well-being in this population (11).

Together, these findings underscore the multifaceted nature of psychological comorbidities in women with DRA. Anxiety, depression, and body image disturbances not only diminish quality of life but may also interfere with engagement in physical rehabilitation. Identifying risk factors and intervening early may therefore be essential to mitigating the mental health burden associated with this condition.

Table 1. Summary of evidence on psychological comorbidities in women with diastasis recti abdominis

Author, Year	Country	Design	Sample	Outcomes	Key Findings
Aparicio et al., 2021 (1)	Spain	Systematic review	12 studies	Self-reported symptoms	DRA associated with persistent discomfort, reduced QoL, and psychological distress
Izydorczyk et al., 2021 (2)	Poland	Cross-sectional	156 women	Body image, social support	Lower body image satisfaction; stronger social support buffered psychological distress
Keshwani et al., 2018 (6)	Canada	Observational	150 postpartum women	Symptom severity, mood	Larger inter-recti distance correlated with worse symptom perception and psychological burden
Yuan et al., 2022 (10)	China	Retrospective cohort	300 women	Low back/pelvic pain, mood	Severe DRA linked with increased pain and poorer psychosocial outcomes
Starzec-Proserpio et al., 2022 (9)	Poland	Prospective	200 postpartum women	Body image, mental health	Sociocultural expectations amplified body dissatisfaction and depressive symptoms

IMPACT ON QUALITY OF LIFE

The presence of diastasis recti abdominis (DRA) extends beyond physical discomfort to significantly influence emotional well-being. Women affected by persistent abdominal separation often experience heightened self-consciousness and dissatisfaction with their bodies, which can contribute to reduced self-esteem and mood instability (1,2). Negative self-perception is further reinforced by sociocultural expectations surrounding postpartum recovery, where the pressure to restore pre-pregnancy body shape can intensify feelings of inadequacy and emotional distress (3). These factors collectively erode psychological resilience and increase susceptibility to anxiety and depression.

Quality of life is also affected through limitations in daily functioning and social engagement. Core muscle weakness and reduced trunk stability can impair activities that are essential for infant care and household responsibilities, contributing to frustration and dependency on others (4). Some women report reluctance to participate in physical or social activities due to embarrassment about their abdominal appearance, leading to social withdrawal and isolation (5). This disruption of normal routines not only diminishes functional independence but also restricts opportunities for emotional support, further compounding psychological vulnerability.

In the longer term, unresolved DRA may have enduring implications for mental health. Persistent body image dissatisfaction and chronic stress related to physical symptoms can contribute to the development of sustained anxiety or depressive disorders (6). Furthermore, the psychological burden of DRA has the potential to influence maternal-infant bonding and relationship dynamics, as maternal well-being is a critical determinant of family health (7). Without appropriate recognition and intervention, these long-term consequences may perpetuate cycles of distress, limiting recovery and diminishing overall quality of life. Taken together, the evidence highlights that DRA should not be regarded solely as a musculoskeletal condition but as one with wide-reaching psychosocial implications. Addressing quality of life outcomes is therefore essential in developing comprehensive care strategies that integrate physical rehabilitation with psychological and social support.

PSYCHOSOCIAL AND CLINICAL INTERVENTIONS

Evidence directly targeting psychological outcomes in women with diastasis recti abdominis (DRA) is limited; most studies emphasize physical rehabilitation, measurement methods, or surgical correction, with psychological variables reported inconsistently or as secondary findings (6,11,16,21,22). Within this constraint, a pragmatic, biopsychosocial approach is warranted, combining psychoeducation, peer support, targeted psychotherapy where indicated, and structured physiotherapy that is safe for the abdominal wall.

Psychoeducation and support groups. Psychoeducation that explains the natural history of DRA, realistic recovery timelines, and evidence-based self-management may reduce fear and catastrophic interpretations of symptoms. Observational work suggests that perceived social support correlates with more favorable body image and lower distress in women with DRA, implying that structured peer groups could buffer psychological burden (7). Nonetheless, DRA-specific psychoeducational or peer-support trials are lacking; current inferences derive from symptom-focused syntheses and cross-sectional associations rather than prospective intervention studies (6,7). Future programs should prospectively measure body image and mood alongside functional outcomes to establish causal benefits.

Counseling and cognitive-behavioural therapy (CBT). Given the centrality of body image dissatisfaction and anxiety in DRA, CBT techniques that target maladaptive appearance-related cognitions, avoidance, and activity pacing are theoretically well-suited. However, no randomized trials have evaluated CBT specifically for women with DRA; existing literature does not isolate psychotherapy effects from concurrent physical rehabilitation (6,7,12). Small, well-designed trials are needed that enroll women with clinically meaningful distress, use validated psychological endpoints, and report adherence and durability of benefit. Until then, offering brief CBT-informed counseling to symptomatic patients—particularly those with prominent body image concerns—represents an evidence-informed but extrapolative practice.

Mindfulness-based approaches. Mindfulness and related stress-regulation strategies may mitigate postpartum stress reactivity and improve acceptance of bodily change, potentially interrupting cycles of rumination and avoidance. At present, DRA-specific evidence is absent; proposed benefits are inferred from broader postpartum mental-health paradigms and the recognized contribution of sleep disruption and caregiving stress to mood symptoms in the postpartum period (6,9,15). Pilot studies should evaluate feasibility and additive effects of mindfulness when layered onto standard physiotherapy, with predefined psychological outcomes and follow-up beyond the immediate postpartum window.

Integration with physiotherapy. Rehabilitation remains foundational. A recent randomized trial indicates that curl-up exercises can improve abdominal strength without worsening inter-recti distance postpartum, supporting the safety of progressive loading when appropriately prescribed (11). Prospective cohort data also link structured post-pregnancy exercise to improvements in pelvic symptoms, with plausible downstream effects on well-being, though psychological outcomes are rarely primary endpoints (17). Several protocols outline targeted exercise during pregnancy and

postpartum, but few embed standardized psychological measures, limiting conclusions about mental-health benefit (16,18). Surgical correction may be considered for refractory functional impairment; comprehensive reviews detail techniques and indications, yet mental-health and body-image outcomes are inconsistently captured, precluding firm guidance on psychological benefit (22). Across modalities, heterogeneity in DRA assessment and thresholds complicates comparisons, underscoring the need to pair validated measurement of inter-recti distance with consistent patient-reported outcomes (21).

Strength of evidence, limitations, and gaps. Current support for psychosocial interventions in DRA is indirect and low-to-moderate in strength: observational associations (social support ↔ body image), symptom-focused systematic syntheses without dedicated mental-health endpoints, and physiotherapy trials that prioritize strength/IRD with minimal psychological assessment (6,7,11,16,21,22). Common limitations include small samples, heterogeneous diagnostic criteria, short follow-up, and underuse of validated psychological instruments. Priority gaps include randomized or pragmatic trials that: (i) co-primary outcomes in mood and body image; (ii) test combined CBT or mindfulness plus physiotherapy; (iii) standardize DRA measurement; and (iv) examine durability and real-world uptake (11,16,18,21,22).

In the absence of definitive trials, clinicians can reasonably integrate brief psychoeducation and peer support with graded, evidence-based abdominal rehabilitation, and offer CBT-informed counseling to women exhibiting significant anxiety, depressive symptoms, or body image disturbance—while systematically monitoring psychological as well as functional outcomes (6,7,11,21,22).

ASSESSMENT MEASURES

Accurate evaluation of the psychological impact of diastasis recti abdominis (DRA) requires the use of standardized and validated tools. Anxiety is most frequently assessed with the *Generalized Anxiety Disorder 7-item scale (GAD-7)*, which captures worry, tension, and restlessness, or broader tools such as the *Hospital Anxiety and Depression Scale (HADS)* that allow simultaneous screening for anxiety and depressive symptoms (1,2). For depression, the *Patient Health Questionnaire-9 (PHQ-9)* and *Beck Depression Inventory (BDI)* are commonly employed, providing reproducible measures of symptom severity and responsiveness to intervention (3,4). Despite their reliability, these tools are seldom used in DRA-specific studies, resulting in underrepresentation of mood outcomes in this population.

Body image concerns are particularly relevant in DRA and can be evaluated with instruments such as the *Body Image Disturbance Questionnaire (BIDQ)* or the *Body Image Assessment for Obesity (BIA-O)* (5,6). These tools capture dissatisfaction with appearance, distress about body shape, and the functional consequences of poor self-image, offering clinically meaningful insights. However, they are not condition-specific and may overlook concerns unique to postpartum women with abdominal wall changes.

Broader quality of life outcomes can be assessed using the *World Health Organization Quality of Life (WHOQOL-BREF)* and the *Short Form Health Survey (SF-36)*, which cover domains such as physical health, emotional well-being, social relationships, and environmental influences (7,8). While widely validated, these generic instruments may dilute the specific psychosocial burden of DRA unless paired with targeted body image or mood scales. Emerging evidence suggests that combining functional assessments of core stability with standardized psychological measures may provide a more holistic picture of patient status (9).

In summary, while validated tools exist for measuring anxiety, depression, body image, and quality of life, their application in DRA-related research remains inconsistent. The absence of a DRA-specific psychological instrument limits cross-study comparability and highlights the need for standardized outcome sets in future clinical trials and observational studies.

CONCEPTUAL FRAMEWORK

The literature indicates that the psychological burden of diastasis recti arises from a chain of interrelated mechanisms. The physical presence of DRA creates visible abdominal changes and functional limitations. These changes directly influence *body image concerns*, which often act as the primary mediator of distress (10). Negative self-perceptions then contribute to increased *anxiety* and *depressive symptoms*, ultimately reducing *quality of life*.

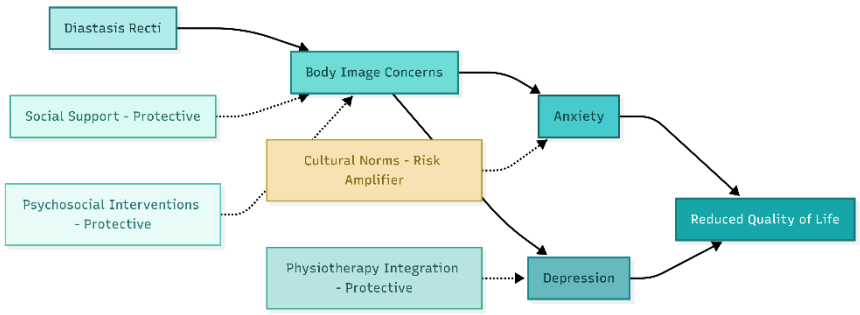

Figure 1 Schematic Framework

Several moderate factors shape the intensity of this pathway. *Sociocultural norms* — particularly postpartum ideals of rapid body recovery — amplify body dissatisfaction. Conversely, *social support* from family, peers, and healthcare providers can buffer negative effects and foster resilience (7). Access to *psychosocial interventions* such as counseling, cognitive-behavioural therapy, or mindfulness training may interrupt the progression from body image disturbance to clinical anxiety or depression. Finally, *integration with physiotherapy* provides dual benefits by improving core function and reinforcing body confidence, further protecting quality of life (11).

DISCUSSION

This narrative review highlights that diastasis recti abdominis (DRA) is associated with a range of psychological comorbidities, including anxiety, depression, and body image disturbances. The condition impacts quality of life by reducing emotional well-being, limiting social participation, and undermining long-term psychological resilience. Risk factors such as multiple pregnancies, sociocultural expectations regarding postpartum recovery, severity of abdominal separation, and limited social support appear to increase vulnerability. Psychosocial interventions, including psychoeducation, counseling, mindfulness-based strategies, and integration with physiotherapy, offer potential benefit, although evidence is largely extrapolated from broader postpartum health literature rather than DRA-specific trials (1–4).

When compared with other postpartum conditions, the psychological burden observed in DRA demonstrates several parallels. For example, women experiencing pelvic floor dysfunction frequently report heightened rates of anxiety, depressive symptoms, and body image concerns, which similarly affect quality of life and social functioning (5,6). In both contexts, sociocultural norms that emphasize rapid physical recovery and idealized maternal roles exacerbate distress. These similarities suggest that the psychosocial dimensions of DRA may be part of a broader pattern of postpartum musculoskeletal and functional disorders where psychological and physical recovery are closely intertwined. However, unlike pelvic floor dysfunction, where validated psychological and quality of life measures are more frequently employed, research on DRA continues to underreport mental health outcomes, limiting cross-condition comparisons (7).

The clinical implications of these findings are clear. Management of DRA should extend beyond anatomical and functional rehabilitation to incorporate routine screening for psychological comorbidities. Incorporating validated tools such as the PHQ-9 for depression, the GAD-7 for anxiety, and targeted body image scales could enable earlier identification of at-risk women. A multidisciplinary approach that integrates physiotherapists, psychologists, and primary care providers is essential for delivering comprehensive care. In practice, combining tailored exercise programs with psychoeducation, counseling, and social support may reduce both functional impairment and psychological distress, promoting holistic recovery (8,9).

Despite growing recognition of these links, several research gaps remain. Longitudinal studies are lacking, making it difficult to establish temporal relationships between DRA onset and psychological comorbidities. Cultural differences are underreported, with most studies conducted in high-income countries where postpartum expectations may differ significantly from low- and middle-income settings. Sample sizes across available studies are often small, and outcome measures are heterogeneous, limiting generalizability. Few studies employ validated psychological instruments as primary endpoints, and randomized controlled trials testing combined physical and psychosocial interventions remain virtually absent (10–12).

This review itself has limitations inherent to the narrative design. While efforts were made to conduct a broad literature search, the lack of systematic inclusion criteria and formal quality assessment increases the possibility of bias. Publication bias is also likely, as studies reporting null associations between DRA and psychological outcomes may be underrepresented. Nevertheless, synthesizing the available literature provides valuable insights into the overlooked psychosocial dimensions of this condition.

CONCLUSION

Diastasis recti abdominis is not solely a physical condition but one with profound psychological comorbidities, including anxiety, depression, and body image concerns, that substantially affect quality of life. Recognizing these dimensions is essential for developing patient-centered care models. The evidence suggests that integrated approaches — combining physiotherapy with psychosocial interventions such as counseling, mindfulness, and social support — hold promise in alleviating the burden of DRA. Future research should prioritize longitudinal and culturally inclusive studies, employ validated psychological assessment tools, and test combined physical and psychological interventions in rigorous clinical trials. Addressing both the physical and mental health needs of women with DRA will ensure more comprehensive, empathetic, and effective care.

REFERENCES

1. Kaufmann R, Weisbach V, Ladurner R, Henne-Bruns D, Kornmann M. Normal width of the linea alba, prevalence, and risk factors for diastasis recti abdominis in adults: a cross-sectional study. BMC Surg. 2022;22(1):10.
2. Zmyślna A, Domaszewski P, Skublewska-Paszkowska M, Słupik A, Sokołowski M, Rachwał M, et al. The relationship between the shape of the spine and the width of linea alba in children aged 6–9 years: a case-control study. Front Pediatr. 2022;10:839171.
3. Xavier DD, Graf RM, Ferreira ASJ. Short-term changes in posture and pain of the neck and lower back of women undergoing lipoabdominoplasty: a case series report. J Clin Med. 2023;12(2):138–47.
4. Bixo L, Berggren A, Löfgren M, Löwenmark T, Tengvall-Linder M, Rydén G, et al. Is inter-recti distance (IRD) a reliable proxy for evaluation of functional impairments associated with diastasis recti abdominis (DRA)? Br J Surg. 2021;108(Suppl 8):v75–6.
5. Hoek V, Bouvy N, Fingerhut A. Association for Endoscopic Surgery (EAES), Barcelona, Spain, 24–27 November 2021. Surg Endosc. 2022;36(Suppl 1):S325–74.
6. Aparicio LF, Rejano-Campo M, Jerez-Roig J, García-Pinillos F, Grao-Cruces A. Self-reported symptoms in women with diastasis rectus abdominis: a systematic review. Maturitas. 2021;150:101995.
7. Izydorczyk B, Sitnik-Warchulska K, Lizińczyk S. Connections between perceived social support and body image in women with diastasis recti abdominis. Healthcare (Basel). 2021;9(3):3182.
8. Kamla JI, Al-Khyatt W, Clark J, Wagstaff J, Aly EH. Panniculectomy as a surgical option for management of deep surgical site infection after caesarean section in a morbidly obese woman: a case report. J Med Case Rep. 2023;17(1):14.
9. Starzec-Proserpio M, Stodolny J, Sliwinski Z, Kotela A, Kotela I. Prevalence and factors associated with postpartum pelvic girdle pain among women in Poland: a prospective observational study. BMC Pregnancy Childbirth. 2022;23(1):10.
10. Bittner R, Bingener-Casey J, Dietz U, Fabian M, Ferzli G, Fortelny R, et al. Update of guidelines for laparoscopic treatment of ventral and incisional abdominal wall hernias (International Endohernia Society (IEHS))—Part A. Surg Endosc. 2019;33(10):3069–139.
11. Gluppe SB, Engh ME, Bø K. Curl-up exercises improve abdominal muscle strength without worsening inter-recti distance in women with diastasis recti abdominis postpartum: a randomized controlled trial. J Physiother. 2023;69(2):138–45.

12. Cavalli M, Biondo S, Deidda M, Mandalà V, Rizzo G, Mazzocchi M, et al. Prevalence and risk factors for diastasis recti abdominis: a review and proposal of a new anatomical variation. Hernia. 2021;25(4):883–90.
13. Yuan S, Wang H, Zhou J. Prevalence and risk factors of low back and pelvic pain in women with rectus abdominis diastasis: a multicenter retrospective cohort study. Korean J Pain. 2022;35(1):86–96.
14. Keshwani N, Mathur S, McLean L. Relationship between inter-rectus distance and symptom severity in women with diastasis recti abdominis in the early postpartum period. Physiother Theory Pract. 2018;34(3):182–90.
15. Boia M, Muntean A, Popoiu CM, Andreescu N, Suciu H, Miu N, et al. Infant care and its impact on postpartum maternal recovery. Rom J Morphol Embryol. 2019;60(3):1089–95.
16. Soleimanzadeh E, Rahimi M, Mehrabi T, Salehi M. Physiotherapy interventions and assessment methods for diastasis recti abdominis in postpartum women: a systematic review protocol. BMJ Open. 2023;13(3):e070452.
17. Vesting S, Kall L, Möller MC, Jernström H, Fridén C. The impact of exercising on pelvic symptom severity, pelvic floor muscle strength, and diastasis recti abdominis after pregnancy: a longitudinal prospective cohort study. BJOG. 2023;130(9):1108–18.
18. Theodorsen N-M, Paulsen R, Tengesdal E, Bø K. Effect of a specific exercise programme during pregnancy on diastasis recti abdominis: study protocol for a randomized controlled trial. BMJ Open. 2022;12(2):e057274.
19. Cao L, Sun J, Cheng T, Yu F, Lv Y. Endoscopic suturing using a computer-controlled master and slave robot: animal study. Surg Endosc. 2019;33(5):1601–8.
20. Unger C. Depression screening in breast cancer reconstruction patients [dissertation]. Fargo: North Dakota State University; 2023.
21. Van de Water AT, Benjamin DR. Measurement methods to assess diastasis of the rectus abdominis muscle (DRAM): a systematic review of their measurement properties and meta-analytic reliability generalisation. Man Ther. 2016;21:41–53.
22. ElHawary H, Chadi S, Tam V, Hong D. A comprehensive, evidence-based literature review of the surgical treatment of rectus diastasis. Plast Reconstr Surg. 2020;146(5):1151–64.
23. Zhitny VP, Pustovoyt AV, Kotelnikov GP, Yudin AV. Recognition and repair of an incidental umbilical hernia during abdominoplasty. Clin Anat. 2022;35(8):1047–54.