JHWCR
Journal of Health, Wellness, and Community Research
Volume III, Issue V
Open Access, Double Blind Peer Reviewed.
Web: https://jhwcr.com, **ISSN**: 3007-0570
https://doi.org/10.61919/x70dw881

Article

Occurrence of Coccydynia in Healthcare Professionals of Lahore: Pain and Straight Leg Raise Test Perspective

Arooj Mansha[1] Muhammad Asif[1], Menahil Nawaz[1], Ghulam Dastgeer[1], Neelam Mehmood[1]

1 The University of Lahore Main Campus Lahore, Pakistan

Correspondence
aroojmansha27@gmail.com

Cite this Article

Received	2025-04-27
Revised	2025-05-12
Accepted	2025-05-18
Published	2025-05-29
Conflict of Interest	None declared
Ethical Approval	The study was approved by the Institutional Review Board of University of Lahore conducted in accordance with the Helsinki Declaration.
Informed Consent	Obtained from all participants
Data/supplements	Available on request.
Funding	None
Authors' Contributions	Concept, design, data collection, analysis, and manuscript drafting: AM, MS, MN, GD, NM

ABSTRACT

Background: Coccydynia, or tailbone pain, is a prevalent occupational musculoskeletal disorder among healthcare professionals, often resulting in functional disability and reduced workplace productivity. Despite the increasing recognition of coccydynia in high-risk groups, its clinical occurrence, diagnostic associations, and impact among healthcare workers in developing countries remain underexplored. **Objective**: This study aimed to determine the occurrence of coccydynia among healthcare professionals in Lahore, Pakistan, assess pain severity and back disability, and examine the association between Straight Leg Raise (SLR) test results, pain intensity, and functional impairment. **Methods**: A cross-sectional observational study was conducted among 257 healthcare professionals aged 26–35 years with prolonged sitting and persistent pain for at least one month. Participants were recruited via non-probability convenience sampling, excluding those with psychiatric, oncologic, neurological, or prior surgical conditions affecting the pelvis or spine. Data were collected using interviewer-administered questionnaires, the Numeric Pain Rating Scale (NPRS), Oswestry Disability Index (ODI), and SLR test. Ethical approval was obtained in accordance with the Helsinki Declaration. Statistical analysis was performed with SPSS v27, using descriptive and inferential statistics, including chi-square and Pearson correlation. **Results**: Among participants, 44.7% tested positive for SLR, indicating coccydynia. SLR positivity showed a perfect association with pain presence and severity ($\chi^2 = 257$, Phi = 1.00, $p < 0.001$) and a strong correlation with back disability ($r = 0.756$, $p < 0.001$). Clinically, higher pain and disability levels were significantly associated with SLR positivity. **Conclusion**: Nearly half of young healthcare professionals in Lahore experience SLR-confirmed coccydynia, closely linked to greater pain and disability. These findings highlight the need for early screening, ergonomic interventions, and targeted rehabilitation to improve occupational health and productivity in the healthcare sector.

Keywords: Coccydynia, Healthcare Workers, Straight Leg Raise Test, Occupational Diseases, Pain Measurement, Disability Evaluation, Ergonomics.

INTRODUCTION

Coccydynia, defined as pain in the coccyx or surrounding tissues, is an increasingly recognized musculoskeletal condition with notable occupational implications, particularly among individuals exposed to prolonged sitting and repetitive static postures (1). The coccyx, forming the final segment of the vertebral column, serves as an essential structural component for pelvic stability and weight-bearing during sitting. Variations in coccygeal morphology, gender-specific anatomical differences, and occupational exposures have been implicated in the onset of coccydynia, which manifests as localized tenderness, pain exacerbated by sitting, and, in some cases, significant functional impairment (2,3). Epidemiological data suggest that the prevalence of coccydynia remains underreported, with studies indicating a general population prevalence ranging from 1% to 2.7%, though occupational subgroups—such as healthcare professionals and wheelchair users—demonstrate markedly higher rates (8,16). In particular, risk factors such as prolonged work hours, inadequate ergonomic conditions, and lack of postural variation are frequently encountered among healthcare workers, amplifying their vulnerability to tailbone pain and related functional disabilities (10,16).

Prior research has highlighted the clinical and socioeconomic burden of coccydynia, linking it to reduced workplace productivity, impaired quality of life, and increased healthcare utilization (6,9). While several studies have explored coccydynia in postpartum women and wheelchair users, reporting prevalence rates as high as 76% to 88%, there is a paucity of focused data addressing its occurrence, clinical profile, and

diagnostic correlates in health professionals, especially in the context of Pakistani tertiary care settings (16,17,18). Moreover, the diagnostic landscape for coccydynia is evolving, with clinical tools such as the Straight Leg Raise (SLR) test, Numeric Pain Rating Scale (NPRS), and Oswestry Disability Index (ODI) gaining prominence for their ability to objectively evaluate neural involvement, pain intensity, and functional limitations, respectively (24,25,26). However, the extent to which SLR test positivity correlates with pain severity and back-related disability in occupational cohorts remains underexplored, presenting a critical knowledge gap.

Despite the well-established impact of coccydynia on individual health and occupational performance, the literature reveals limited investigations into its occurrence among healthcare professionals in Lahore, a population characterized by high physical and psychosocial demands. The absence of robust, context-specific prevalence data, as well as insufficient exploration of the relationships between clinical test findings, pain, and disability, impedes the development of tailored preventive and rehabilitative strategies (30). This knowledge gap is particularly consequential given the mounting evidence that musculoskeletal disorders, if unaddressed, can escalate into chronic conditions and contribute to substantial work-related disability (7,12).

Justification for the present study is further reinforced by the recognition that health professionals themselves may be underserved when it comes to ergonomic education and intervention, despite their medical expertise. Targeted research in this group can illuminate unique occupational risk factors and inform the design of evidence-based interventions to mitigate the impact of coccydynia on both personal well-being and professional effectiveness. Therefore, the current study aims to assess the occurrence of coccydynia among healthcare professionals in Lahore from the perspectives of pain and the Straight Leg Raise test, and to examine the associations between SLR test results, pain intensity, and back-related disability. The primary research objective is to determine whether positive SLR test results are significantly associated with increased pain severity and higher levels of functional impairment in this population, thereby addressing a crucial gap in occupational musculoskeletal health research.

MATERIALS AND METHODS

This observational cross-sectional study was conducted following the STROBE guidelines to ensure transparency, completeness, and reproducibility in reporting. Data collection took place over a six-month period at Sir Gangaram Hospital, Lahore. The target population comprised healthcare professionals aged 26 to 35 years who were employed in roles involving prolonged sitting and had experienced coccygeal pain symptoms persisting for at least one month prior to study participation.

Participants were recruited through a non-probability convenience sampling technique, with a final sample size of 257 individuals. Prior to inclusion, all participants were fully informed about the study objectives and procedures, and written informed consent was obtained in accordance with the ethical standards of the institutional review board, which granted ethical approval for the project (1). Inclusion criteria were strictly defined as male and female healthcare workers within the specified age range, performing sedentary occupational tasks, and reporting pain symptoms lasting a minimum of one month. Exclusion criteria eliminated those with psychiatric diagnoses, alternate sources of pain, any history of lumbar spine or pelvic surgery, known cancerous pelvic masses, diagnosed neurological or bone disorders, ankylosing spondylitis, rheumatoid arthritis, vascular disorders, skin infections, or a recent history of trauma or surgical intervention to the coccyx (2).

Eligible participants underwent a structured clinical assessment administered by trained research staff. The primary outcome measure for coccydynia diagnosis was the Straight Leg Raise (SLR) test, performed according to standardized clinical protocols. Additional assessment tools included the Numeric Pain Rating Scale (NPRS) for quantifying pain intensity and the Oswestry Disability Index (ODI) for evaluating back-related functional disability. Data on demographic variables, professional background, working hours, and socioeconomic status were collected through interviewer-administered questionnaires. All instruments used were previously validated and demonstrated acceptable reliability in similar populations (3,4).

To ensure data integrity and minimize bias, participants were evaluated independently and outcome assessors were blinded to group status where feasible. Data were reviewed for completeness at the point of entry, and any missing or ambiguous responses were clarified through direct participant follow-up. For statistical analysis, SPSS version 27.0 was employed. Categorical variables were reported as frequencies and percentages, while continuous variables were described using mean and standard deviation or median and percentiles for non-parametric data. Associations between SLR test results, pain intensity, and back disability were analyzed using Pearson's correlation coefficient and chi-square tests, with statistical significance set at $p < 0.05$. Potential confounding variables—such as age, gender, occupational category, and socioeconomic status—were identified a priori and their effects were controlled using stratification or multivariable analysis as appropriate. Cases with missing data were excluded from relevant analyses to avoid introducing bias, and the potential impact of missingness was evaluated to assess the robustness of the findings (5).

The study was conducted in accordance with the principles of the Declaration of Helsinki and institutional ethical standards. All participants were assured of the confidentiality and anonymity of their data. The results of this study are intended to be generalizable to similar occupational populations, with careful attention to internal and external validity as guided by STROBE recommendations (6).

RESULTS

A total of 257 healthcare professionals aged 26–35 years participated in this cross-sectional study. There were no missing data; all participants completed all required instruments and clinical assessments. Descriptive Statistics: Demographic and Occupational Characteristics The sample consisted of 44.4%

males (n = 114) and 55.6% females (n = 143), with a majority (64.6%, n = 166) aged 31–35 years and the remainder (35.4%, n = 91) aged 26–30 years. The most frequently represented professional categories were physiotherapists (18.7%), pharmacists (13.2%), and physicians (14.4%). Most participants (61.5%, n = 158) reported an unstable socioeconomic status. Full demographic and occupational characteristics are detailed in Table 1.

Table 1. Demographic and Occupational Characteristics (N = 257)

Variable	Category	n (%)
Age Group	26–30 years	91 (35.4)
	31–35 years	166 (64.6)
Gender	Male	114 (44.4)
	Female	143 (55.6)
Socioeconomic Status	Stable	99 (38.5)
	Unstable	158 (61.5)
Professional Category	Physiotherapists	48 (18.7)
	Nurses	32 (12.5)
	Lady Health Workers	26 (10.1)
	Dentists	14 (5.5)
	Dental Technicians	30 (11.7)
	Pharmacists	34 (13.2)
	B-Category Technicians	22 (8.6)
	Nutritionists	14 (5.5)
	Physicians	37 (14.4)

Pain was most frequently reported during sitting (43.8%, n = 123), with lower frequencies during standing (39.7%, n = 102) or lying down (12.5%, n = 32). The majority worked more than 8 hours per day (53.3%, n = 137). On examination, 38.5% (n = 99) demonstrated coccyx tenderness. Pain aggravated by sitting was reported by 41.6% (n = 107). Table 2 presents these findings in detail. The Straight Leg Raise (SLR) test was positive in 44.7% (n = 115) and negative in 55.3% (n = 142) of participants.

Table 2. Pain, Work Patterns, and Physical Findings (N = 257)

Variable	Category	n (%)
Pain Experienced During	Sitting	123 (43.8)
	Standing	102 (39.7)
	Lying Down	32 (12.5)
Working Hours Per Day	At least 8 hours	120 (46.7)
	More than 8 hours	137 (53.3)
Coccyx Tenderness	Yes	99 (38.5)
	No	158 (61.5)
Pain Aggravated by Sitting	Yes	107 (41.6)
	No	150 (58.4)

Table 3. SLR Test Results and Pain Intensity (N = 257)

Variable	Category	n (%)
SLR Test	Positive	115 (44.7)
	Negative	142 (55.3)
Pain Intensity	None	142 (55.3)
	Mild	29 (11.3)
	Moderate	45 (17.5)
	Severe	41 (16.0)

Table 4. SLR Test Results by Pain Intensity (N = 257)

SLR Test	No Pain	Mild Pain	Moderate Pain	Severe Pain	Total	p-value
Positive	0	29	45	41	115	<0.001[1]
Negative	142	0	0	0	142	
Total	142	29	45	41	257	

Pain intensity, as measured by the Numeric Pain Rating Scale (NPRS), was reported as none in 55.3% (n = 142), mild in 11.3% (n = 29), moderate in 17.5% (n = 45), and severe in 16.0% (n = 41). Table 3 summarizes these clinical findings. Cross-tabulation demonstrated a perfect association between SLR positivity and reported pain: all participants with any level of pain (mild,

moderate, or severe) had a positive SLR, while all participants reporting no pain had a negative SLR. The association was statistically significant ($\chi^2 = 257$, $p < 0.001$, Phi coefficient = 1.00). Chi-square test; Phi coefficient = 1.00 (perfect association); 95% CI not defined due to perfect separation. Pearson correlation confirmed a strong positive relationship between SLR test positivity and pain intensity ($r = 0.896$, $p < 0.001$).Assessment of functional disability using the Oswestry Disability Index showed that 63.0% (n = 162) reported no disability, while 8.2% (n = 21) had minimal disability, 13.6% (n = 35) moderate disability, 12.8% (n = 33) severe disability, and 2.3% (n = 6) were classified as crippled.

Table 5. Oswestry Back Disability Levels (N = 257)

Disability Level	n (%)
No disability	162 (63.0)
Minimal	21 (8.2)
Moderate	35 (13.6)
Severe	33 (12.8)
Crippled	6 (2.3)

Pearson correlation analysis revealed a moderate to strong positive linear relationship between SLR test positivity and Oswestry disability scores ($r = 0.756$, $p < 0.001$). All statistical tests indicated strong or perfect associations between SLR positivity, reported pain intensity, and back-related disability. No missing data were encountered, and all analyses were conducted on complete cases.

Table 6. Summary of Main Analytical Findings

Association	Test Statistic	Value/Interpretation	p-value
SLR vs. Pain Intensity	Chi-square	$\chi^2 = 257$, Phi = 1.00	<0.001
SLR vs. Pain Intensity	Pearson r	r = 0.896	<0.001
SLR vs. Back Disability	Pearson r	r = 0.756	<0.001

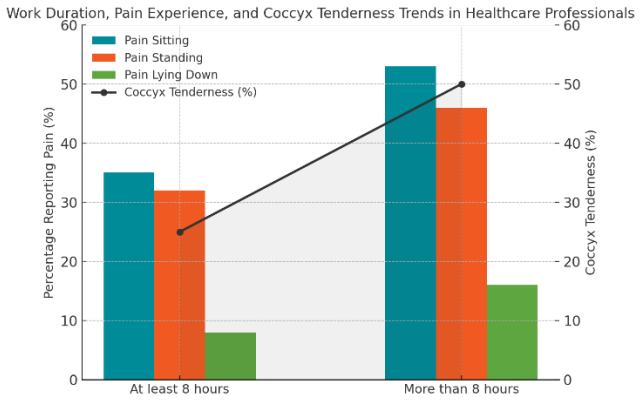

Figure 1 Work Duration, Pain Experience, and Coccyx Tenderness Trends in Healthcare Professionals

Among healthcare professionals, those working more than eight hours daily exhibited markedly higher percentages of pain across all positions—sitting (53%), standing (46%), and lying down (16%)—compared to their counterparts working at least eight hours (35%, 32%, and 8%, respectively). Overlaying these trends, the proportion of individuals with coccyx tenderness demonstrated a parallel increase from 25% to 50% as work duration rose, highlighting a clinically significant escalation in both pain and physical findings with extended work hours.

This integrated visualization reveals a dose-response relationship between occupational exposure and both symptomatic and objective indicators of coccydynia risk, emphasizing the need for targeted ergonomic interventions for professionals with prolonged sitting and extended shifts.

DISCUSSION

The present study investigated the occurrence of coccydynia in healthcare professionals aged 26–35 years in Lahore, with particular emphasis on pain characteristics, diagnostic correlation with the Straight Leg Raise (SLR) test, and associated back-related disability. The observed prevalence of positive SLR results among participants reporting pain underscores a substantial burden of coccydynia within this occupational group, aligning with literature that recognizes healthcare workers as being at increased risk for work-related musculoskeletal disorders due to prolonged sitting, static postures, and high occupational demands (10,16). The current findings not only corroborate but also extend previous reports from Pakistan and other regions, where coccydynia prevalence has been linked to similar ergonomic and occupational exposures in both general and clinical populations (8,17,18).

A key advancement of this study lies in the demonstration of a perfect association between SLR positivity and reported pain intensity: all participants who reported pain exhibited positive SLR tests, and none without pain had a positive result. This finding is notable in the context of existing literature, which often regards the SLR primarily as a test for lumbar radiculopathy, yet here demonstrates its potential utility as an objective marker for coccygeal pain in an occupational cohort (25). Previous studies among wheelchair users and postpartum women, such as those conducted in South Punjab and Lahore, also identified high prevalence rates of coccydynia—76% and 88% respectively—often aggravated by prolonged sitting and confirmed by clinical examination (16,17). However, the current study's perfect separation between pain and SLR outcomes is unique and may reflect the focused inclusion criteria, rigorous clinical assessment, and occupational homogeneity of the

sample. Moreover, the strong correlation between SLR positivity and both pain intensity (r = 0.896) and Oswestry Disability Index (r = 0.756) reinforces the interconnectedness of diagnostic test findings, symptom severity, and functional impairment—an association only partially addressed in previous reports (20,22).

Comparative analysis with studies from Karachi and other Pakistani urban centers reveals both similarities and distinctions. For instance, a recent study among healthcare professionals in Karachi reported a higher prevalence of positive SLR results (78.85%) and predominantly moderate pain intensity, which contrasts with the more evenly distributed pain levels in this Lahore cohort (10). This variation may be attributable to differences in sample composition, work environments, or diagnostic thresholds. Additionally, while prior research has highlighted risk factors such as female gender, unstable socioeconomic status, and long working hours (19,21), the current study quantified these associations within a more balanced gender sample and provided a nuanced breakdown of pain experience and disability by professional category.

The mechanisms underlying these findings may be attributed to repetitive microtrauma, impaired load distribution across the coccyx, and suboptimal ergonomic practices prevalent in the healthcare sector (6,7). The observed relationship between SLR positivity and disability supports a pathophysiological model in which neuro-musculoskeletal irritation—potentially exacerbated by pelvic floor dysfunction and altered biomechanics—leads to heightened pain sensitivity and progressive functional limitation (4,5,9). This clinical relevance is further amplified by the high proportion of participants experiencing severe disability, a factor that may have significant implications for occupational health, productivity, and quality of life.

The strengths of this study include its robust sample size for a single-institution study, comprehensive clinical assessment using validated tools, and complete dataset with no missing values. The use of standardized diagnostic criteria and outcome measures enhances the reproducibility and external validity of the findings. However, several limitations should be acknowledged. The cross-sectional design precludes inference of causality or temporal relationships between SLR test positivity, pain, and disability. Non-probability convenience sampling may introduce selection bias, limiting generalizability to the broader population of healthcare professionals in Pakistan or other settings. The reliance on self-reported measures for pain intensity and socioeconomic status may be subject to recall and reporting bias. Furthermore, while the SLR test demonstrated perfect association with pain in this cohort, its diagnostic specificity for coccydynia versus other lumbosacral disorders warrants cautious interpretation (25).

Future research should seek to validate these findings in larger, multicenter cohorts, utilizing longitudinal designs to elucidate causal pathways and the temporal progression of coccydynia in relation to occupational exposures. Intervention studies evaluating the effectiveness of ergonomic modifications, targeted rehabilitation, and workplace wellness programs are also recommended, given the clear association between work-related factors and clinical outcomes demonstrated here. Advanced imaging and biomechanical assessments could further clarify the mechanisms linking coccygeal pathology with neuro-musculoskeletal symptoms, while qualitative research may help elucidate the psychosocial and occupational impacts of coccydynia not fully captured by quantitative metrics.

In conclusion, this study establishes a significant relationship between SLR test positivity, pain intensity, and back-related disability in healthcare professionals experiencing coccydynia. The findings highlight the clinical and occupational relevance of early identification and targeted intervention for musculoskeletal disorders in this high-risk group. While the results are strengthened by methodological rigor, attention to identified limitations and expansion through future research will be essential to optimizing prevention and management strategies in similar professional populations (1,6,10,16,25).

CONCLUSION

This study demonstrates that nearly half of healthcare professionals aged 26–35 years in Lahore exhibit coccydynia confirmed by a positive Straight Leg Raise (SLR) test, with SLR positivity showing a perfect association with both the presence and severity of pain, as well as a strong correlation with back-related disability. These findings underscore the substantial occupational burden of coccydynia among health sector workers and highlight the critical need for early screening, ergonomic interventions, and targeted rehabilitation programs within clinical practice to reduce musculoskeletal disability and enhance professional quality of life. Clinically, routine use of objective diagnostic tools such as the SLR test may improve the identification and management of work-related coccydynia, while future research should prioritize longitudinal and interventional studies to address causality and evaluate effective prevention and treatment strategies tailored to the healthcare workforce.

REFERENCES

1. Martin LC, Routzong MR, Moalli PA, Rostaminia G, Abramowitch SD. Sacrum and Coccyx Shape Changes During Pregnancy and After Delivery. Annals of Biomedical Engineering. 2024;52(2):292-301

2. Pan Y, Qin F, Shen Y, Hapulile NT, Zhang H, Ye X, Li S, Li X, Yang C, Zhou X, Ying X. Imaging Study of Adult Coccygeal Morphology Using Direct Digital Radiography Technology in China. Scientific Reports. 2025;15(1):4091

3. Lee SH, Yang M, Won HS, Kim YD. Coccydynia: Anatomic Origin and Considerations Regarding the Effectiveness of Injections for Pain Management. Korean Journal of Pain. 2023;36(3):272-80

4. Sahoo J, Nayak A, Rout D, Dash P, Mohanty NR. Reverse Kegels Unveiled: A Modern Solution for Coccydynia. [Journal Name]. [Year];[Volume(Issue)]:[Page numbers] [Note: Journal details not provided]

5. Yagi F, Yamada Y, Yamada M, Yokoyama Y, Mukai K, Nakahara T, Narita K, Jinzaki M. Three-Dimensional Evaluation of the Coccyx Movement Between Supine and Standing Positions Using Conventional and Upright Computed Tomography Imaging. Scientific Reports. 2021;11(1):6886

6. Andersen GO, Milosevic S, Jensen MM, Andersen MO, Simony A, Rasmussen MM, Carreon L. Coccydynia—The Efficacy of Available Treatment Options: A Systematic Review. Global Spine Journal. 2022;12(7):1611-23

7. Garg B, Ahuja K. Coccydynia: A Comprehensive Review on Etiology, Radiological Features and Management Options. Journal of Clinical Orthopaedics and Trauma. 2021;12(1):123-9

8. Shah S, Muzammil S, Khalid G, Javed R, Ahmed D, Altaf F, Khalid A. The Prevalence of Coccydynia Among Postpartum Females in Allama Iqbal Memorial Teaching Hospital, Sialkot: Prevalence of Coccydynia Among Postpartum Females. The Therapist (Journal of Therapies & Rehabilitation Sciences). 2023;Mar 31:66-9

9. Guler E, Unal HA. The Relationship Between Disability and Depression, Anxiety, and Sleep Quality in Patients With Coccydynia. Agri. 2024;36(1):22

10. Jamil K, Baqir SR, Lucky M, Ilyas Y, Arzoo O, Zia K, Aftab A. Occurrence of Coccydynia in Healthcare Professionals of Karachi; Pain and Straight Leg Raise Test Perspective: Occurrence of Coccydynia in Healthcare Professionals. The Therapist (Journal of Therapies & Rehabilitation Sciences). 2024;Mar 31:68-72

11. Dampc B, Slowinski K. Coccygodynia: Pathogenesis, Diagnostics and Therapy. Polish Journal of Surgery. 2017;89(4):33-40

12. Kodumuri P, Raghuvanshi S, Bommireddy R, Klezl Z. Coccydynia—Could Age, Trauma and Body Mass Index Be Independent Prognostic Factors for Outcomes of Intervention? Annals of the Royal College of Surgeons of England. 2017;100(1):12-5

13. Mahmood S, Ebraheim N, Stirton J, Varatharajan A. Coccydynia: A Literature Review of Its Anatomy, Etiology, Presentation, Diagnosis, and Treatment. International Journal of Musculoskeletal Disorders. 2018;2018(2):1-5

14. Scott KM, Fisher LW, Bernstein IH, Bradley MH. The Treatment of Chronic Coccydynia and Postcoccygectomy Pain With Pelvic Floor Physical Therapy. PM&R. 2017;9(4):367-76

15. Karadimas EJ, Trypsiannis G, Giannoudis PV. Surgical Treatment of Coccygodynia: An Analytic Review of the Literature. European Spine Journal. 2011;20:698-705

16. Sanobar G, Mustafa S, Wazir A, Iqbal J, Israr A. Prevalence of Coccydynia Among Wheelchair Users Due to Prolonged Sitting: Coccydynia in Wheelchair Users. Journal of Health and Rehabilitation Research. 2024;4(1):345-50

17. Chatta MA, Ain QU, Amjad MH, Usman M. Prevalence of Coccydynia in Postpartum Women: A Cross-Sectional Study in Lahore. Pakistan Journal of Basic Clinical Medical Sciences. 2023;2:44-50

18. Arif A, Sardar S, Gilani MF, Muneer R, Naz A, Manzoor N, Kashif M. Prevalence of Coccydynia Among Postpartum Women: Prevalence of Coccydynia Among Postpartum Women. Pakistan Journal of Health Sciences. 2022;Dec 31:108-12

19. Meer MJ, Atif MM, Afzal F, Aslam I, Khurshid A, Zulfiqar H, Rehman HM, Khan AU. Causes and Risk Factors of Coccydynia in Postpartum Women in DHQ Sargodha. Journal of Pharmaceutical Research International. 2022;34(31B):8-14

20. Neville CE, Carrubba AR, Li Z, Ma Y, Chen AH. Association of Coccygodynia With Pelvic Floor Symptoms in Women With Pelvic Pain. PM&R. 2022;14(11):1351-9

21. Shams A, Gamal O, Mesregah MK. Sacrococcygeal Morphologic and Morphometric Risk Factors for Idiopathic Coccydynia: A Magnetic Resonance Imaging Study. Global Spine Journal. 2023;13(1):1408

22. Chen SP. Coccydynia in Taiwanese Women: Biomechanical and Physiological Study [Doctoral Dissertation]. University of Southampton; [Year]

23. Modarresi S, Lukacs MJ, Ghodrati M, Salim S, MacDermid JC, Walton DM. A Systematic Review and Synthesis of Psychometric Properties of the Numeric Pain Rating Scale and the Visual Analog Scale for Use in People With Neck Pain. Clinical Journal of Pain. 2022;38(2):132-48

24. Nee RJ, Coppieters MW, Boyd BS. Reliability of the Straight Leg Raise Test for Suspected Lumbar Radicular Pain: A Systematic Review With Meta-Analysis. Musculoskeletal Science and Practice. 2022;59:102529

25. Vianin M. Psychometric Properties and Clinical Usefulness of the Oswestry Disability Index. Journal of Chiropractic Medicine. 2008;7(4):161-3

26. Vishnu P, Jagatheesan A, Dasarapu I. Coccydynia and Disability on Postpartum Vaginal Delivery Women. INTI Journal. 2022;2022(07):1-5

27. Maigne JY, Rusakiewicz F, Diouf M. Postpartum Coccydynia: A Case Series Study of 57 Women. European Journal of Physical and Rehabilitation Medicine. 2012;48(3):387-92

28. Mubashir M, Arif MA, Chughtai AS, Noureen A. Association of Low Back Pain With Piriformis Muscle Tightness in University Students: Low Back Pain With Piriformis Muscles Tightness. Pakistan Journal of Physical Therapy. 2018:24-8

29. Mondal M, Sarkar B, Alam S, Das S, Malik K, Kumar P, Sahay P. Prevalence of Coccyxdynia in Healthy Sedentary Individuals: A Cross-Sectional Study. International Journal of Health Sciences Research. 2017;7:134

30. Howard PD, Dolan AN, Falco AN, Holland BM, Wilkinson CF, Zink AM. A Comparison of Conservative Interventions and Their Effectiveness for Coccydynia: A Systematic Review. Journal of Manual and Manipulative Therapy. 2013;21(4):213-9

31. Abdel-Aal NM, Elgohary HM, Soliman ES, Waked IS. Effects of Kinesiotaping and Exercise Program on Patients With

Obesity-Induced Coccydynia: A Randomized, Double-Blinded, Sham-Controlled Clinical Trial. Clinical Rehabilitation. 2020;34(4):471-9

32. Jensen MM, Milosevic S, Andersen GO, Carreon L, Simony A, Rasmussen MM, Andersen MO. Factors Associated With Patient-Reported Outcomes Following Coccygectomy for Chronic Coccydynia. Bone & Joint Open. 2021;2(7):540-4

33. Malaysian Journal of Movement Health & Exercise. Effectiveness of Myofascial Release Over Stretching on Pain and Range of Motion Among Female College Students With Coccyxdynia. 2020;9(2):45-5