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The Role of Dynamic Neuromuscular Stabilization Exercises in Pelvic Floor Rehabilitation: A Literature Review

Dinamik Nöromusküler Stabilizasyon Egzersizlerinin Pelvik Taban Rehabilitasyonundaki Rolü: Bir Literatür Derlemesi

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ABSTRACT

Dynamic Neuromuscular Stabilisation is a rehabilitative approach based on developmental kinesiology and targeting an integrated spinal stabilisation system. The pelvic floor is an important component of this system and this review study aims to examine the effectiveness of DNS on pelvic floor dysfunctions. In addition, it aims to identify gaps in the existing literature and investigate the use of DNS as an alternative intervention method to traditional pelvic floor exercises. The traditional pelvic floor rehabilitation approach focuses solely on strengthening the pelvic floor muscles. However, emerging evidence emphasises the importance of other core muscles in achieving the best results. Dynamic Neuromuscular Stabilization exercises are designed to promote comprehensive activation and strengthening of the entire core musculature, rather than targeting individual muscles in isolation. Despite the growing evidence and applications of Dynamic Neuromuscular Stabilization in various fields, there is limited understanding of the extent and implications of its potential in pelvic floor rehabilitation. However, given the available information, Dynamic Neuromuscular Stabilization appears to be a promising intervention for pelvic floor rehabilitation.

Keywords: *Core stabilization, Dynamic neuromuscular stabilization, Kegel exercise, Pelvic floor rehabilitation*

ÖZET

Dinamik Nöromusküler Stabilizasyon gelişimsel kinezyolojiye dayanan ve entegre spinal stabilizasyon sistemi hedef alan rehabilite edici bir yaklaşımdır. Pelvik taban, bu sistemin önemli bir bileşeni olup, bu derleme çalışması, DNS'in pelvik taban disfonksiyonları üzerindeki etkinliğini incelemeyi amaçlamaktadır. Bunun yanı sıra, mevcut literatürdeki eksiklikleri belirlemeyi, DNS'in geleneksel pelvik taban egzersizlerine alternatif bir müdahele yöntemi olarak kullanılabilmesini araştırmaktadır. Geleneksel pelvik taban rehabilitasyonu yaklaşımı yalnızca pelvik taban kaslarının güçlendirilmesine odaklanır. Ancak ortaya çıkan kanıtlar, en iyi sonuçları elde etmede diğer kor kaslarının önemini vurgulamaktadır. Dinamik Nöromusküler Stabilizasyon egzersizleri, izole bir şekilde tek tek kasları hedeflemek yerine, tüm kor kas sisteminin kapsamlı aktivasyonunu ve güçlendirilmesini teşvik edecek şekilde tasarlanmıştır. Dinamik Nöromusküler Stabilizasyonun çeşitli alanlarda giderek artan kanıt ve uygulamalarına rağmen, pelvik taban rehabilitasyonundaki potansiyelinin kapsamı ve etkileri hakkında sınırlı bir anlayış bulunmaktadır. Ancak mevcut bilgiler göz önüne alındığında, Dinamik Nöromusküler Stabilizasyon, pelvik taban rehabilitasyonu için umut verici bir müdahale gibi görünmektedir.

Anahtar kelimeler: *Kor stabilizasyon, Dinamik nöromusküler stabilizasyon, Kegel egzersizi, Pelvik taban rehabilitasyonu*

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INTRODUCTION

Dynamic Neuromuscular Stabilization (DNS) is a rehabilitative approach based on developmental kinesiology, developed by Pavel Kolar and influenced by the Vojta concept. It focuses on optimizing movement by enhancing spinal stability through key muscles, including the pelvic floor (PF), which is vital for intra-abdominal pressure regulation and lumbopelvic stability (Kobesova and Kolar, 2014; Hodges et al., 2007). DNS utilizes innate infant movement patterns for rehabilitation (Judge and Tronik, 2021).

This review examines DNS's role in pelvic floor rehabilitation by analyzing studies (2020–2025) from PubMed, Cochrane Library, and Google Scholar using keywords like "DNS and PF." Key findings were synthesized thematically from relevant English-language articles.

Basic Principles of DNS and its Relationship with the Pelvic Floor

DNS operates based on the principles of developmental kinesiology, Central Nervous System (CNS) control, joint centration (joint centration is the neuromuscularly ideal positioning of a joint where forces are evenly distributed and stability is maximized), core stabilization—Integrated Spinal Stabilizing System (ISSS)—and intra-abdominal pressure (IAP) (A neuromuscularly generated intra-abdominal pressure that contributes to thoracolumbopelvic stability by engaging the surrounding core musculature and supporting visceral structures) (Frank et al., 2013; Kobesova and Kolar, 2014).

Developmental Kinesiology

DNS is based on the scientific theories of developmental kinesiology and emphasizes the existence of innate central movement patterns (Kobesova and Kolar, 2014). These patterns include ideal muscle activation and joint positions. DNS exercises aim to restore ideal muscle coordination by returning to these developmental positions, involving the diaphragm, pelvic floor muscles (PFM) (e.g., levator ani, pubococcygeus, coccygeus, iliococcygeus, ischiocavernosus, bulbospongiosus, transversus perinei superficialis, transversus perinei profundus, sphincter urethrae, etc.), and abdominal muscles (e.g., obliquus externus abdominis, obliquus internus abdominis, transversus abdominis, rectus abdominis, pyramidalis, etc.) (Kolar, 2007; Madle et al., 2022).

Joint Centration

DNS aims to position the joints ideally, i.e., centering them. PFM, along with the diaphragm and abdominal muscles, help distribute the load on the spine and maintain the joints in an optimal position through intra-abdominal pressure (IAP) (Hodges et al., 2007; Krause, 2020).

Integrated Spinal Stabilizing System

ISSS consists of the balanced co-activation of deep cervical flexors (e.g., longus colli, longus capitis) and spinal extensors in the cervical and upper thoracic regions, and the diaphragm, PF, abdominal muscles, and spinal extensors in the lower thoracic and lumbar regions (Frank et al., 2013). The diaphragm, PF, and transversus abdominis (TrA) regulate IAP, providing anterior postural stability to the lumbopelvic region. The activation of these stabilizers occurs before any purposeful movement, and these muscles work together rather than in isolation (Hodges et al., 2007; Borghuis et al., 2008). If one segment of this stabilization system is disrupted, it can negatively affect the function of others, as the diaphragm, transversus abdominis (TrA), and PFM serve both postural and respiratory functions.

Intra-Abdominal Pressure (IAP)

Proper generation of IAP involves the activation of the diaphragm, PFM, deep cervical flexors, spinal extensors, and TrA (Frank et al., 2013). The PFM, located in the lower part of the abdominal cavity, act as a piston alongside the diaphragm. While the contraction of the diaphragm increases IAP, the PFM counteract this pressure, helping to balance IAP (Hodges, 1999; Bradley et al., 2014). Changes in IAP affect the activation of the PFM (Junginger et al., 2010). An increase in IAP triggers a reflexive contraction response in the PFM (Hodges et al., 2007). This contraction contributes to the support of pelvic organs, control of micturition and defecation, and spinal stability (Sapsford, 2001; Sapsford et al., 2001; Hodges et al., 2007).

Central Nervous System (CNS) Control

The PFM and other muscles regulating IAP (e.g., diaphragm, TrA) are controlled by the Central Nervous System (CNS). These muscles are automatically activated before conscious movements, stabilising the columna vertebralis and pelvis (Frank et al., 2013).

Functional Anatomy of the Pelvic Floor Muscles

The PF is a complex musculoskeletal structure primarily consisting of the levator ani muscles, which receive somatic innervation from the lumbosacral plexus. These muscles play a vital role in supporting pelvic organs and maintaining anatomical and functional integration with the pelvis, coccyx, and gluteal muscles (Eickmeyer, 2017; Flusberg et al., 2019).

Structurally, the PF comprises striated muscles, ligaments, and fascial layers. Its stability is maintained through two synergistic systems:

1. The support system (muscular and aponeurotic structures) provides direct mechanical support to pelvic organs.
2. The suspension system (ligamentous structures) maintains the anatomical position of visceral

structures (Flusberg et al., 2019; Muro and Akita, 2023).

Functionally, PF stabilization involves the dynamic coordination of voluntary (skeletal muscles) and involuntary (smooth muscles) control mechanisms. This synchronized contraction ensures biomechanical efficiency during intra-abdominal pressure changes, supporting continence, organ positioning, and dynamic stability (Muro and Akita, 2023).

Role of Pelvic Floor Muscles in Spinal Stabilization

The PFM contribute substantially to spinal stabilization through coordinated activation with core musculature (TrA, multifidus). This synergy maintains lumbopelvic stability via intra-abdominal pressure modulation. Neuromuscular control of these muscles supports sacroiliac joint stability and spinal segmental control. Their respiratory-phase-dependent activity patterns demonstrate their dynamic postural stabilization function (Hodges et al., 2007).

Pelvic Floor Assessment in the DNS Approach

DNS approach evaluates PF function as an integral component of the core stabilization system. Literature indicates DNS assesses PFM synergistically with other core muscles rather than through isolated techniques (Sharma and Yadav, 2020).

DNS examines the coordinated function of the core cylinder (diaphragm, abdominal wall, PF) during dynamic tests evaluating postural control and intra-abdominal pressure regulation (Kolar et al., 2014). Key assessments include:

1.Intra-abdominal pressure test (observing abdominal activation and thoracopelvic alignment)
2.Functional movement tests (hip flexion, head/neck extension, quadruped rocking)

These evaluate pelvic positioning and stability within integrated movement patterns (Kobesova and Kolar, 2014).

Notably, DNS assesses PF function dynamically during movement and postural control rather than static positions (Hodges et al., 2007; Kobesova and Kolar, 2014).

DNS Treatment Methods and Use in Rehabilitation

DNS therapy utilizes functional exercises derived from developmental kinesiological positions of healthy infants to reconstruct the ISSS (Gulrandhe and Kovela, 2023; Milić, 2020). The foundation of treatment lies in establishing core stabilization, which serves as a prerequisite for all exercises (Kolar et al., 2014). This process emphasizes maintaining spinal alignment and diaphragmatic breathing, with particular focus on achieving 360° expansion of the abdominal wall during inspiration, including posterior and lateral aspects (Kolar et al., 2014).

The DNS approach prioritizes neutral joint positioning while supporting stability in both hypomobile and hypermobile joints (Kolar et al., 2014; Katarína and Čief, 2024).

The treatment protocol adopts an individualized strategy based on comparing the patient's movement patterns with developmental standards (Frank et al., 2013; Kobesova and Kolar, 2014). This technique can be supported in positions appropriate to the neurodevelopmental stages emphasised by Kolar et al. to train the postural function of the diaphragm. The prone position, specific to the fifth month, targets the early development of upper limb and core stabilisation. The side sitting position seen in the eighth month is effective in providing pelvic-rotator control. The quadruped position in the ninth month provides a neuromotor development for coordinated limb movements, while the tripod position specific to the tenth month improves postural balance and intra-abdominal pressure (IAP) regulation (Kolar, 2007; Kolar andamp; Kobesova, 2010).

This systematic approach ensures comprehensive neuromuscular re-education by progressively challenging the stabilization system through ontogenetic movement patterns while maintaining optimal postural alignment and respiratory function throughout all therapeutic interventions.

Table 1 summarises the progression of Dynamic Neuromuscular Stabilisation (DNS) exercises based on the developmental stages of motor development observed at 5, 8 and 9 months.

DNS is an effective rehabilitation approach for musculoskeletal, neurological, and respiratory disorders (Sharma and Yadav, 2020). DNS has demonstrated efficacy in neurological rehabilitation, including stroke, MS, Parkinson’s, and Alzheimer’s, through structured protocols involving diaphragmatic breathing, postural activation (prone/supine/sitting positions), and functional transitions (sit-to-stand) (Kaushik et al., 2024). Clinical trials typically employ 3–5 weekly sessions over 4–8 weeks, with 30–75 minute durations. Comparative studies show DNS outperforms conventional therapies (e.g., core stabilization, neurodevelopmental treatment) in improving respiratory function, balance, gait, and activities of daily living (Benfiry et al., 2018; Yoon et al., 2020; Maran et al., 2023).

DNS treatment has been recognized as a beneficial approach for individuals with low back pain, particularly in reducing pain intensity and improving quality of life (Najafi Ghagholestani et al., 2022; Mousavi and Mirsafaei Rizi, 2022; Kararti et al., 2023; Kaushik and Ahmad, 2024). DNS has also been used in sports rehabilitation, with studies showing that a sports program based on DNS principles can reduce low back pain and enhance sensory perception quality in athletes (Frank et al., 2013; Kobesova et al., 2020; Kobesova et al, 2021).

Table 1. Sample exercise sequence in DNS according to developmental positions (5th, 8th, 9th month)

Developmental Month	Developmental Position	Key Motor Control Goals	Example DNS Exercise(s)	Clinical Application Notes
5th Month	Supine with Lower Extremity Lifting	Activation of deep core stabilizers, symmetrical limb control, initiation of IAP	Supine breathing with 90-90 hip and knee flexion; reaching for toys with arms while maintaining trunk control	Suitable for early-stage rehabilitation (e.g., postpartum recovery, lumbar instability); facilitates deep core activation and initial neuromuscular patterning. (*Frank et al., 2013)*
8th Month	Oblique Sitting and Creeping	Lateral weight shift, segmental trunk rotation, scapular and pelvic dissociation	Side-sitting with reaching tasks across midline; assisted creeping positions for functional rotation training	Ideal for addressing unilateral instability, postural asymmetries, and scapular control deficits. *(Kobesova and Kolar, 2014)*
9th Month	Bear (Quadruped) and Half-Kneeling	Dynamic trunk stability, contralateral coordination, vertical postural control	Quadruped rocking with contralateral arm-leg lift; half-kneeling with forward reaching	Effective in re-integrating gait-related coordination and proximal control in neurorehabilitation and return-to-play stages. *(Kobesova and Kolar, 2014)*

Table 2. Comparison of DNS and Traditional Exercises

Criterion	DNS	Traditional Exercises
Primary Aim	Improves motor control and optimizes postural stability.	Increases muscle strength, flexibility, and endurance.
Approach	Developmental kinesiology-based; focuses on central stability.	Focuses on isolated muscle training or general conditioning.
Neuromuscular Interaction	High interaction with the CNS via reflexive and postural responses.	Emphasizes peripheral muscle strengthening; less neuromotor integration.
Muscle Activation	Targets deep stabilizers (TrA, multifidus, diaphragm, pelvic floor).	Primarily activates superficial muscle groups.
Postural Effect	Enhances dynamic postural control.	Assessed mainly through static postures.
Functional Relevance	Directly integrated into functional and daily movement patterns.	Functional transfer may be limited.
Application Duration	Sessions last 20–40 minutes; motor learning may require weeks.	Sessions 30–60 minutes; faster visible outcomes possible.
Scope	Includes breathing patterns, core stability, reflex development, joint centration.	Focuses on strength, flexibility, and cardiopulmonary endurance.
Target Population	Orthopedic, neurological, pediatric, athletic, and postural disorder patients.	General public, athletes, and rehabilitation patients.
Assessment Tools	Uses DNS tests and postural control assessments.	Uses strength tests, range of motion and endurance measurements.
Expertise Requirement	Requires certified DNS-trained therapist.	Can be applied by general physiotherapists or fitness trainers.

CNS: Central Nervous System, DNS: Dynamic Neuromuscular Stabilisation, TrA: Transversus Abdominis

Table 2 provides a comparison between Dynamic Neuromuscular Stabilisation (DNS) and Traditional Exercises in terms of therapeutic effect, scope and duration of application (Comerford and Mottram, 2012; Frank et al, 2013; Kobesova and Kolar, 2014; Richardson et al., 2004).

The Role of DNS in Pelvic Floor Dysfunctions and Use in Pelvic Floor Rehabilitation

The PF consists of muscles, ligaments, and fascia, and it supports pelvic organs (e.g., bladder, uterus, rectum, etc.). The PFM play a role in maintaining urinary and fecal continence, micturition, defecation, and childbirth (Tim and Mazur-Bialy, 2021). When the PFM fail to function properly, pelvic floor dysfunctions (PFD) such as urinary and fecal incontinence, pelvic organ prolapse, sexual dysfunctions, and pelvic pain may occur (Wallace et al., 2019).

Pelvic floor rehabilitation is a conservative treatment method used as a first-line approach to improve PFD (Wallace et al., 2019). Pelvic floor rehabilitation may include PFM exercises alone or in combination with other physiotherapy methods such as bladder training, biofeedback, or electrical stimulation (Kenton and Smilen, 2015).

While traditional pelvic floor rehabilitation focuses primarily on strengthening the PFM, emerging evidence highlights the importance of other core muscles, such as the TrA, diaphragm, and multifidus, in achieving optimal outcomes (Sapsford et al., 2001). It is assumed that pelvic floor rehabilitation reaches its full potential when all core muscles are addressed simultaneously (Sapsford et al., 2001).

DNS targets the ISSS, which includes the deep cervical flexors, diaphragm, TrA, multifidus, and PF (Kobesova and Kolar, 2014). DNS exercises are specifically designed to promote comprehensive activation and strengthening of all core muscles, including the diaphragm. It is important to note that the diaphragm plays a significant role in stabilizing the abdominal, lumbar, and pelvic regions. Proper breathing ensures adequate stabilization of the spine and enhances stability and support to the spine, pelvis, and surrounding structures (Frank et al., 2013; Sharma and Yadav, 2020).

Table 3. Coactivation Scheme of Pelvic Floor and Core Muscles in the Context of DNS

Muscle Group	Function	Role in DNS Coactivation	Clinical Relevance / Application
Pelvic Floor Muscles (levator ani, pubococcygeus, iliococcygeus)	Support of pelvic organs, continence control	Coordinate contraction with intra-abdominal pressure (IAP); fundamental for stabilization	Reactivation in pelvic floor dysfunction (e.g., incontinence, prolapse)
TrA	Trunk stabilization, visceral support	Early coactivation with pelvic floor for deep core stabilization	Focus in low back/pelvic pain rehabilitation
Multifidus	Segmental stabilization of the spine	Co-contraction with pelvic floor and TrA for spinal centration	Essential in chronic low back pain management
Diaphragm	Breathing, regulation of intra-abdominal pressure	Works with pelvic floor and abdominal muscles to manage IAP and provide stabilization	Breath control in cases of respiratory dysfunction
Obliquus Internus	Trunk rotation and stabilization	Synergistic activation with TrA and pelvic floor	Important for rotational stability

IAP: Intra-Abdominal Pressure, TrA: Transversus Abdominis

Table 3, systematically summarizes the synergistic relationship between key muscle groups involved in core stabilization within the DNS approach (Hodges, 1999; Hodges and Richardson, 1999; Kolar et al., 2014; Dumoulin et al., 2015). Given these principles, DNS exercises, with their holistic approach, can significantly contribute to pelvic floor rehabilitation. In recent years, DNS exercises have also begun to be explored as a treatment method for PFD.

Krause (2020) investigated whether Dynamic Neuromuscular Stabilization (DNS) was more effective than a pelvic girdle alone for managing pelvic girdle pain (sacroiliac and pubic symphysis) in a female athlete. The study highlighted that pelvic girdle pain occurs not only during pregnancy but also in athletes. While pelvic girdles are a known treatment, Krause compared their efficacy to DNS-based core stabilization.

The planned intervention involved eight sessions over four phases:

1. Pelvic girdle use (first week).
2. Posture and breathing correction (diaphragmatic breathing, intra-abdominal pressure exercises).
3. Trunk and hip stabilization (DNS positions like low oblique).
4. Functional integration of DNS into pain-provoking activities.

Despite the structured approach, the study was halted due to COVID-19. Even if completed, its single-case design would limit clinical generalizability, and distinguishing DNS effects from placebo or natural recovery would remain challenging. Nevertheless, the study underscores the need for further research on DNS for pelvic pain in athletes.

Table 4. Comparative Analysis of Literature

Study (Year)	Objective	Method	Findings	Limitations
Krause (2020)	To compare the effectiveness of DNS versus a pelvic belt in managing pelvic girdle pain.	Single-case study (female athlete); 4-phase DNS protocol (8 sessions).	Could not be completed due to COVID-19. Theoretically well-structured protocol.	Single case, low generalizability. Unable to distinguish placebo/natural recovery effects.
Judge and Tronik (2021)	To compare DNS techniques with traditional pelvic floor exercises for SUI treatment.	Systematic review of 11 studies (2 SR, 6 RCTs, 3 controlled intervention studies).	DNS components (breathing, IAP, stabilization) combined with pelvic floor training were more effective.	Lack of clear exercise protocols/dosage; low evidence quality in many studies.
Ghavipanje et al. (2022)	To assess DNS effects on low back pain and respiratory function in obese postpartum women.	40 participants (DNS vs. general exercise); 6 weeks, 6 sessions/week.	DNS improved pain and respiratory function better than general exercise.	Small sample size; no long-term follow-up.
Sharma et al. (2023)	To compare DNS and Kegel exercises in managing SUI.	Pilot RCT (24 women); 12-week intervention (DNS vs. Kegel).	DNS was more effective than Kegel (measured via EMG/perineometry).	Unclear phase transition criteria; limited to young/mild SUI cases.
Sharma et al. (2024)	To confirm the superiority of DNS in SUI management.	Expanded RCT (90 women); s		

DNS: Dynamic Neuromuscular Stabilization, SUI: Stress Urinary Incontinence, RCT: Randomized Controlled Trial, SR: Systematic Review, IAP: Intra-Abdominal Pressure, EMG: Electromyography

Judge and Tronik (2021) systematically reviewed traditional pelvic floor exercises (PFE) and Dynamic Neuromuscular Stabilization (DNS) for treating stress urinary incontinence (SUI) in women aged 20–60. Analyzing 11 studies (2 systematic reviews, 6 RCTs, 3 controlled trials) from five databases (2010–2021), they found limited direct evidence linking DNS to pelvic floor strength. However, combining DNS components (abdominal activation, diaphragmatic breathing, intra-abdominal pressure control, trunk stabilization) with pelvic floor muscle training (PFMT) improved SUI symptoms, leakage frequency, and quality of life more than PFMT alone. Despite promising results, most studies lacked clear exercise protocols or dosage details, and evidence quality was often low, highlighting methodological limitations.

DNS therapy, focusing on the diaphragm, TrA and PFM, has also been applied in obese women in the postpartum period and has been found to be more effective in improving low back pain and respiratory function compared to general exercise (Ghavipanjeet al, 2022). Ghavipanje et al. included 40 obese postpartum primiparous women aged between 24 and 34 years with a Body Mass Index (BMI) greater than 30 kg/m² in their study and randomly assigned the participants to the DNS group or the general exercise group. Both groups exercised 6 sessions (3 supervised, 3 home-based) per week for 6 weeks. The DNS protocol used diaphragmatic breathing, Baby Rock (supine 90-90), Prone, Rolling, Side Lying, Oblique Sit, Tripod, Kneeling, Squat, and standing positions. The relatively small sample size of the study is a limitation. The study confirms that DNS is feasible in obese postpartum women with low back pain and effectively improves pain and respiratory function. In this context, DNS seems promising for the treatment of women with PFD in the postpartum period.

Sharma et al. (2023) reported that a comprehensive approach that goes beyond traditional PFE is needed to address this multifaceted problem in women with SUI and thought that DNS exercises targeting the ISSS may offer an alternative to traditional pelvic floor exercises. Therefore, they compared the effectiveness of DNS exercises and Kegel exercises in managing SUI in women and presented a pilot study. The results of the study suggested that DNS exercises may provide a more effective approach to pelvic floor rehabilitation compared to traditional Kegel exercises. The study included 24 women aged 18-40 years with mild to moderate SUI. Participants were randomly divided into DNS and Kegel exercise groups. The intervention period lasted 12 weeks. The DNS exercise protocol included positions such as crook lying, prone, supine with legs supported on a stool/gym ball, quadruped, quadruped with knees supported on an unstable surface, quadruped to heel sitting, sagittal stabilisation with hip abduction, and sagittal stabilisation with hip flexion. In the Kegel exercise group, PFM contractions were performed as 10 repetitions per set and three sets in total, keeping each contraction for 10 seconds, and a one-minute rest period was left between the sets. After the exercise intervention, PFM strength was measured by perineometer and PFM electrical activity was measured by Electromyography (EMG). However, the phase transition criteria in the DNS group are not clearly defined and there are deficiencies in the intervention protocols. Age restriction and exclusion of severe SUI reduce the generalisability of the findings. The strengths of the study include the fact that it was a randomised controlled trial, standardisation was achieved, exercise intervention lasted longer and objective measurement methods were used.

Sharma et al. (2024) applied the same study protocol to 90 women with SUI and emphasised that DNS was superior to Kegel exercises for SUI management and was a promising intervention for improving urinary continence in women with SUI (Sharma et al, 2024).

CONCLUSION

A review of the existing literature shows that the Dynamic Neuromuscular Stabilisation (DNS) approach offers a more holistic treatment option in pelvic floor rehabilitation compared to traditional isolated PFE. However, randomised controlled trials directly investigating the effectiveness of DNS in pelvic floor rehabilitation are quite insufficient. Gaps in the literature include the lack of research on the short/long-term effects of DNS protocols directly on PFM activation and the lack of prospective analyses of DNS in patient groups with specific PFD (e.g. pelvic organ prolapse, chronic pelvic pain syndrome). Methodological heterogeneity, small samples, lack of standardised DNS protocols, inadequacy of chronic follow-up data of treatment outcomes, limited number of studies with individuals with severe pelvic floor dysfunction and elderly population, inadequacy of studies examining the neuromechanical effects of DNS on PFM activation and evaluating them with objective methods are important limitations in existing studies. These limitations significantly affect the generalisability of the findings presented in this review and make it difficult to make definite recommendations for clinical practice.

In conclusion, this review synthesised the theoretical foundations of DNS in pelvic floor rehabilitation and available clinical data. Considering the available information, DNS seems to be a promising intervention for pelvic floor rehabilitation. It can be said that more randomised controlled trials are needed to recognise the importance of DNS in pelvic floor rehabilitation, to fill the knowledge gap in the literature and to establish a protocol that can be applied in pelvic floor rehabilitation. In clinical practice, it is recommended that DNS, which focuses not only on the PFM but also on the coordinated activation of the diaphragm, abdominal muscles, multifidus and PF, should be integrated into traditional pelvic floor rehabilitation methods, taking into account the individual needs of patients. New studies in this field, especially the development of standardised protocols, focusing on the evaluation of long-term results by applying it in different populations such as men and elderly patients, and investigating the specificity of this approach will contribute to the elimination of existing gaps in the literature.

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