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The impact of fibromyalgia: A cross-sectional examination across different life domains

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Abstract

Background: Fibromyalgia is a complex, multifactorial chronic pain syndrome characterized by widespread musculoskeletal pain. Its symptoms significantly impact patients' quality of life, functional capacity, autonomy, and the ability to work or engage in leisure activities. **Aims:** Given the numerous hypotheses regarding the etiology of fibromyalgia, the difficulties faced by healthcare professionals in its diagnosis and management, and its substantial negative impact on the quality of life of those affected, this study aims to characterize the patient sample and assess the condition's impact across various life domains. **Methods:** A cross-sectional study was conducted with participants of both sexes, achieving a statistical power of 99%. **Results:** A higher prevalence of fibromyalgia was observed in individuals who reported being in a stable union (71.76%) and who possessed higher education (45.78%). The majority (56.47%) reported "very severe" pain. Significant differences were found in all evaluated domains: leisure, work, self-care, ability to exercise, functionality, and quality of life, indicating a significant deterioration following fibromyalgia diagnosis. **Conclusion**: The observed pattern of functional decline across various domains supports the allostatic load model of chronic pain and provides empirical evidence for the fear-avoidance model. **Relevance for patients:** Integrated treatments addressing physical and psychological aspects simultaneously may be, therefore, more effective.

Keywords: Epidemiology; Chronic pain; Quality of life; Public health

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1. Introduction

Fibromyalgia is a complex, multifactorial chronic pain syndrome primarily characterized by widespread musculoskeletal pain without evidence of inflammation in the painful areas.[1-3] It affects 2–10% of the global population, with a higher prevalence among women.[2,4,5] In Brazil, the general population prevalence is reported to be 2.5%.[1]

Classic nociplastic pain is a hallmark of fibromyalgia, manifesting as hyperalgesia, an exaggerated perception of pain in response to mildly painful stimuli, and allodynia, the perception of pain from normally non-painful stimuli.[4,6-8] Beyond pain, fibromyalgia is associated with fatigue, sleep disturbances, and cognitive dysfunction, all of which significantly impact patients' quality of life.[9-11] These symptoms often lead to a decline in self-care, functional capacity, autonomy, and the ability to work or engage in leisure activities, thereby exacerbating the overall burden on patients.[12-14] To date, no objective

test or specific biomarker with sufficient diagnostic accuracy has been identified; however, emerging findings from proteomic research and gene expression profiling show potential for developing novel diagnostic methods.[15]

As such, the onset of fibromyalgia symptoms marks a significant shift in individuals' functional, social, and emotional lives.[16] Research employing health questionnaires repeatedly shows that people with fibromyalgia suffer considerable disadvantages across multiple domains of health status (i.e., physical ability, social interaction, physical discomfort, overall well-being, energy levels, social functioning, and mental health) compared to the general population and other chronic pain conditions.[9] Fibromyalgia patients often struggle to fulfill their professional responsibilities, resulting in decreased output, higher rates of absenteeism, and presenteeism, where individuals are physically present but perform at a subpar level.[2,12,14] The intensification of symptoms directly correlates with decreased work productivity.[17] For example, a study in Australia found that among women with fibromyalgia, 54.2% worked full-time and 21.5% part-time at symptom onset, but 5 years later, only 15.6% worked full-time, and 44.8% were no longer engaged in paid employment.[18] Leisure activities are also adversely affected, as patients often lack the energy or physical capacity for recreational pursuits, leading to social and emotional isolation.[13,19] Research has found that the majority of women with fibromyalgia experience pain and fatigue for more than 90% of their waking hours, thereby reducing their enjoyment of leisure activities.[19]

Psychological factors, including anxiety, depression, and coping mechanisms, are significant contributors to the deterioration of quality of life and physical functioning in individuals with fibromyalgia.[13,14] Depression and anxiety are common comorbidities that worsen pain perception, fatigue, and sleep problems, thereby making it even more difficult for patients to participate in self-care and maintain their independence. Features such as pain catastrophizing and self-efficacy, one's perceived ability to cope with stressful situations, affect the impact of pain on daily activities, regardless of pain intensity. Research has found that catastrophizing about pain is linked to a greater detrimental effect on daily life tasks.[20]

Engaging in physical activity and exercise is widely acknowledged as a vital component for managing fibromyalgia's impact on health.[21,22] Individuals with fibromyalgia frequently exhibit avoidance behaviors, prioritizing pain prevention over achieving physical activity and exercise objectives.[23] Avoidance of movement (kinesiophobia) is negatively associated with self-efficacy, partly mediated by general fatigue and the functional impact of fibromyalgia.[23,24] Over time, this behavior can lead to impaired functionality, physical disability, and a rise in negative mood, contributing to a psychological feeling of helplessness that, if prolonged, may result in depression.[25,26] Conversely, maintaining physical activity is associated with a lower perception of functional limitation despite pain.[24] Despite these obstacles, physical activity is a recommended treatment option for individuals with fibromyalgia, even though pain, fatigue, and decreased mobility frequently limit their participation.[11,27]

Despite the south of Brazil being a significant hub for healthcare development, the state of Paraná still shows a scarcity of research in this area.[28] Understanding diseases and dispelling misconceptions about them requires a comprehensive epidemiological profile, which in turn enables the development of informed public policy.[29] Although fibromyalgia is not a contagious condition necessitating public health control measures, it has a significant impact on individuals with the syndrome as well as their family members.[30] Given the numerous hypotheses about the cause of fibromyalgia, the challenges healthcare professionals face in diagnosing and treating it, and the significant negative effect on the quality of life of those affected, this study aims to gather epidemiological data about fibromyalgia patients in a specific health region in Brazil. The objective is to characterize the sample and its effects across numerous life domains, which can be justified by the scientific and social significance of producing information about the local reality of fibromyalgia, raising awareness of this condition, and contributing to the enhancement of healthcare and quality of life for those affected.

2. Materials and methods

2.1. Study design and setting

This cross-sectional study was conducted as part of a broader project titled "Biopsychosocial Aspects of Individuals Diagnosed with Fibromyalgia." The study population was drawn from the 8th Health Region of the State of Paraná, a region with approximately 350,000 inhabitants. Following a sample size calculation, as detailed in the data analysis section, the study included 85 participants of both sexes. Of these, 84.71% were from the city of Francisco Beltrão, 8.24% from Barracão, and 7.06% from other municipalities. The average monthly income was Brazilian Real (R$) 4,439.10 (standard deviation [SD] = R$ 3,695.77).

2.2. Procedures

The study rigorously adhered to all ethical principles recommended by relevant regulatory bodies. Data collection

commenced only after participants signed the Free and Informed Consent Form, which was included in the study approved by the Research Ethics Committee of the Western Paraná State University (CAAE: 73259023.6.0000.0107). Participants were thoroughly informed about the study's objectives, potential risks, and benefits, as stipulated by current legislation. Each participant was also aware of the option to request individual feedback on their results. Furthermore, it was explained that participants could, at any time, withdraw from participation or request the removal of their information from the study. The sample was selected by convenience through contacts with institutions serving the target population. Data were collected between 2023 and 2025.

Inclusion criteria required participants to report a medical diagnosis of fibromyalgia, with the majority (78.8%) diagnosed by a rheumatologist. Exclusion criteria included being younger than 18 years and non-residence within the jurisdiction of the 8th Regional Health Department of Paraná, Brazil. Moreover, participants who were illiterate were excluded from the investigation, as the study relied on self-reported measures.

To achieve the objectives of this study, participants completed a series of instruments using a digital, individual platform. For this specific investigation, data were extracted from the "Sociodemographic, Health, and Occupational Forms" section. This questionnaire gathered information such as age, sex, non-communicable chronic diseases diagnosis and treatment, fibromyalgia diagnosis, and the duration of living with the condition. In addition, data on profession and field of work, working hours, marital status, and income were collected. These data points were selected based on their relevance to previous investigations with similar objectives.[31,32] To facilitate interpretation and comparison with international studies, participants' responses to these measures were recorded on a 0–10 Likert scale, where higher scores indicated higher agreement. Psychometric properties revealed that participants' understanding of the questions was deemed excellent for both the "perceived impact of fibromyalgia on different life domains" scale and the "satisfaction of individuals on different life domains before and after fibromyalgia diagnosis" scale ($\alpha = 0.90$).

2.3. Statistical analysis

Responses were extracted into Microsoft Excel spreadsheets and carefully checked for potential data entry errors. Jeffrey's Amazing Statistical Program (JASP) (JASP, version 0.19) was utilized for all statistical analyses. For descriptive purposes—the primary objective of this study, which aimed to outline the epidemiological profile—variables were expressed as frequencies, percentages, means, and SDs. Normality tests were conducted to determine the appropriateness of basic inferential statistics, revealing a non-normal distribution of the data. Consequently, non-parametric techniques were employed and are detailed in each respective table. Regarding the study's statistical power, the sample size calculation was performed using G*Power software (version 3.1.9). Inputting the smallest observed effect size along with the achieved sample size yielded a statistical power of 99.36% at an alpha level (α) of 0.05 (Figure 1).

3. Results and discussion

3.1. Sample profile

Fibromyalgia is marked by significant features that affect individuals, encompassing both physical limitations and psychosocial factors. Understanding the characteristics and epidemiological profile of individuals with fibromyalgia can significantly facilitate clinical reasoning and decision-making among multidisciplinary teams. Thus, the current study reports that participants had an average age of 49.71 years (range = 26–69; SD = 9.50), with a notable majority (96.47%) being female, and only 2.70% were older than 65 years. This demographic aligns with prior research in other areas of Brazil, such as a study in the northern region that reported 97% of patients were female.[28] Regarding chronic pain, participants reported, on average, living with pain for 14.82 years (SD = 9.81).

The time since fibromyalgia diagnosis varied widely from 7 months to 40 years (SD = 9.35), with an average of 11.13 years. The prolonged period required to receive a diagnosis is crucial, particularly concerning the associated economic burden of fibromyalgia. Studies indicate that the average interval between initial symptom onset and accurate diagnosis typically ranges from 4 to 10 years. A lengthy diagnostic process, complicated by the complex and subjective presentation of fibromyalgia symptoms, frequently increases the strain on healthcare resources.[33-35]

Table 1 provides an overview of the frequencies and percentages for each category within the analyzed variables. A higher prevalence of fibromyalgia was observed in individuals who reported being married or in a stable union (71.76%) and who possessed higher education levels, with 45.78% having completed higher education. The proportion of individuals with other comorbidities was rather high, with the most common being hypertension (19.72%), respiratory diseases (9.86%), and obesity (9.86%).

These results, depicted in Table 1, show some differences when compared to previous research by Rezende *et al.*,[1]

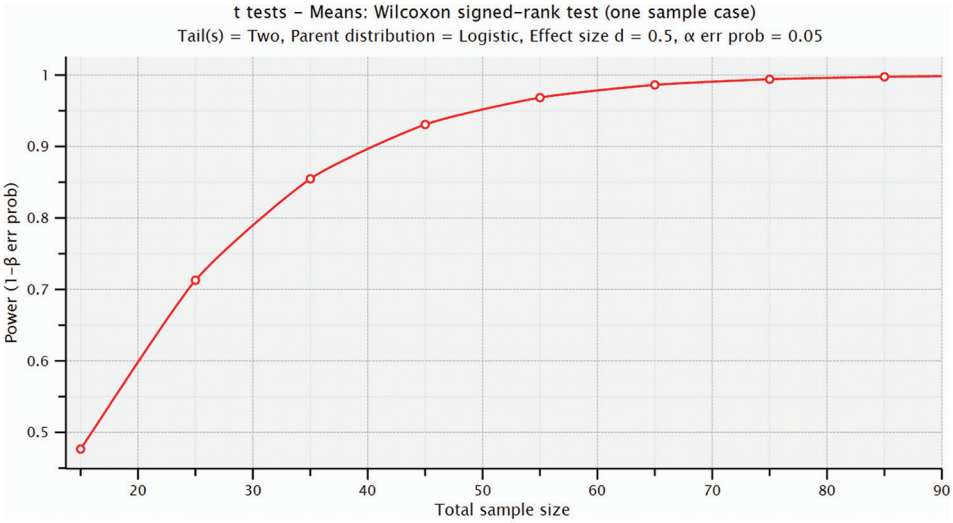

Figure 1. Power calculation plot

which analyzed 500 women diagnosed with fibromyalgia. In their study, 59.4% of women reported being married, a finding consistent with the sample in the current study. However, unlike the present study, they found a higher prevalence of women with complete elementary education, totaling one-third of their sample (37%), with only 8% having completed higher education. This discrepancy in educational attainment might be attributed to differences in sample size, methodology, and demographic characteristics between the studies.

3.2. Fibromyalgia and its impacts

Regarding the severity of pain experienced by participants in the last 30 days, the majority (56.47%) reported "very severe" pain, while 28.24% classified their pain as "moderately severe." Approximately 13% considered the pain "a little severe," and only 2.35% reported "not severe at all." Furthermore, nearly half of the participants (47.62%) reported that pain had a "very great" impact on their lives, and an additional 28.57% considered the impact "extremely great." Another 11.9% felt a "moderate" impact, and 10.71% stated that pain had "a little" impact. Only 1.19% of participants reported no impact from pain on their lives. These findings align with previous research demonstrating links between pain severity and quality of life.[36] In that study, 69.6% of participants rated their pain between 8 and 10 on a subjective scale, and the Fibromyalgia Impact Questionnaire score was 82.46 ± 2.9, collectively indicating a poor quality of life associated with the symptomatic profile of the sample.

Tables 2 and 3 provide data on the "perceived impact of fibromyalgia on different life domains" and "satisfaction of individuals on different life domains before and after fibromyalgia diagnosis." As shown in Table 4, inferential statistics are presented. Significant differences were found in all evaluated domains. Across all assessed dimensions—leisure, work, self-care, ability to exercise, functionality, and quality of life—there was a significant difference between the period "before" and "after" the fibromyalgia diagnosis, with $p<0.001$ in all cases. This indicates that all observed changes have strong statistical evidence and are highly unlikely to have occurred by chance. The *W*-test value, related to the non-parametric Wilcoxon analysis, further confirmed the existence of these differences in each domain, especially in conjunction with effect size analysis. Indeed, the magnitude of the effect can be considered high for all comparisons (point-biserial correlation coefficients >0.60). The Hodges-Lehmann estimate indicates the median change in participants' evaluations between the pre- and post-diagnosis periods.

Decline in scores across leisure activities, work functioning, exercise capacity, and functional capacity indicates a significant deterioration in physical functioning domains. The consistency across domains suggests a systemic rather than domain-specific pattern of deterioration, as previously reported.[37] The effect sizes in all domains (ranging from 0.60 to 0.70) are particularly noteworthy, as they exceeded what is considered clinically significant changes in fibromyalgia-related functioning measures.[38] The changes likely indicate genuine reductions in participants' everyday functioning abilities, with both clinical and statistical significance. The largest effect size was observed for the quality of life and overall functionality domains, suggesting that overall life satisfaction is remarkably susceptible to decline in this population. These findings are in line with previous

Table 1. Sociodemographic characteristics of study participants

Variables	*n*	Percentage
Gender		
Male	3	3.53
Female	82	96.47
Single		
No	61	71.76
Yes	24	28.24
Physically active (>150 min per week)		
No	40	47.62
Yes	44	52.38
Education		
Complete primary education	16	19.28
Complete secondary education	25	30.12
Complete higher education	38	45.78
Incomplete higher education	3	3.61
Prefer not to respond	1	1.20
Children		
No	7	8.24
Yes	78	91.76
Family history of psychiatric disorder		
No	37	54.41
Yes	31	45.59
Comorbidities		
No	7	8.24
Yes	75	97.76
Diagnosis psychiatric disorder		
No	43	63.24
Yes	25	36.76
Psychiatric treatment in the past year		
No	51	75.00
Yes	17	25.00
Psychological treatment in the past year		
No	41	60.29
Yes	27	39.71
Use of psychiatric medication		
No	43	63.24
Yes	25	36.76

Table 2. Perceived impact of fibromyalgia on different life domains

Parameters	Mean	SD	Minimum	Maximum
Leisure	8.26	1.64	1.00	10.00
Ability to work	8.32	1.55	3.00	10.00
Self-care	8.82	1.37	5.00	10.00
Overall functionality	8.43	1.35	5.00	10.00
Ability to exercise	8.40	1.53	4.00	10.00
Quality of life	8.83	1.54	4.00	10.00

Abbreviation: SD: Standard deviation.

Table 3. Satisfaction of individuals in different life domains before and after fibromyalgia diagnosis

Parameters	Mean	SD	Minimum	Maximum
Before fibromyalgia diagnosis				
Leisure	8.27	2.55	0.00	10.00
Ability to work	8.50	2.39	0.00	10.00
Self-care	8.46	2.48	0.00	10.00
Overall functionality	8.59	2.45	0.00	10.00
Ability to exercise	8.40	2.64	0.00	10.00
Quality of life	8.27	2.67	0.00	10.00
After fibromyalgia diagnosis				
Leisure	6.48	3.05	0.00	10.00
Ability to work	6.55	3.10	0.00	10.00
Self-care	6.09	3.38	0.00	10.00
Overall functionality	6.38	3.14	0.00	10.00
Ability to exercise	6.06	3.35	0.00	10.00
Quality of life	5.96	3.26	0.00	10.00

Abbreviation: SD: Standard deviation.

research highlighting the pervasive effects of chronic pain on quality-of-life outcomes.[39] Reduced physical activity aligns with the deconditioning cycle model, leading to physiological deconditioning and further limiting function in a self-perpetuating cycle that involves corresponding declines in exercise capacity and functional ability.[7,40] In addition, Macfarlane *et al.*,[41] found similar patterns of activity restriction and functional decline in their study of fibromyalgia patients, attributing these changes to both biological processes and psychological factors, particularly fear-avoidant behaviors.

The current findings, however, reveal significant declines in several areas. Thus, despite the long-standing nature of participants' pain conditions (lasting, on average, 14.82 years), adaptation mechanisms may have been inadequate to sustain psychological well-being over prolonged periods. Indeed, fibromyalgia patients experience a worsening psychological distress trajectory, which aligns with the observations by Clauw *et al.*,[42] even for those with long-standing diagnoses. Declines in work functioning and other areas appear to occur in parallel, suggesting a myriad of interconnected factors influencing multiple aspects of life at the same time. The pattern supports an integrated biopsychosocial model proposed by Edwards

Table 4. Comparisons of domains assessed by participants before and after fibromyalgia diagnosis

Domains	*W*	*p*-value	Hodges-Lehmann	Effect[a]	95% CI	
					Lower	Upper
Leisure	1,230.50	<0.001	3.00	0.60	0.37	0.76
Ability to work	1,336.50	<0.001	3.50	0.67	0.48	0.81
Self-care	1,529.50	<0.001	3.50	0.67	0.48	0.80
Overall functionality	1,356.00	<0.001	4.00	0.70	0.51	0.82
Ability to exercise	1,550.00	<0.001	3.50	0.69	0.51	0.82
Quality of life	1,263.00	<0.001	4.00	0.70	0.51	0.83

Notes: [a]Point-biserial correlation; *W* derived from the Wilcoxon test.
Abbreviations: SD: Standard deviation; CI: Confidence interval.

et al.,[43] which stresses the interconnected relationships among physical symptoms, psychological well-being, self-care, and social/occupational functioning in chronic pain conditions. Therefore, a significant reduction in self-care scores indicates deterioration in patients' ability to maintain personal care routines. This finding corresponds with research documenting progressive limitations in activities of daily living among fibromyalgia patients.[44] Indeed, evidence suggests that self-care activities are often compromised as pain conditions progress, partly due to increased fatigue, reduced physical capacity, and cognitive difficulties.[45-47]

3.3. Limitations and implications for theory and practice

The pattern of functional decline across various domains lends robust support to the allostatic load model of chronic pain, as proposed by Borsook *et al.*,[48] in which persistent pain imposes progressively heavier physiological and psychological loads on adaptive systems, ultimately resulting in accelerated deterioration across multiple functional areas. The current results showed substantial effect sizes across all functional domains, even among participants with long-standing pain conditions, consistent with this theoretical framework.

The present results also offer empirical evidence for the fear-avoidance model. This concept may be of paramount interest to society, healthcare professionals, and the broader healthcare system because it suggests that fear of pain causes individuals to shun physical activity, resulting in physical deconditioning and subsequent functional deterioration.[49,50] The observed declines in physical activity and functioning across various domains (e.g., leisure and exercise) and aspects (e.g., work and self-care) are consistent with the model's forecasted cyclical pattern of deterioration. Moreover, the findings also strengthen the theoretical understanding of the connection between physical capabilities and mental health in chronic pain situations. Physical and psychological deterioration, as proposed by Edwards *et al.*,[43] are interdependent, rather than one domain being the primary driver of changes in the other. This interdependence highlights the importance of preventive and intervention programs that target multiple domains simultaneously. Specifically, because declines in both physical and psychological domains often occur together, integrated treatments may yield more effective outcomes than treatments focusing on one area alone. Studies have shown that multimodal treatment programs, which combine physical and psychological interventions, achieve better results than single-modal approaches in fibromyalgia treatment.[21,44,51] Notably, studies have repeatedly demonstrated that physical activity is a vital element in the management of fibromyalgia. A review of 18 studies involving 1,184 participants found that physical exercise, especially when tailored to an individual's requirements, has positive effects on pain, depression, and quality of life.[52]

Research has consistently demonstrated that customized exercise plans, comprising aerobic exercises, strength training, and mind–body disciplines such as yoga and tai chi, can boost functional capacity, alleviate symptoms, and enhance quality of life.[11,27,36] Typically, an optimal exercise routine comprises moderate-intensity, tailored plans that balance physical activity with periods of rest to prevent the worsening of symptoms.[11,45] In addition to physical activity, psychological treatments also play a crucial role in fibromyalgia management. Approaches such as cognitive-behavioral therapy, mindfulness-based stress reduction, and acceptance and commitment therapy have shown effectiveness in enhancing psychological well-being and quality of life in fibromyalgia patients.[53] These interventions work by empowering patients with coping strategies to control pain and enhance their capacity for daily tasks, thereby promoting self-care and independence.[10] Moreover, group-based interventions have shown promising results in diverse settings, including primary care. A notable example is the *Amigos de Fibro* (Fibro Friends) program developed in the State of São

Paulo, which may serve as a model for similar initiatives in other regions.[54]

In clinical practice, the current results highlight the importance of establishing realistic expectations about disease progression and implementing measures to slow functional decline. Preventive approaches should particularly target domains that showed the largest effect sizes in this study, namely quality of life and self-care, by integrating both psychological and physical treatment protocols.[41]

Finally, several methodological limitations should be considered when interpreting these findings. First, the absence of a control group limits causal inferences about the natural progression of functional decline versus potential intervention effects or other confounding factors. Second, reliance on participants' self-reported diagnoses may introduce bias. Third, the study sample was predominantly female, which, although consistent with the epidemiology of fibromyalgia, may limit the generalizability of findings to more diverse populations. Finally, the reliance on self-reported measures without complementary objective functional assessments represents an additional limitation. Future research employing controlled, longitudinal designs would provide stronger evidence for disease progression patterns in chronic pain conditions.

4. Conclusion

This study indicates that fibromyalgia is a syndrome primarily affecting women of productive age, with a higher prevalence among those who are married, in a stable union, and with higher levels of education. A significant deterioration of fibromyalgia was found across multiple functional domains, including leisure, work, self-care, physical ability, and overall quality of life, underscoring the pervasive burden of this condition. The consistent pattern of decline across domains suggests a systemic rather than domain-specific deterioration. Moreover, the simultaneous deterioration in both physical and psychological domains supports integrated biopsychosocial models of chronic pain, suggesting that multimodal treatment approaches may be more effective for preserving functioning. Particular attention should be directed to domains showing the largest declines (i.e., quality of life and self-care) through integrated physical and psychological interventions.

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Conflict of interest

The authors declare they have no competing interests.

Author contributions

Conceptualization: All authors
Formal analysis: All authors
Investigation: All authors
Methodology: All authors
Writing–original draft: All authors
Writing–review & editing: All authors

Ethics approval and consent to participate

This study was approved by the Western Paraná State University Research Ethics Committee, under opinion number: 73259023.6.0000.0107. Written informed consent was obtained from all participants prior to their inclusion in the study.

Consent for publication

Participants provided their written consent for publication.

Availability of data

Data are available from the corresponding author upon reasonable request.

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