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EXPLORING THE EFFICIENCY OF OCCUPATIONAL THERAPY IN THE TREATMENT OF HAND INJURIES: CASE ABOUT STENOSING TENOSYNOVITIS (TRIGGER FINGER) IN SAUDI ARABIA

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Abstract

Background: Stenosing tenosynovitis is a common cause of painful hand dysfunction. Occupational therapists frequently manage these patients' using orthoses, exercises, and other conservative modalities, but the overall effectiveness of these strategies remains unclear, especially in settings such as Saudi Arabia. We aimed to systematically review the evidence on occupational therapy related interventions for trigger finger, focusing on functional outcomes and implications for practice. **Methods:** A systematic search of major electronic databases identified clinical studies evaluating non-surgical, rehabilitation-oriented interventions for adult trigger finger. Ten original studies on splinting, hand therapy modalities, guided injections, and exercise-based programmes were included, alongside ten review and guideline papers used to contextualise the findings. Data were extracted on design, sample, interventions, and patient centred outcomes. **Results:** Orthotic management and structured conservative protocols consistently reduced pain and triggering and improved hand function. Radial extracorporeal shockwave therapy and tendon, hand exercise programmes produced clinically important improvements, while ultrasound guided steroid injection optimised accuracy with similar short-term outcomes to blind techniques. However, evidence specific to occupational therapy, return to work, and role performance remains limited, and no included study was conducted in Saudi Arabia. **Conclusion:** Conservative, hand therapy-oriented management of trigger finger is effective for many patients and aligns well with occupational therapy practice. High quality, context specific research from Saudi Arabia is needed to guide local service development.

Keywords: Trigger Finger; Stenosing Tenosynovitis; Occupational Therapy; Hand Injuries; Splinting; Shockwave Therapy; Saudi Arabia.

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INTRODUCTION

Stenosing tenosynovitis is a frequent cause of pain, catching, and loss of smooth finger motion due to mismatch between the flexor tendon and its sheath, most notably at the A1 pulley (Makkouk et al. 2008; Saldana 2001). It is reported to affect around 2 3% of the general population, with higher prevalence in middle aged women and people with diabetes or other systemic conditions (Makkouk et al. 2008; Bridges et al. 2023). Functionally, patients report painful locking, difficulty gripping, and limitations in work and daily activities that fit squarely within the scope of occupational therapy practice (Bridges et al. 2023). Contemporary guidelines emphasise a stepped approach to management, progressing from activity modification, orthotic use, and local corticosteroid injection to percutaneous or open release when conservative care fails (Huisstede et al. 2014; Bridges et al. 2023). Narrative and systematic reviews highlight that injection and orthotic treatment are the most widely used conservative options, with steroid injection often producing rapid symptom relief and orthoses providing a slower but noninvasive alternative (Lunsford et al. 2019; Ferrara et al. 2020; Ricarte Almeida et al. 2023). More recently, hand therapy modalities such as shockwave therapy, targeted exercise, and structured rehabilitation programmes have attracted interest as adjuncts to, or substitutes for, injection and surgery (Ferrara et al. 2020; Donati et al. 2024). Within this therapeutic landscape, the specific contribution of occupational therapy is less clearly defined. Systematic reviews of orthotic management show that splints that limit metacarpophalangeal (MCP) joint flexion can meaningfully decrease pain and triggering (Lunsford et al. 2019; Leong et al. 2023), but data on occupational performance, role resumption, and work participation remain sparse. Broader reviews of conservative care rarely disaggregate the roles of occupational therapists, physiotherapists, and surgeons, despite differing professional emphases on function, participation, and ergonomics (Ferrara et al. 2020; Donati et al. 2024). For Saudi Arabia, where rehabilitation services and occupational therapy are rapidly expanding, local evidence on therapy led management of hand injuries is still emerging. Trigger finger is common in primary care, occupationally active adults, and people with metabolic conditions seen in the region, yet the best way to structure OT led services has not been synthesised. This systematic review therefore aimed to summarize original clinical evidence on occupational therapy related interventions for trigger finger, and interpret these findings through the lens of existing reviews and guidelines, with particular attention to implications for practice and research in Saudi Arabia.

METHODS

This review was planned and reported in line with PRISMA principles for systematic reviews, including a pre specified search strategy, eligibility criteria, and structured data extraction.

Search strategy

A comprehensive search of MEDLINE (PubMed), Embase, CINAHL, Web of Science, Scopus and Cochrane Library was conducted up to August 2025. Search terms combined

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controlled vocabulary and keywords for the condition and interventions, including: trigger finger, stenosing tenosynovitis, trigger digit, occupational therapy, hand therapy, orthosis, splint, shock wave, exercise therapy and corticosteroid injection. Reference lists of key reviews and guidelines were hand searched to identify additional studies (Makkouk et al. 2008; Saldana 2001; Lunsford et al. 2019; Ferrara et al. 2020; Bridges et al. 2023).

Eligibility criteria

We included peer reviewed original studies that: involved adults with trigger finger or trigger thumb of any Quinnell grade; evaluated at least one conservative, non-surgical intervention relevant to occupational therapy (orthoses, hand exercises, shockwave therapy, or guided injections within a rehabilitation context); and reported clinical or functional outcomes such as pain, triggering frequency, range of motion, grip, pinch strength, disability indices, or patient reported function. Randomised and non randomised controlled trials, prospective cohorts, and observational surveys were eligible. Case reports, purely surgical series without conservative comparison, paediatric only samples, and non-English articles were excluded. To contextualise findings, we also identified ten high quality review, guideline, or meta-analytic papers on the epidemiology, conservative treatment, and rehabilitation of trigger finger (Huisstede et al. 2014; Lunsford et al. 2019; Ferrara et al. 2020; Leong et al. 2023; Donati et al. 2024, among others).

Study selection and data extraction

Titles and abstracts were screened, followed by full text review against inclusion criteria. From each eligible original study, data were extracted on country and setting, design, sample size, participant characteristics, interventions and comparators, follow up duration, outcome measures, and main findings. Particular emphasis was placed on occupational therapy related components (orthotic design, exercise content, functional training, and return to work advice). Because the included studies were heterogeneous in design and outcome measures, a narrative synthesis was undertaken rather than a quantitative meta-analysis, consistent with prior reviews (Lunsford et al. 2019; Ferrara et al. 2020). Risk of bias was considered qualitatively, taking into account randomisation, blinding of outcome assessment, completeness of follow up, and selective reporting, but formal scoring tools are not reported here so the text remains adaptable for journal specific checklists.

RESULTS

Overview of included studies

Ten original studies met the inclusion criteria. They spanned North America, Europe, Asia and the Middle East, but none were conducted in Saudi Arabia. Designs included four randomised controlled trials, three prospective cohort studies, one non randomised controlled trial, and two observational studies focusing on functional status or professional practice.

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Table 1: Characteristics of included original studies

Study	Country	Design	Sample	Intervention	Comparator	Key outcomes
Colbourn et al. 2008	Canada, outpatient hand therapy	Prospective clinical trial	28 adults with idiopathic trigger finger	Custom MCP blocking orthosis worn 6 weeks plus tendon gliding exercises and activity modification	Pre and post within group comparison	Pain, triggering events and symptom severity improved significantly, most participants reported better hand use in daily activities (Colbourn et al. 2008).
Tarbhai et al. 2012	Canada, hand clinic	Randomized trial	30 adults, 2 orthosis designs	DIP joint blocking orthosis vs standard MCP blocking splint, worn 6 weeks, both plus usual advice	MCP blocking orthosis	Both splints reduced triggering and pain, DIP blocking orthosis yielded earlier symptom improvement and high satisfaction, supporting individualized orthotic choice (Tarbhai et al. 2012).
Camargo et al. 2009	Brazil, orthopaedic clinic	Prospective cohort	131 trigger fingers in adult patients	Stepwise conservative protocol: rest, NSAIDs, splinting, and local corticosteroid injection as needed	None (single arm)	High rates of symptom resolution were reported with the stepwise regimen, with many patients avoiding surgery when splinting and injection were combined (Camargo et al. 2009).
Langer et al. 2017	USA, OT outpatient services	Cross sectional comparative study	63 clients with trigger finger, 66 matched controls	Standard OT evaluation including grip strength, pinch, and QuickDASH, description of typical OT management	Matched non trigger finger controls	Clients with trigger finger showed greater disability, lower grip strength, and poorer hand function, highlighting the functional burden and need for occupational therapy (Langer et al. 2017).
Langer 2014	USA, survey of therapists	Cross sectional survey	61 occupational therapists	Self-reported use of orthoses, exercise, activity modification, and occupation-based interventions for trigger finger		Most therapists used MCP blocking splints, tendon gliding exercises, patient education, and graded functional tasks, but outcome measures and return to work assessments were inconsistent (Langer 2014).
Dogru et al. 2020	Turkey, university hospital	Prospective cohort	18 adults with Quinnell grade 2	Radial extracorporeal shockwave therapy (10 sessions over 5 weeks)	No control group	rESWT produced statistically significant improvements in pain, range of motion, grip and pinch

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			trigger fingers	plus encouragement to use the hand in daily activities		strength, and QuickDASH scores at post treatment and 3 month follow up (Dogru et al. 2020).
Yildirim et al. 2016	Turkey, hospital outpatient	Randomised controlled trial	40 adults, actively correctable trigger finger	ESWT protocol (1000 impulses, 2.1 bar)	Single corticosteroid injection	Both groups improved significantly in pain, triggering frequency and functional scores up to 6 months, no important between group differences, suggesting ESWT as a noninvasive alternative for steroid adverse patients (Yildirim et al. 2016).
Massoud et al. 2018	Egypt, university hospitals	Randomised prospective study	50 trigger digits	Blind needle placement followed by ultrasound guided confirmation and injection of steroid plus lidocaine at A1 pulley	Comparison of ultrasound accuracy versus blinded needle position	Ultrasound guidance improved accuracy of in sheath injection compared with blinded technique, with similar short term clinical outcomes and no reported complications (Massoud et al. 2018).
Sato et al. 2012	Brazil, rheumatology centres	Randomised clinical trial	Adults with trigger finger (multiple digits)	Single corticosteroid injection, percutaneous pulley release, or conventional open surgery	Three arm comparisons	Surgical procedures achieved higher cure and lower recurrence than single injection, but injections were less invasive and relevant as part of a stepped conservative strategy before surgery (Sato et al. 2012).
Choi et al. 2025	Hong Kong, primary care	Randomised clinical trial	76 adults post steroid injection (38 per group)	Home based finger gliding exercise programme with online logs for 24 weeks	Usual care after injection	Both groups improved substantially in pain, Quinell grade and need for repeat injection, additional finger gliding exercises did not confer extra clinical benefit, though adherence was acceptable (Choi et al. 2025).

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Interventions fell into four broad occupational therapy relevant categories: Orthotic management and conservative stepwise protocols; MCP blocking and other orthoses for idiopathic trigger finger (Colbourn et al. 2008; Tarbhai et al. 2012); A multi component conservative regimen including rest, NSAIDs, orthoses and steroid injection (Camargo et al. 2009). Functional impact and OT practice; Comparative cross-sectional assessment of hand function in clients with trigger finger versus matched controls (Langer et al. 2017); Survey of occupational therapists about occupation-based assessments and interventions used for trigger finger (Langer 2014). Therapeutic modalities and exercise-based interventions; Radial extracorporeal shockwave therapy (rESWT) as a standalone modality (Dogru et al. 2020); Extracorporeal shockwave therapy versus corticosteroid injection (Yildirim et al. 2016); Finger gliding exercises following steroid injection (Choi et al. 2025). Guided injection and procedural aspects relevant to rehabilitation; Ultrasound guided steroid injection for trigger finger (Massoud et al. 2018); Randomised comparison of corticosteroid injection, percutaneous release, and open surgery (Sato et al. 2012). Table 1 summarises key characteristics of the included original studies.

Orthotic management and conservative care

The two orthotic trials directly inform occupational therapy practice. Colbourn et al. provided MCP blocking splints for six weeks with tendon gliding exercises and activity modification, reporting meaningful reductions in pain and triggering and improved self-rated hand use (Colbourn et al. 2008). Tarbhai et al. compared DIP joint versus MCP joint blocking orthoses, finding that both designs were effective, but DIP blocking splints yielded slightly faster symptom improvement and high patient satisfaction (Tarbhai et al. 2012). These findings complement systematic reviews showing that orthoses can achieve clinically important symptom reduction and may be a defensible first line strategy in early grade trigger finger (Lunsford et al. 2019, Leong et al. 2023).

Camargo et al. studied a stepwise conservative protocol combining rest, NSAIDs, splinting and steroid injection for 131 trigger fingers, reporting high rates of symptom control and avoidance of surgery when patients adhered to the protocol (Camargo et al. 2009). This aligns with narrative reviews that identify steroid injection and orthotic treatment as the cornerstone of non-surgical management (Ricarte Almeida et al. 2023, Bridges et al. 2023).

Functional impact and occupation-based practice

Langer et al. demonstrated that individuals with trigger finger have significantly greater disability, lower grip strength and worse QuickDASH scores than matched controls, underlining the disorder's impact on function and participation (Langer et al. 2017). In a complementary therapist survey, Langer reported that most occupational therapists use MCP blocking splints, tendon gliding exercises, joint protection advice and graded activity-based tasks, but relatively few uses standardised functional outcome measures or work-related assessments (Langer 2014). These findings suggest a gap between routine OT practice and the occupation centred, outcome driven care recommended in broader rehabilitation frameworks (Donati et al. 2024).

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Shockwave therapy and other modalities

Dogru et al. evaluated radial ESWT in 18 patients and observed large, statistically significant improvements in pain, range of motion, grip and pinch strength and functional capacity over three months (Dogru et al. 2020). In the randomised trial by Yildirim et al., ESWT achieved similar cure rates and functional improvements to single corticosteroid injection through six months, without exposing patients to glucocorticoids (Yildirim et al. 2016).

Narrative reviews of physical therapy modalities highlight ESWT as a promising adjunct for tendinopathies, including trigger finger, particularly when injection is contraindicated or declined (Ferrara et al. 2020).

For occupational therapists, these findings suggest that ESWT, where available in multidisciplinary services, can be integrated with education, splinting and graded activity programmes, although cost and equipment availability may limit routine use in some settings, including parts of Saudi Arabia.

Injection related findings relevant to rehabilitation

Massoud et al. showed that using musculoskeletal ultrasound to guide trigger finger injections increased the accuracy of in sheath delivery relative to blinded insertion, with similar short term symptom improvement and no complications (Massoud et al. 2018). Sato et al.'s randomised trial found that percutaneous and open release provided higher cure and lower recurrence than a single corticosteroid injection, but with more invasive procedures and longer recovery (Sato et al. 2012). Meta analytic data confirm that steroid injection offers high initial success but non negligible recurrence, while surgical release provides more durable resolution at higher upfront cost and risk (Ma et al. 2019). Within a stepped care model, occupational therapists play a key role in optimising hand use before and after injection or surgery and in screening for patients who fail conservative care.

Exercise and hand therapy programmes

The Sci Rep trial by Choi et al. tested whether structured finger gliding exercises add benefit after steroid injection. Despite good adherence, the exercise group did not differ from usual care in pain, Quinell grade, recurrence or need for repeat injection at 24 weeks (Choi et al. 2025). Nonetheless, functional exercise programmes remain central in OT practice, and earlier small studies and reviews in related tendon disorders suggest that tendon gliding and strengthening may help maintain motion and support broader participation goals (Ferrara et al. 2020, Donati et al. 2024).

Overall, the included evidence indicates that conservative, OT aligned interventions—orthoses, education, and selected modalities, can meaningfully reduce symptoms and improve hand function for many patients with trigger finger. However, robust occupation-based outcome measures, return to work data, and studies from Saudi or Gulf populations are lacking.

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DISCUSSION

This review synthesised ten original studies and ten complementary reviews and guidelines to explore the efficiency of occupational therapy related interventions for trigger finger. In diverse settings, orthotic management and structured conservative protocols were consistently associated with reduced pain and triggering and improved hand function (Colbourn et al. 2008, Tarbhai et al. 2012, Camargo et al. 2009). These findings reinforce systematic reviews showing that splints and orthoses, especially those limiting MCP flexion, are a credible first line option and may reduce the need for surgery when combined with education and, where appropriate, steroid injection (Lunsford et al. 2019, Leong et al. 2023, Ricarte Almeida et al. 2023).

Shockwave therapy studies provide additional options at the interface of physical and occupational therapy. Dogru et al. reported significant improvements in pain, range of motion and functional scores after rESWT without serious adverse events (Dogru et al. 2020), while Yildirim et al. showed that ESWT was non inferior to corticosteroid injection in a randomised trial (Yildirim et al. 2016). Narrative reviews of physical therapies underline that ESWT may be particularly attractive for patients wishing to avoid steroids or with multiple affected digits (Ferrara et al. 2020, Bridges et al. 2023). For occupational therapists in multidisciplinary services, these modalities can be integrated with splinting, ergonomics and activity-based rehabilitation to create comprehensive treatment plans.

The functional impact of trigger finger and the current state of OT practice also emerged as important themes. Langer et al. documented demonstrable deficits in grip strength and self-reported disability among people with trigger finger compared with controls (Langer et al. 2017). However, the accompanying therapist survey highlighted inconsistent use of standardised outcome measures and limited reporting of occupation-based goals such as job retention or household role performance (Langer 2014). This contrasts with broader rehabilitation frameworks, which emphasise participation, contextualised outcome measures and shared decision making (Donati et al. 2024). Synthesising this literature suggests that occupational therapists could strengthen their contribution by systematically using validated tools (e.g., QuickDASH, work related scales), documenting return to work, and explicitly targeting valued roles in treatment planning.

Guideline and review articles support a stepped, evidence informed approach that begins with education, activity modification, and orthoses, progresses to steroid injection (ideally accurately delivered, with ultrasound guidance where available), and reserves percutaneous or open release for refractory cases (Makkouk et al. 2008, Saldana 2001, Huisstede et al. 2014, Bridges et al. 2023, Ma et al. 2019). Occupational therapists are central to each stage: identifying early functional decline, fitting and adjusting orthoses, coaching tendon gliding and workplace modifications, and providing post procedural rehabilitation.

From the perspective of Saudi Arabia, the main gap is geographical. None of the included original studies were conducted in Saudi or Gulf populations, and little is known about local referral patterns, occupational demands, or cultural factors influencing adherence.

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Nevertheless, the underlying biomechanics and treatment principles are generalisable. The evidence base strongly supports establishing OT led hand therapy services that offer splinting, education, and collaboration with orthopaedic and rehabilitation physicians around injections, shockwave therapy and surgical referral. Future Saudi based studies could prospectively evaluate locally designed OT protocols, measure return to work and religious or household participation, and explore cost effectiveness within the national health system.

The methodological quality of the available evidence is mixed. Several trials have small sample sizes, limited blinding of outcome assessment, or short follow up, and heterogeneity in outcome measures hampers pooling of results. High quality, adequately powered randomised trials of clearly described OT protocols with standardised functional outcomes are needed to refine best practice. Despite these limitations, the convergence between trials and review articles indicates that occupational therapy aligned conservative management is a key, effective component of trigger finger care and should be fully integrated into multidisciplinary hand services.

CONCLUSION

Available evidence supports the efficiency of occupational therapy related interventions—especially splinting, education, and selected modalities such as shockwave therapy—in reducing pain and triggering and improving hand function in adults with trigger finger. Orthotic management and structured conservative protocols can help many patients avoid surgery, while OT involvement is crucial before and after injections or surgical release. However, occupation-based outcomes and return to work data are limited, and no studies were identified from Saudi Arabia. Developing and evaluating context specific OT protocols in Saudi hand clinics should be a priority to optimise patient centred, function focused care.

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