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The Fallacies in Physiotherapy Practice

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Abstract:

Fallacies in physiotherapy practice encompass a spectrum of misconceptions and erroneous beliefs that can significantly impact clinical decision-making, patient care, and treatment outcomes. These fallacies often stem from factors such as outdated information, cognitive biases, limited experience, and societal influences. Recognizing and addressing these fallacies is of paramount importance to ensure that physiotherapy remains grounded in evidence-based principles, safety, and efficacy.

This article examines various types of fallacies encountered within the realm of physiotherapy practice and offers practical remedies to mitigate their effects. These fallacies include the Diagnostic Certainty Fallacy, Confirmation Bias, Availability Heuristic, Therapeutic Misconception, Anchoring Bias, Overestimation of Treatment Benefits, Halo Effect, Minimal Intervention Fallacy, Newer Is Better Fallacy, Hasty Generalization, Omission Bias, Defensive Medicine Fallacy, Authority Bias, and Personal Experience Fallacy.

Each fallacy is dissected, providing insights into how it may manifest in the clinical setting and offering specific strategies to counteract it. These strategies encompass critical thinking, evidence-based decision-making, holistic patient assessment, and effective communication to align treatment plans with individual patient needs and the best available evidence.

In conclusion, this article emphasizes the vital role of continuous learning, critical thinking, and evidence-based practice in addressing and rectifying fallacies in physiotherapy. By prioritizing patient well-being over personal biases and integrating the latest evidence into treatment decisions, physiotherapists can provide tailored, high-quality care that aligns with the best practices in the field.

Keywords:

Fallacies, Bias, Misconceptions,Physiotherapy practies

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Introduction

Fallacies in physiotherapy practice are misconceptions or erroneous beliefs that physiotherapists may hold, impacting their clinical decision-making, patient care, and treatment outcomes. These fallacies can arise due to various factors, including outdated information, cognitive biases, limited experience, and the influence of cultural or societal beliefs. Identifying and addressing these fallacies is crucial to ensure that medical care is evidence-based, safe, and effective.

Types of fallacies and their remedies

Let's take a look at how some of these fallacies might manifest within the context of physiotherapy:

1. **Diagnostic Certainty Fallacy:**

In physiotherapy, practitioners might overly rely on specific assessments or tests to diagnose musculoskeletal conditions without considering the broader clinical picture. This can lead to misdiagnoses and inappropriate treatment plans. [(1)]

To combat the Diagnostic Certainty Fallacy in physiotherapy, practitioners must be willing to challenge their biases and not solely rely on isolated assessments or tests for diagnosing musculoskeletal conditions. Instead, they should consider the broader clinical context. For example, a physiotherapist should not solely rely on an magnetic resonance imaging (MRI) scan to diagnose a patient's lower back pain but should also consider the patient's medical history, lifestyle, and physical examination findings. By doing so, they can reduce the risk of misdiagnoses and create more appropriate treatment plans tailored to each patient's unique needs.

2. **Confirmation Bias:** Physiotherapists might focus on information that confirms their initial assessment, ignoring signs that suggest an alternative diagnosis or treatment approach. This can lead to tunnel vision and missed opportunities for more effective interventions.[(2)]

Addressing Confirmation Bias in physiotherapy requires practitioners should avoid fixating solely on information that confirms their initial assessment while disregarding signs that may indicate an alternative diagnosis or treatment approach. For instance, if a physiotherapist initially suspects a knee injury, they should remain open to other possibilities even if subsequent assessments point toward a different issue, such as hip dysfunction. This approach can prevent tunnel vision and ensure that more effective interventions are not missed.

3. **Availability Heuristic:**

Physiotherapists could base their treatment decisions on the most recent or memorable cases they've encountered rather than considering the full range of possible conditions and treatments. [(3)]

To combat the Availability Heuristic in physiotherapy, practitioners should avoid relying solely on their most recent or memorable cases when making treatment decisions. For example, if a physiotherapist had a recent success treating a patient with a specific shoulder injury, they should not automatically assume the same approach will work for every patient with shoulder pain. Instead, they should consider the full range of possible conditions and treatments to provide the most appropriate care for each individual.

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4.Therapeutic Misconception:

Patients in physiotherapy might misunderstand the goals and expectations of their treatment, leading to unrealistic expectations about their recovery timeline or the outcomes they can achieve. [4-6]

To address the Therapeutic Misconception in physiotherapy, it's crucial for practitioners to ensure that patients have a clear understanding of the goals and expectations of their treatment. Patients may sometimes misinterpret the nature of their therapy, resulting in unrealistic expectations regarding their recovery timeline or achievable outcomes. For instance, a patient undergoing physiotherapy for a knee injury may believe they can return to high-impact sports within a few weeks, not realizing that the process may take longer and involve gradual progress. Therefore, physiotherapists must communicate treatment plans and expected outcomes clearly to help patients develop realistic expectations.

5. **Anchoring Bias:**

Physiotherapists might anchor their treatment plans to the initial complaints reported by the patient, potentially overlooking important information that arises during subsequent assessments. [7]

To mitigate the Anchoring Bias in physiotherapy, it's essential for practitioners to remain open to evolving information throughout the treatment process. They should avoid fixating on the initial complaints reported by the patient and be receptive to any new, pertinent information that emerges during subsequent assessments. For example, if a patient initially presents with knee pain but later mentions symptoms in their hip during follow-up appointments, the physiotherapist should not anchor their treatment solely to the initial knee complaint. Instead, they should consider the broader clinical picture to ensure comprehensive and effective care.

6.**Overestimation of Treatment Benefits:**

Practitioners could overestimate the effectiveness of certain interventions, leading to a bias toward recommending those treatments even when evidence for their efficacy is limited. [8, 9]

To counteract the Overestimation of Treatment Benefits in physiotherapy, practitioners should maintain a balanced and evidence-based approach when recommending interventions. This involves avoiding the tendency to overestimate the effectiveness of specific treatments, especially when there is limited supporting evidence. For instance, if a physiotherapist comes across a new therapy for lower back pain that has received some positive anecdotal feedback but lacks robust scientific validation, they should exercise caution in promoting it as a primary treatment option. Instead, they should prioritize treatments with a more established evidence base, considering the potential risks and benefits of each intervention in a well-informed manner.

7.Halo Effect:

Physiotherapists might assume that a patient's physical fitness level directly correlates with their overall health, overlooking other factors that could contribute to their condition. [10, 11]

To address the Halo Effect, it's important for physiotherapists to avoid making assumptions about a patient's overall health based solely on one aspect, such as their physical fitness level. Instead, they should consider a comprehensive range of factors

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that could contribute to the patient's condition. For example, if a physiotherapist encounters a patient who appears physically fit and active but presents with persistent pain, they should resist the temptation to assume that the patient's overall health is excellent. Instead, they should conduct a thorough assessment, taking into account other potential factors like stress, diet, sleep patterns, and medical history to ensure a more holistic understanding of the patient's health and condition. This approach helps in making well-rounded and effective treatment decisions.

8. Minimal Intervention Fallacy: Physiotherapists might underestimate the severity of a patient's musculoskeletal issue and opt for less intensive treatment, potentially delaying recovery or exacerbating the condition. [12]

To combat this Fallacy, physiotherapists should avoid underestimating the severity of a patient's musculoskeletal issue and instead opt for treatment that appropriately matches the condition's needs. For example, if a physiotherapist encounters a patient with persistent shoulder pain, assuming it's a minor issue and recommending minimal intervention like rest and simple exercises might delay recovery if, in fact, the patient has a more severe underlying condition like a rotator cuff tear. It's essential for the physiotherapist to conduct a thorough assessment and consider the full range of potential issues to ensure the appropriate level of intervention and prevent further complications.

9. Newer Is Better Fallacy:

Physiotherapists might assume that the latest gadgets or technologies are superior without thoroughly evaluating their effectiveness or appropriateness for a specific patient's needs. [13]

To address the Newer Is Better Fallacy, physiotherapists should refrain from assuming that the latest gadgets or technologies are always superior and, instead, conduct a careful evaluation of their effectiveness and suitability for each patient's unique needs. For instance, if a physiotherapist encounters a new cutting-edge device for treating knee injuries, they should resist the temptation to automatically incorporate it into all treatment plans. Instead, they should critically assess whether this technology provides tangible benefits over existing, proven methods for individual patients, considering factors like cost, accessibility, and patient preferences to make informed and patient-centered decisions.

10. Hasty Generalization:

Drawing broad conclusions about a patient's condition based on limited movement assessments or initial observations can lead to inaccurate treatment approaches. [14]

To counteract the Hasty Generalization fallacy, physiotherapists should avoid making sweeping conclusions about a patient's condition based solely on limited movement assessments or initial observations. For example, if a physiotherapist observes a patient struggling with a particular exercise during the first session, they should refrain from assuming that the patient's overall progress will be similarly challenging. Instead, they should conduct a comprehensive evaluation, considering the full range of factors that may

affect the patient's condition and treatment needs to ensure more accurate and tailored therapeutic approaches.

11. Omission Bias:

Physiotherapists might avoid recommending more aggressive treatments, such as surgery or invasive procedures, due to concerns about potential risks or complications.[15-17]

To address Omission Bias, physiotherapists should refrain from avoiding potentially beneficial treatments, such as surgery or invasive procedures, solely out of concerns about potential risks or complications. For example, if a physiotherapist is working with a patient who has a severe musculoskeletal condition that could benefit from surgery, they should not omit discussing surgical options just because of fears about possible complications. Instead, they should present a comprehensive view of the available treatments, including potential risks and benefits, and involve the patient in a shared decision-making process to determine the most suitable course of action based on the patient's specific needs and preferences.

12. Defensive Medicine Fallacy:

In physiotherapy, practitioners might recommend unnecessary exercises or interventions to avoid potential patient dissatisfaction or claims of inadequate care. [18, 19]

To counter this Fallacy, physiotherapists should avoid recommending unnecessary exercises or interventions solely to prevent potential patient dissatisfaction or legal claims of inadequate care. For instance, if a physiotherapist believes that a patient's condition can be managed effectively with a minimal intervention plan, they should not succumb to defensive practices by overloading the treatment plan with excessive exercises or therapies. Instead, they should base their recommendations on the patient's actual needs and clinical assessment, ensuring that the provided care aligns with the best interests of the patient's health and recovery rather than merely trying to avoid perceived legal risks.

13. Authority Bias:

Relying solely on the recommendations of senior physiotherapists without critically evaluating the evidence behind their suggestions can hinder the integration of new, evidence-based practices.[20]

To counteract this Bias, physiotherapists should refrain from unquestionably following the recommendations of senior physiotherapists and instead critically evaluate the evidence supporting their suggestions. For example, if a junior physiotherapist receives guidance from a senior colleague regarding a treatment approach, they should not blindly adopt it without considering the current scientific literature or patient-specific factors. Instead, they should assess the evidence and adapt their practices accordingly, ensuring that the integration of new, evidence-based techniques takes precedence over tradition or authority-driven decisions.

14. Personal Experience Fallacy:

Physiotherapists might base their treatment decisions on their own experiences or successes with certain techniques, overlooking alternative approaches that might be more appropriate for specific patients. [21]

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To address this Fallacy, physiotherapists should avoid making treatment decisions solely based on their personal experiences or past successes with specific techniques. Instead, they should consider a broader range of approaches that may be more suitable for individual patients. For example, if a physiotherapist had success treating previous patients with a particular exercise regimen for lower back pain, they should not automatically apply the same approach to all new patients with similar symptoms. Each patient's condition and needs vary, so it's important for the physiotherapist to assess and tailor the treatment plan accordingly, considering a variety of evidence-based interventions beyond their personal experiences.

Conclusion

Physiotherapists must commit to continuous learning, critical thinking, and evidence-based practice to address these fallacies. This involves challenging biases, prioritizing patient well-being over personal beliefs, and integrating the best evidence into treatment decisions to provide tailored, high-quality care.

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Prevalence of Carpal Tunnel Syndrome in Dentists Executing Complex Task with The Upper Extremities

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Abstract:

Carpal tunnel syndrome (CTS) is a complex condition characterized by various symptoms caused by the compression of the median nerve within the inflexible carpal tunnel at the wrist. Imbalances in the musculoskeletal system resulting from overuse and underuse of hand and forearm muscles can contribute to the narrowing of the carpal tunnel, making it less resilient to the strain imposed by the flexor muscles. The repetitive wrist and hand movements commonly seen in dental professionals can exacerbate the muscular imbalance in the carpal tunnel. While there is limited literature on the prevalence of CTS in dental professionals, this study aimed to determine its occurrence among dentists performing intricate tasks with their upper extremities. A prevalence study was conducted in 2021 among dentists aged 27 to 45 in Calicut, Malappuram, and Kannur. The study enrolled 101 dentists who met the inclusion criteria, and the Boston Carpal Tunnel Questionnaire (BCTQ) was employed to assess the prevalence of CTS. Participants completed the questionnaire through a Google form. Among the 101 subjects, comprising 59 females and 42 males, the prevalence of Carpal Tunnel Syndrome in dentists was 47.5%. Most affected individuals were in the 25-35 age group. Notably, 14% of dentists reported experiencing severe symptoms, while 17% faced difficulties completing their daily tasks. In conclusion, the study highlights the significant prevalence of carpal tunnel syndrome among dentists. It underscores the importance of recognizing and managing this occupational disease to enhance affected individuals' quality of life and overall well-being. The findings emphasize the need for further research to validate and expand on these results and stress the importance of implementing preventive measures to safe guard the hand health of dentists.

Keywords: Carpal tunnel syndrome, Dental professionals, Dental technicians, Posture, Boston Carpal Tunnel questionnaire, Pain severity.

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Introduction

Carpal tunnel syndrome (CTS) is a complex condition characterized by a constellation of symptoms resulting from the compression of the median nerve at the wrist within the rigid carpal tunnel[1]. One of the conditions that affects the nerves in the hands is carpal tunnel syndrome (CTS), which is often brought on by exposure to vibrations in the wrist. In the general population, CTS occurs 1 to 2% of the time[2].

The carpal tunnel functions as a closed compartment, providing a passageway for the median nerve and several tendons as they traverse from the forearm to the hand. The median nerve, originating from the brachial plexus, comprises roots from C5 to T1, and it courses down the arm alongside the brachial artery[3]. As it enters the forearm, the median nerve navigates between the two heads of the pronator teres before gliding between the flexor digitorum superficialis (FDS) and flexor digitorum profundus (FDP). Eventually, the nerve emerges deep into the flexor retinaculum, passing through the carpal tunnel along with four tendons of FDS, four tendons of FDP, and one tendon of flexor pollicis longus (FPL). These structures interact and slide past each other during wrist flexion, creating a dynamic environment vulnerable to compression and inflammation[4].

The primary cause of CTS is the entrapment of the median nerve by an inflamed and swollen transverse carpal ligament, reducing the available space within the carpal tunnel[5]. Furthermore, musculoskeletal imbalances resulting from overuse and underuse of hand and forearm muscles can contribute to the narrowing of the carpal tunnel, making it less capable of withstanding the strain imposed by the flexor muscles. Consequently, individuals affected by CTS experience a range of symptoms, such as numbness, pain, and tingling sensations in the first three fingers and the radial side of the ring finger 3. Nocturnal symptoms, including pain, numbness, and impaired fine motor control, often disrupt sleep, and they are believed to be exacerbated by prolonged wrist flexion or extension during sleep. Prolonged wrist flexion or extension during sleep has been associated with the prevalence of nocturnal symptoms[4].

The condition can impact anyone, but it is most prevalent in the general population, affecting approximately 3.8% of people[6]. However, it has a higher prevalence rate in women (3%-5.6%) than men (0.6%-2.8%). Studies estimate that about 1 out of 20 individuals may experience the effects of CTS. Interestingly, the prevalence rate among women is significantly higher than that of men within the age range of 25 to 55[4].

Despite the diverse nature of CTS, it is more comprehensive than specific demographics or professions. In addition to the general population, specific occupational groups are at an elevated risk of developing CTS due to the repetitive hand movements involved in their work[7]. Musicians, carpenters, farmers, sewers, handloom weavers, meat packers, shoemakers, dental technicians, nurses, clerks, computer operators, and various other professions all fall into this category. Dentists, like many other professions that involve repetitive hand movements, are at an increased risk of developing CTS due to the demands of their work. This suggests that repetitive use of the hand is a significant contributing factor to the development of CTS[8] .

Dentists, in particular, face a notable risk of developing CTS due to the nature of their profession[9]. The constant and repetitive use of dental instruments and the need for precise and delicate hand movements place a substantial strain on the median nerve within the carpal tunnel. As a result, dentists are among the subpopulations at higher risk of developing CTS, which highlights the importance of understanding and addressing this prevalent condition within the dental community[10].

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Researchers have looked into a number of diagnostic methods and standards to validate CTS. Among these are the Tinsel's nerve percussion test, the Phalen's Sign, the wrist flexion test, the reverse Phalen test, the Tourniquet test, the tethered median nerve stress test, the carpal compression test, and lastly the electrodiagnostic test (EDX), which is the gold standard test[11]. The most successful strategy has been proposed as a combination of clinical symptoms and electric conductivity. This could result in the accurate diagnosis of CTS in high-risk populations[12].

Boston carpal tunnel syndrome questionnaire (BCTQ) is a highly valid questionnaire that is easy to administer and helps to identify the severity and functional status of individuals with CTS[13]. The Boston Carpal Tunnel Syndrome Questionnaire (BCTQ) is a validated self-administered tool to assess the severity of symptoms and functional limitations in individuals with carpal tunnel syndrome (CTS). It consists of two subscales: The Symptom Severity Scale, which evaluates the intensity and frequency of CTS symptoms, and the Functional Status Scale, which assesses the impact of CTS on daily activities[13]. The BCTQ is widely used in clinical practice and research to monitor symptom progression and treatment efficacy, providing valuable insights into the patient's well-being and guiding individualized treatment plans[14].

Carpal tunnel syndrome is a prevalent and multifaceted condition that results from compression of the median nerve within the carpal tunnel. Dentists, alongside numerous other professions, requiring repetitive hand movements, face an increased risk of developing CTS due to the demands of their work[15]. Recognizing the prevalence and risk factors associated with CTS in the dental profession can aid in implementing preventive measures and appropriate management strategies to ensure the well-being of dental professionals and mitigate the impact of this condition on their careers and quality of life. Since there are few studies on the prevalence of carpal tunnel syndrome in dental professionals, this study aimed to identify the prevalence of carpal tunnel syndrome in dentists executing complex tasks with the upper extremities

Methodology

This study is cross-sectional research conducted at various Calicut, Malappuram, and Kannur district dental clinics. Before commencing the study, ethical clearance was obtained from the institutional ethical committee. The participants recruited for the study consisted of 145 dental surgeons and dental assistants practicing in the selected areas. The study's inclusion criteria were dental practitioners with a minimum of 5 years of experience in the field and were primarily involved in clinical practice. The selected participants belonged to the age group of 27 to 45 years, encompassing both genders. However, individuals who had pre-existing complaints of upper limb pain, non-clinical practitioners, and those with any wrist or forearm fractures were excluded from the study.

All participants were personally contacted, while some were reached via telephone, and their email IDs were obtained. A Google form with a pre-designed questionnaire using the Boston Carpal Tunnel Syndrome (BCTQ) questionnaire was created. The questionnaire was provided only in the English language, and a consent form was attached at the end of the questionnaire. The study's duration was set to two months. The Google form with the questionnaire was emailed to all participants, allowing them two weeks to complete it.

At the end of the initial two weeks, only 46 forms were returned. In response, reminders were sent to the remaining participants through telephone and messaging. After granting an additional grace period of two weeks, 55 forms were eventually received, resulting in a final dataset of 101 forms for analysis. The collected data were then entered and subjected to statistical analysis using SPSS 24.0 software.

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Results

The demographical representation of the students is tabulated in Table I. The mean age group of participants was 32.80, with male students with an age group of 31.07 years and female students with an age of 32.11 years. Out of 101 study subjects, 59 females and 42 male's prevalence of Carpal Tunnel Syndrome in dentists was 47.5%, and most of the affected subjects were from the 25-35 years of age group. This prevalence study has been done using Boston Carpal Tunnel Questionnaire. This study shows that 14% of dentists experience severe symptoms, and 17% have difficulty in daily tasks.

Table I
Demographic Data

Gender	Sampels	Percentage
Male	42	41.2%
Female	59	58.8%

Table II
BCTQ: Shows the symptom severity scale

Severity	Percentage
Normal	49%
Mild	36%
Moderate	6%
Severe	2%
Very severe	6%

Table III
BCTQ: Shows the level of severity in functional status

Level of Difficulty	Percentage
No difficult	54.40%
Little difficult	28%
Moderate difficult	15%
Intense difficult	2%

Conclusion

This study concluded that the prevalence of Carpal Tunnel Syndrome (CTS) among dentists performing complex tasks with their upper extremities is 47.5%. Age, years of working, and hours worked per day were identified as factors affecting the incidence of CTS. Further research is needed to validate and expand on these findings, emphasizing the importance of preventive measures for dentists' hand health.

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Conflict of Interest: Authors declare no conflict of interest

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Neck, Shoulder, and Back pain Among Photographers: Prevalence and its Risk Factors

Joel regi Jacob[1], Dr.Mandar Malawade[2], Dr.Amrutkuvar Rayjade [3]

ABSTRACT

Background: photographers have to carry heavy gears, hike miles for a perfect photo and/or maintain an odd position over time can develop shoulder, neck and back pain. These pains can affect their photography. So, a study was carried out to assess the prevalence of shoulder, neck, and back pain among photographers and to investigate the relationship between this pain and its risk factors.
Methodology: A sample size of ninety photographers were taken for this study. To assess risk factor of pain among photographers were asked to fill the work-related musculoskeletal disorders questionnaire (WMSDsQ)to identify the musculoskeletal disorders during the photo-shoots. It is analysed by rapid upper limb analysis (RULA) and ergonomic risk factors noted. The outcome measure used in this study is RULA (rapid upper limb analysis).
Result: The prevalence of neck and shoulder pain is comparatively higher in photographers. The causes of the pain are repeated strain and awkward working postures, excessive positioning injuries and other musculoskeletal conditions. In this study the professional photographers (57%) showed more neck and shoulder pain than freelance photographer (35%)
Conclusion: It was found that prolonged occupational hazard and maintaining awkward positions were the main reasons for musculoskeletal disorders among photographers.

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Introduction

Neck, shoulder and back pain is relatively common among photographers and has a negative impact on their physical and psychological health. Neck, shoulder and back pain is relatively mild musculoskeletal condition, but in recent years it has become a major health problem and has imposed a heavy burden on the person and community [2,3]. The World Health Organization (WHO) has ranked neck, shoulder and other musculoskeletal diseases as the 4th and 10th health problems, respectively, for years lived with disability [1].

A typical photographer's posture is with upper body forward, shoulders rolled in, and neck bent forward with chin extended. Work-related musculoskeletal disorders (WMSDs) result from the workplace risk factors and are well known by the terms such as cumulative trauma disorders and repetitive strains injuries[2].

Musculoskeletal disorders are the injuries that affect the human body's movement or musculoskeletal system (muscle, tendon, ligament, nerve, discs, blood vessel). Neck, shoulder and back pain is relatively mild musculoskeletal condition, but in recent years it has become a major health problem and has imposed a heavy burden on the person and community[3]. Body posture refers to the position of a person's body in space, the alignment of body parts in relationship to one another and to the environment at one point in time and is influenced by each of the body's joints[4]. Habitual postural patterns are associated with musculoskeletal pain, and improving a maladaptive posture requires postural awareness to lead to clinical improvements[4,5].Postural control refers to building up posture against gravity and to ensuring that balance is maintained. It enables postural stabilization during voluntary movements and recovery of balance after disturbance. Postural control also constructs a reference frame for proprioception, i.e., the perception of joint angles and muscle tensions, of movement, balance and posture[6]. When less attention is paid to the physical damage caused by holding a certain position over time causes holding injuries technically called excessive positioning injuries[7]. Swelling and heat in joints, physical stiffness and discomfort, headaches, jaw pain, and chronic neck or low back pain are all signs of excessive positioning injuries. The findings of a study showed that camera usage increased the risk of developing musculoskeletal disorders[7,8,9]. Such an increase is mediated by ergonomic factors such as standing for prolonged periods, adoption of inadequate or uncomfortable postures, hiking miles for perfect photo, performing certain angles for photograph, carrying heavy lens luggage on the back and psychosocial factors. Standing for more than half a day in an awkward position increases the likelihood of having musculoskeletal problems[10]. This study is done to assess the prevalence of shoulder, neck, and back pain among photographers and to investigate the relationship between this pain and its risk factors using Work-related musculoskeletal disorders

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(WMSDs) and rapid upper limb assessment (RULA).

Methodology

Prior collecting the data, permission was received from Institutional Ethics committee from the Krishna Institute of Medical Sciences "deemed to be university" to collect data. Participants were informed and the participation was voluntary. Participants were selected by simple random sampling method according to inclusion criteria and exclusion criteria. Ninety photographers working in and around local area were taken for this study with full consent. The selected photographers were working in the profession with more than one year experience, either freelancers or professional photographers. A professional photographer is typically part of a company or agency and works full-time either have their own photo studio, On the other hand, a freelancer takes on jobs on a contract basis as opposed to being an employee for a company.

All the participants were males in the age between 20– 60 years. The 90 participants divided into 2 groups with 45 participants in each group.

Group A: 45 freelance photographers

Group B: 45 professional photographers

The procedure and purpose of the study was explained to the participants. Assessment was carried out by using RULA (rapid upper limb assessment) .The Rapid Upper Limb Assessment (RULA) method has been developed in 2004 by Dr. Lynn McAtamney and Professor E. Nigel Corlett, ergonomists from the University of Nottingham in England . RULA is a postural targeting method for estimating the risks of work-related upper limb disorders. A RULA assessment gives a quick and systematic assessment of the postural risks to a worker. The analysis can be conducted before and after an intervention to demonstrate that the intervention has worked to lower the risk of injury. They were asked to perform their task in their working posture. Using RULA assessment, scores were given according to their respective posture during work. Work-related musculoskeletal disorder questionnaire (WMSDs) . Using the scores obtained from RULA assessment and musculoskeletal disorder questionnaire a comparative statistical analysis, interpretation was obtained.

RESULT

The prevalence of neck and shoulder pain is slightly higher in photographers. The causes of the pain are repeated strain and awkward working postures, excessive positioning injuries and other musculoskeletal conditions. In this study the professional photographers (57%) showed more neck and shoulder pain than freelance photographer (35%).

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TABLE 1:

RULA score obtained from working posture

Sr. No	Type of photographer	Age group	Total no. of participants	RULA score >2	RULA score <=2
1	professional photographers	between 20-29	13	7	6
		between 30-39	15	10	5
		between 40-49	12	5	7
		between 50-59	5	4	1
TOTAL			45	26(57%)	18
2	Freelance photographers	between 20-29	16	4	12
		Between 30-39	12	4	8
		between 40-49	13	6	7
		between 50-59	4	2	2
TOTAL			45	16(35%)	29

TABLE 2: Prevalence of pain with respect to body region

Sr .No	Reported region	professional photographers	Freelance photographers
1.	Neck	65%	52%
2.	Shoulder	60%	34%
3.	Back	40%	35%

TABLE 3: Average % of RULA score with respect to age

Sr .No	Age	Average % of RULA score >2	Average% of RULA score<=2
1.	20-40	44.6%	55.3
2.	40and above	50%	50%

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DISCUSSION

This study conducted on the prevalence of neck, shoulder and back pain among photographers, specifically professional and freelance photographers.

The study was conducted using the Rapid Upper Limb Assessment (RULA) method to assess the working posture of the participants. The RULA score(>2) was greater(57%) in professional photographers than freelancers due to there working environment , where professional photographers need to I had to carry around professional equipment and edit in there lab for hours, also the results showed that photographers are at a higher risk of developing pain due to their work-related risk factors such as prolonged standing, inadequate or uncomfortable postures, and carrying heavy equipment. By using work-related musculoskeletal disorders questionnaire (WMSDsQ) it was found that the prevalence of neck and shoulder pain is slightly higher in photographers, and professional photographers showed more neck and shoulder pain than freelance photographers. The average percentage of unacceptable RULA score (>2) were shown by 40 above age group. The causes of the pain were attributed to repeated strain and awkward working postures, carrying around heavy objects, excessive positioning injuries, and other musculoskeletal conditions. Therefore, ergonomic interventions with the aim of improving physical factors in the working environment like designing suitable bags carrying heavy objects, improving posture while shooting, starting regular exercise and stretching (hamstrings, shoulders and arms) programs may help preventing of such complaints.

CONSULSION

The Study found that the Professional Photographers have higher risk of developing Musculoskeletal Symptoms than free Lancers.

LIMITATIONS

This is a small sample study. Only descriptive method was used and RULA score wasn't compared to their age matched to their age matched controls. High frequency of pain and high-risk levels, according to the RULA method, suggest inappropriate and incorrect ergonomic postural habits existing among photographers.

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Comparative study between the effects of Myofascial Release Technique (MFR) and Phonophoresis followed by Cervical Isometrics in pain and range of motion on patients with Trapezitis

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ABSTRACT

Background: The inflammation of the trapezius muscle, known as trapezitis, is brought on by overworking the muscle and injuring it, which causes regional fibers to unintentionally shorten. MFR works by loosening up tight muscles, boosting circulation and lymphatic drainage, and triggering the stretch reflex in the muscles and surrounding fascia. (1) Phonophoresis is a therapeutic ultrasound technique used to deliver pharmacologic substances, typically anti-inflammatory or analgesic medicines, via the skin into the subcutaneous tissues. (2)
Methodology: sixty individuals were chosen based on inclusion and exclusion criteria. They were split into two groups, each with thirty subjects, and given treatment using MFR and Phonophoresis followed by Cervical Isometrics. Treatment was given for six consecutive days. VAS, NDI, and ROM were assessed and compared. Outcome measure: Visual analogue scale (VAS), Cervical ROM, Neck Disability Index (NDI)
Result: Both groups saw considerable Pain reduction, ROM improvement, and improvement in Neck Disability; however, Group A experienced more significant differences in pain, disability index, and ROM than Group B.
Conclusion: In lowering pain and neck dysfunction while enhancing ROM in patients with Trapezitis,
Myofascial Release Technique is superior to Phonophoresis.
Keywords: Trapezitis, MFR, Phonophoresis, Dexamethasone, VAS, NDI, Cervical ROM

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INTRODUCTION

The term "trapezitis" refers to inflammation of the trapezius muscle. [3] The trapezius is a triangular, flat muscle that originates from all twelve thoracic vertebrae as well as the medial third of the superior nuchal line of the occipital bone, ligamentum nuchae, and the spinous process. Upper fibers are put into the lateral portion of the clavicle's posterior edge. Middle fibers are placed into the acromion's medial border and the crest of the scapula's top lip. A deltoid tubercle tendon that has recovered is what inserts the lower fibers. [4] The amount of the population that has neck pain is influenced by the workplace and the posture that people adopt during the day. People who spend a lot of time driving or working at desks and on computers are more likely to develop this illness because their upper trapezius muscles become uncomfortable and spasmodic. The person whose neck movement is precipitated or worsened may suffer a restriction in their range of motion, neck pain, and a sense of stiffness. Even when you are at rest, you might still feel pain, and exercise makes it worse. Agonist muscle groups' discomfort and protective spasms can cause passive range of motion to be uncomfortable and limited. [5] The stress that causes this illness frequently involves both muscle tension and contraction. The function of side bending, extension, and neck rotation is assisted by the trapezius muscle. The neck's range of motion may be reduced by muscle tightness. The cervical joints' mobility may be negatively impacted by the reduction in range of motion. [6] Pain from trapezitis can be effectively treated with Physical Therapy. There are numerous therapeutic techniques available, including Ultrasound, Laser, TENS, and IFT. Trapezitis treatment necessitates a diverse strategy. The taut bands are to be eliminated in the near future. Pain alleviation using tender points and trigger points. Long-term, the muscle must regain its flexibility. In order to lower the rate of recurrence. [6]

MYOFASCIAL RELEASE TECHNIQUE: The definition of the soft tissue mobilization technique known as myofascial release is "the facilitation of mechanical, neurological and psycho physiological adaptation potential as interfaced via the myofascial system". [7][8] The Myofascial Complex is used in MFR therapy, which aims to restore ideal length, reduce discomfort, and enhance function.[9] Myofascial release uses manual traction and sustained muscle and fascia stretching to break down adhesions, which reduces discomfort, increases flexibility, and expands range of motion (ROM).[10]

PHONOPHORESIS: Phonophoresis is a method that uses therapeutic ultrasound to deliver pharmacologic compounds through intact skin and into the subcutaneous tissues, typically anti-inflammatory or analgesic medicines. Theoretically, the treatment of common inflammatory disorders including bursitis, sprains, strains, and tendinitis with phonophoresis can offer a secure and painless alternative to injections. Numerous anti-inflammatory medications, such as hydrocortisone, dexamethasone, and salicylates, as well as aesthetics like lidocaine, have been investigated in vivo with phonophoresis, with varying degrees of success. [2] Epicondylitis, tendinitis, tenosynovitis, bursitis, and osteoarthritis have all been conditions that phonophoresis has been used to treat. Greater cell permeability and local vasodilation in conjunction with an acoustic pressure wave may lead to increased topical agent diffusion. [2]

Commonly used Drugs: • Dexamethasone-phosphate (DEX-P) • Sodium diclofenac • Acetic acid • Hydrocortisone • Salicylates • Lidocaine The medication that will be used is

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Dexamethasone Phosphate (DEX- P) Compared to other factors • Better outcomes • Fewer negative impacts are the reason. • Budget-friendly

CERVICAL ISOMETRIC EXCERCISES: Exercises for the neck that involve isometric contraction and relaxation massage all the toxins that contribute to inflammation. Additionally, due to the same, muscle fibers are strengthened. [11] If performed in this way, neck exercises will help to increase the neck muscles stability. [12][13] • Cervical flexion: Lean the neck slightly forward, place palm of both hands-on forehead and push the head towards the hands while resisting the movement with hands. • Cervical extension: Keep the neck straight, put palm of both hands behind the head, push the head backwards the hands while resisting the movement with hands. • Right Lateral Flexion: Keep the neck straight, put palm of right hand on right side of the head, push the head towards the hand to bring head down to the right shoulder while pushing the hand vice versa. • Left Lateral Flexion: Keep the neck straight, put palm of left hand on left side of the head, push the head towards the hand to bring head down to the left shoulder while pushing the hand vice versa.

OBJECTIVES OF THE STUDY:

1. To determine how MFR followed by Cervical Isometrics affect pain and ROM in patients with trapezitis.
2. To determine how Phonophoresis followed by Cervical Isometrics affect pain and ROM in patients with Trapezitis.
3. To evaluate the effects of MFR and Phonophoresis followed by Cervical Isometrics on pain and ROM in patients with Trapezitis

HYPOTHESIS:

NULL HYPOTHESIS: There is no significant difference between the effects of Myofascial Release Technique and Phonophoresis in patients with trapezitis.

ALTERNATE HYPOTHESIS: There is significant difference between the effects of Myofascial Release Technique and Phonophoresis in patients with Trapezitis.

REVIEW OF LITREATURE:

1. Divya Sanjay Raja P.T., Parag Kulkarni P.T., and Ajay Kumar P.T (2018) conducted Comparative study between the effects of Ultrasound and Phonophoresis in patients with Trapezitis and concluded that Ultrasound and Phonophoresis both are beneficial in reducing pain, whereas there is significant improvement in ROM using Phonophoresis than compared to Ultrasound.
2. Dr. Saad Kamil P. T, Princy Dhakan, Tanvi Joshi, Dr. Sarfraj Khan P.T (2020) conducted Comparative study between effects of Ultrasound and Myofascial Release Technique in patients with Trapezitis and concluded that MFR is more effective than US in reducing pain and ROM in patients with Trapezitis.
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METHODOLOGY:

Study setting: Shri U.S.B. College of Physiotherapy, Abu Road. Source of data: Various colleges in Mumbai and Abu Road.
Method of collection of data:
Study population: Patients with trapezitis Subjects size: 60 Sampling method: Randomized control trial
Study design: An experimental study
Materials to be used: • Electrotherapy modality Ultrasound • Ultrasonic gel • Cotton • Dexamethasone • Consent Form • Pillow • Chair • Goniometer • Questionnaire of NDI, VAS, Cervical ROM.

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Inclusion Criteria • Young adults of age 18-25 diagnosed with Trapezitis • Both Male and Females were included • Patient having neck pain • Pain of minimum 3/10 on VAS • Restriction in Cervical Lateral Rotation
•Jump Sign characterized by patient vocalization and withdrawal
Exclusion Criteria • Traumatic Neck Injury • Torticollis • Malignancy of upper trapezius • Cervical Radiculopathy • Fracture of Cervical Vertebrae • Neurological Deficit • Inflammatory Disease • Skin allergic condition • Scoliosis • Congenital Anomalies • Any degenerative condition of Cervical Spine.

Outcome Measures:

1. VAS: The VAS is made up of one continuous horizontal line that is typically 10 cm in printed length, together with two descriptive sentences at either end. The standard range for the scale is 0 (left, least extreme) to 10 (right, most extreme). [14]

2. Cervical ROM: The most popular and affordable tool used in clinical settings to record joint ROM during physical evaluation is the universal goniometer (UG). The UG is a protractor having two arms that may be rotated 180 degrees or 360 degrees. One arm is fixed while the other is moveable around the axis. [15] disability index (NDI), [16] while enabling clinicians and researchers to share knowledge. and examine the results of interventions, offering a standard measure to be utilized in clinical practices and research projects. [17]

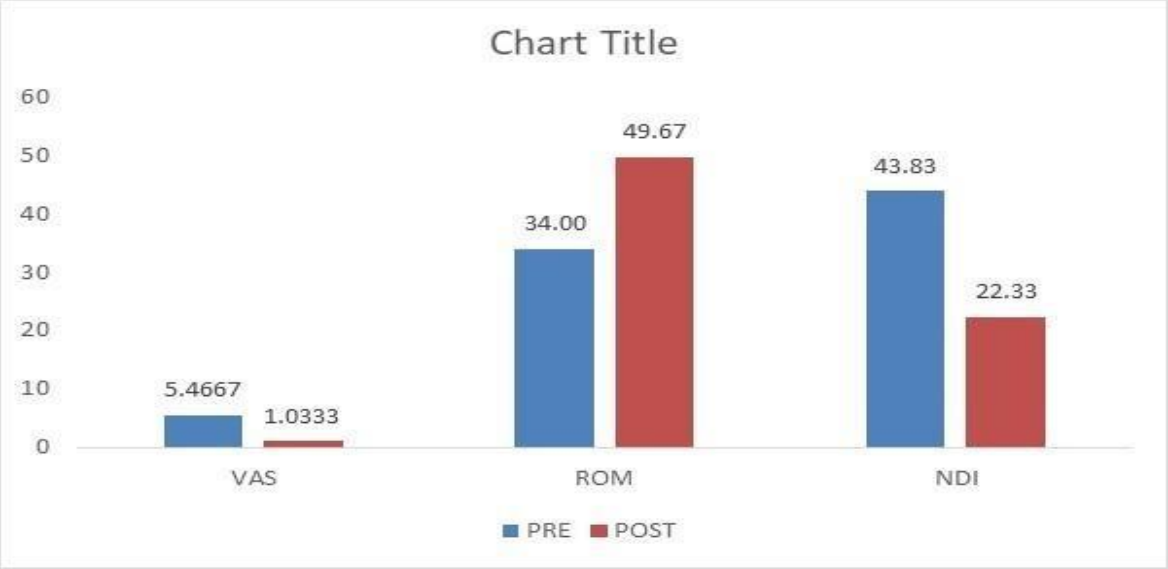
Procedure:

• Group A: This will include 30 patients of both sexes who will receive Myofascial Release Technique treatment. The patient should be su-upported in the back and sat comfortably, with the elbow extended and the forearm resting on a pillow. For 30 seconds, apply sustained deep pressure with the thumb to the upper trapezitis. Lowering the tension in the upper trapezius muscle will relieve pressure. MFR must be applied for 5 minutes before doing Cervical Isometrics Ex. Isometrics for cervical flexion, extension, and side flexion on the right and left.

• Group B These 30 patients, who will be of both sexes, will receive treatment using ultrasound, Dexamethasone Phosphate Ions combined with Ultrasonic Gel-Phonophoresis Technique. 1.5 w/cm3 for intensity Phonophoresis must be applied for 6 minutes before doing Cervical Isometrics Ex. Isometrics for cervical flexion, extension, and side flexion on the right and left.

RESULT:

SPSS Statistics version 20.0 for Windows was used to conduct all the statistical analysis. Graphs and tables were produced using Microsoft Excel.



Graph 1.1 - Comparison of Pre and Post readings of Group A

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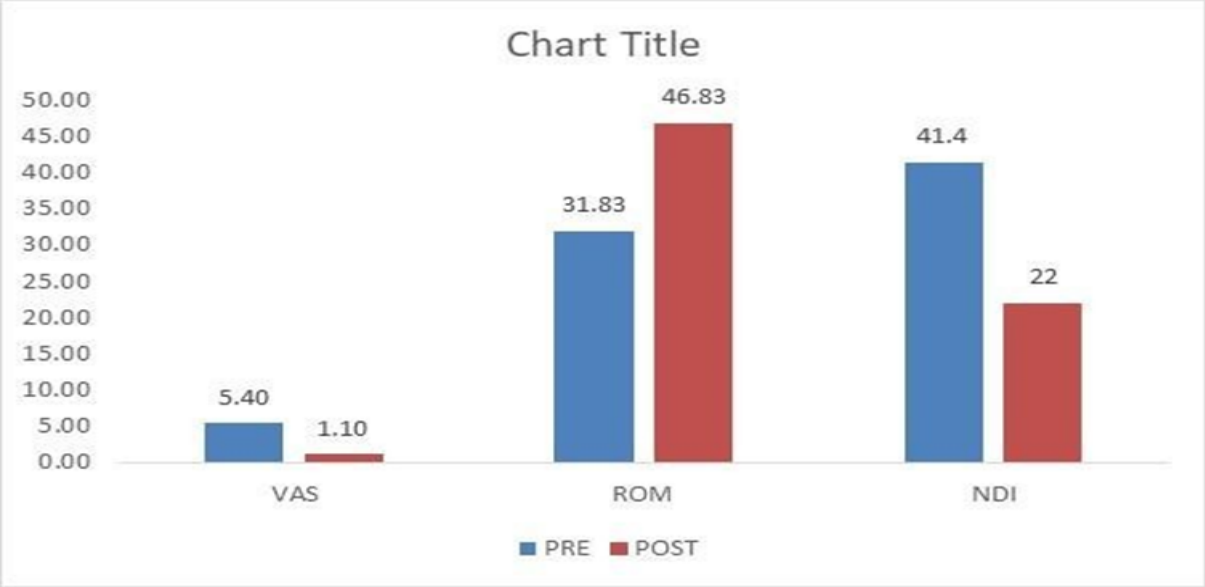
1.1 Comparison of Pre and Post readings of Group A PRE-TREATMENT POST TREATMENT t-Value p-Value MEAN SD MEAN SD VAS 5.4667 1.5024 1.0333 1.2726 3.48397 p<0.05 ROM 34.00 6.997 49.666 6.288 2.4914 p<0.05 NDI 43.83 8.078 22.33 7.581 2.836037 p<0.05

	PRE-TREATMENT		**POST TREATMENT**		**t-Value**	**p-Value**
	MEAN	**SD**	**MEAN**	**SD**		
VAS	5.4667	1.5024	1.0333	1.2726	3.48397	p<0.05
ROM	34.00	6.997	49.666	6.288	2.4914	p<0.05
NDI	43.83	8.078	22.33	7.581	2.836037	p<0.05

Table 1.1 - Comparison of Pre and Post readings of Group A

INTERPRETATION: - According to the data, there was a significant difference (p ‹ 0.05) between the Pre and Post VAS and NDI readings and there was a substantial improvement in cervical lateral flexion ROM



Graph 1.2 - Comparison of Pre and Post readings of Group B Table

1.2 Comparison of Pre and Post readings of Group B PRE-TREATMENT POST TREATMENT t-Value p-Value MEAN SD MEAN SD VAS 5.4 1.404 1.1 0.959 4.483837 p<0.05 ROM 31.83 4.822 46.833 7.249 2.06971 p<0.05 NDI 41.4 6.223 22 6.512 2.979115 p<0.05.

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	PRE-TREATMENT		POST TREATMENT		t-Value	p-Value
	MEAN	SD	MEAN	SD		
VAS	5.4	1.404	1.1	0.959	4.483837	p<0.05
ROM	31.83	4.822	46.833	7.249	2.06971	p<0.05
NDI	41.4	6.223	22	6.512	2.979115	p<0.05

Table 1.2 - Comparison of Pre and Post readings of Group B

INTERPRETATION: According to the data, there was a significant difference (p ‹ 0.05) between the Pre and Post VAS and NDI readings and there was a substantial improvement in cervical lateral flexion ROM.

Graph 1.3 Comparison of mean of difference between Group A and Group B

	MFR		PHONO	
	Mean Of Difference	SD of Difference	Mean Of Difference	SD of Difference
VAS	4.4334	0.2298	4.3	0.445
ROM	15.67	0.709	15.00	2.427
NDI	21.5	0.497	19.4	0.289

Table 1.3 Comparison of mean of difference between Group A and Group B

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INTERPRETATION: According to the data, there was a substantial difference in VAS, NDI,and Cervical ROM between Group A and Group B. In VAS, NDI, and ROM, Myofascial Release Approach ismore effective

DISCUSSION: The aim of the study was to contrast the effects of Phonophoresis and Myofascial Release Technique on pain and range of motion in patients with Trapezitis. Different electrotherapy and manipulation procedures work to lessen discomfort and muscular spasm while boosting muscle strength and regaining mobility. The effectiveness of these therapeutic approaches has not, however, been supported by many investigations. Therefore, the purpose of this study is to look into the effects of Phonophoresis and Myofascial Release on Trapezitis.

Sixty subjects who met the inclusion and exclusion requirements were divided into two groups of 30 each, by random assignment. MFR was administered to Group A (n=30) patients, whose ages ranged from 18 to 25. Phonophoresis was used to treat Group B (n=30) patients, who ranged in age from 18 to 25. Both groups had their severity assessed using the VAS scale, NDI, and goniometer before the treatment began and at the end of the programmed. The therapy was continued for six days in a row.

Comparison of Pre and Post Treatment values were statistically done using Paired 't' test. The t value of pre and posttest analysis of VAS in Group A is t=3.4839 and in Group B is t=4.4838 with the 'p' value is $p<0.05$, pre and posttest of analysis of ROM in Group A is t=2.4914 and in Group B is t=2.06971 with the 'p' value is $p<0.05$, pre and posttest of analysis of NDI in Group A is t=2.8360 and in Group B is t=2.9791 with the 'p' value is $p<0.05$.

Further comparison between Group A and Group B were done using the means of difference of both groups. The average improvement in VAS score in Group A is 4.4334 and Group B is 4.3. The average improvement in ROM in Group A is 15.67 and Group B is 15.00. The average

improvement in NDI in Group A is 21.5 and Group B is 19.4.

The findings of the current study showed that both groups significantly improved, but when additional comparisons were made using the mean of difference, group A (who had MFR treatment) displayed higher results range of VAS, NDI, and ROM improvement in individuals with Trapezitis.

Therefore, statistical evidence shows that MFR is superior to Phonophoresis in the treatment of Trapezitis.

CLINICAL IMPLICATION:

Results indicate that MFR is more beneficial than Phonophoresis for patients with Trapezitis when compared to both techniques, i.e., MFR and Phonophoresis. MFR may therefore be more advantageous for this group of participants.

LIMITATIONS:

The researchers employed a tiny sample size for their investigation. A larger sample size may have contributed to some variation in the outcome. After the procedure, no follow-up was made. The study was only conducted for 6 days. Because the subjects were not matched for age, sex, height, weight, or body mass index, the outcome could have been impacted.

RECOMMENDATIONS FOR FURTHER STUDIES:

Large sample sizes enable the conducting of additional research. Duration of the study can be more than 6 days. Further studies can be done including other Physiotherapy treatment modalities and exercises.

CONCLUSION:

In this randomized trial investigation, the effects of MFR and Phonophoresis on patients with Trapezitis were compared. Consequently, we determined that MFR is more efficient than the Phonophoresis easing discomfort and enhanced cervical range of motion in Trapezitis patients.

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Prevalence of Postural Deviations among Industry Workers: A Pilot Study

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Table of content

ABSTRACT

Background – Musculoskeletal disorders (MSDs) are one of the major concerns among industry workers which have a great influence on their work productivity. The aim of this study is to find out the prevalence of postural deviations among industry workers.

Method- Industry workers were selected based on inclusion and exclusion criteria. After taking consent, images of the workers were clicked using phone camera (Google Pixel 6a-12.2 megapixels) from all four different views and the GaitON software was used to analyze any deviations from normal posture. Accordingly, the study was conducted to determine the prevalence of postural deviations in workers.

Result-Descriptive statistics, including frequency and percentage, were calculated for the analysis. The data revealed that 99.57% had a transverse anterior superior iliac spine (ASIS) angle, 99.57% had a Horizontal acromion angle, 82.7% had a Forward head angle (FHA), 58.22% had shoulder angle and 29.11% had a Rearfoot angle.

Discussion- Industrial workers are exposed to a range of physical and ergonomic hazards on the job. Adopting awkward positions can contribute to the development of MSDs. Therefore, the study seeks to evaluate postural deviations among industry workers.

Conclusion- The current research indicates that poor posture among industrial workers can have adverse effect on their health, potentially causing musculoskeletal issues later on. Moreover, early retirement, disability, and absenteeism are all its occupational hazard.

Keywords – Ergonomics, Forward head angle (FHA), GaitON, Musculoskeletal disorder (MSD),Postural deviation

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INTRODUCTION

Work is an integral part of every individual's daily life, and has a certain price. Health and work are interlinked with each other.[1] The human body is incredibly adaptable and capable of functioning in a variety of environments and circumstances.[2] Prolonged use of computers for professional purposes often involves frequent and extended periods at the workplace that are not always ergonomically designed. Moreover, among IT professionals, sedentary activity due to long static periods at the computer affects all body systems.[3] Office workers often sit at least six hours a day at work. Prolonged sedentary work is associated with adverse health consequences, including musculoskeletal disorders, cardiovascular disorders, and type II diabetes. Sedentary lifestyle is well known to have impact on low circulatory demands and muscle activation.[4]

An ideal posture is considered when the external auditory canal is aligned with the vertical posture line. The vertical posture line, when viewed from the side, passes slightly in front of the ankle joint and the Centre of the knee joint, slightly behind the Centre of the hip joint, and passes through the shoulder joint and the external auditory meatus.[5] The preservation of a particular postural pattern is necessary for every daily task. Any deviation from the normal posture has an adverse effect on the nearby joints and muscles, leading to musculoskeletal illnesses.[6]

Work-related musculoskeletal disorders (MSDs) are often associated with ergonomic risk factors such as contact stress and postural discomfort (alteration of normal working posture). MSD affects the neck, shoulders and lower back (LB) and has a significant impact on a person's health and work performance.[7] Musculo-skeletal disease is a multifactorial phenomenon, in which psycho- social causes can play a significant role.[8]Work-related MSD accounts for 70– 80% in industrialized countries, demonstrating the need for therapeutic interventions.[7]

Data suggest that neck and lower extremity pain may be associated with sitting for long periods of time at work, and upper extremity problems may be associated with computer use. Prolonged sitting can also be a factor in exacerbating back pain when combined with uncomfortable positions (e.g., sitting forward and not upright) or whole-body vibrations. In particular, office workers spend many hours sitting, on average 75% of their working time is sitting and most of this sitting time accumulates over extended, uninterrupted periods of 30 minutes or more.

The most common musculoskeletal problems in office workers are neck, shoulder and lower back pain. The direction of causality (i.e., whether pain affects movement, vice versa, or both) remains unclear.[9]

Disorders of the musculoskeletal system occupy an important place in the disease statistics of all industrialized countries.

Although there are many diversification based on occupation, regional, social insurance organization, work culture etc., more than one-fifth of all lost working days are due to musculoskeletal and connective tissue diseases.8 Therefore, the aim of this study was to find out the prevalence of different posture deviations such as forward head posture, rounded shoulder posture, pelvic tilt and foot over-pronation using GaitON software (a motion analysis system used to analyze posture, biomechanics, gait etc) and help detect

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future risks associated with these conditions among workers in the industry.
GaitON by uptime technologies analyses the standing posture of the patient. Its posture analysis protocol identifies key postural deviations from multiple views and export all data to report. It helps in comparing deviations with the help of plumb line.

MATERIALS AND METHOD

The study was conducted from July to September 2023.Signed consent was obtained from all the participants before the study. Purposive sampling was utilized to select participants from various industries of Raipur, Chhattisgarh. The sample size of the study was 237. The inclusion criteria were population aged between 20 to 60 years. The subject with previous injury history, congenital anomalies, or symptomatic cervical spine deformities, cervical spine pathology, cervical surgery, cervical spine fracture, and psychological issue were the exclusion for the study.

Experimental procedure

The selection of population was based on the inclusion and exclusion criteria. After obtaining consent, images of the workers were captured from 4 different views i.e., Anterior, posterior, right lateral view and left lateral view. The postural parameters were calculated using GaitON software.

Flowchart of the procedure-

↓

Industry workers were screened on the basis of inclusion and exclusion criteria

↓

Workers were informed about the study and signed consent was taken

↓

Body Markers were attached to various body prominences

↓

Photogrammetry method was used in which 4 different pictures were taken from 4 different views (anterior, posterior and lateral right and left) using phone camera (google pixel 6a- 12.2 megapixels)

↓

GaitON Software was used to calculate the different postural angles and the result was obtained

Postural parameters-

Forward head angle (FHA)-forward head posture
Shoulder angle- Rounded Shoulder posture
Rearfoot angle- Flat-foot
Horizontal alignment of ASIS- Pelvic Tilt/Asymmetry
Horizontal angle of acromion- Shoulder levels at horizontal view

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Figure 1 & 2: Anterior and posterior view for angle deviations

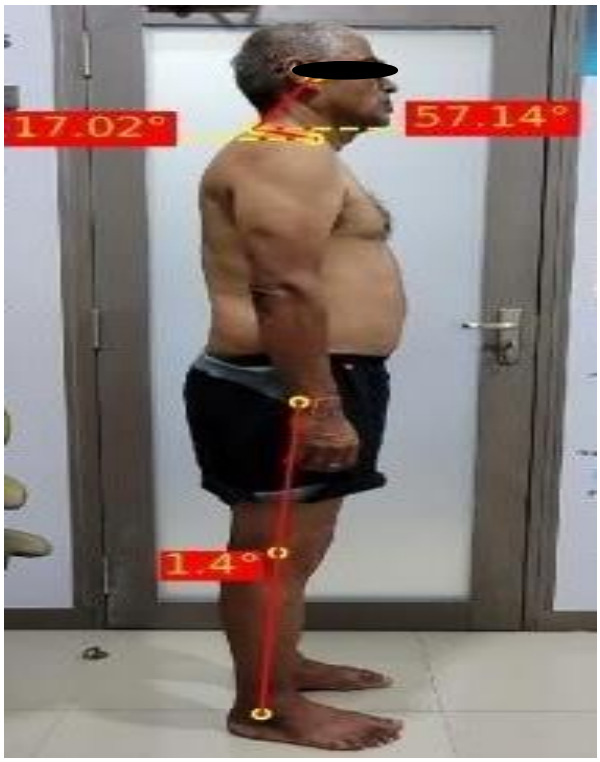

Figure 3 & 4: Left lateral view and Right lateral view

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motion analysis system designed for clinicians, equipped with inbuilt modules for posture, walking gait, running gait & sports biomechanical analysis. It uses cameras to capture the patient's motion and generates a comprehensive report highlighting abnormal biomechanics.[10]

STATISTICAL METHOD AND RESULT

The data was statistically analyzed using IBM SPSS STATISTICS VERSION Statistical tests used in the present study was Descriptive statistics in which frequency and percentage was calculated.

VARIABLE	**MEAN ± SD**
AGE	47.4±8.45
HEIGHT	168.14±7.78
WEIGHT	76.74±15.04
FHA	55.32±5.42
SHOULDER ANGLE	54.11±10.95
REARFOOT ANGLE	4.19±2.73
HORIZONTAL ALIGNMENT OF ASIS	-1.92±2.34
HORIZONTAL ANGLE OF ACROMION	0.29±2.34

The values are presented as mean ± standard deviation as data followed normal distribution

VARIABLE/PARAMETER	**FREQUENCY**	**PERCENTAGE**
FHA	196	82.70
SHOULDER ANGLE	138	58.22
REARFOOT ANGLE	69	29.11
HORIZONTAL ALIGNMENT OF ASIS	236	99.57
HORIZONTAL ANGLE OF ACROMION	236	99.57

Frequency and percentage distribution of postural deviation among workers

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DISCUSSION

Industrial workers face a range of physical and ergonomic hazards during their job life. Adopting awkward positions can contribute to the development of MSDs.[11] Therefore, the study seeks to evaluate postural deviations among industry workers by using GaitOn software. The findings of current study showed that 99.57% had anterior pelvic tilt, 99.57% had abnormal shoulder level at the horizontal view, 82.7% had Forward head posture, 58.22% had rounded shoulder posture and 29.11% had an over pronation at foot.

Pelvic Tilt/Asymmetry- In the current study it was found out that 99.57% of workers had poor alignment of ASIS in horizontal plane, indicating pelvic tilt or asymmetry. Research conducted by Lee Herrington in 2016 says that when there is asymmetry within the pelvic structures, it is believed to trigger a series of postural adjustments, making the person more susceptible to various neuromusculoskeletal problems. For instance, research indicates that existence of pelvic alignment asymmetry can serve as an indicator of SIJ dysfunction.[12] Furthermore a 2023 analysis conducted by Shu Hao Du and colleagues highlighted the significant connection between postural imbalances and low back pain. Abnormal postural behavior is frequently a potential risk factor for low back pain and lumbar injury, and spinal postural examination is a crucial component in the assessment of low back pain.[17]

Shoulder level at horizontal view-In the current study it was found out that 99.57% workers had abnormal alignment of their shoulder levels. The horizontal angle to the acromion typically refers to the angle between a reference line, often a vertical line, and a line drawn to the acromion process of the scapula.

A study conducted by Leticia B Janaurio et al in 2014 highlighted that when engaging in tasks like office work, the neck and shoulder region is especially subjected to low- level, monotonous workload for extended periods of time. This, combined with exposure to vibration, temperature, and lighting, this overload is linked to numerous additional risk factors, including a fast-paced work environment, clumsy or repetitive actions, maintaining awkward postures, or sitting still.[18] All of these factors collectively contribute to the abnormal alignment observed in the shoulder levels of the workers in this study.

Forward Head Posture – In the current study, it was revealed that 82.7% of workers exhibited FHP, a condition where the head is positioned too far forward in relation to a vertical reference line.[13] Research conducted by Sun et al. in 2014, it was observed that FHP tends to increase with age in healthy individuals, likely due to reduced range of motion.[14]Another study focused on IT professionals and ergonomics found that the degree of neck disability among this group is influenced by both the lack of a suitable work environment and insufficient physical activity. The research indicated a positive correlation between FHP, age, work experience, and poor workplace ergonomics.[3]

positioning, and a lack of attention to body posture while working. Addressing FHP early is crucial, as it can lead to various

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health issues such as neck pain, headaches, shoulder discomfort and even changes in spinal curvature over time.

Rounded Shoulder Posture- In the current study, it was identified that 58.22% had rounded shoulder posture, it can be described as a posture characterized by acromion protraction in front of the line of gravity, shoulder protraction, and downward rotation as well as anterior.[16] Research done by Young Lee et al in 2017 says that Changes in physical functions that occur due to rounded shoulders can cause one or more abnormal conditions in a complex structure consisting of the head, neck, and shoulders.

Flat-foot- In the current study 29.11% workers were having flat-foot. Flat foot or pes planus, is a condition where the arches of the feet collapse, causing the foot to excessively roll inward (pronation). This leads to the internal rotation of the shin and thigh bones, as well as an anterior tilt of the pelvis. This abnormality disrupts the natural movement of the lower limbs, alters how the body responds to ground forces, affects muscle function, and impacts overall walking patterns.

Research done by Adel F Almutairi et al. in 2021 says that participants with flat feet had a prevalence of LBP of 65.9%, while those with regular feet had a prevalence of 32.8%. The study found that those with flat feet who did not engage in physical exercise had a higher prevalence of chronic low back pain than those who did. There are other factors that also contributes in this like adhering to a balanced diet and engaging in regular exercise results in thinner feet, higher/stiffer arches, and stronger ankle muscles.[19]

The development of a person's posture is shaped by a multitude of factors, encompassing diet, physical fitness, ability to prevent defects and diseases, and various environmental and developmental factors. In this study, uncontrollable variables such as daily activities, rest, nutrition, personal habits, and methods of sitting and standing could have impacted the results differently. This highlights a limitation of the research, emphasizing the need for future studies to consider and control for these variables to draw more definite conclusions.

CONCLUSION

The existing research indicates that inadequate posture among industrial workers can significantly jeopardize their health, potentially resulting in musculoskeletal disorders in the future. Additionally, this poor posture can diminish efficiency and productivity in the workplace**.** [20]

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Nil.

Conflicts of interest

None.

Further Study

1) Sample can be taken from other parts of the India which can represent the diversity of morphology.
2) Relationship of the altered posture and the hours of working can be considered to find out risk for MSDs.
3) Data can be used to lower the population's future risk for MSDs.

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