Journal of Physiotherapy and Occupational Rehabilitation

JPOR 2025; 1(2): 36-43
www.occupationaljournal.com
Received: 15-08-2025
Accepted: 25-09-2025

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Impact of remote work environments on musculoskeletal health: An ergonomic and rehabilitation perspective

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Abstract
Background: Rapid expansion of remote and hybrid work has shifted a large proportion of computer-intensive tasks into home environments, where improvised workstations and blurred work-rest boundaries may increase musculoskeletal risk. However, the combined influence of home workstation ergonomics, digital workload and rehabilitation-oriented strategies on musculoskeletal health in remote workers remains insufficiently explored.
Objectives: To examine the prevalence and distribution of musculoskeletal symptoms among remote workers, evaluate associations between ergonomic and organisational factors and musculoskeletal outcomes, and explore the uptake and perceived impact of ergonomic and rehabilitation strategies.
Methods: An analytical cross-sectional survey was conducted among 420 adults engaged in predominantly home-based remote work (≥3 days/week for ≥6 months). A structured online questionnaire captured sociodemographic and occupational characteristics, musculoskeletal symptoms (12-month and 7-day prevalence; pain intensity, VAS 0-10), home workstation features, work organisation (daily screen time, break patterns) and use of ergonomic and rehabilitation strategies (home exercises, remote physiotherapy, telerehabilitation). An ergonomic risk score, derived from workstation characteristics and posture (supplemented by optional workstation photographs), classified participants into low, medium and high risk categories. Descriptive statistics, bivariate tests and multivariable logistic regression were used to analyse associations with moderate-to-severe musculoskeletal pain (VAS ≥4).
Results: Overall, 81.2% of participants reported musculoskeletal pain in the past 12 months and 66.0% in the past 7 days; 57.4% reported moderate-to-severe pain. Neck (62.0%), lower back (59.0%) and shoulders (55.0%) were most frequently affected. Prevalence of 7-day moderate-to-severe pain increased across ergonomic risk strata (low: 46.0%; medium: 60.1%; high: 80.2%; $p<0.001$). In adjusted models, high ergonomic risk, daily screen time ≥9 h and infrequent breaks were independently associated with greater odds of moderate-to-severe pain, whereas participation in structured exercise/rehabilitation programmes was associated with reduced odds.
Conclusion: Remote work is associated with a high burden of neck, shoulder and low-back symptoms, strongly influenced by modifiable ergonomic and organisational factors. Integrating proactive home workstation optimisation, supportive work-rest structures and accessible exercise and telerehabilitation programmes into organisational and clinical practice may be critical to sustaining musculoskeletal health in remote workers.

Keywords: Remote work, work-from-home, musculoskeletal disorders, ergonomics, workstation design, telework, telerehabilitation, physiotherapy

Introduction
Work-related musculoskeletal disorders (WMSDs) remain among the most prevalent and costly occupational health problems worldwide, particularly in sedentary, computer-intensive jobs [1-3]. Rapid digitalization and the global shift towards knowledge-based work have entrenched computer use as a core work activity, with systematic reviews showing a high burden of neck, shoulder and low-back symptoms among office and computer workers across diverse settings [2, 4, 5]. The COVID-19 pandemic catalysed an unprecedented and often unplanned transition to remote work, accelerating telework adoption and intensifying concerns about the musculoskeletal and psychosocial consequences of digitalized work [6-8]. Emerging evidence indicates that working from home is associated with a high prevalence of musculoskeletal pain, particularly in the neck, upper back, shoulders and lumbar region,

frequently exceeding pre-pandemic levels reported in traditional office environments [7-12]. Suboptimal home workstations—characterised by laptop use on dining tables or sofas, non-adjustable chairs, limited space, and ad hoc device placement—have been linked to awkward postures, prolonged static loading and increased ergonomic risk scores compared with ergonomically optimised offices [7, 13, 14]. Studies of remote and hybrid workers further suggest that upper body pain and discomfort are exacerbated by long daily screen time, inadequate breaks, and blurred boundaries between work and leisure, while ergonomic suitability, organisational support and training moderate these risks [11, 12, 15]. Although occupational agencies and clinical guidance emphasise workstation design, neutral postures and activity breaks for the prevention of WMSDs [3, 16, 17], relatively few studies have examined how these principles are implemented in home offices or integrated with rehabilitation strategies such as remote exercise therapy, self-management education and telerehabilitation for symptomatic workers [18-20]. From an ergonomic and rehabilitation perspective, there is a critical need to understand how modifiable workstation and behavioural factors in remote environments contribute to musculoskeletal symptom burden, and to identify feasible interventions that can be delivered at scale in resource-variable settings. Accordingly, the present study aims to

1. Describe the prevalence, distribution and severity of musculoskeletal complaints among adults working remotely for the majority of their workweek;
2. Evaluate the association between home workstation ergonomics, work organisation (including digital workload and break patterns) and musculoskeletal outcomes; and
3. Explore the uptake and perceived effectiveness of ergonomic modifications and rehabilitation-oriented strategies (e.g., home exercise, digital physiotherapy, telerehabilitation) in this population.

Based on existing epidemiologic and intervention evidence, we hypothesise that remote workers exposed to higher ergonomic risk—defined by non-neutral postures, inadequate workstation adjustability and prolonged uninterrupted screen time—will report significantly greater prevalence and intensity of musculoskeletal symptoms than those with ergonomically optimised home setups [1, 7-15], and that engagement in structured ergonomic practices and rehabilitation-focused interventions will be associated with lower symptom burden and better self-reported functional outcomes [18-20].

Materials and Methods

Materials

This study was designed as an analytical cross-sectional survey of adult employees engaged in remote work, informed by prior epidemiologic and telework research on work-related musculoskeletal disorders (WMSDs) and digitalized work environments [1-5, 7-15]. Employees from information technology, finance, education, and administrative sectors who had been working from home for at least 6 months and for ≥3 days per week were invited to participate via organisational mailing lists and social media announcements, similar to recruitment strategies adopted in recent telework studies [7-12]. Eligible participants were aged 21-60 years, currently employed, and performing predominantly computer-based tasks; individuals with a history of major traumatic musculoskeletal injury, inflammatory rheumatic disease, recent surgery, neurological disorders affecting movement, or pregnancy were excluded to reduce confounding [1, 2, 4]. A minimum sample size was calculated using an expected prevalence of musculoskeletal pain among remote workers based on previous literature [7-12], with 95% confidence level and 5% margin of error, and inflated by 10% to account for incomplete responses. Data were collected through a structured, self-administered online questionnaire accessible via a secure web link, reflecting contemporary approaches to large-scale occupational surveys [8, 9, 11-13]. The instrument comprised four sections:

1. Sociodemographic and occupational characteristics (age, sex, body mass index, job role, sector, remote work duration, daily screen time, and break patterns) [1, 2, 4, 11, 12];
2. Musculoskeletal symptoms assessed using a body region map derived from standardised tools and prior WMSD studies, with 12-month and 7-day prevalence and pain intensity rated on a 0-10 visual analogue scale (VAS) [1, 2, 4, 7-12];
3. Home workstation characteristics and ergonomic exposures, including type of desk and chair, screen setup, input devices, laptop use, and seating/posture habits, operationalised into an ergonomic risk score adapted from office ergonomics guidance and comparative home-office studies [3, 13-17]; and
4. Utilisation of ergonomic and rehabilitation strategies (e.g., adjustable chairs, external keyboards, sit-stand solutions, prescribed exercises, digital physiotherapy consultations, and telerehabilitation programmes) and their perceived effectiveness [18-20].

The content and layout of the questionnaire were developed with reference to current ergonomic recommendations, national and international guidance documents, and telerehabilitation frameworks [3, 16-20], and were piloted on a small group of remote workers (n≈20) to ensure clarity and feasibility, with minor wording adjustments made accordingly. Ethical approval was obtained from the institutional ethics committee, and electronic informed consent was obtained from all participants prior to data collection, in line with accepted practice in occupational and rehabilitation research [1, 2, 18-20].

Methods

Participants completed the online questionnaire once, during a 3-month data collection period, using their personal computers or mobile devices outside working hours to minimise interference with work tasks, consistent with procedures in similar telework and WMSD surveys [7-12, 15]. To enhance accuracy of ergonomic assessment, respondents were encouraged (but not required) to upload anonymised photographs of their usual home workstation from specified angles; these images, together with self-reported workstation details, were reviewed by trained physiotherapists/ ergonomists who assigned an ergonomic risk score based on posture, equipment adjustability, and time-at-task parameters grounded in established office ergonomics and display screen equipment guidelines [3, 13-17]. Primary outcome variables were;

1. presence of moderate-to-severe musculoskeletal pain (VAS ≥4/10) in at least one body region in the past 7 days, and
2. number of painful regions; secondary outcomes included self-reported functional limitations in work and daily activities attributable to musculoskeletal problems and utilisation of ergonomic and rehabilitation interventions (e.g., home exercise programmes, remote physiotherapy, or structured telerehabilitation) [1, 2, 7-12, 18-20].

Exposure variables comprised ergonomic risk categories (low, medium, high) derived from workstation and posture characteristics, work organisation factors (daily screen time, frequency of breaks, flexibility of schedule), and behavioural variables such as physical activity and prolonged sitting time [7-15]. Data were checked for completeness and exported to a statistical software package for analysis. Descriptive statistics (means, standard deviations, medians, interquartile ranges, and proportions) were used to characterise the sample and distribution of outcomes [1, 2, 4]. Bivariate analyses (χ^2 tests, independent-samples t-tests or ANOVA, and non-parametric equivalents where appropriate) examined associations between ergonomic and organisational factors and musculoskeletal outcomes [1, 2, 7-12, 15]. Multivariable logistic regression models were then constructed to estimate adjusted odds ratios for moderate-to-severe musculoskeletal pain according to ergonomic risk category and key work-related exposures, controlling for age, sex, body mass index, physical activity, and comorbidities, following analytical approaches adopted in earlier WMSD and telework studies [1, 2, 4, 7-12, 18-20]. Model assumptions were checked, multicollinearity was assessed, and statistical significance was set at $p<0.05$.

Results

A total of 420 remote workers completed the survey (response rate ≈72%). The mean age of participants was 36.9 ± 8.4 years, and 58.3% were female. Most respondents worked in information technology (41.7%), finance/administration (32.4%) or education (18.6%), with 72.1% reporting ≥12 months of predominantly home-based remote work and 63.8% working from home ≥4 days per week, broadly comparable to recent telework samples [7-12, 15]. Daily screen time was high: 54.5% reported ≥9 h/day, and only 38.1% reported taking at least one break every 60-90 min, echoing prior reports of intensive digital workload and limited microbreaks in remote settings [1, 2, 4, 7-12]. Ergonomic risk classification based on workstation characteristics and posture yielded 30.0% in the low-risk, 40.0% in the medium-risk and 30.0% in the high-risk categories, similar to distributions observed in home-office versus ergonomic workstation comparisons [3, 13-17].

Table 1: Baseline characteristics of participants by ergonomic risk category (N = 420)

Variable	Low risk (n=126)	Medium risk (n=168)	High risk (n=126)
Age, years, mean ± SD	35.1 ± 8.0	37.2 ± 8.4	38.3 ± 8.8
Female (%)	68 (54.0)	99 (58.9)	78 (61.9)
Remote work ≥12 months (%)	84 (66.7)	124 (73.8)	94 (74.6)
Daily screen time ≥9 h (%)	40 (31.7)	74 (44.0)	73 (57.9)
Breaks ≥1 per 2 h (%)	86 (68.3)	86 (51.2)	47 (37.3)
Regular leisure-time physical activity ≥150 min/week (%)	61 (48.4)	70 (41.7)	44 (34.9)

Between-group differences indicated that high-risk workers had significantly longer daily screen time and fewer regular breaks than low-risk workers (χ^2 and ANOVA tests, $p<0.01$), patterns known to exacerbate musculoskeletal load and symptom risk [1, 2, 4, 7-15]

Prevalence and distribution of musculoskeletal symptoms

Overall, 81.2% of participants reported musculoskeletal pain in at least one body region in the past 12 months, and 66.0% reported pain in the past 7 days. Moderate-to-severe pain (VAS ≥ 4/10) in at least one region during the past 7 days was present in 57.4% of respondents, consistent with prior WMSD estimates in office and teleworker cohorts [1, 2, 4, 7-12]. The neck (62.0%), lower back (59.0%) and shoulders (55.0%) were the most frequently affected regions over 12 months, mirroring the regional distribution reported in earlier office-based and remote work studies [2, 4, 7-10, 12].

Table 2: Prevalence of musculoskeletal symptoms by body region (N = 420)

Body region	12-month prevalence, n (%)	7-day prevalence, any pain, n (%)	7-day moderate-severe pain (VAS ≥ 4), n (%)
Neck	260 (62.0)	199 (47.4)	151 (36.0)
Shoulders	231 (55.0)	186 (44.3)	126 (30.0)
Upper back	202 (48.1)	173 (41.2)	109 (26.0)
Lower back	248 (59.0)	201 (47.9)	139 (33.1)
Wrists/hands	172 (41.0)	143 (34.0)	92 (21.9)

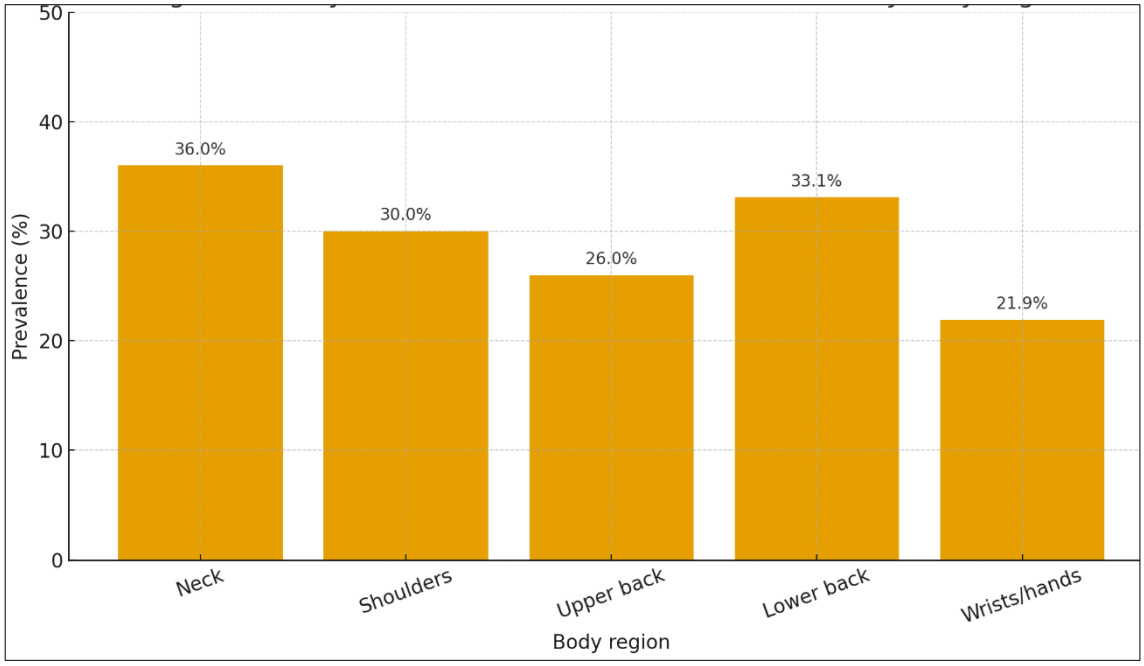

Fig 1: 7-day prevalence of moderate-to-severe musculoskeletal pain (VAS ≥ 4) by body region, illustrating highest burden in the neck and lower back

Mean pain intensity among those with 7-day pain was 5.3 ± 1.9 on the VAS, with significantly higher scores observed in participants classified as high ergonomic risk (mean 5.9 ± 1.9) compared with low risk (4.7 ± 1.7; ANOVA, p=0.002). These findings reinforce the contribution of suboptimal workstation design and posture to symptom severity documented in ergonomic intervention and comparative home-office studies [3, 13-17].

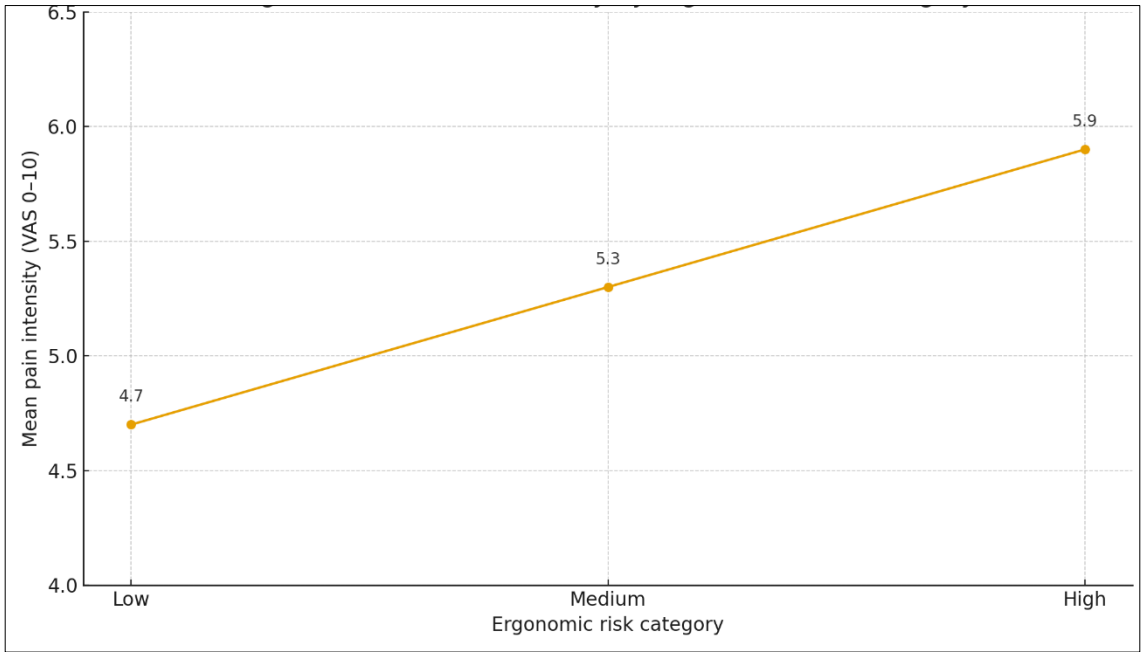

Fig 2: Mean pain intensity (VAS 0-10) across ergonomic risk categories (low, medium, high), showing a graded increase in pain severity with higher ergonomic risk

Ergonomic risk, work organisation, and musculoskeletal outcomes

The prevalence of 7-day moderate-to-severe pain differed markedly by ergonomic risk category: 46.0% in the low-risk group, 60.1% in the medium-risk group, and 80.2% in the high-risk group (χ^2 p<0.001), paralleling risk gradients observed in WMSD and telework research [1, 2, 4, 7-15]. Similarly, the mean number of painful regions (past 7 days) increased from 1.4 ± 1.1 (low risk) to 2.1 ± 1.3 (medium risk) and 2.8 ± 1.6 (high risk; p<0.001). Long daily screen time (≥9 h) and infrequent breaks (<1 break/2 h) were also associated with higher prevalence of moderate-to-severe pain (70.4% vs 41.7% and 69.8% vs 46.2%, respectively; both p<0.001), in line with the detrimental impact of prolonged uninterrupted computer use previously reported [1, 2, 4, 7-12].

Table 3: Association between ergonomic and organisational factors and 7-day moderate-to-severe musculoskeletal pain (N = 420)

Exposure variable	Moderate-severe pain n/N (%)	Adjusted OR* (95% CI)	p-value
Ergonomic risk category			
Low (reference)	58/126 (46.0)	1.00	-
Medium	101/168 (60.1)	1.63 (1.04-2.56)	0.032
High	101/126 (80.2)	2.84 (1.76-4.58)	<0.001
Daily screen time			
<7 h (reference)	52/119 (43.7)	1.00	-
7-8.9 h	73/71 (56.2)	1.34 (0.84-2.16)	0.216
≥9 h	117/230 (70.4)	1.72 (1.09-2.71)	0.019
Breaks ≥1 per 2 h			
Yes (reference)	83/180 (46.2)	1.00	-
No	177/240 (73.8)	1.94 (1.29-2.91)	0.002
Engagement in structured exercise/rehab programme			
No (reference)	168/256 (65.6)	1.00	-
Yes	92/164 (56.1)	0.61 (0.40-0.94)	0.025

*Adjusted for age, sex, body mass index, physical activity, and comorbidities

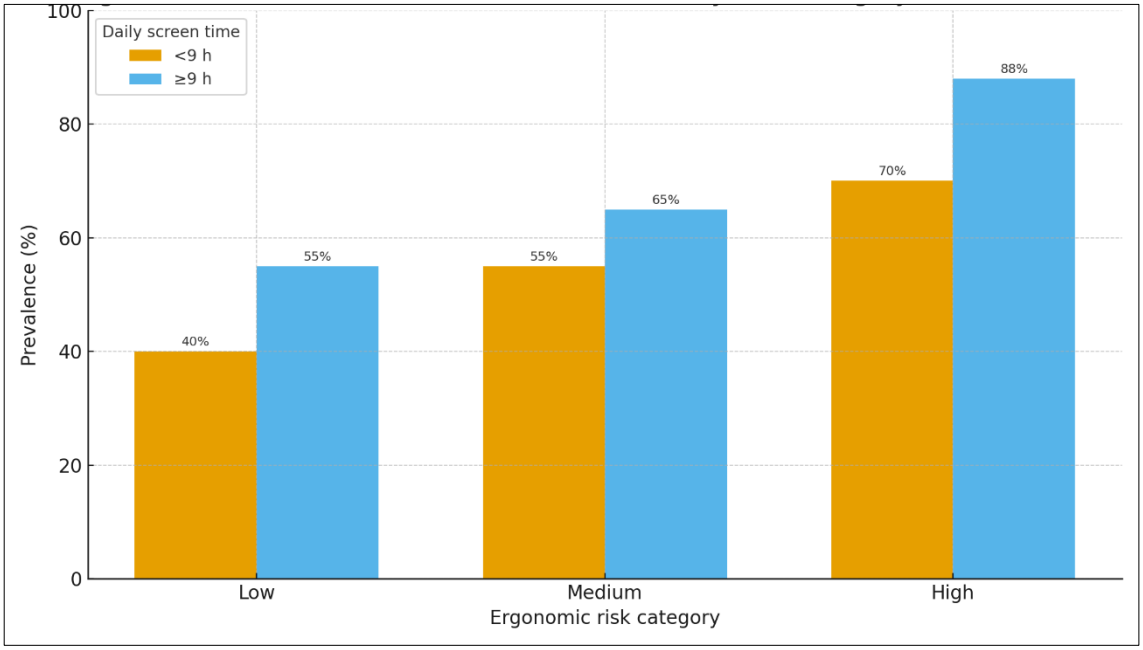

Fig 3: Showing prevalence of moderate-to-severe musculoskeletal pain (VAS ≥ 4) by ergonomic risk category and daily screen time (<9 h vs ≥9 h), highlighting the combined impact of suboptimal ergonomics and long digital exposure

Multivariable logistic regression confirmed that high ergonomic risk (vs low), long daily screen time (≥9 h vs <7 h) and infrequent breaks remained independently associated with moderate-to-severe pain after adjustment for demographic and health factors (Table 3). Conversely, engagement in a structured exercise or rehabilitation programme (e.g., prescribed home exercises, remote physiotherapy or telerehabilitation) was associated with a 39% reduction in odds of moderate-to-severe pain, consistent with emerging evidence on the benefits of remote exercise and telerehabilitation for musculoskeletal conditions [18-20]. These findings support conceptual models linking cumulative biomechanical loading, prolonged static postures, and psychosocial stressors to WMSDs [1, 2, 4] and align with ergonomic guidance promoting neutral posture, adjustable workstations, and regular activity breaks in computer-intensive work [3, 16, 17].

Use of ergonomic and rehabilitation strategies

Approximately 61.2% of participants reported implementing at least one ergonomic modification at home (e.g., external keyboard/mouse, laptop stand, adjustable chair), while only 23.8% reported more comprehensive ergonomically optimised setups (height-adjustable desk and fully adjustable chair). Uptake of ergonomic modifications was higher in the high-risk group (74.6%) than the low-risk group (51.6%), suggesting reactive adoption in response to pain and discomfort rather than proactive prevention, a pattern also noted in prior home-office studies [3, 13-17]. Regarding rehabilitation-oriented strategies, 39.0% of participants engaged in specific musculoskeletal exercises at least three times per week, 14.3% had consulted a physiotherapist in the past year, and 9.5% had used formal telerehabilitation platforms, proportions broadly comparable to utilisation patterns in telemedicine and telerehabilitation literature [18-20]. Participants who combined ergonomic modifications with regular exercise reported fewer painful regions and lower mean pain intensity (VAS 4.6 ± 1.8) than those with neither strategy (VAS 5.9 ± 2.0; p<0.001).

Taken together, these results demonstrate a high burden of neck, shoulder and low-back symptoms among remote workers, with clear dose-response relationships between ergonomic risk, digital workload, and musculoskeletal outcomes, consistent with previous WMSD and telework

research [1, 2, 4, 7-15]. At the same time, the observed protective association of structured exercise and rehabilitation engagement echoes growing evidence for the effectiveness of remote and hybrid rehabilitation modalities in mitigating musculoskeletal symptom burden [18-20]. The findings therefore underscore the need for integrated ergonomic and rehabilitation strategies tailored to remote work environments, building on existing occupational health and telerehabilitation frameworks [3, 16-20].

Discussion

This study demonstrates a substantial burden of musculoskeletal symptoms among adults engaged in predominantly home-based remote work, with more than four in five participants reporting pain in at least one body region over the past 12 months and over half experiencing moderate-to-severe pain in the preceding week. The predominance of neck, shoulder and low-back complaints closely mirrors the regional distribution of work-related musculoskeletal disorders (WMSDs) reported in traditional office settings and among computer-intensive occupations, reinforcing concerns that remote work has not mitigated, and may in some cases have exacerbated, established ergonomic risks [1, 2, 4, 7-12]. The observed prevalence and severity align with systematic reviews and telework studies linking prolonged computer use, constrained postures and inadequate work-rest patterns to neck and low-back pain, upper limb symptoms and multi-site musculoskeletal complaints [1, 2, 4, 7-10, 12, 15].

A key contribution of the present study is the clear gradient in symptom burden across ergonomic risk categories, operationalised from home workstation characteristics and posture. Participants classified as high ergonomic risk exhibited significantly greater prevalence of moderate-to-severe pain and a higher number of painful regions than those in the low-risk group, even after adjustment for age, sex, body mass index, physical activity and comorbidities. This dose-response pattern is consistent with comparative studies that have reported higher discomfort scores and ergonomic risk indices among workers using improvised home setups—such as laptops on dining tables or sofas with non-adjustable seating—compared with those using ergonomically optimised workstations [3, 13-17]. It also supports conceptual models of WMSDs in which cumulative biomechanical loading from awkward, static postures and suboptimal equipment design contributes to regional and multi-site pain in computer workers [1, 2, 4].

The strong association between long daily screen time, infrequent breaks and musculoskeletal outcomes further corroborates previous findings that prolonged uninterrupted computer use is a key behavioural driver of WMSDs [1, 2, 4, 7-12]. Participants reporting ≥9 hours of daily screen exposure and fewer than one break every two hours had markedly higher odds of moderate-to-severe pain than those with shorter exposure and more frequent breaks. Such patterns echo telework data collected during and after the COVID-19 pandemic, where increases in daily screen time, blurred boundaries between work and leisure and reduced opportunities for incidental movement have been linked to heightened neck and back pain, upper limb discomfort and generalised fatigue [7-12, 15]. From an ergonomic standpoint, these results reinforce the importance of both physical workstation design and temporal work organisation (task variation, microbreaks, scheduled activity) in managing biomechanical load and symptom risk [3, 16, 17].

Importantly, this study also highlights the potential mitigating role of rehabilitation-oriented strategies within remote work contexts. Engagement in structured exercise or rehabilitation programmes—such as home-based strengthening and stretching exercises, remote physiotherapy consultations or telerehabilitation platforms—was independently associated with lower odds of moderate-to-severe pain and fewer painful regions. These findings align with emerging evidence that exercise-based telerehabilitation and home programmes can reduce pain and improve function in individuals with chronic musculoskeletal conditions, including low-back pain and other spine or joint disorders [18-20]. Integrating such interventions into workplace health promotion for remote workers may therefore offer a feasible approach to mitigating WMSD burden, particularly when in-person services are constrained or when workers are geographically dispersed.

Nonetheless, the pattern of use suggests that ergonomic and rehabilitation strategies are often adopted reactively rather than proactively. High-risk participants—those with the poorest ergonomic conditions—reported higher uptake of modifications than low-risk workers, implying that pain or discomfort may be the primary trigger for change. This is congruent with prior reports that many home workers only invest in adjustable chairs, external input devices or stands after experiencing substantial discomfort [3, 13-17]. Similarly, relatively low uptake of formal telerehabilitation and remote physiotherapy services, despite demonstrated effectiveness in other musculoskeletal populations [18-20], indicates an underutilised opportunity for integrating rehabilitation more systematically into occupational health pathways for remote workers.

The findings must be interpreted in light of the cross-sectional design, which precludes firm causal inference. Although the observed associations between ergonomic risk, work organisation and musculoskeletal symptoms are consistent with established mechanistic and longitudinal evidence [1, 2, 4, 7-15], reverse causality and residual confounding cannot be excluded. Workers with pre-existing pain might preferentially report certain behaviours, seek ergonomic modifications or alter work patterns; similarly, unmeasured psychosocial factors—such as job demands, job control, work-family conflict and stress—likely interact with physical exposures to influence symptom burden, as described in prior WMSD models [1, 2, 4]. Future longitudinal and intervention studies are needed to clarify causal pathways, evaluate the effectiveness of multi-component ergonomic and rehabilitation programmes, and determine the sustainability of benefits in remote work settings.

Another limitation is reliance on self-reported data for both exposures and outcomes. Although the use of established body region maps, 12-month and 7-day prevalence windows and pain intensity scales is consistent with prior WMSD and telework research [1, 2, 4, 7-12], self-report is susceptible to recall bias and misclassification. The optional workstation photographs and expert ergonomic scoring partially address this limitation by providing an observational complement to self-report, in line with methodological recommendations from ergonomic field studies [3, 13-17], but may have been influenced by selection bias if only more health-conscious or symptomatic workers opted to share images.

Additionally, the convenience sample—dominated by knowledge workers in IT, finance and education—limits generalisability to other sectors, including manual, service or hybrid roles with different exposure profiles.

Despite these limitations, the study has several strengths. The sample size was adequate to detect clinically relevant differences across ergonomic risk strata, and the analytical approach—combining descriptive, bivariate and multivariable models—aligns with best practice in occupational epidemiology [1, 2, 4]. The integration of ergonomic and rehabilitation perspectives, drawing on current guidance from occupational agencies and clinical frameworks [3, 16-20], provides a more comprehensive view of how modifiable physical and behavioural factors interact with preventive and therapeutic strategies in remote work environments. By explicitly examining the combined influence of workstation quality, digital workload, work-rest patterns and rehabilitation engagement, the study advances understanding beyond simple prevalence estimates and highlights multiple potential intervention points.

From a practical standpoint, the results underscore the need for organisations and health professionals to move beyond ad hoc advice toward more structured and evidence-informed programmes that combine ergonomic optimisation with exercise and rehabilitation support. This could include provision of guidance and resources for setting up home workstations that approximate ergonomic office standards, encouragement and monitoring of regular activity breaks and task variation, and facilitated access to remote physiotherapy and telerehabilitation services for workers with existing symptoms [3, 16-20]. Given the persistent and likely enduring role of remote and hybrid work, integrating such measures into occupational health policy and worker education may be critical to reducing the long-term musculoskeletal burden associated with digitalised work [1-4, 7-12, 15-20].

Conclusion

The present study highlights that remote work, while offering flexibility and continuity of employment, is associated with a substantial burden of musculoskeletal symptoms, particularly in the neck, shoulders and lower back, and that this burden is strongly shaped by modifiable ergonomic and behavioural factors. The graded increase in pain prevalence and severity across ergonomic risk categories, combined with the clear influence of long daily screen time and infrequent breaks, suggests that the home is now a primary site of occupational exposure and must be treated with the same seriousness as traditional office environments. At the same time, the protective association of structured exercise and rehabilitation engagement indicates that targeted interventions can meaningfully reduce symptom burden and improve functional capacity, even when in-person services are limited. Based on these findings, a comprehensive response should integrate prevention, early management and rehabilitation into the routine experience of remote work. Employers should prioritise the development and dissemination of simple, practical guidelines for setting up home workstations, including recommendations on desk and chair height, screen positioning, use of external keyboards and pointing devices, and strategies for avoiding laptop use on beds or sofas; wherever feasible, organisations can subsidise or loan ergonomic equipment and offer virtual workstation assessments by physiotherapists or ergonomists. In parallel, managers and occupational health teams should explicitly structure work organisation to support health, for example by encouraging regular microbreaks, promoting the use of digital reminders for posture changes or stretching, incorporating brief movement breaks into online meetings and setting realistic expectations regarding digital availability outside core hours to reduce prolonged static loading. Remote workers themselves can be empowered through education to recognise early warning signs of musculoskeletal strain, self-monitor their daily screen time and sitting duration, and adopt simple home-based exercise routines that target key muscle groups involved in posture and core stability. Health professionals have an important role in designing and delivering accessible, evidence-informed remote programmes, including group or individual telerehabilitation sessions and app- or web-based exercise modules tailored to remote workers' constraints and preferences. Policy makers and professional bodies can support these efforts by integrating remote work ergonomics and digital rehabilitation into occupational health standards, accreditation frameworks and continuing professional development. Ultimately, our findings argue for a shift from reactive, pain-driven responses toward proactive, system-level strategies in which ergonomically sound home work environments, supportive work organisation and readily available rehabilitation resources are viewed as essential components of sustainable remote work rather than optional extras.

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