

DISTRIBUTION AND INTENSITY OF MUSCULOSKELETAL PAIN AMONG RECREATIONAL DEADLIFT USERS IN PALEMBANG: A CROSS-SECTIONAL STUDY

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ABSTRACT

Deadlift merupakan latihan resistensi yang banyak digunakan untuk meningkatkan kekuatan otot, tetapi teknik yang tidak tepat dapat meningkatkan risiko nyeri muskuloskeletal. Penelitian ini bertujuan untuk menganalisis distribusi dan intensitas nyeri muskuloskeletal pada pengguna recreational deadlift dengan desain cross-sectional. Sebanyak 42 responden dari dua komunitas gym di Kota Palembang dipilih secara purposive sampling. Data dikumpulkan melalui kuesioner dan dianalisis secara deskriptif. Hasil penelitian menunjukkan bahwa 48,9% responden memiliki postur yang buruk saat melakukan deadlift, dan mayoritas (66,7%) mengangkat beban berat ($\geq 70\%$ dari 1RM). Nyeri muskuloskeletal paling sering dilaporkan pada punggung bawah (85,3%), diikuti oleh pantat (8,8%) dan bahu kanan (5,9%). Sebagian besar responden mengalami nyeri ringan (37,8%) atau tidak mengalami nyeri sama sekali (37,8%), sementara nyeri sedang dilaporkan oleh 24,4% responden. Tidak ditemukan keluhan nyeri berat. Hasil ini menunjukkan bahwa meskipun deadlift dapat menyebabkan ketidaknyamanan muskuloskeletal, intensitas nyeri yang dialami umumnya masih dapat ditoleransi.

ABSTRACT

Distribution And Intensity of Musculoskeletal Pain Among Recreational Deadlift Users In Palembang: A Cross-Sectional Study. Deadlift is a resistance training exercise commonly used to enhance muscle strength, but improper technique can increase the risk of musculoskeletal pain. This study aimed to analyze the distribution and intensity of musculoskeletal pain in recreational deadlift users using a cross-sectional design. A total of 42 respondents from two gym communities in Palembang were selected through purposive sampling. Data were collected via questionnaires and analyzed descriptively. The results showed that 48.9% of respondents had poor posture during deadlift, and the majority (66.7%) lifted heavy loads ($\geq 70\%$ of 1RM). Musculoskeletal pain was most frequently reported in the lower back (85.3%), followed by the glutes (8.8%) and the right shoulder (5.9%). Most respondents experienced mild pain (37.8%) or no pain at all (37.8%), while moderate pain was reported by 24.4% of respondents. No cases of severe pain were recorded. These findings indicate that although deadlift can cause musculoskeletal discomfort, the pain intensity is generally tolerable.

INTRODUCTION

The deadlift is a widely practiced form of resistance training within the fitness and weightlifting community.¹ It is commonly utilized by individuals aiming to enhance muscular strength, particularly targeting the lower back, hamstrings, and gluteal muscles. Additionally, the deadlift is classified as a functional exercise, contributing to improved postural stability and overall body balance.² Nevertheless, improper technique and excessive loading relative to an individual's capacity may elevate the risk of musculoskeletal injuries, especially among recreational deadlift practitioners who lack adequate training experience.¹

Musculoskeletal pain represents a prevalent complaint among individuals engaging in resistance exercises. Variables such as exercise technique, frequency, duration, and intensity are recognized as significant contributors to the onset of such discomfort. Although numerous studies have investigated the broader effects of resistance training, evidence concerning the specific patterns and intensity of pain experienced by recreational deadlift users remains limited.^{2,3}

This study aims to describe the distribution and intensity of musculoskeletal pain in recreational deadlift practitioners. By identifying pain patterns associated with this exercise, the findings are expected to offer valuable insights for fitness professionals and deadlift users in developing effective injury prevention strategies and optimizing exercise technique. This research adopts a descriptive, cross-sectional design to assess pain location and severity within the targeted population comprehensively.⁴

METHODS

This study employed a descriptive, cross-sectional design aimed at evaluating the distribution and intensity of musculoskeletal pain among recreational deadlift practitioners. The research was conducted between July 30 and November 10, 2024, at Gym Espresso and Gym Boxx in Palembang, Indonesia. Participants were selected using purposive sampling based on predefined inclusion and exclusion criteria, yielding a total of 42 respondents determined through a two-population proportion estimation formula. Eligible participants included individuals aged 18–50 years who regularly performed deadlifts, either independently or under the supervision of a personal trainer, and with or without the use of a weightlifting belt. Individuals with a history of low back pain caused by infection, malignancy, scoliosis, or congenital spinal abnormalities were excluded from the study.

Data was collected using a questionnaire incorporating the Nordic Musculoskeletal Questionnaire (NMQ) to assess pain distribution across different body regions and the Visual Analog Scale (VAS) to measure pain intensity. The collected data were analyzed using descriptive statistical methods to illustrate the patterns of musculoskeletal pain experienced by respondents. Incomplete or invalid responses were excluded from the final analysis. Ethical approval for this study was granted by the Health and Medical Research Ethics Committee of the Faculty of Medicine, Universitas Sriwijaya, under certificate number 128-2024, issued on June 20, 2024.

RESULTS

In this study, the distribution of respondents based on posture during deadlift exercises revealed that 23 participants (51.1%) demonstrated good posture, while 22 participants (48.9%)

exhibited poor posture. These findings suggest that nearly half of the respondents performed deadlifts with suboptimal form, potentially increasing their risk of developing musculoskeletal pain.

Regarding training frequency, the majority of respondents (66.7%) reported performing deadlifts less than twice per week, while 15 participants (33.3%) engaged in the exercise more than twice weekly. In terms of load intensity, most respondents (66.7%) lifted heavy weights, defined as $\geq 70\%$ of their one-repetition maximum (1RM), whereas 15 individuals (33.3%) used lighter loads ($< 70\%$ of 1RM).

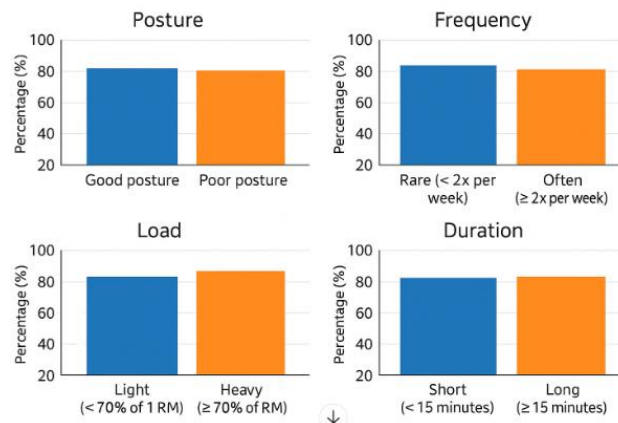


Figure 1. Characteristics of respondents' deadlift performance.

Higher training frequency, heavier lifting loads, and suboptimal body posture were recorded as more prevalent compared to other categories.

Training duration was also recorded, showing that 23 respondents (51.1%) completed their deadlift sessions in under 15 minutes, while 22 respondents (48.9%) trained for 15 minutes or longer. This distribution indicates that a slight majority of participants preferred shorter deadlift sessions.

The distribution of musculoskeletal pain among recreational deadlift users indicated that the lower back was the most commonly affected area, reported by 29 respondents (85.3%). The gluteal region was the second most frequently reported pain site, with 3 respondents (8.8%) experiencing discomfort in this area.

Pain in other body regions was relatively uncommon; the right shoulder was the only upper extremity site affected, with 2 respondents (5.9%) reporting symptoms. No cases of pain were reported in the neck, upper back, arms, elbows, wrists, thighs, knees, calves, or feet. These findings suggest that musculoskeletal pain associated with deadlift exercises predominantly occurs in body regions directly involved in load-bearing movements, particularly the lower back and pelvic area.

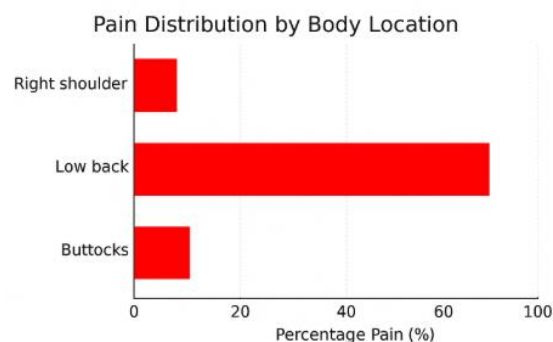


Figure 2. Distribution of respondents' musculoskeletal pain.

The majority of respondents reported pain in the lower back, which serves as the primary working area during deadlift movements.

Regarding pain intensity, most respondents reported either mild pain (1–4) or no pain (0) at all, each accounting for 17 respondents (37.8%). Moderate pain (5–7) was reported by 11 participants (24.4%), while no cases of severe pain (scores of 8–10) were recorded.

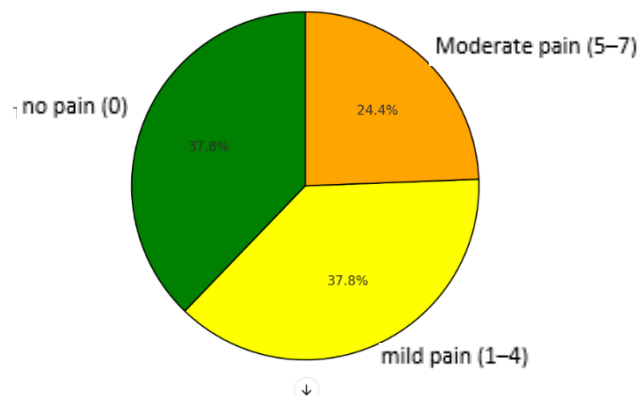


Figure 3. Intensity of respondents' musculoskeletal pain.

The majority of respondents experienced either mild pain (37.8%) or no pain at all (37.8%).

DISCUSSION

Postural alignment during deadlift exercises is a critical factor influencing the risk of musculoskeletal injury. The findings of this study revealed that nearly half of the respondents (48.9%) demonstrated poor posture while performing deadlifts. Suboptimal posture may increase mechanical stress on the lower back due to uneven load distribution, predisposing individuals to injury. Previous studies have similarly reported that improper lifting techniques can elevate intervertebral disc pressure and contribute to a higher incidence of lower back pain, particularly among weightlifting athletes.^{5,6}

Training frequency also plays a role in the distribution of musculoskeletal complaints. In this study, most respondents (66.7%) performed deadlifts fewer than twice per week, which may suggest insufficient neuromuscular adaptation to the imposed loads. Conversely, 33.3% of participants engaged in deadlifts more than twice weekly, potentially increasing the risk of pain due to cumulative mechanical stress on musculoskeletal tissues. Earlier research indicated that high training frequencies without adequate technique supervision could lead to an increased occurrence of muscle soreness and overuse injuries.^{7,8}

Load intensity represents another important factor associated with musculoskeletal pain. The majority of respondents (66.7%) lifted heavy loads ($\geq 70\%$ of their 1RM), which may heighten biomechanical stress on muscles and joints, particularly in the lower back region. Biomechanical studies have demonstrated that lifting heavy loads elevates intra-abdominal pressure and spinal shear forces, thereby increasing the risk of injury.⁹

The distribution of musculoskeletal pain in this study showed that the lower back was the most frequently reported site (85.3%), followed by the gluteal region (8.8%) and the right shoulder (5.9%). These findings are consistent with previous literature indicating that the lower back is the

most vulnerable area during heavy lifting tasks, especially when proper technique is not maintained. The absence of pain reports in the neck, upper back, upper limbs, and lower extremities suggests that biomechanical loading during deadlifts is concentrated primarily on the posterior chain of the lower body.¹⁰

Most respondents in this study reported either mild pain (37.8%) or no pain (37.8%), while moderate pain was reported by 24.4% of participants. No cases of severe pain were documented. These results indicate that although deadlift exercises may cause musculoskeletal discomfort, the intensity is generally tolerable. Contributing factors such as exercise adaptation, appropriate technique, and the use of supportive equipment like lifting belts likely play a role in mitigating pain severity.¹¹

These findings highlight the importance of proper education regarding safe and effective lifting techniques, as well as individualized load adjustments. The involvement of qualified fitness professionals is also crucial for posture correction and load management, ultimately reducing the risk of pain and injury associated with deadlift exercises.¹²

CONCLUSION

The findings of this study indicate that the lower back is the primary site of musculoskeletal pain among recreational deadlift practitioners. Most respondents reported experiencing either mild pain or no pain at all. However, factors such as poor postural alignment, along with training frequency, load intensity, and session duration, were identified as contributing variables that may increase the risk and severity of musculoskeletal discomfort.

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