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ORIGINAL ARTICLE

The Effectiveness of Therapeutic Exercises for Office Workers with Neck Pain

Flemi Rose Joju[1], P. Sneha Balakrishnan[2]

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ABSTRACT

Neck pain is felt in the muscles and structures of the back of the neck or shoulders, without involving nerve issues or serious conditions like tumors, fractures, or infections. Factors like sitting for long periods, poor posture, repetitive tasks, work-related stress, and job strain can contribute to neck pain. These factors combine biological and psychosocial elements, including physical, emotional, and social aspects. Certain jobs, such as dentistry, nursing, office work, computer users have high rates of neck pain, it is essential to recognize the effectiveness of physiotherapy interventions in pain management. This manuscript comprehensively reviews the literature examining the effectiveness of Physiotherapy interventions in reducing neck pain. A thorough search of literature database was conducted to identify relevant articles published between 2013 and 2023. Six studies were selected for analysis, illustrating various interventions for neck pain. Further research is warranted to elucidate the underlying mechanisms and optimal physiotherapy treatment strategies presenting with neck pain.

KEYWORDS

• Office workers • Neck pain • Exercise and/or Exercise therapy • QoL, • Strengthening • Stretching • Endurance • Physiotherapy and/or Physical therapy

INTRODUCTION

Neck pain is felt in the muscles and structures of the back of the neck or shoulders, without involving nerve issues or serious conditions like tumors, fractures, or infections. Factors like sitting with sedentary lifestyle, poor posture, repetitive tasks, work-related stress, and job strain can contribute to neck pain. These

AUTHOR'S AFFILIATION:

[1] BPT 4th Year, Department of Physiotherapy, St John's Medical College, Bangalore, Karnataka, India.

[2] Associate Professor, Department of Physiotherapy, St John's Medical College, Bangalore, Karnataka, India.

CORRESPONDING AUTHOR:

P. Sneha Balakrishnan, Associate Professor, Department of Physiotherapy, St John's Medical College, Bangalore, Karnataka, India.

E-mail: snehapt@gmail.com

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factors combine biological and psychosocial elements, including physical, emotional, and social aspects. Neck pain is the second most common musculoskeletal disorder after low back pain, leading to significant disability and absence from work in developed countries.[1] Certain jobs, such as dentistry, nursing, and office work, have high rates of neck pain, with computer workers experiencing the highest incidence. Individual factors like age, gender, physical activity, stress, and education also play a role.[1]

Workplace interventions aim to prevent or minimize health hazards and promote workability. Studies have tested various interventions, including exercise programs, ergonomic adjustments, and return-to-work programs. Multidimensional interventions, particularly those focusing on mental and physical health education, relaxation, breaks, and musculoskeletal training, have been found to reduce self-reported neck pain and disability.[2]

Few comprehensive studies have examined how office workers with vague neck discomfort fare in terms of quality of life. This study seeks to evaluate the efficacy of exercise treatment for non-specific neck pain in office workers by examining the effects of workouts focusing on therapeutic strategies, such as strength, endurance, or stretching, on pain reduction and quality of life.

Need for the Study

"Neck pain is a common health issue affecting office workers worldwide. This study aimed to determine the most recent evidence regarding the effectiveness of therapeutic exercise compared to no therapeutic exercise in reducing neck pain and enhancing the quality of life (QoL) for office workers experiencing neck pain."

Objectives

The study aims to assess whether therapeutic exercises reduce neck pain in individuals who work in an office.

METHEDOLOGY

Search Strategy

An electronic web search for studies from 2013 to 2023 was conducted in the PubMed and Cochrane Library databases. Articles were identified using keywords such as 'Office workers', 'neck pain', 'exercise' and/or 'exercise therapy', 'QoL', 'strengthening', 'stretching', 'endurance', 'physiotherapy' and/or 'physical therapy' were searched from inception until 2023.

Search Techniques

The search techniques used for extracting articles for this literature review were performed using the Boolean operators "OR" as well as "AND".

Study Selection

Inclusion Criteria

Types of studies: randomized controlled trials, systematic review, meta -analysis. Timeline: articles published from 2013 to 2023

For the purpose of this systematic review, only papers written in English and made available in their entirety were considered. The comprehensive review included studies with subjects who were at least 18 years old, had a diagnosis of acute or chronic non-specific neck pain, were actively employed in an office setting, and were either self-reported sufferers or had their pain diagnosed.

Exclusion Criteria

Articles published in languages other than English.

Articles where full text was not available.

Articles excluding office workers.

Procedure

An online web based literature search using database PubMed and Cochrane Library. The search aimed to yield studies which establish The Effectiveness of therapeutic exercises in reducing neck pain among office workers. The exercises included stretching, endurance, strengthening, and postural correction. A search strategy was developed to establish the same using the keywords, randomized controlled trials, systematic review and meta-analysis published between 2013 and 2023.

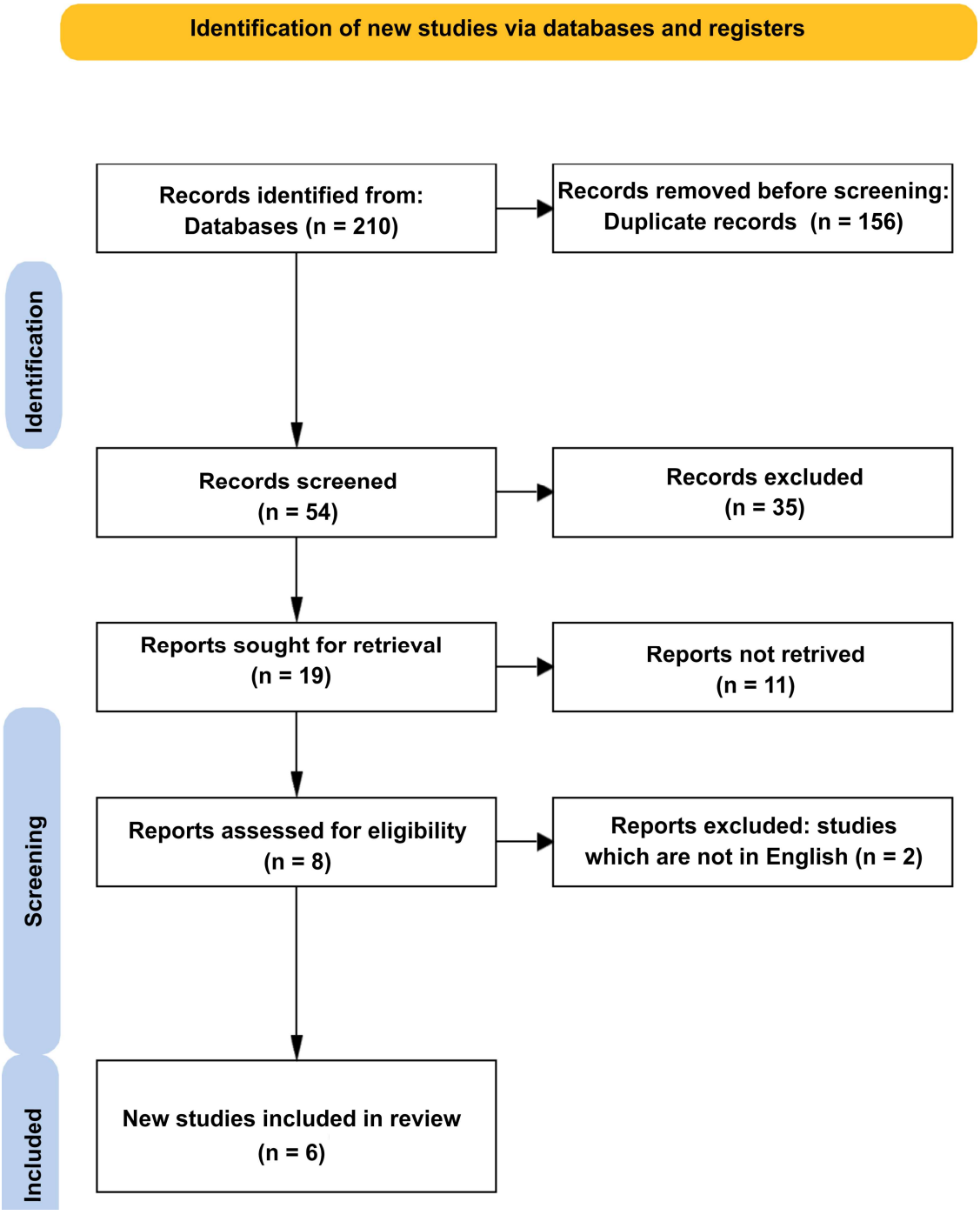
210 articles were found during the search. Following a screening of the titles and inclusion criteria, 6 articles were kept and included in this evaluation limiting the search using filters to only return free full text and English language results.

Our primary aim was to find out the Effectiveness of therapeutic exercises in reducing neck pain among office workers. The articles were further assessed based on objectives and data was analyzed and explored. The included articles will be studied in detail and a critical appraisal tools such as CASP for RCTs and systematic reviews, and JBI for quasi-randomized controlled experimental studies.

Search Results

[Neck pain (Title/Abstract)] OR [office workers (Title/Abstract)] OR [acute/chronic neck pain (Title/Abstract)] AND [physiotherapy Title/(Abstract)] OR [therapeutic exercises (Title/Abstract)] AND [strengthening/stretching exercises (Title/Abstract)] OR [ergonomic training (Title/Abstract)]

RESULTS



LITERATURE REVIEW

1. V. Kuptniratsaikul *et al* conducted study to compare the effects of Hatha yoga and stretching exercises on pain reduction, physical performance, and psychological well-being in sedentary office workers with mild to moderate neck and shoulder pain. The study involved 150 participants who were randomly assigned to either a Hatha yoga group or a stretching group. Both groups attended a 30-minute session once a week for 4 weeks and were also instructed to practice at home. The participants were followed up at 4 and 8 weeks.

   The primary outcome measured was the numeric rating scale (NRS) score for pain, while secondary outcomes included tests for physical performance and various psychological assessments. After 4 weeks, it was found that there was significance in the NRS score between the Hatha yoga and stretching groups. However, no significant differences were observed between the groups for other outcome measures.

   Most participants reported satisfaction with their assigned treatment, and most of them perceived improvement in their condition. Common adverse events reported were musculoskeletal pain and muscle tension. The analysis showed that Hatha yoga was found to be non-inferior to stretching exercises in terms of safety and its effects on pain, anxiety, depression, flexibility, neck function, and quality of life.[1]

2. Mr. Martin frutiger *et al* conducted systematic review with meta-analysis and meta-regression and sought to evaluate the combined impact of workplace interventions on neck pain in office Workers.neck pain is a common issue among office workers, and workplace interventions aim to minimize its impact and improve work quality. However, the overall effectiveness of these interventions remains unclear. We conducted a thorough search of 7 electronic databases

   Up to january 2020 for randomized clinical trials. Twenty-nine trials, including 8 high-quality met our inclusion criteria. Our analysis revealed that neck strengthening showed the reduction in pain scores. Additionally both activity performance and workplace modifications led to significant improvements in self-reported neck pain.

   While there is low-quality evidence supporting the effectiveness of neck strengthening and tailored workstation modifications in reducing neck pain, further high-quality research involving clinicians is essential to fully understand this combined effect. Meta-regression analysis did not yield significant insights into the impact of time on these interventions. In conclusion, more rigorous research, including the involvement of clinicians, is needed to comprehensively evaluate the combined impact of workplace interventions on neck pain in office workers.[2]

3. Saeterbakken *et al* examined the impact of nordic walking on office workers' self-reported neck and shoulder discomfort were compared to those of targeted strength training and a non-training control group in a randomised intervention study Over half of all people have dealt with neck discomfort at some point in the past six months. Research has demonstrated that reducing shoulder and neck discomfort is possible with targeted strength training of the afflicted muscles. Yet, there has been a lack of research into the effects of targeting the muscles of the neck and shoulders with endurance training.

   Thirty-four female office workers with neck and shoulder pain participated in the study. The participants were assigned to NW, ST, or Con. Pain intensity (measured on a 0-100 mm Visual Analog Scale), isometric abduction strength, and a six-minute walk test were assessed before, after, and 10 weeks after the intervention. Both training groups attended the training programs twice per week for ten weeks (30 minutes per session).

   The results showed that both training groups, NW and ST, demonstrated a similar, but significant, reduction in pain intensity (P=0.014-0.018). However, between the post-test and the 10-week post-intervention test, a similar pain intensity was observed in the NW group (p=0.932),

while the ST group demonstrated an increase (p=0.136). Throughout the testing period, no difference in pain was observed for the Con group (p=0.724-1.000) or between the Con group and the training groups (p=0.421-0.802).Additionally, there were no changes in strength and endurance observed between or within the groups (p=0.184-0.870). Based on the findings, both Nordic walking and specific strength training were found to reduce pain for office workers with low neck and shoulder pain, suggesting these approaches may be useful for this group.[3]

4. Shereen louw *et al* discussed in a review office workers frequently deal with non-specific neck discomfort. In order to find out what the latest research on therapeutic exercise for non-specific neck pain has to offer in terms of lowering pain and enhancing qol in office workers, this systematic review set out to compare the two approaches. Search terms such as "office workers," "non-specific neck pain," "exercise," "exercise therapy," "quality of life," "strengthening," "endurance," "physiotherapy," and "physical therapy" were used to search seven electronic databases from conception to march 2017. Narratives accompanied the diverse data sets, and similar, homogenous data sets were combined. The evaluation averaged a 6.63 out of a possible 10 on the Physiotherapy Evidence Database (PEDro) rating, and it comprised eight RCTs. In terms of exercise methods, five studies used strengthening activities, one used endurance exercises in addition to stretching, one used stretching exercises alone, and one used a combination of the two. Strength training alleviated neck discomfort in five of the studies that looked at it, and improved quality of life in four more. Two studies found improvements in quality of life and one found a substantial reduction in neck discomfort after endurance training. There was a marked reduction in neck discomfort in the research that included stretches. A clinically significant difference favouring strengthening activities over no exercise was shown in the meta-analysis for pain reduction, but no such difference was found for quality of life.

   In order to alleviate neck discomfort and increase quality of life, doctors should use strengthening activities, according to level II evidence. But we need to learn more about the benefits of stretching and endurance training.[4]

5. Springer–verlag *et al* compared progressive resistance training (prt) and fixed resistance training (frt)

   In females experiencing discomfort in the neck. Many office workers suffer from chronic neck ache caused by their computers. There is some evidence that strengthening exercises aimed at the neck might reduce discomfort and enhance mobility. Aiming to determine whether progressive resistance training would be more beneficial for women suffering from work-related neck discomfort, this study compared the efficacy of several resistance training methods. Participating in the study were 109 working women who had chronic neck pain. They were randomly assigned to one of three groups: PRT, FRT, or CG, depending on their level of pain tolerance. Both the PRT and FRT groups used an elastic rubber band to consistently execute four exercises targeting the neck muscles for a duration of six weeks. Training efficacy was assessed pre-treatment, twice, four, and six weeks into the program, and again three months following completion of the program. Maximum isometric neck strength, pressure pain threshold, visual analogue scale, and neck disability index were among the evaluation instruments used. At both the 6-week and 3-month follow-ups, the PRT and FRT groups outperformed the control group by a substantial margin. At the 4-week, 6-week, and 3-month follow-up intervals, the VAS scores in the PRT group also reduced considerably as compared to the FRT group. Results showed that women suffering from chronic neck discomfort from computer use saw improvements in pain threshold, mobility, and strength in their neck muscles after participating in neck resistance training. Important implications for future clinical management may arise from the findings that imply PRT may be more beneficial for women with work-related neck discomfort.[5]

6. Research by Bibi Gramme *et al.* compares the effectiveness of occupational strength training for the neck and shoulders with and without frequent monitoring in reducing headaches and neck and shoulder discomfort in office workers. Three hundred and fifty-one office workers participated in a cluster randomised controlled trial over the course of twenty weeks. Half of the participants were assigned to a training group that met three times weekly under the guidance of an exercise instructor. The other half received no such instruction. The severity of headaches and neck discomfort has decreased significantly over the past week, according to the results. Office workers reported less headaches and neck pain after receiving neck/shoulder training, and this effect was shown regardless of the level of monitoring.[6]

Summary of Literature Review

V. Kuptniratsaikul *et al* conducted a study comparing hatha yoga and stretching exercise to treat sedentary office workers with shoulder pain with CASP score 8.[1] Mr. Martin frutiger *et al* conducted a strength training and workplace modifications may reduce neck pain in office workers with CASP score 8.[2] Saeterbakken *et al* conducted a, nordic walking and specific strength training for neck- and shoulder pain in office workers CASP score 7.[3] Shereen louw *et al* conducted study to show effectiveness of exercise in office workers with neck pain with CASP score 8.[4] Springer – verlag *et al* conducted a study the effectiveness of resistance training in women with chronic computer-related neck pain: a randomized controlled study, CASP score 7.[5] Bibi Gram *et al* conducted effectiveness of Strength Training for Reducing Neck/Shoulder Pain and Headache in Office Workers with a CASP score 8.[6]

DISCUSSION

A study compared the effects of Hatha yoga and stretching exercises on sedentary office workers with neck and shoulder pain. 150 participants were randomly assigned to either a Hatha yoga group or a stretching group. Both groups had weekly sessions and were instructed to practice at home. After 4 weeks, a significant difference in pain reduction was observed between the two groups, but no significant differences were found for other outcome measures. Most participants were satisfied with their treatment and reported improvement. Hatha yoga was found to be non-inferior to stretching exercises in terms of safety and effects on pain, anxiety, depression, flexibility, neck function, and quality of life. An analysis of 7 electronic databases found 29 trials on reducing neck pain. Neck strengthening showed the most significant decrease in pain scores, and workplace modifications led to improvements. More high-quality research involving clinicians is needed for a comprehensive understanding of the combined impact of workplace interventions on neck pain[1].

"In a study involving female office workers with neck and shoulder pain, Nordic walking (NW) and specific strength training (ST) both significantly reduced pain intensity. No change in pain was observed in the non-training control group. Both NW and ST were found to be effective in reducing pain for office workers with low neck and shoulder pain.[2]

The review of eight trials showed that strengthening exercises are effective in reducing neck pain and improving quality of life. Endurance and stretching exercises need further exploration. This study aimed to compare different resistance training programs for women with work-related neck pain.

In a study, 109 employed women with chronic neck pain were divided into three groups: progressive resistance training (PRT), fixed resistance training (FRT), and a control group (CG). Both the PRT and FRT groups had better outcomes compared to the control group at the 6-week mark and the 3-month follow-up. The study concluded that neck resistance training was effective in relieving pain and improving mobility in women with chronic computer-related neck pain.PRT group experienced greater pain reduction. This suggests PRT may be more beneficial for women with work-related neck pain.[5]

Study	Author(s)	Intervention	Benefit	Level of Evidence
1	V Kuptniratsaikul, C Muaksorn, C Koedwan, O Suesuwan, A Srisomnu	Hatha yoga vs. Stretching exercise	Pain reduction, improved physical performance (e.g., flexibility, mobility), enhanced psychological status (e.g., stress reduction) compared to baseline.	Randomized Controlled Trial (Non-inferiority design) Level 11
2	Martin Frutiger, Robert Borotkanics	Strength training and workplace modifications	Systematic review and meta-analysis showing significant reduction in neck pain through targeted exercises and ergonomic adjustments in office environments.	Systematic Review and Meta- analysis Level 1
3	Atle H. Saeterbakken, Solveig Nordengen, Vidar Andersen, Marius S. Fimland	Nordic walking and specific strength training	Pilot study suggesting feasibility and potential efficacy in reducing neck and shoulder pain among office workers, potentially improving muscle strength and posture	Pilot Study Level 11
4	Shereen Louw, Shale Makwela, Lorisha Manas, Lyle Meyer, Daniele Terblanche, Yolandi Brink	Various forms of exercise (e.g., aerobic, resistance training)	Systematic review and meta-analysis indicating exercise as effective in managing neck pain among office workers, with specific benefits depending on exercise type	Systematic Review and Meta- analysis Level 1
5	Xiao Li, Caina Lin, Cuicui Liu, Songjian Ke, Qing Wan, Haijie Luo, Zhuxi Huang, Wenjun Xin, Chao Ma, Shaoling Wu	Resistance training	Randomized controlled study comparing effectiveness of resistance training in women with chronic computer-related neck pain, demonstrating significant pain reduction and improved functional outcomes	Randomized Controlled Trial Level 11
6	Bibi Gram, Christoffer Andersen, Mette K Zebis, Thomas Bredahl, Mogens T Pedersen, Ole S Mortensen, Rigmor H Jensn, Lars L Andersen, Gisela Sjøgaard	Supervised strength training	Cluster randomized controlled trial evaluating effectiveness of supervised strength training in reducing neck and shoulder pain and headache among office workers	Cluster Randomized Controlled Trial Level 11

CONCLUSION

The use of therapeutic exercise in the treatment of office workers with neck pain was found to be effective. Further research is needed regarding interventions that may be beneficial. From existing publications, stretching exercises are at the forefront of effective protocols to reduce neck pain.

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