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LOW BACK PAIN AMONG RECREATIONAL GYM WEIGHTLIFTERS: PREVALENCE, SEVERITY, AND ASSOCIATED FACTORS

Zubaida Yousaf [*1], Shahzad Ahmad[2], Etisam Wahid[3], Abdullah[4], Hifsa Shah Akhunzadi[5], Shaheen Abdullah[6], Adnan Haleem[7], Ayesha Nisar[8]

[*1]*Consultant Physical Therapist - Helping Hand for Relief and Development (HHRD), Lakki Marwat, KP, Pakistan*
[2]*Assistant Professor - Physical Therapy, University of Veterinary and Animal Sciences (UVAS), Swat, KP, Pakistan*
[3]*Lecturer - Physical Therapy, University of Veterinary and Animal Sciences (UVAS), Swat, KP, Pakistan*
4Lecturer - PEF Post Graduate College, Peshawar, KP, Pakistan
[5]*Consultant Physical Therapist, Spine Care Rehabilitation Center, Peshawar, KP, Pakistan*
[6]*Lecturer - Physical Therapy, University of Veterinary and Animal Sciences (UVAS), Swat, KP, Pakistan*
[7]*Lecturer – Pathology, University of Veterinary and Animal Sciences (UVAS), Swat, KP, Pakistan*
[8]*Consultant Physical Therapist, Mahaban Hospital Topi, Swabi, KP, Pakistan*

[*1]zubikhan2542@gmail.com, [2]drshahzad@uvasswat.edu.pk, [3]dr.etisam@uvasswat.edu.pk, [4]abdullahsaeedkhan188@gmail.com, [5]Hifsa1.shah@gmail.com, [6]eagleschoice007@gmail.com, [7]Adnan.haleem@uvasswat.edu.pk, [8]ayeshanisar224@gmail.com

[2]0001-0001-6319-7934, [3]0009-0009-0227-3735, [6]0009-0007-8578-4391
[8]0009-0003-7459-1093

Corresponding Author: *
Shahzad Ahmad
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ABSTRACT

Background: *Low back pain is among the most prevalent musculoskeletal disorders globally and is a significant factor contributing to disability and reduced quality of life. Weightlifting entails repetitive stress on the spine and may intensify the likelihood of back pain, especially if practiced with poor technique or disproportionate weight.*

Objective: *To determine the prevalence of low back pain among weightlifters in gyms of Hayatabad, Peshawar, and to describe pain characteristics, severity, timing, and associated factors.*

Material & Methods: *A cross-sectional descriptive study was conducted from March to September 2021 in selected gyms of Hayatabad, Peshawar. A total of 278 weightlifters (161 males, 117 females) aged 18 to 50 were recruited through non-probability convenience sampling. Individuals with previous spinal conditions, injuries, concerning symptoms, systemic illnesses, or those who are pregnant were not included. Data were gathered employing the Modified Nordic Musculoskeletal Questionnaire. Descriptive statistics such as frequencies, percentages, means, and standard deviations were analysed using SPSS version 25.*

Results: *Of the 278 participants, 199 (71.6%) reported low back pain. A total of 105 (37.8%) participants reported mild pain, 74 (26.6%) reported moderate pain, and 20 (7.2%) reported severe pain. Low back pain occurred most frequently after weightlifting (32.7%), followed by during*

weightlifting (29.9%). The standing posture while lifting and handling weights of 20–25 kg was often linked to low back pain. The most frequently mentioned effective treatment was physical therapy.

Conclusion: *Low back pain is highly prevalent among weightlifters attending gyms, especially in young adults and males. Discomfort often arises during or following weightlifting, indicating a possible involvement of muscular fatigue and biomechanical strain. These results emphasize the importance of appropriate lifting methods, preventive measures, and rehabilitation-oriented approaches in fitness settings.*

Keywords: *Low back pain; Weightlifting; Rehabilitation; Physical therapy; Prevalence; Musculoskeletal disorders; Gym-based exercise*

INTRODUCTION

Low back pain (LBP) is among the most common musculoskeletal conditions globally and is a primary contributor to disability in individuals of all ages(1). It is typically characterized as pain or discomfort situated between the twelfth rib and the lower gluteal folds, with or without radiation to the legs(2). LBP significantly impacts quality of life, leads to more work absenteeism, and increases healthcare usage, resulting in a considerable socioeconomic strain on individuals and health systems(3).

The causes of low back pain are intricate and involve multiple factors. Mechanical stress, improper posture, repetitive actions, muscle imbalances, psychological strain, and lifestyle factors all contribute to the onset of LBP(4). In numerous instances, LBP is regarded as non-specific, meaning there is no discernible pathological reason, but symptoms continue and disrupt daily activities(5). Epidemiological research indicates that as many as 84% of people will encounter low back pain at least once in their lives, with prevalence rates differing by region and population(6). Exercise is commonly encouraged for musculoskeletal well-being; however, certain types of physical activity could heighten the risk of LBP if done improperly or excessively. Weightlifting is a well-liked type of resistance training focused on enhancing muscle strength, growth, and overall fitness. It entails raising external weights via intricate movement patterns that exert significant compressive and shear forces on the lumbar spine(7). Movements like squats, deadlifts, and Olympic lifts demand synchronized engagement of core and lower body muscles to preserve spinal stability while under load. Incorrect lifting methods, overly heavy training loads, lack of supervision, and weak core muscles have been recognized as possible risk factors for low back pain in weightlifters(8, 9). Biomechanical research shows that loading on the lumbar spine escalates considerably during flexion and extension motions with heavy weights, potentially putting individuals at risk for muscular strain, ligament injuries, or stress on intervertebral discs(10). Continuous exposure to mechanical stress without proper recovery can result in both acute and chronic lower back pain.

Young adults and casual gym-joiners fall into a group of significant concern. The rising number of commercial gyms and fitness centres has resulted in higher engagement in weightlifting exercises, frequently lacking professional guidance or personalized training regimens(11). Teenagers and young adults might be particularly at risk because of intense training, competitive drive, and a lack of knowledge regarding injury prevention methods(12). Earlier research has indicated a significant occurrence of low back pain in weightlifters and strength-training athletes, with figures varying from 23% to more than 80% based on the level of training and evaluation techniques used(13). Although weightlifting is becoming more popular, there is still a lack of epidemiological data regarding low back pain in recreational weightlifters from developing nations. The majority of current research comes from high-income or developed countries, creating a notable lack of understanding about low back pain prevalence and features in low- and middle-income areas(14).

In Pakistan, there is limited published information concerning weightlifters who attend gyms and their musculoskeletal health, especially

in the areas of rehabilitation and physical therapy. Grasping the frequency, intensity, and traits of low back pain in weightlifters is crucial for creating specific preventive measures, enhancing training methods, and directing rehabilitation efforts. Recognizing pain patterns and related factors can help physical therapists and healthcare professionals in creating evidence-based exercise prescriptions, injury prevention strategies, and initial management plans. The purpose of this research was to assess the prevalence of low back pain in weightlifters at gyms in Hayatabad, Peshawar, and to detail pain intensity, occurrence, and associated features utilizing a standardized musculoskeletal evaluation tool.

Material and Methods

Study Setting & Sampling

A descriptive cross-sectional study was conducted to determine the prevalence of low back pain among weightlifters attending selected gyms in Hayatabad, Peshawar. The study population consisted of male and female recreational weightlifters aged 18 to 50 years who were actively participating in gym-based weightlifting activities during the study period. Data were collected over a six-month period from March to September 2021.

A non-probability convenience sampling technique was used to recruit participants from the selected gyms.The sample size was calculated using an online RaoSoft sample size calculator. Assuming a population size of 1,000 gym-going weightlifters, a confidence level of 95%, and a margin of error of 5%, the required sample size was estimated to be 278 participants. The data was collected from multiple commercial and institutional gyms located in Hayatabad, Peshawar, Khyber Pakhtunkhwa, Pakistan. Data collection took place in the following gyms: RMI Gym, Hayatabad Sports Complex Gym, Iraq University Gym, Hayatabad Squash Court Gym, Fitness First Gym, World Gym, Qazi Bodybuilding Gym, and Fit Man Fitness Gym.

Eligibility Criteria

Inclusion Criteria

- Male and female weightlifters aged 18–50 years
- Individuals actively engaged in weightlifting exercises in gym settings

Exclusion Criteria

- History of spinal cord injury, disc herniation, trauma, or deformity
- Presence of red-flag conditions, including spinal infection, fracture, tuberculosis, malignancy, congenital spinal disorders, or cauda equina syndrome
- Known systemic disease affecting the musculoskeletal system
- Pregnant women
- Individuals younger than 18 years or older than 50 years

Variables

Chronic lower back pain was considered as the dependent variable. The independent variables consisted of age, sex, stature, mass, body mass index (BMI), weightlifting stance, and the quantity of weight lifted. Body weight was measured in kilograms and height in meters following standardized methods. BMI was determined by dividing body weight (kg) by height squared (m^2) and classified based on the International Obesity Task Force standards for Asian populations: underweight (<18.5 kg/m^2), normal (18.5–24.99 kg/m^2), overweight/pre-obese (25–29.99 kg/m^2), and obese (≥30 kg/m^2).

Data Collection Tools, Procedure & Analysis

Data were collected using the Modified Nordic Musculoskeletal Questionnaire. The survey was used to assess the presence, severity, duration, and characteristics of low back pain in participants. It included elements related to the onset of pain, pain severity, restrictions in activity, treatment given, and the timing of pain associated with weightlifting exercises. Data were analyzed with the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics were employed to condense the data. Frequencies and percentages were determined for categorical variables, whereas means and standard deviations were employed for continuous variables. Results were displayed in tables and figures as necessary.

Ethical Approval and Informed Consent

Permission to conduct the research was obtained from the relevant institutional authorities and gym management. Ethical approval for the research was secured from the review board of Pakistan Educational Foundation (PEF) Post Graduate College, Peshawar. Authorization was secured from gym officials before the data collection process. Informed written consent was secured from all participants prior to their enrollment, and the confidentiality of participant information was upheld during the entire study. Participants were approached in the gym setting and informed about the purpose of the study. After obtaining written informed consent, participants were instructed on how to complete the questionnaire. Participants filled out the questionnaires themselves, receiving explanations when necessary.

Results

Participant Characteristics

The study included 278 weightlifters, comprising 161 males (57.9%) and 117 females (42.1%). The average age of participants was 27.88 ± 7.67 years. The average height was 1.70 ± 0.09 m, and the average body weight was 72.09 ± 11.84 kg. According to BMI classification, 18 individuals (6.5%) were classified as underweight, 125 (45.0%) had a normal BMI, 99 (35.6%) were classified as overweight, and 36 (12.9%) were categorized as obese.

Table 1. Demographic Characteristics of Participants (N = 278)

Variable		n (%) / Mean ± SD
Age (in years')		27.88 ± 7.67
Height (in meters')		1.70 ± 0.09
Weight (in kgs')		72.09 ± 11.84
Gender	Male	161 (57.9%)
	Female	117 (42.1%)
Body Mass Index (BMI)	Underweight (<18.5 kg/m²)	18 (6.5%)
	Normal (18.5–24.99 kg/m²)	125 (45.0%)
	Overweight (25–29.99 kg/m²)	99 (35.6%)
	Obese (≥30 kg/m²)	36 (12.9%)
Total (n)		278 (100%)

Prevalence of Low Back Pain in Gym-lifters

As indicated in Table 2, 199 individuals reported suffering from low back pain, resulting in a total prevalence of 71.6%. Of these, 179 participants (64.4%) identified weightlifting activities as the specific cause of their low back pain, whereas 79 participants (28.4%) claimed they had no prior history of low back pain. The prevalence of low back pain was greater in males compared to females; nonetheless, both sexes exhibited a significant burden of symptoms (Fig. 1).

Table 2. Prevalence of Low Back Pain Among Weightlifters

Variable	n (%)
Reported low back pain	199 (71.6%)
No low back pain	79 (28.4%)
Low back pain attributed to weightlifting	179 (64.4%)
Total (n)	278 (100%)

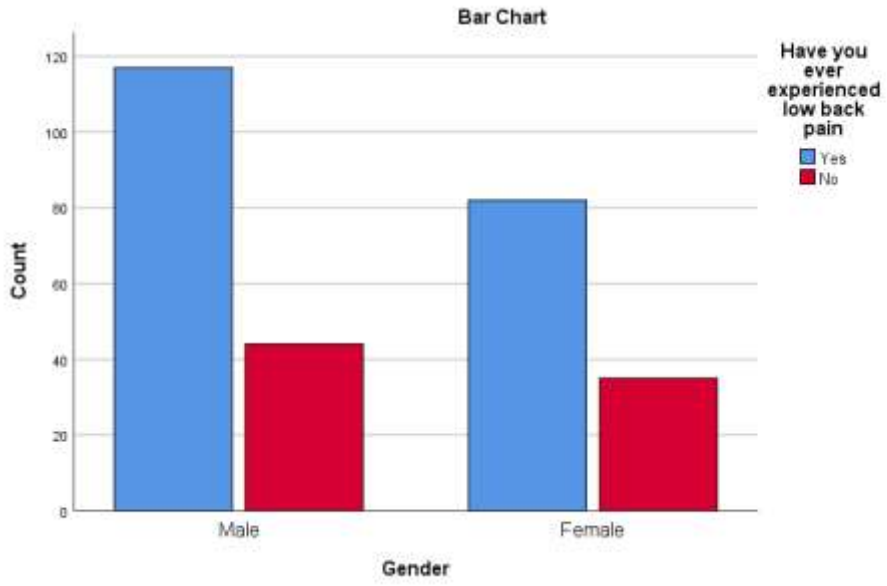

Figure 1. Prevalence of Low Back Pain Among Weightlifters

Clinical Characteristics of Low Back Pain within the Pain-affected group

Table 2 presents Clinical Characteristics of Low Back Pain within the Pain-affected group (n=199). In terms of symptom presentation, pain emerged as the most commonly reported symptom, impacting 91 participants (32.7%), followed by stiffness in 41 participants (14.7%), aching in 38 participants (13.7%), cramps in 23 participants (8.3%), tingling in 4 participants (1.4%), and numbness in 2 participants (0.7%). A total of 79 participants (28.4%) indicated they did not experience any symptoms related to low back pain. The intensity of pain differed among the individuals. Mild low back pain was experienced by 105 participants (37.8%), moderate pain by 74 participants (26.6%), and severe pain by 20 participants (7.2%). The other 79 participants (28.4%) indicated that they felt no pain. The occurrence of low back pain associated with gym activities was most common within 0–1 month for 78 participants (28.1%), then 1–3 months for 49 participants (17.6%), over 6 months for 27 participants (9.7%), and 3–4 months for 20 participants (7.2%). Twenty-five participants (9.0%) were uncertain about the duration of onset.

Table 2. Clinical Characteristics of Low Back Pain in the Pain-impacted population (N = 199)

Variable	Category	n (%)
Symptoms	Pain	91 (32.7%)
	Stiffness	41 (14.7%)
	Aching	38 (13.7%)
	Cramps	23 (8.3%)
	Tingling	4 (1.4%)
	Numbness	2 (0.7%)
Pain severity	Mild	105 (37.8%)
	Moderate	74 (26.6%)
	Severe	20 (7.2%)
Pain duration	0–1 month	78 (28.1%)
	1–3 months	49 (17.6%)

	3–4 months	20 (7.2%)
	>6 months	27 (9.7%)
	Uncertain	25 (9.0%)
Total (n)	199 (79.16%)	

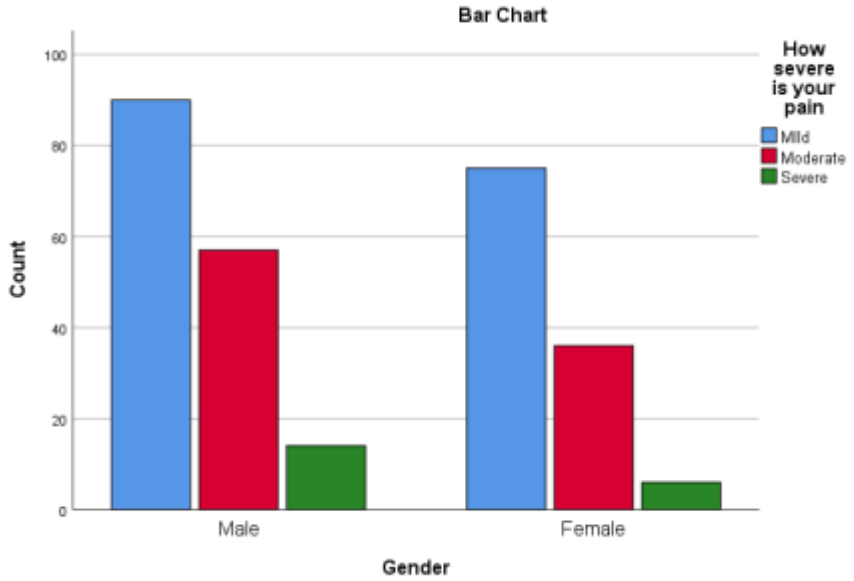

Figure 2. Severity Distribution of Low Back Pain among weightlifters

Functional Impact, Management, and Outcomes in the Pain-impacted population

Low back pain limited daily or gym-related activities in 102 participants (36.7%), while 97 participants (34.9%) reported no activity limitation. Clinical assessment by a healthcare professional was reported by 87 participants (31.3%), whereas 112 participants (40.3%) had not sought clinical evaluation for their condition.

Among participants with low back pain, 63 (22.7%) received physical therapy, 66 (23.7%) used medication, and 52 (18.7%) reported other forms of treatment. No treatment was reported by 97 participants (34.9%). Improvement following treatment was reported by 145 participants (52.2%), while 46 participants (16.5%) reported no change, and 8 participants (2.9%) reported worsening of symptoms.

Table 3. Functional Impact, Management, and Outcomes in the Pain-impacted population (N = 199)

Variable	Category	n (%)
Activity limitation	Yes	102 (36.7%)
	No	97 (34.9%)
Clinical assessment	Assessed by clinician	87 (31.3%)
	Not assessed	112 (40.3%)
Treatment received	Physical therapy	63 (22.7%)
	Medication	66 (23.7%)
	Other	52 (18.7%)
	None	97 (34.9%)
Treatment outcome	Improved	145 (52.2%)
	Unchanged	46 (16.5%)
	Worsened	8 (2.9%)
Total (n)	199 (79.16%)	

Weightlifting-Related Factors Associated with Low Back Pain

A standing position while weightlifting was noted by 125 participants (45.0%), followed by a sitting position in 40 participants (14.4%) and a lying position in 34 participants (12.2%). The weight range most frequently linked to low back pain was 20–25 kg, as stated by 70 individuals (25.2%). Subsequently, there were 10–15 kg in 58 individuals (20.9%), 30–35 kg in 41 individuals (14.7%), and 15–20 kg in 27 individuals (9.7%). Low back pain primarily arose post-weightlifting, as reported by 91 individuals (32.7%). Pain during weightlifting was reported by 83 participants (29.9%), and pain before weightlifting by 25 participants (9.0%).

Table 4. Weightlifting-Related Factors Associated with Low Back Pain (N = 199)

Variable	Category	n (%)
Lifting position	Standing	125 (45.0%)
	Sitting	40 (14.4%)
	Lying	34 (12.2%)
Load associated with pain (kg)	10–15	58 (20.9%)
	15–20	27 (9.7%)
	20–25	70 (25.2%)
	25–30	3 (1.1%)
	30–35	41 (14.7%)
Timing of pain	Before lifting	25 (9.0%)
	During lifting	83 (29.9%)
	After lifting	91 (32.7%)
Total (n)	278 (100%)	

Discussion

This research examined the prevalence and clinical features of low back pain in recreational weightlifters visiting gyms in Hayatabad, Peshawar. The results indicate a significant occurrence of low back pain (71.6%), with most affected individuals experiencing mild to moderate symptoms. These findings emphasize low back pain as a prevalent musculoskeletal issue among weightlifters at the gym and highlight its importance in rehabilitation and physical therapy.

The occurrence of low back pain noted in this study aligns with earlier findings that highlight a significant burden of lumbar spine issues in individuals participating in resistance training. Epidemiological research indicates that low back pain impacts as much as 84% of people at some stage in their lives, with increased occurrence noted in physically active groups subjected to repetitive spinal stress(1, 6). Research on weightlifters and strength-training athletes has found prevalence rates between 23% and more than 80%, influenced by factors such as training intensity, supervision level, and assessment techniques(7, 11, 13). The elevated prevalence noted in this study could be linked to regular exposure to mechanical strain, poor lifting methods, and a lack of focus on core stabilization during weightlifting activities. Leisure gym-goers frequently exercise without expert guidance, potentially raising the likelihood of musculoskeletal strain and injury(9).

The majority of participants indicated mild to moderate low back pain, whereas a lesser number encountered severe symptoms. This distribution is consistent with current literature showing that most cases of low back pain in physically active groups are non-specific and range from low to moderate intensity(2). Even though mild pain might seem clinically unimportant, if recurrent or persistent symptoms are not properly managed, they can develop into chronic low back pain and result in functional limitations(5). Pain commonly manifested during or following weightlifting exercises, indicating a link between mechanical load, muscle fatigue, and stress on the lumbar

spine. Earlier biomechanical research has shown heightened compressive and shear forces on the lumbar spine during resistance exercises like squats and deadlifts, especially when done under fatigue or with poor technique(8, 10).

In this study, pain onset was frequently linked to standing while lifting moderate-to-heavy loads. Biomechanical evidence supports these findings, demonstrating that spinal loading rises markedly during upright lifting activities, particularly when trunk control is impaired(15). Weakness in core muscles and poor lumbopelvic coordination have been recognized as factors contributing to low back pain in weightlifters(16). The timing of pain, mostly appearing after weightlifting, could suggest delayed onset muscle fatigue or microtrauma to lumbar tissues. Muscle fatigue is known to change movement patterns and decrease spinal stability, which raises the likelihood of injury(17). Over one-third of participants indicated activity restrictions caused by low back pain, emphasizing its functional effects even on young and recreationally active people. Nonetheless, a significant number of participants refrained from obtaining clinical evaluation, indicating a widespread habit of underreporting or managing musculoskeletal pain independently within athletic groups(18).

The treatment most commonly reported as effective was physical therapy, with most participants who received it indicating improvement. This result aligns with evidence that endorses exercise rehabilitation, manual therapy, and education as effective treatments for both acute and chronic low back pain. Approaches centered on rehabilitation that highlight movement control, load management, and correction of technique are especially significant for weightlifters(19-21).

The results of this research carry significant consequences for rehabilitation professionals and physical therapists. Timely recognition of low back pain signs, instruction on correct lifting methods, and the establishment of preventive exercise routines could alleviate the impact of low back pain on recreational weightlifters. Injury prevention strategies in the gym should focus on core stabilization, gradually increasing load, and supervised workouts.

Limitations

This research has various limitations that must be taken into account when analyzing the results. Initially, the cross-sectional design restricts the capacity to determine causal links between weightlifting factors and the onset of low back pain. The correlations noted in this research cannot establish temporal or cause-and-effect relationships.

Secondly, data were gathered through a self-reported questionnaire, which could be influenced by recall bias and reporting bias. Participants might have either understated or overstated symptoms, pain intensity, or training factors. Objective clinical evaluations and biomechanical assessments were not conducted.

Third, employing non-probability convenience sampling might restrict the applicability of the results to all weightlifters or individuals who go to the gym, especially those in varying locations or training settings. Moreover, the training volume, frequency, quality of lifting techniques, and level of supervision were not evaluated quantitatively, potentially impacting pain results. Ultimately, psychological aspects, lifestyle factors, and previous physical activity history were not examined, even though their impact on low back pain is well established.

Recommendations

Drawing from the results of this research, numerous suggestions can be made. Future studies ought to utilize longitudinal or prospective designs to determine causal risk factors and injury mechanisms linked to low back pain in weightlifters. Integrating objective evaluations, including biomechanical assessments, muscle strength measurements, and clinical assessments, would improve methodological robustness.

From a clinical standpoint, physical therapists and rehabilitation experts must prioritize injury prevention techniques in gym environments. This encompasses training on correct lifting methods, gradual load management, core stability exercises, and sufficient recovery time. Developing guided training programs and prompt referrals to physical therapy could aid in minimizing symptom escalation and functional constraints.

Gym owners and fitness trainers ought to be motivated to adopt organized screening and educational initiatives designed to lower the risk of musculoskeletal injuries. Public health efforts emphasizing safe resistance training techniques could further help lessen the prevalence of low back pain in recreational weightlifters.

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