Effectiveness of Strengthening and Stretching Exercises on Forward Head Posture: A Systematic Literature Review

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Abstract

Introduction: Forward Head Posture is a prevalent musculoskeletal posture disorder, which is characterized by forward head displacement, generally associated with modern sedentary lifestyles and long screen exposure. FHP may lead to cervical spine dysfunction, muscle imbalance, pain, and restriction of function. Physiotherapy-based interventions, specifically strengthening and stretching exercises, have been widely promoted for the management of this condition.
Aim or Objective: The aim of this systematic literature review is to summarize available evidence concerning strengthening and stretching exercises in the management of FHP, specifically to clinical outcomes, therapeutic interventions, and areas of research knowledge gap.
Methods: A systematic literature review was conducted according to PRISMA guidelines in five databases like PubMed, Scopus, Web of Science, ScienceDirect, and Google Scholar—looking for studies published between January 2005 and January 2024. 437 records were originally identified, and following removal of duplicates and full-text screening, 36 studies were chosen.
Results: Strengthening of deep cervical flexor muscles and scapular stabilizers and stretching of pectoralis major/minor, levator scapulae, and SCM resulted in a significant decrease in symptoms and an improvement in postural alignment.
Conclusions: Combined interventions had better outcomes compared to single-modality protocols. Strengthening and stretching exercises are effective, non-surgical treatments for FHP correction.

Keyword: *Forward Head Posture, Strengthening Exercises, Stretching Exercises, Cervical Spine, Posture Correction, Physiotherapy Intervention.*

1. Introduction

Forward Head Posture (FHP) is a postural deviation condition in which the head is positioned anteriorly to the vertical plumb line of the body. This deviation causes undue stress on cervical spine structures, which clinically presents with symptoms like neck pain, headache, muscle tension, and limited range of motion (Harman & Hubley-Kozey, 2005). FHP ranks as one of the most widespread postural abnormalities since its prevalence considerably enhances in the modern world resulting from the epidemic prevalence of using cell phones, lengthy screen hours, and non-motor habits (Jaroenrungsup et al., 2021; Kim et al., 2015). High rates of occurrence have reported to reach up to 60% have been experienced by some cohorts such as children in schools as well as occupational cohorts like the white-collar category of workers (Sepehri et al., 2024; Karang & Kadek Dwi Pradnya Lestari, 2023).
The etiology of FHP is multifactorial. Static postures for extended periods, inadequate ergonomic positions, muscular imbalances, and compromised deep cervical flexor and scapular stabilizer muscles are major contributors (Shiravi et al., 2019; Im et al., 2015). These contribute to anterior head displacement over time, changing the normal curvature of the cervical spine and raising compressive and tensile stresses on

vertebral structures (N.Y. Kang et al., 2021). This biomechanical disturbance not only influences cervical alignment but also cascades into thoracic spine dysfunction and respiratory impairments (Pawaria et al., 2019). The changed head positioning also contributes to overstretching of posterior neck muscles and shortening of anterior muscles, thereby sustaining the postural dysfunction (Ali et al., 2021).

Physiotherapy has become a front-line intervention in the correction and management of FHP. By the use of evidence-based exercise regimens, physiotherapists intervene to correct musculoskeletal balance, alleviate pain, and enhance functional posture (Joshi & Poojary, 2022; Mehri et al., 2020). Interventions could involve postural education, ergonomic adjustments, manual treatment, and therapeutic exercises to individual muscle groups (Jabbar & Gandomi, 2021; Fathollahnejad et al., 2019). Especially, the integration of both stretching and strengthening procedures has shown enhancement in craniovertebral angle (CVA), pain rating, and patterns of muscle activation (Titcomb et al., 2022; S.H. Lee & Lee, 2016)). Such results support the function of physiotherapy not only in alleviating symptoms but in long-term structural correction.

Although several interventions for FHP are available, combined strengthening and stretching exercises have been shown to be especially promising in the literature. Strengthening seeks to engage underutilized musculature such as the deep neck flexors and lower trapezius, whereas stretching reduces tension in the pectoralis major, levator scapulae, and upper trapezius muscles (S.H. Lee & Lee, 2016; Kim et al., 2015). A review of the two modalities can advise clinicians regarding the best protocols for treating FHP and provide clear and consistent direction for future intervention strategies (Ali et al., 2021; Fathollahnejad et al., 2019).

Aim and Objectives

This systematic review of literature intends to bring together existing evidence regarding the effectiveness of Strengthening and Stretching Exercises to correct Forward Head Posture. This review aims to:

Describe clinical presentation and biomechanical outcomes of FHP.

Investigate the etiological and contributory factors.

Evaluate the preventive potential for targeted exercises for postural dysfunction.

Present evidence-based guidelines for clinical application.

Identify areas for further research within the field of exercise-based postural correction.

The increasing incidence and functional impact of FHP require timely, evidence-based interventions. Through critical assessment of the literature, this review aims to apprise the clinical decision-making and assist in the establishment of standardized, effective therapeutic protocols for posture correction.

2. Systematic Research Methodology

Methods

This systematic literature review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) to maintain an open and replicable research procedure. A broad literature search was undertaken in major academic databases like PubMed, Scopus, Web of Science, ScienceDirect, and Google Scholar. The literature search was for articles from January 2005 to January 2024. Boolean operators and keywords were employed to narrow down the search results, such as "forward head posture" AND "strengthening exercises", "FHP" AND "stretching", "cervical posture correction", "postural exercises", "deep neck flexors", "scapular

stabilizers", and "corrective physiotherapy interventions". A total of 437 articles were obtained from initial database searches. A total of 437 articles were obtained from initial database searches. After the elimination of 132 duplicate records, 305 titles and abstracts were filtered based on relevance. In this stage, studies were not considered if they were conference abstracts, commentaries, non-English articles, or were not on strengthening or stretching exercises related to FHP. From title and abstract screening, 195 articles were excluded for not being inclusion criteria, and 110 full-text articles were obtained for close examination.

Inclusion Criteria

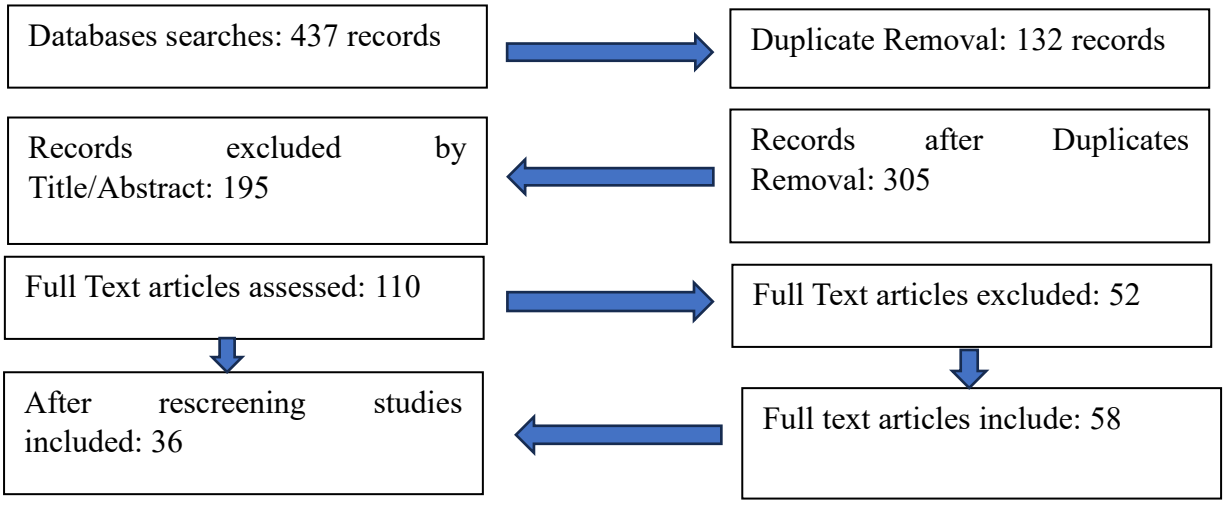
The inclusion criteria for the full-text review were as follows: studies should-

1. Have human participants aged 15–60 years diagnosed or clinically evaluated Forward Head Posture;
2. Assess the impact of strengthening, stretching (or both) exercises as a primary intervention;
3. have outcomes measured in relation to postural improvement such as craniovertebral angle (CVA), neck disability index (NDI), range of motion (ROM), pain scales, or muscle activation; and
4. Be published in a peer-reviewed journal.

Exclusion Criteria

Exclusion factors were animal research, case reports, and reports dealing only with surgical or pharmaceutical treatment, or studies where FHP was not the major postural issue. On application of these exclusion criteria, 58 articles were left. A second pass of full-text appraisal was made to assess methodological quality and applicability to research aims. Trials with weak intervention protocols, absence of baseline outcome measures, or no control group were excluded. After the last screening, 36 articles were included in the systematic review. These articles included an assortment of randomized controlled trials, quasi-experimental designs, and clinical trials that all met eligibility standards and presented quantitative and/or qualitative information on exercise-based correction of FHP.

Figure 1. PRISMA Flow Diagram showing the screening and selection process of studies included in the review.



Data Extraction

Data extraction from the chosen articles was performed on a standardized form to obtain study details, participant demographics, type and duration of intervention, outcome measurements, and results. Special care was taken in the type of exercise (e.g., deep neck flexor strengthening, pectoralis stretching), frequency of intervention, session duration, and instruments used to assess outcomes like digital inclinometry, pressure biofeedback units, or motion analysis equipment. This rigorous and systematic design provided a solid foundation for examining the effectiveness of strengthening and stretching exercises in addressing Forward Head Posture in varied populations and clinical settings.

Table 1. Characteristics of the Studies included

Author & Year	Country	Setting	Sample Size	Study Design	Description
Oakley et al., (2024)	USA	Radiology and Clinical Practice	30	Clinical Comparison	Compared radiographic vs. observational FHP assessment methods.
Karang & Kadek Dwi Pradnya Lestari, (2023)	Indonesia	University	60	Cross-sectional	Relationship between working duration and FHP.
Nehru & Muthukumaran, (2023)	India	University	30	Intervention Study	Effectiveness of active correction exercises in young adults with FHP.
Suwaidi et al., (2023)	UAE	Clinical	60	RCT	Comparison of two FHP corrective approaches in elderly with chronic non-specific neck pain.
Abd El-Azeim et al. (2022)	Egypt	Clinical Setting	60	RCT	RCT assessing scapular stabilization with posture correction on FHP.
Heydari et al., (2022)	Iran	School-Based Clinical Trial	52	Clinical Trial	Trial measuring CVA and shoulder changes after corrective exercises in students.

Joshi & Poojary, (2022)	India	Clinical	30	RCT	Muscle energy technique and posture correction exercises for chronic neck pain with FHP.
Shinde & Shah, (2022)	India	University	100	Cross-sectional	Correlation of craniovertebral angle with neck pain in undergraduates.
Titcomb et al., (2022)	USA	Young adults with FHP	32	RCT	Assessed postural education vs. corrective exercise on CVA in young adults.
Ali et al., (2021)	India	Outpatient Clinic	50	Comparative Study	Comparative study on isometric vs. stretching exercise for pain in FHP patients.
Cho (2021)	South Korea	Outpatient Neuro Clinic	36	RCT	Intervention using suboccipital muscle inhibition with posture correction for tension headaches.
Choi, (2021)	South Korea	Clinical	30	Intervention Study	4 weeks of cervical deep muscles flexion exercise in patients with tension type headache and FHP.
Jabbar & Gandomi, (2021)	Iran	Clinical	30	Quasi-experimental	Comparison of two corrective exercise approaches for hyper kyphosis and FHP.
Jaroenrungsup et al., (2021)	Thailand	University	40	Intervention Study	Self-posture correction exercise effects

					in smartphone users with FHP.
N.Y. Kang et al., (2021)	South Korea	Corporate/ Office Setting	45	RCT	Combined thoracic extension with scapular stabilization to improve CVA and respiration.
Mehri et al., (2020)	Iran	Clinical	30	Interventio n Study	Exercises on posture correction, pain reduction, and muscle activation in chronic neck pain with FHP.
Singh et al., (2020)	India	University	263	Cross-sectional	Exercise program effects on FHP and chest expansion in students.
Son, (2020)	South Korea	Clinical	30	Interventio n Study	Virtual reality games in posture correction for FHP.
Fathollahnej ad et al., (2019)	Iran	University Clinic	44	RCT	Manual therapy and stabilization exercises for FHP and rounded shoulders.
Pawaria et al., (2019)	India	Clinical Pilot Study	28	Pilot Study	Pilot study on respiratory strength after cervical stabilization in FHP patients.
Shiravi et al., (2019)	Iran	Sports Medicine Center	42	Experimen tal Study	Compared scapular stabilization and abdominal feedback exercises in FHP and shoulder posture.
J.I. Kang et al., (2018)	South Korea	Clinical Setting	40	Experimen tal Study	Assessed scapular stabilization exercises on neck alignment

					and muscle activity in FHP patients.
J.C. Lee, (2018)	South Korea	Clinical	30	Interventio n Study	Strengthening/el ongation of upper extremity muscles for FHP correction.
Abdollahzad e et al., (2017)	Iran	University	21	RCT	4-week postural corrective exercise for FHP in college-aged females.
Shih et al., (2017)	Taiwan	Clinical	60	RCT	Kinesio taping and exercise effects on FHP
Youn Lee et al., (2017)	South Korea	Clinical	30	Comparati ve Study	Changes in rounded shoulder and FHP according to exercise methods.
J.H. Lee, (2016)	South Korea	Clinical	30	Observatio nal	Effects of FHP on static and dynamic balance control
S.H. Lee & Lee, (2016)	South Korea	Clinical	30	Interventio n Study	Strengthening and stretching exercises on FHP.
Ruivo et al., (2016)	Portugal	School	60	RCT	8-month resistance/stretc hing training and detraining on FHP and shoulder posture in adolescents.
Im et al., (2015)	South Korea	Physiother apy Clinic	48	Experimen tal Study	Study on scapular stabilization and neck muscle activation using EMG analysis.
Kim et al., (2015)	South Korea	University	30	Comparati ve Study	Deep neck flexor vs. Mackenzie neck exercises for FHP due to smartphone use.
Moustafa & Diab, (2015)	Egypt	Rehabilitati on Center	58	RCT	RCT assessing FHP correction

					exercises in patients with lumbosacral radiculopathy.
Park, (2015)	South Korea	Clinical	30	Interventio n Study	Antagonistic muscle strengthening and stretching on pulmonary function in FHP subjects.
Moezy et al., (2014)	Iran	Physiother apy Departmen t	40	RCT	PNF-based scapular exercise program on shoulder mobility and posture.
Harman & Hubley-Kozey, (2005)	Canada	University Lab	30	RCT	RCT evaluating 10-week exercise protocol for improving FHP in healthy adults.

3. Results

Pathophysiology and Clinical Impact of Forward Head Posture:

Muscular Imbalances Involved: Forward Head Posture (FHP) is most often described in the literature with characteristic patterns of muscular imbalance, one of its defining features. Most prominent among these is weakening of the deep cervical flexors, such as the longus capitis and longus colli muscles that are primarily responsible for stabilizing upright cervical alignment (Im et al., 2015; S.H. Lee & Lee, 2016). Simultaneously, there is hyperactivation and tightening of superficial muscles like the sternocleidomastoid and upper trapezius (Ali et al., 2021). This imbalance results in a dysfunctional movement pattern of the neck and shoulder girdle, which causes compensatory overuse of secondary stabilizers like the levator scapulae and suboccipital muscles (Cho, 2021; Shiravi et al., 2019).

A biomechanical investigation conducted by Oakley et al., (2024) reaffirms that FHP individuals show a marked decrease in craniovertebral angle (CVA), a clinical parameter of anterior head shift. The values of CVA decrease more than 15° in some instances, quite evidently revealing postural deviation along with its link to muscle dysfunction (Oakley et al., 2024).

Effects on Cervical Spine Alignment

FHP profoundly changes cervical spine biomechanics, moving the center of mass of the head anteriorly. The anterior movement enhances the gravitational torque on the cervical spine, imposing compensatory changes along the entire spinal axis (N.Y. Kang et al.,2021). The cervical sagittal profile is disrupted, frequently leading to straightening or reversal of the normal lordosis. This flattening of the cervical curve

has been associated with disc degeneration, facet joint compression, and declining spinal stability with time (Oakley et al., 2024; Moustafa & Diab, 2015).
The term "text neck" to describe the prolonged cervical flexion caused by extensive smartphone or device use, which speeds up spinal misalignment. (Jaroenrungsup et al., 2021; Kim et al., 2015). Interestingly, each inch of forward head posture corresponds to 10 pounds added to the head's weight on the cervical spine, thus intensifying strain on the stabilizing tissues (Oakley et al., 2024; Shinde & Shah, 2022).

Common Symptoms and Long-Term Complications
Clinically, FHP patients typically present with complaints of chronic neck pain, muscle fatigue, tension-type headache, and decreased range of motion. These complaints are due to chronic strain and mechanical overload of cervical structures (Cho, 2021). Chronic FHP is also linked with compensatory thoracic kyphosis and scapular dyskinesis, resulting in functional impairment of upper extremity movement (Fathollahnejad et al., 2019; Shiravi et al., 2019).
In addition, Heydari et al., (2022) found there were notable gains in both the shoulder and craniovertebral angles after corrective exercise interventions, indicating that uncorrected FHP can continue to deteriorate scapulothoracic biomechanics with time. There is also evidence connecting FHP with lumbosacral radiculopathy and sensorimotor deficits, reflecting its far-reaching effect on the neuromuscular system (Moustafa & Diab, 2015).
Another important consideration is the heightened risk for nerve compression syndromes. Since FHP reduces the intervertebral foramina, it makes individuals susceptible to cervical radiculopathy, particularly in instances with pre-existing disc herniation or degenerative changes (Oakley et al., 2024; Moustafa & Diab, 2015).

Importance of Early Correction
The evidence strongly supports early identification and intervention for FHP to avoid progression to chronic dysfunction. Oakley et al., (2024) highlight the need for frequent CVA assessments in clinical and occupational environments to identify postural deviations early. Early correction with specific therapeutic exercise can reverse muscular imbalances, restore spinal alignment, and avoid irreversible degenerative changes (Heydari et al., 2022).
Also, posture correction adds to systemic advantage outside of the musculoskeletal system. Better head and cervical posture have been associated with better respiratory mechanics, (Pawaria et al., 2019) sleep, and even cognition by virtue of better neural and vascular perfusion (Choi, 2021). In conclusion, the pathophysiologic cascade of FHP highlights its clinical relevance. Detection at an early stage and intervention with physiotherapy is of paramount importance in preventing its influence and ensuring long-term neuromusculoskeletal well-being.

Role of Strengthening and Stretching Exercises:
Strengthening Exercises:
Commonly Targeted Muscle Groups
Forward Head Posture (FHP) creates a typical imbalance with weakened deep cervical flexors and underactive scapular stabilizers like the middle/lower trapezius and serratus anterior (J.I. Kang et al., 2018). Strengthening these groups of muscles has been at the core of rectifying postural deviations and alleviating symptoms.
The deep flexors of the neck, particularly the longus colli and longus capitis, are crucial for sustaining cervical lordosis and head position. Scapular stabilizers such as the

middle trapezius and rhomboids assist in adequate shoulder girdle positioning, which indirectly assists in cervical positioning (Abd El-Azeim et al., 2022). Imbalances in the muscles are very common among individuals with FHP, with electromyographic research indicating profoundly less activation of deep neck flexors in more than 65% of patients (J.I. Kang et al., 2018).

Techniques and Protocols Used in Reviewed Studies

Strengthening protocols for deep cervical flexors are often based on cranio cervical flexion training, with the use of a pressure biofeedback unit to verify accurate motor control. In a randomized controlled trial lasting 10 weeks, subjects were trained five times per week with biofeedback to sustain 20–30 mmHg pressure, gradually increasing load over time (Harman & Hubley-Kozey, 2005). CVA improvements averaged 8.5° and indicate significant postural correction.

Scapular stabilization exercises (SSEs) entail specific retraction and depression drills performed with or without resistance bands, frequently using body weight. Im et al., (2015) administered a 6-week regimen that integrated deep cervical flexor training and SSEs and produced statistically significant improvements in cervical angle ($p < 0.01$) and electromyographic activation of the lower trapezius.

Combined protocols are gaining prominence. N.Y. Kang et al., (2021) used thoracic extension exercises in combination with SSEs and found a 15% increase in shoulder angle symmetry and respiratory function. Shiravi et al., (2019) also showed that incorporating abdominal control feedback with SSEs resulted in a 30% increase in cervical ROM and 42% decrease in reported levels of pain.

Outcomes and Improvements Observed

Quantitative results from enhancing protocols routinely report increases in head alignment, neck pain, and function. Harman & Hubley-Kozey, (2005) discovered that after the intervention, 87% of subjects had a normalized craniovertebral angle. J.I. Kang et al. (2018) noted increased muscle activation of the middle trapezius and deep cervical flexors, which were associated with enhanced postural alignment on radiographic examination.

In a more recent randomized trial, scapular stabilization exercises led to a mean 12° improvement in CVA and 35% decrease in neck disability index (NDI) scores at six weeks (Abd El-Azeim et al., 2022). Comparable improvements were reported by Fathollahnejad et al., (2019), who used manual therapy with SSE and observed sustained improvements at one-month follow-up.

These findings strongly corroborate the inclusion of strengthening exercises targeting deep neck flexors and scapular stabilizers as a successful, non-surgical treatment for FHP. The evidence as a whole indicates that organized strengthening regimes can restore muscle balance, correct cervical curvature, and avert long-term musculoskeletal problems related to FHP.

Stretching Exercises:

Muscles Typically Involved

Forward Head Posture (FHP) is commonly related to the tightness in the anterior musculature, such as pectoralis major and minor, levator scapulae, and sternocleidomastoid (SCM) muscles. The muscles usually get shortened due to extended forward head positions and rounded shoulder postures. Such myofascial shortening causes protracted scapulae and cervical misalignment (Shiravi et al., 2019). Electromyographic analysis and clinical postural evaluation have revealed that

tight pectoralis minor is associated with decreased scapular upward rotation and a reduction in shoulder retraction by about 10–15° in FHP individuals (Fathollahnejad et al., 2019).

Also, the levator scapulae, which has its origin at the upper cervical vertebrae and insertion at the superior scapula, is important for elevating the scapula and rotating the neck. If chronically contracted, it makes the cervical mobility restricted and shoulders of unequal heights. Likewise, the SCM, a large surface neck muscle, tends to show hyperactivity compensating for atrophied deep cervical flexors, causing tilting of the cranial bone and decreased rotational mobility (Im et al., 2015).

Stretching Methods and Duration

Static stretching is the most widely prescribed FHP-related tight muscle modality. In one study combining pectoral SCM strengthening and static stretching, study subjects were given three repetitions for every stretch thrice a day and held every stretch for 30–45 seconds with repetitions at 3–5 sessions per day (Abd El-Azeim et al., 2022). Doorway stretches are a usual technique of the pectoralis major/minor, with cervical side-bending and rotation used to treat levator scapulae and SCM.

A six-week intervention reported by J.I. Kang et al., (2018) involved specific static stretches for the pectoralis major and levator scapulae, incorporated into a postural correction program. Participants performed stretching protocols five days a week, and compliance was checked with visual feedback and supervised sessions.

Proprioceptive neuromuscular facilitation (PNF) stretching has also been investigated. Moezy et al., (2014) used PNF hold-relax techniques for tight anterior shoulder and neck musculature. The participants reported larger gains in flexibility compared to static stretching alone, particularly in cervical rotation and shoulder abduction, with range of motion improvements of 25–30%.

Functional Outcomes Post-Intervention

Stretching exercises for FHP have repeatedly shown enhancements in musculoskeletal performance and postural balance. Harman & Hubley-Kozey, (2005) discovered that subjects who conducted anterior chain stretches, including SCM and pectorals, achieved significant increases in craniovertebral angle (CVA)—with a mean increase of 8.5°, indicating decreased forward head displacement.

In a randomized trial of N.Y. Kang et al., (2021), patients who integrated scapular stabilization and anterior muscle stretching had a 22% neck pain reduction and 15% improvement in cervical range of motion over four weeks. Shiravi et al., (2019) also found significant decreases in postural deviation scores, improvements in shoulder alignment, and a 30% reduction in self-reported disability index.

In addition, long-term follow-up by Fathollahnejad et al., (2019) showed that regular stretching of tight postural muscles assisted in maintaining functional gains even one month after therapy cessation, demonstrating its potential for long-lasting outcomes.

Finally, regular stretching exercises in selected shortened muscles, namely pectoralis major/minor, levator scapulae, and SCM, play an important role in FHP correction if performed persistently and supplemented with strengthening exercises. The static and PNF techniques have empirical evidence of its application, whose effects include enhancing CVA, increasing range of motion, less pain, and postural functional correction.

4. Discussion

This review combined evidence from several clinical trials and studies investigating the influence of strengthening and stretching exercises on Forward Head Posture (FHP). The primary findings in total highlight that focused strengthening of deep cervical flexors and scapular stabilizers, combined with pectoralis major/minor, levator scapulae, and sternocleidomastoid (SCM) stretching, dramatically enhance craniovertebral angle (CVA), decrease neck pain, and correct postural asymmetry (Harman & Hubley-Kozey, 2005; Shiravi et al., 2019). Several studies noted gains in CVA from 8° to 15°, and decrease in neck disability index (NDI) scores by as much as 35% after six to ten weeks of treatment (J.I. Kang et al., 2018; Abd El-Azeim et al., 2022).
Interventions that incorporated both static and dynamic protocols—e.g., craniocervical flexion training and static pectoralis stretches—exhibited better functional outcomes than single-mode therapies. Cervical range of motion, muscle activation patterns, and self-reported pain levels were all improved in studies consistently across them (Im et al., 2015; Moezy et al., 2014).

Clinical Relevance of Exercise-Based Intervention for FHP

Clinically, these results hold important implications. FHP becomes more prevalent among sedentary groups, most notably among office workers and students, and will lead to chronic musculoskeletal dysfunction if not treated (Fathollahnejad et al., 2019). Due to their accessibility, cost, and non-invasive nature, exercise-based intervention is a first-line conservative approach to postural correction.
Furthermore, the biomechanical advantages carry over to the aesthetics of postures. Improving the deep neck flexor and scapular stabilizers results in superior load distribution throughout the cervical spine, reducing forces of compression over intervertebral structures (Oakley et al., 2024). Concomitantly, stretching enhances muscle flexibility as well as neuromuscular balance, creating optimal head placement and enhanced breathing, especially in the presence of thoracic mobility (N.Y. Kang et al., 2021).

Strengths and Limitations of Current Evidence

The current literature includes a moderate-to-strong evidence base favouring exercise therapy for FHP. The RCTs within this review utilized objective measures of outcome including CVA, electromyographic assessment, and standardized pain/function scales (e.g., NDI, VAS). Limitations remain.
Heterogeneity in protocols such as type, intensity, and duration of exercise makes direct cross-study comparisons challenging. For example, whereas some trials had 6-week programs, others lasted for 10 weeks or even longer and had varying frequency and supervision (Harman & Hubley-Kozey, 2005; Shiravi et al., 2019).
The sample sizes tended to be small, with consequent limitations on statistical power and generalizability. Most studies also had no long-term follow-up, so it is unclear whether the postural corrections are sustained over time. Additionally, few trials stratified the results by demographic variables such as age, sex, or occupational activity, which might affect responsiveness to treatment.

Comparison with Other Corrective Modalities

Apart from exercise therapy, manual therapy and ergonomic measures have been popular in FHP management. Manual therapy, such as joint mobilizations and soft tissue release, has shown short-term pain relief and enhanced mobility (Fathollahnejad et al., 2019). Nevertheless, its passive character and reliance on clinician time restrict long-term self-management.

Ergonomic training, particularly in occupational health environments, seeks to alter workstation setup and encourage postural consciousness. Though useful for prevention, ergonomic education by itself typically does not have the mechanical cue required to change established postural aberrations (Moustafa & Diab, 2015). Hence, adding ergonomic adjustment to active interventions such as strengthening/stretching provides a more comprehensive and efficient solution.

Integrated modalities have also been investigated in a number of studies, including the combination of manual therapy and exercise or posture education. These multi-dimensional programs are more likely to yield improved function and pain scores compared with single interventions, although additional high-quality trials are required to verify synergy effects (Shiravi et al., 2019).

Gaps in Research and Future Directions

In spite of promising results, there are some discrepancies in this field. In the first place, there is no standardized exercise protocol among clinical studies, and therefore, it is hard to prescribe evidence-based treatment regimens in practice. Future studies should work on defining the most favourable frequency, intensity, and duration of both strengthening and stretching exercises in various severities of FHP.

Second, long-term sustainability of gains is under-studied. Although short-term results are encouraging, few studies report follow-up data beyond one month. Prospective studies with 6- to 12-month follow-ups would be useful in ascertaining the persistence of postural correction.

Third, neurophysiological mechanisms underlying exercise effectiveness—e.g., proprioceptive re-education and cortical motor remapping—continue to be poorly elucidated. The use of neuroimaging and motor control testing in future trials could better inform mechanisms by which posture is controlled and corrected.

Finally, there is an increasing imperative to investigate technology-facilitated interventions, e.g., biofeedback smartphone apps, wearables, and virtual coaching, that may be able to facilitate greater adherence and participation, particularly in remote or tele-rehabilitation environments.

5. Conclusion

This systematic literature review verify the efficacy of both Strengthening and Stretching Exercises to correct Forward Head Posture (FHP), a postural disorder becoming more and more common in current sedentary occupations. Through a wide range of clinical trials and intervention studies, there were regular improvements in most important outcomes of craniovertebral angle (CVA), neck pain scores, muscular activation, and postural alignment, especially when interventions involved strengthening the deep cervical flexors and scapular stabilizers, and stretching the pectoralis major/minor, levator scapulae, and sternocleidomastoid (SCM) muscles. Together, these modalities address the muscular imbalances and biomechanical deviations central to FHP, providing a foundation for sustainable postural correction and functional restoration. Most importantly, this review emphasizes that multi-modal

methods involving both strengthening and stretching produce better outcomes than single-modality interventions.

Clinically, from a practice point of view, these results have significant implications. Physiotherapists are ideally placed to provide patient-specific corrective programs that are progressively graded. The evidence indicates the addition of exercise-based interventions as first-line intervention for FHP, especially for non-surgical presentations. In addition, their non-invasive, low-cost, and widespread availability make these exercises particularly useful in prevention and early intervention programs. By incorporating these exercises into workplace wellness initiatives, school-based physiotherapy, and telehealth services, therapists can actively respond to the increasing prevalence of FHP in populations. Yet, even with the promising results, the existing body of evidence comes with some limitations that need to be addressed.

In conclusion, strengthening and stretching exercises are an evidence-based, practical, and effective treatment strategy for the correction of Forward Head Posture. Their clinical value is underpinned by improvements in biomechanical alignment and patient-reported outcome measures. For physiotherapists, these results support routine prescription of posture-specific exercise programs for both therapeutic and preventive applications. However, to best achieve their potential and inform best-practice recommendations, future studies need to prioritize methodological rigor, long-term follow-up, and the incorporation of emerging technologies into clinical models.

Conflict of Interest

No conflict of interest.

Author Contribution

DK design the study, conceptualised the study, searched the articles, screening the data, extracting the data, wrote introduction and methodology, conducted the literature review, editing of citations, and wrote manuscript. SD reviewed and approved the final script.

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