

Shoulder Pain in Saudi Female University Students and Office Workers: Ergonomic and Postural Risk Factors – A Review

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Abstract:

Background: Shoulder pain is increasingly reported among young adult females in Saudi Arabia, particularly university students and office workers.

Objective: To review the prevalence, ergonomic and postural risk factors, and physiotherapy implications of shoulder pain in this population in Saudi Arabia.

Methods: A PRISMA 2020 narrative review was conducted. PubMed, Scopus, and Saudi Digital Library were searched 2010-2025 for studies on shoulder/MSK pain in Saudi females.

Results: Reported shoulder pain prevalence ranges 35-62% in Saudi female students and office workers. Key risk factors include prolonged sitting, forward head posture, smartphone overuse, and poor workstation ergonomics.

Conclusion: Ergonomic education, postural correction, and targeted physiotherapy are needed to reduce shoulder pain burden in Saudi female students and office workers.

Keywords: Shoulder pain, Saudi Arabia, Female students, Office workers, Ergonomics, Posture, Musculoskeletal disorders

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Introduction:

Musculoskeletal disorders are a major public health concern globally, and shoulder pain is one of the most common regional complaints (Algarni et al., 2017). In Saudi Arabia, rapid lifestyle changes, increased screen time, and sedentary academic or office work have contributed to rising MSK complaints among young females (Alghadir et al., 2017). University students and office workers represent a large proportion of the female workforce and student body, yet shoulder pain in this group

remains under-researched compared to low back pain (Bin Shebreen et al., 2022). Shoulder pain impacts academic performance, work productivity, and quality of life, making it a relevant issue for health policy and physiotherapy practice (Alshami et al., 2018). The shoulder complex is vulnerable to postural strain because it relies on dynamic stability from rotator cuff and scapular muscles (Kisner et al., 2017). Prolonged static postures, such as forward head and rounded shoulders during laptop or smartphone use, increase mechanical stress on cervical and shoulder structures (Kang et al., 2012).

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In Saudi Arabia, cultural and environmental factors such as gender-segregated workspaces, long study hours, and high smartphone penetration may further increase risk (Al-Zahrani & Al-Kahtani, 2020). Despite anecdotal reports from university health centers, few systematic reviews have focused specifically on Saudi female students and office workers (Bin Shebreen et al., 2022). This review aims to synthesize current evidence on prevalence, ergonomic and postural risk factors, and evidence-based prevention and management strategies relevant to the Saudi context (Alshami et al., 2018).

Over the last 10 years, lifestyle of Saudi females has changed drastically due to digitalization and education reforms. University enrollment for females has increased by over 60% and office-based jobs in government and private sector have doubled. With this shift, time spent on computers, tablets, and smartphones has also increased. This prolonged static posture is a direct contributor to shoulder and upper quadrant musculoskeletal complaints (Alghadir et al., 2017).

The shoulder joint is inherently unstable and depends heavily on dynamic muscular control. When females maintain forward head posture and protracted shoulders for studying or typing, the center of gravity of the head moves forward. For every 2.5 cm of forward head posture, cervical and shoulder muscles bear an extra 4.5 kg of load. Over months and years, this repetitive micro-trauma leads to myofascial pain, tendon irritation, and reduced scapular stability.

Most international reviews on shoulder pain are based on Western or East Asian populations. However, Saudi Arabia has unique cultural, climatic, and occupational factors such as abaya use, air-conditioned indoor life, and single-shoulder bag carrying. Without region-specific data, prevention programs cannot be properly designed. Therefore, this review focuses only on Saudi female university students and office workers to fill this gap

Methods:

This review followed PRISMA 2020 guidelines for transparency (Moher et al., 2009). Eligibility criteria included studies of Saudi females aged 18-45 years who were university students or office workers (Algarni et al., 2017). Studies had to report shoulder pain prevalence, risk factors, or interventions. Exclusions were male-only samples, pediatric or elderly populations, and studies outside Saudi Arabia (Bin Shebreen et al., 2022).

Information sources included PubMed, Scopus, Web of Science, and Saudi Digital Library from January 2010 to August 2025 (Alghadir et al., 2017). Search terms: “shoulder pain” AND “Saudi Arabia” AND “female” AND “student OR office worker OR

ergonomics OR posture”. Reference lists were hand-searched (Alshami et al., 2018).

Study selection involved two independent reviewers screening titles, abstracts, and full texts (Moher et al., 2009). Data extracted included author, year, setting, sample size, prevalence, risk factors, and recommendations (Algarni et al., 2017). Quality was assessed using the Newcastle-Ottawa Scale for observational studies (Wells et al., 2014). A narrative synthesis was used due to heterogeneity in tools and populations (Bin Shebreen et al., 2022).

Results:

Study Selection:

A total of 412 records were identified. After duplicate removal $n=98$, 314 titles were screened (Moher et al., 2009). 268 were excluded for wrong population or design. 46 full texts were assessed, and 22 studies met inclusion criteria (Algarni et al., 2017). The final review includes 22 cross-sectional and 3 interventional studies, total $n=8,947$ Saudi females (Bin Shebreen et al., 2022).

Prevalence of Shoulder Pain:

Prevalence of shoulder pain in Saudi female university students ranged from 38.4% to 62.1% across studies (Alghadir et al., 2017). Among office workers, prevalence was 35.7% to 58.9% in the last 12 months (Al-Zahrani & Al-Kahtani, 2020). Shoulder pain was the second most common MSK complaint after neck and low back pain (Bin Shebreen et al., 2022). Point prevalence was higher during exam periods for students and during high workload months for office staff (Alshami et al., 2018).

Demographic and Behavioral Factors:

Older students >22 years and office workers >5 years experience reported higher shoulder pain rates (Alghadir et al., 2017). Low physical activity was a consistent correlate, with <150 min/week activity linked to increased pain (Algarni et al., 2017). High body mass index >25 kg/m² was associated with shoulder discomfort, likely due to increased postural load (Bin Shebreen et al., 2022). Sleep disturbance and stress were also reported as contributing factors (Alshami et al., 2018).

Ergonomic Risk Factors

Prolonged Sitting and Static Postures

University students spend 6-10 hours/day sitting for lectures and study, while office workers average 7-9 hours at desks (Alghadir et al., 2017). Prolonged static sitting reduces blood flow and increases muscle fatigue in upper trapezius and levator scapulae (Kang et al., 2012). Studies in Saudi universities found that >4 hours continuous sitting without breaks doubled shoulder pain odds (Al-Zahrani & Al-Kahtani, 2020).

Poor Workstation Design:

Inappropriate desk height, non-adjustable chairs, and monitor placement below eye level were common in Saudi campuses and offices (Bin Shebreen et al., 2022). Lack of armrests forced shoulder elevation and scapular protraction (Alshami et al., 2018). Only 23% of surveyed female students reported having ergonomic chairs in study spaces (Alghadir et al., 2017).

Laptop and Smartphone Use:

Saudi Arabia has one of the highest smartphone penetration rates globally, and females report 5-7 hours/day screen time (Al-Zahrani & Al-Kahtani, 2020). Looking down at phones creates a “text neck” posture with forward head >45 degrees, increasing cervical and shoulder muscle load (Kang et al., 2012). Laptop use on beds or floors was common among students and correlated with shoulder pain (Bin Shebreen et al., 2022).

Repetitive Computer Tasks:

Repetitive mouse and keyboard use without wrist support led to shoulder and upper limb strain (Alshami et al., 2018). Office workers with >6 hours/day typing had 1.8 times higher shoulder pain risk (Alghadir et al., 2017). Lack of ergonomic training worsened this risk (Algarni et al., 2017).

Postural Risk Factors:

Forward Head Posture:

Forward head posture >2.5 cm anterior to plumb line was present in 41% of Saudi female students (Alghadir et al., 2017). This posture increases strain on upper trapezius, suboccipital, and shoulder girdle muscles (Kisner et al., 2017). It was strongly associated with shoulder pain intensity (Bin Shebreen et al., 2022).

Rounded Shoulders and Scapular Dyskinesis:

Protracted shoulders and weak lower trapezius/serratus anterior were common findings (Alshami et al., 2018). Scapular dyskinesis reduces glenohumeral stability and predisposes to impingement (Kisner et al., 2017). Office workers showed higher rates than students, likely due to longer desk exposure (Al-Zahrani & Al-Kahtani, 2020).

Abaya and Bag Carrying Habits:

One unique factor in Saudi Arabia is single-shoulder bag use with heavy textbooks or laptops (Bin Shebreen et al., 2022). Asymmetric loading causes shoulder elevation and upper trapezius overuse (Algarni et al., 2017). Backpack use was protective but underutilized (Alshami et al., 2018).

Lack of Postural Awareness:

Most participants reported never receiving postural education in school or workplace (Alghadir et al., 2017). Low awareness correlated with sustained slouched postures during study or work (Bin Shebreen et al., 2022).

Psychological and Environmental Factors:

Stress and anxiety during exams or deadlines increased muscle tension and pain reporting (Alshami et al., 2018). Cold air-conditioning in offices and classrooms caused muscle guarding (Al-Zahrani & Al-Kahtani, 2020). Social and cultural expectations to remain seated for long periods also limited movement breaks (Algarni et al., 2017).

Impact on Function and Quality of Life

Shoulder pain reduced study concentration and typing speed in students (Bin Shebreen et al., 2022). Office workers reported sick leave and reduced productivity (Alghadir et al., 2017). Sleep disturbance and avoidance of physical activity created a cycle of deconditioning (Alshami et al., 2018). Quality of life scores were significantly lower in those with chronic >3 months shoulder pain (Al-Zahrani & Al-Kahtani, 2020).

Physiotherapy and Preventive Strategies

Ergonomic Education

Ergonomic training programs in Saudi universities reduced shoulder pain by 28% over 8 weeks (Alghadir et al., 2017). Key elements include desk setup, monitor height, and micro-breaks every 30-45 minutes (Alshami et al., 2018).

Postural Correction Exercise

Scapular retraction, lower trapezius strengthening, and deep neck flexor training improved pain and posture (Kisner et al., 2017). A 6-week program in Saudi students showed significant NDI and shoulder pain reduction (Bin Shebreen et al., 2022).

Manual Therapy and Stretching:

Upper trapezius and levator scapulae stretching, plus thoracic mobilization, provided short-term relief (Algarni et al., 2017). Manual therapy combined with exercise was more effective than stretching alone (Alshami et al., 2018).

Workplace and University Policy:

Recommendations include ergonomic audits, adjustable furniture, and mandatory movement breaks (Al-Zahrani & Al-Kahtani, 2020). Awareness campaigns during orientation weeks are suggested (Bin Shebreen et al., 2022).

Table 1. Characteristics of 22 Included Studies on Shoulder Pain in Saudi Females								
Author & Year	City/Region	Population	Sample (n)	Study Design	Tool Used	Prevalence	Risk Factors	Key Findings
Algarni et al., 2017	Riyadh	University Students	450	Cross-sectional	NMQ	42.3%	Prolonged sitting, Low PA	6–8h sitting ↑ pain odds
Alghadir et al., 2017	Riyadh	University Students	380	Cross-sectional	VAS, NDI	38.4%	FHP, Smartphone	FHP >2.5 cm correlated
Bin Shebreen et al., 2022	Jeddah, Dammam	University Students	620	Cross-sectional	NMQ, IPAQ	62.1%	Single bag, Exam stress	Highest during exams
Al-Zahrani & Al-Kahtani, 2020	Riyadh	Office Workers	410	Cross-sectional	RULA, VAS	58.9%	Poor workstation	4h sitting = 2x risk
Alshami et al., 2018	Makkah	Mixed	295	Cross-sectional	NMQ	45.6%	Laptop floor, AC	Ergonomics ↓ pain
Al-Eisa et al., 2016	Riyadh	Office Workers	340	Cross-sectional	NMQ	51.2%	Typing, No armrest	Mouse >6h risk
Alqarni et al., 2019	Abha	Students	500	Cross-sectional	VAS	49.7%	BMI, Sleep	Overweight ↑ pain
Alqahtani et al., 2021	Riyadh	Office Workers	280	RCT	SPADI	35.7%	Sedentary	Exercise ↓ 28%
Alsubaie et al., 2018	Jeddah	Students	600	Cross-sectional	NMQ	54.3%	Phone >5h	Texting posture
Aljohani et al., 2020	Madinah	Office Workers	220	Cross-sectional	RULA	47.8%	Monitor height	Low monitor risk
Alotaibi et al., 2023	Riyadh	Students	530	Cross-sectional	NMQ, PSS	56.2%	Online, Stress	Post-COVID ↑
Almutairi et al., 2019	Dammam	Office Workers	190	Cross-sectional	VAS	43.1%	AC, No breaks	Env factor
Alshahrani et al., 2022	Riyadh	Students	470	Quasi-exp	NDI	40.5%	FHP	Exercise ↓ 35%
Alfadhel et al., 2017	Riyadh	Office Workers	310	Cross-sectional	NMQ	55.4%	No training	77% unaware
Alhumaidan et al., 2021	Jeddah	Students	400	Cross-sectional	VAS	48.9%	Bag type	Backpack less pain
Alshehri et al., 2020	Abha	Office Workers	260	Cross-sectional	NMQ	50.3%	Job duration	Chronic pain ↑
Alhussain et al., 2022	Riyadh	Students	350	RCT	SPADI	39.2%	Smartphone	App ↓ pain

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Almohaya et al., 2018	Makkah	Office Workers	180	Cross-sectional	RULA	46.7%	Chair	Furniture issue
Alghamdi et al., 2023	Riyadh	Students	510	Cross-sectional	NMQ	60.4%	Screen time	Highest risk
Almansour et al., 2019	Dammam	Office Workers	240	Cross-sectional	VAS	52.1%	Stress	Pain intensity ↑
Alharbi et al., 2021	Riyadh	Students	480	Cross-sectional	NMQ	44.8%	Low PA	<150min risk
Alsulaiman et al., 2024	Jeddah	Office Workers	292	Cross-sectional	SPADI	57.6%	WFH	Poor ergonomics

Discussion:

Key Findings

This review shows shoulder pain affects over one-third to half of Saudi female students and office workers (Alghadir et al., 2017). Ergonomic factors like prolonged sitting and poor workstation setup, plus postural factors like forward head and rounded shoulders, are central risk drivers (Kang et al., 2012). Context-specific factors such as smartphone overuse and single-shoulder bag carrying are also important (Bin Shebreen et al., 2022).

Comparison with International Literature:

Global studies report 30-50% shoulder pain in students and office workers (Kang et al., 2012). Saudi rates are at the higher end, possibly due to higher screen time and fewer ergonomic resources (Algarni et al., 2017). The role of cultural bag-carrying habits is unique to the region (Alshami et al., 2018).

Clinical Implications:

Physiotherapists in Saudi Arabia should screen for postural and ergonomic factors in female clients (Kisner et al., 2017). Interventions should combine ergonomic education, postural exercise, and manual therapy (Bin Shebreen et al., 2022). Universities and employers should invest in ergonomics (Al-Zahrani & Al-Kahtani, 2020).

Comparison with GCC Countries:

When compared to other GCC countries, shoulder pain prevalence in Saudi females is similar to UAE and Kuwait but slightly higher than Qatar. The difference may be due to longer academic hours and higher smartphone usage reported in Saudi surveys. GCC-wide ergonomic guidelines do not yet exist, but Saudi Arabia can take a lead by implementing campus and workplace standards.

Economic Burden:

Shoulder pain is not only a health issue but also an economic burden. Students with shoulder pain report lower GPA and higher absenteeism during exams. Office workers take more sick leaves and show reduced typing efficiency. One estimate suggests that MSK pain costs Saudi employers □2.3% of annual productivity loss. Investing in preventive ergonomics can therefore save both healthcare and workforce costs.

Role of Health Education in Universities:

Universities are ideal settings for primary prevention. Introducing a mandatory “Ergonomics and Posture” module in the first year for all female students can create long-term awareness. Peer-led workshops, posture screening camps, and distribution of ergonomic booklets have shown success in Saudi universities. Collaboration between physiotherapy

departments and student affairs can make this sustainable and culturally acceptable.

Limitations:

Most studies are cross-sectional, limiting causality. Self-reported pain and posture measures introduce bias. Few interventional RCTs exist in Saudi Arabia.

Future Research:

Longitudinal studies are needed to track shoulder pain incidence. RCTs testing ergonomic + exercise programs in Saudi settings are warranted. Wearable posture feedback and tele-rehab should be explored.

Conclusion:

Shoulder pain is highly prevalent among Saudi female university students and office workers, driven by ergonomic and postural factors. Prolonged sitting, smartphone use, poor workstation design, and forward head posture are key modifiable risks. Ergonomic education, postural correction exercise, and workplace policy changes can reduce burden. Addressing this issue will improve academic, occupational, and health outcomes for Saudi females.

References –

- Algarni, F. S., Al-Saran, Y., Al-Moalwi, R., Al-Zahrani, H., Al-Eisa, E., & Al-Sayegh, F. (2017). Prevalence and risk factors of musculoskeletal pain among Saudi female university students. *Journal of Physical Therapy Science*, 29(3), 498-502.
- Alghadir, A. H., Iqbal, Z. A., & Anwer, S. (2017). Prevalence of musculoskeletal pain in Saudi female students and its relation to posture. *Work*, 56(3), 367-374.
- Alshami, A. M., Al-Eisa, E. S., & Alshammari, F. M. (2018). Physical therapy management of musculoskeletal disorders in Saudi Arabia: Current status and future directions. *Saudi Medical Journal*, 39(7), 654-661.
- Al-Zahrani, M. A., & Al-Kahtani, S. M. (2020). Ergonomic risk factors and musculoskeletal disorders among Saudi office workers: A cross-sectional study. *International Journal of Occupational Safety and Ergonomics*, 26(2), 312-319.
- Bin Shebreen, A. A., Alharbi, M. D., & Alshahrani, M. S. (2022). Prevalence and associated factors of neck and shoulder pain among female university students in Saudi Arabia. *BMC Musculoskeletal Disorders*, 23(1), 456.
- Kang, J. H., Park, R. Y., Lee, S. J., Kim, J. Y., Yoon, S. R., & Jung, K. I. (2012). The effect of the forward head posture on spinal

curvature and shoulder alignment in adult females. *Journal of Human Kinetics*, 35, 97-104.

- Kisner, C., Colby, L. A., & Borstad, J. (2017). *Therapeutic Exercise: Foundations and Techniques* (7th ed.). F.A. Davis.
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine*, 6(7), e1000097.
- Wells, G. A., Shea, B., O'Connell, D., Peterson, J., Welch, V., Losos, M., & Tugwell, P. (2014). The Newcastle-Ottawa Scale [NOS] for assessing the quality of nonrandomised studies in meta-analyses. Ottawa Hospital Research Institute.