

## PREVALENCE OF ANXIETY AND DEPRESSION AND THEIR EFFECTS ON QUALITY OF LIFE IN HEMODIALYSIS PATIENTS

Fiza Nazir<sup>1</sup>

[fizinazeer@gmail.com](mailto:fizinazeer@gmail.com)

Nimra Ilyas<sup>2</sup>

[ladyironblood@gmail.com](mailto:ladyironblood@gmail.com)

Ayesha Yaseen<sup>3</sup>

[aishstic009@gmail.com](mailto:aishstic009@gmail.com)

Rida Asghar<sup>4</sup>

[ridachaudhary10@gmail.com](mailto:ridachaudhary10@gmail.com)

<sup>1,2,3,4</sup>Renal and Dialysis Technology, Department of Emerging Health Professional Technology, Allied Health Sciences, Superior University Lahore, Pakistan

### Author Details

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Corresponding E-mails & Authors\*:

Kainat Badar

[kainatbadar123@gmail.com](mailto:kainatbadar123@gmail.com)

### Abstract

**Background:** End-Stage Renal Disease (ESRD) is a serious health condition that requires lifelong treatment such as hemodialysis. Patients undergoing hemodialysis often face not only physical challenges but also psychological problems, including anxiety and depression. These mental health issues can negatively influence patients' quality of life, treatment adherence, and overall well-being.

**Objective(s):** To determine the prevalence of anxiety and depression and their effects on the quality of life among patients undergoing hemodialysis.

**Methodology:** A cross-sectional study design was used for this research. Data were collected from multiple dialysis centers in Lahore over a period of four months. A total of 59 patients undergoing hemodialysis were selected through a non-probability convenience sampling technique. Participants aged 18 years and above who had been receiving hemodialysis for at least six months were included in the study. Data were collected using a structured questionnaire that included demographic information and the Hospital Anxiety and Depression Scale (HADS). The collected data were

analyzed using SPSS version 25. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to present the results.

**Results:** The mean age of participants was 45.95 years, with males representing 57.6% and females 42.4% of the sample. The findings revealed that 44.1% of participants had abnormal anxiety and 39.0% had borderline anxiety. In terms of depression, 33.9% showed abnormal depression and 52.5% showed borderline depression. Many participants also reported symptoms such as restlessness, sadness, and worrying thoughts.

**Conclusion(s):** The study concludes that anxiety and depression are highly prevalent among hemodialysis patients and significantly affect their psychological well-being. Regular mental health screening and psychological support are essential to improve the quality of life of these patients.

## INTRODUCTION

End-Stage Renal Disease (ESRD) is the final and most severe stage of chronic kidney disease (CKD), in which the kidneys lose their ability to perform essential physiological functions such as removal of waste products, maintenance of fluid and electrolyte balance, and regulation of blood pressure. ESRD usually occurs when the glomerular filtration rate falls below 15 mL/min, leaving dialysis or kidney transplantation as the only options for survival (1,2). Chronic kidney disease develops progressively over time due to irreversible damage to kidney structures, commonly caused by diabetes mellitus, hypertension, chronic glomerulonephritis, polycystic kidney disease, autoimmune disorders, and prolonged use of nephrotoxic drugs. The increasing prevalence of these chronic diseases, along with aging populations, has made ESRD a major global health concern, especially in low- and middle-income countries where access to advanced treatment facilities remains limited (3,4). Renal replacement therapies, particularly hemodialysis and peritoneal dialysis, are essential for sustaining life in ESRD patients. Hemodialysis involves circulating blood through a dialyzer that removes toxins, waste products, and excess fluids before returning purified blood to the body, while peritoneal dialysis utilizes the peritoneal membrane as a natural filter (5). Hemodialysis is widely

used because it helps maintain metabolic stability, electrolyte balance, and blood pressure control in patients with severe kidney dysfunction (6). It is indicated in conditions such as ESRD, acute kidney injury, severe electrolyte imbalance, metabolic acidosis, fluid overload, and uremic symptoms (7). Although dialysis significantly improves survival, it does not fully restore normal kidney function and often imposes considerable physical limitations and treatment burdens on patients (8).

Patients undergoing long-term dialysis frequently experience psychological complications, particularly depression and anxiety, which negatively affect treatment adherence, coping ability, and quality of life (9). The chronic and demanding nature of hemodialysis, including multiple weekly sessions lasting several hours, contributes significantly to emotional distress (10). Physical symptoms such as fatigue, muscle cramps, weakness, nausea, and hypotension further worsen mental well-being (11). In addition, ESRD patients commonly face financial difficulties related to treatment expenses, uncertainty regarding prognosis, and concerns about the possibility of kidney transplantation, all of which increase psychological stress (12). Social isolation caused by physical limitations and reduced participation in family and community activities also contributes to emotional suffering (13).

Several demographic and treatment-related factors influence the occurrence of anxiety and depression among ESRD patients. Younger patients may struggle more with accepting a chronic life-threatening illness and its impact on future plans, while inadequate social support can increase vulnerability to psychological disorders (14). Furthermore, studies suggest that patients receiving hemodialysis often experience greater emotional distress than those undergoing peritoneal dialysis due to the frequency and duration of treatment sessions (15). The prevalence of anxiety and depression may also vary between public and private dialysis centers because of differences in healthcare resources, patient support systems, and quality of care. Therefore, understanding the psychological burden associated with ESRD is essential for improving mental health interventions, enhancing patient care, and achieving better treatment outcomes among individuals receiving maintenance hemodialysis (16).

### Literature Review

Recent literature has consistently highlighted the high prevalence of depression and anxiety among patients undergoing hemodialysis and their strong association with poor quality of life. Studies conducted by Luca et al. (2026), Duran et al. (2025), and Gurung et al. (2025) reported that a significant proportion of hemodialysis patients experienced moderate to severe symptoms of depression and anxiety, which negatively affected their physical, emotional, and social well-being (23–25). These studies utilized standardized psychological assessment scales and quality-of-life questionnaires to demonstrate that psychological distress significantly reduces patients' ability to cope with the burden of long-term dialysis treatment. Similarly, Haider et al. (2024) found that depression, anxiety, and stress were highly prevalent among dialysis patients, with increased psychological distress strongly linked to poorer quality-of-life outcomes across multiple domains (26). Several studies also examined the relationship between mental health conditions and the overall well-being of patients with chronic kidney disease receiving maintenance hemodialysis. Machaca et al. (2024) and Xia et al. (2024) identified anxiety and depression as strong predictors of reduced quality of life, particularly affecting emotional stability, physical functioning, and social participation (27,28). Xia et al. further emphasized that symptom burden, including fatigue and physical discomfort, acted as a mediating factor between depression and lower quality-of-life scores among dialysis patients (28). Likewise, Alshelleh et al. (2023) reported that depression and anxiety not only impaired emotional health but also reduced motivation, increased fatigue, and limited patients' participation in everyday activities and social interactions (29).

Research has also focused on identifying the demographic and clinical factors associated with depression and anxiety among hemodialysis patients. Nagy et al. (2023) found that older age, presence of multiple comorbidities, and lack of social support significantly increased the risk of severe depression and anxiety among patients undergoing dialysis (30). Similarly, Elezi et al. (2023) highlighted that elderly hemodialysis patients were particularly vulnerable to mental health disorders because of social isolation, limited mobility, and declining physical health (31). Ali et al. (2023) also

demonstrated that patients with chronic conditions such as diabetes and hypertension were more likely to experience moderate to severe depression and anxiety, emphasizing the need for psychological support in patients with multiple comorbid illnesses (32).

Earlier studies further reinforced the importance of integrating mental health care into routine dialysis management. Al-Shammari et al. (2021) reported that depression and anxiety were highly prevalent among ESRD patients across different patient populations, establishing mental health as a major concern in dialysis care (33). Similarly, Mosleh et al. (2020), Elhadad et al. (2020), Ma et al. (2020), and Gadia et al. (2020) consistently observed high rates of depression and anxiety among hemodialysis patients and emphasized their negative impact on physical health, treatment adherence, social functioning, and overall quality of life (34–37). These studies collectively recommended routine psychological screening, psychiatric evaluations, and counseling services as essential components of comprehensive dialysis care to improve patient outcomes and enhance overall well-being.

### Materials and Methods

This study followed a cross-sectional research design to assess the prevalence of anxiety and depression among patients with End-Stage Renal Disease (ESRD) undergoing hemodialysis. Data were collected from multiple dialysis centers in Lahore over a period of four months following the approval of the research synopsis. A non-probability convenient sampling technique was used to recruit participants for the study. The sample size was calculated using the standard formula  $N = Z^2p(1 - p)/d^2$ , where the confidence interval was set at 95%, the prevalence rate was taken as 92%, and the margin of error was 5%, resulting in a final sample size of 57 participants.

The study included adult patients aged 18 years and above who had been diagnosed with ESRD and were undergoing hemodialysis for at least six months. Participants were required to be mentally capable of understanding the study and providing informed consent. Only those willing to participate and complete the Hospital Anxiety and Depression Scale (HADS) questionnaire were

included in the study. Patients with cognitive impairments or severe psychiatric disorders such as schizophrenia and bipolar disorder were excluded. In addition, patients receiving peritoneal dialysis, those who had recently undergone kidney transplantation within the previous six months, and individuals participating in other clinical trials affecting mental health outcomes were excluded from the study.

Data collection was conducted using a structured questionnaire consisting of demographic and clinical information along with the Hospital Anxiety and Depression Scale (HADS). The demographic section included variables such as age, gender, educational status, employment status, duration of ESRD, dialysis duration, and associated comorbidities including diabetes and hypertension. The HADS instrument was used to evaluate symptoms of anxiety and depression among participants. It consists of 14 items, including 7 items each for anxiety and depression, scored on a 4-point Likert scale ranging from 0 to 3. Scores of 8 or above on either subscale were considered indicative of clinically significant anxiety or depression symptoms. During data collection, eligible participants were approached during dialysis sessions, informed about the purpose of the study, and asked to provide written informed consent before participation. Confidentiality and anonymity of all participants were strictly maintained throughout the research process.

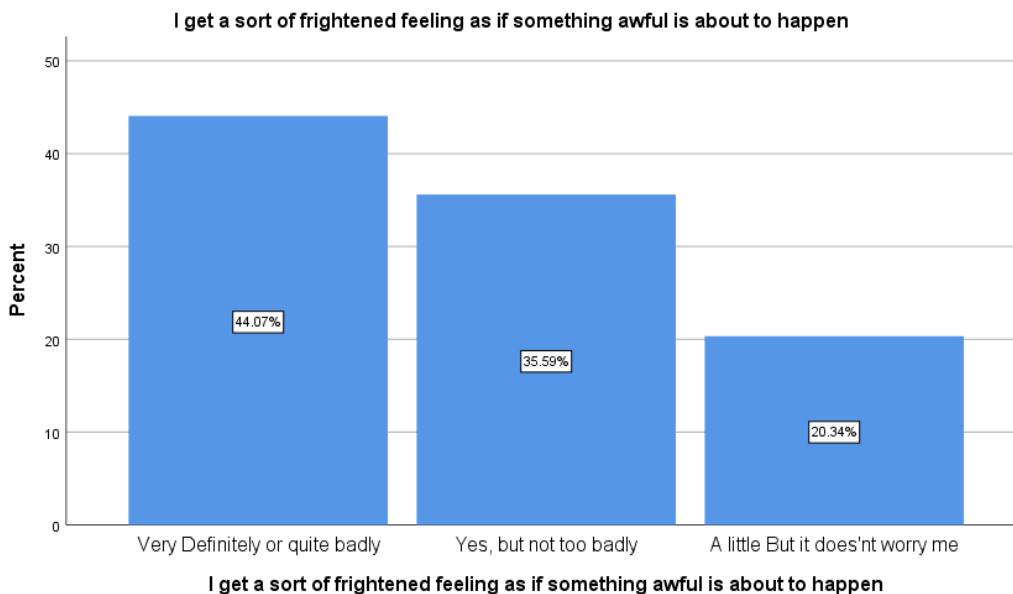
The collected data were entered and analyzed using Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics including frequencies, percentages, means, and standard deviations were used to summarize demographic variables and study findings. Anxiety and depression levels were categorized as normal, borderline, or abnormal according to standard HADS scoring guidelines. The results were presented through tables, bar charts, and histograms to illustrate the prevalence of anxiety and depression among hemodialysis patients. Furthermore, the Chi-square test was applied to determine the association between quality of life and psychological factors including anxiety and depression. A p-value of less than 0.05 was considered statistically significant. Ethical principles approved by the ethical committee of Superior University were strictly followed, including voluntary

participation, informed consent, confidentiality, anonymity, and the participants' right to withdraw from the study at any stage without any consequences.

## Results

The study was conducted on 59 patients undergoing hemodialysis. The mean age of the participants was  $45.95 \pm 11.00$  years, with ages ranging from 18 to 65 years, indicating moderate variation among the participants. The histogram of age distribution demonstrated an approximately normal distribution, with the majority of participants falling between 35 and 60 years of age. Regarding gender distribution, males constituted a slightly higher proportion of the study population, with 34 participants (57.6%) being male and 25 participants (42.4%) female. These findings indicate that middle-aged adults, particularly males, represented the majority of patients included in the study.

### Bar chart of I get a sort of frightened feeling as if something awful is about to happen



Assessment of general emotional and psychological symptoms revealed that a considerable proportion of participants experienced mental and emotional distress. More than half of the participants, 31 (52.5%), reported experiencing restlessness or difficulty in sleep, while 30 participants (50.8%) reported feelings of helplessness or sadness. Additionally, 20 participants (33.9%) experienced a loss of interest in activities, and 14 participants (23.7%) reported suicidal thoughts or behavior. These findings suggest that emotional disturbances and psychological burden were common among patients receiving maintenance hemodialysis.

### Bar chart of I can laugh and see the funny side of things

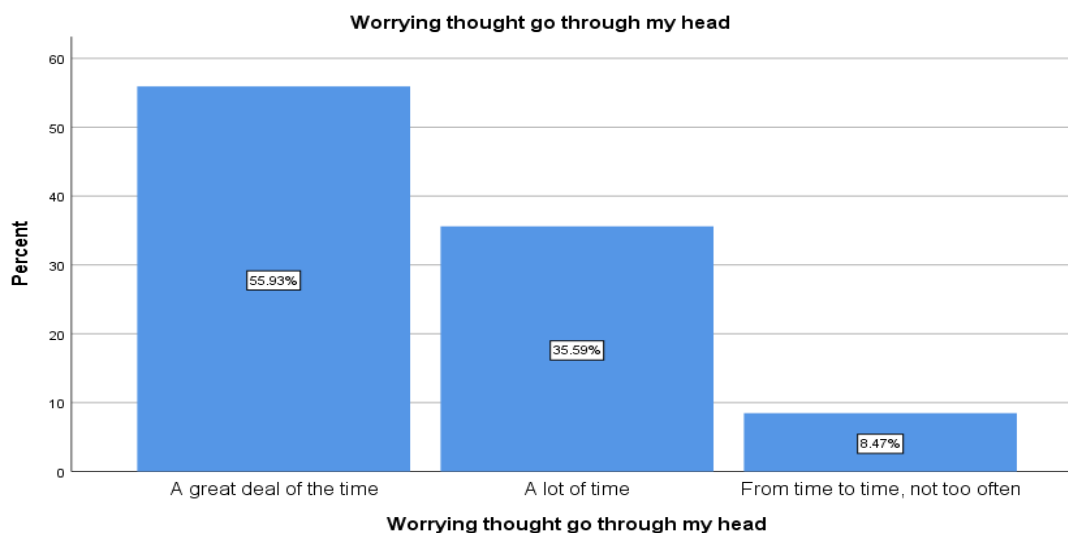


The Hospital Anxiety and Depression Scale (HADS) responses further highlighted the prevalence of anxiety-related symptoms among the participants. A large proportion of patients reported feeling tense or “wound up,” with 40.7% experiencing this feeling a lot of the time and 32.2% most of the time. Similarly, 44.1% of participants experienced frightened feelings as if something awful was about to happen, while 55.9% reported that worrying thoughts passed through their minds a great deal of the time. Feelings of restlessness were also highly prevalent, with 45.8% reporting that they

felt restless very much indeed, and 47.5% reporting sudden feelings of panic quite often. These results demonstrate a high level of anxiety symptoms among hemodialysis patients.

Symptoms associated with depression were also prominent among the participants. Although many participants reported still enjoying certain activities, emotional well-being appeared significantly affected. Nearly half of the participants, 47.5%, reported definitely losing interest in their appearance, while 37.3% admitted they did not take as much care of themselves as they should. Furthermore, 66.1% of participants stated that they did not feel cheerful at all, and 45.8% reported feeling slowed down nearly all the time. These findings indicate that depressive symptoms such as reduced motivation, low mood, and emotional exhaustion were common among the study population.

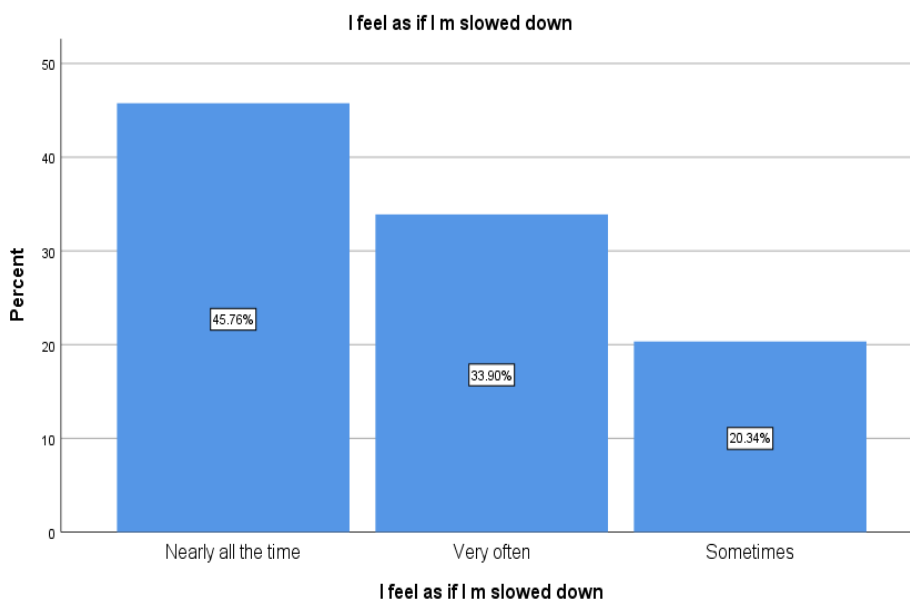
Bar chart of Worrying thought go through my head



The overall prevalence of anxiety and depression among participants was notably high. Regarding anxiety levels, 26 participants (44.1%) were categorized as having abnormal anxiety, while 23 participants (39.0%) fell within the borderline anxiety category. Only 10 participants (16.9%) had

normal anxiety levels. Similarly, depression assessment showed that 31 participants (52.5%) had borderline depression and 20 participants (33.9%) had abnormal depression, whereas only 8 participants (13.6%) were categorized as normal. These findings indicate that the majority of hemodialysis patients experienced varying levels of anxiety and depression, highlighting the substantial psychological burden associated with ESRD and long-term dialysis treatment.

### Bar chart of I feel as if I'm slowed down



The relationship between quality of life and psychological status showed statistically significant findings. Among participants with normal anxiety levels, all reported a good quality of life. In contrast, participants with borderline and abnormal anxiety demonstrated relatively poorer quality-of-life outcomes, including moderate and poor quality of life categories. Overall, 84.7% of participants reported good quality of life, while 10.2% had moderate and 5.1% had poor quality of life. The Pearson Chi-square test demonstrated a statistically significant association between quality of life and anxiety and depression levels ( $\chi^2 = 13.834$ ,  $df = 4$ ,  $p = 0.004$ ). Since the p-value was less

than 0.05, the results confirm that anxiety and depression were significantly associated with variations in quality of life among patients undergoing hemodialysis.

### Discussion

The present study was conducted to determine the prevalence of anxiety and depression and their impact on the quality of life among patients undergoing hemodialysis. The findings revealed that psychological distress was highly prevalent among the study participants. A considerable proportion of patients experienced symptoms such as restlessness, sadness, panic, sleep disturbance, and reduced interest in activities. The prevalence of abnormal anxiety was 44.1%, while 39.0% of participants had borderline anxiety. Similarly, 33.9% of participants had abnormal depression and 52.5% had borderline depression. These findings indicate that the majority of hemodialysis patients experienced varying degrees of psychological distress. The results also demonstrated a statistically significant association between anxiety, depression, and quality of life, suggesting that worsening mental health negatively affects the overall well-being of dialysis patients.

The findings of the current study are consistent with the results reported by Luca et al. (2026) and Duran-Gomez et al. (2025), who found high rates of anxiety and depression among patients receiving maintenance hemodialysis (23,42). Both studies concluded that psychological distress significantly reduced physical functioning, emotional stability, and social participation among dialysis patients. Similar patterns were observed in the present study, where many participants reported persistent worrying thoughts, panic, sadness, and emotional exhaustion. Furthermore, the majority of participants in the current study fell into either borderline or abnormal categories for anxiety and depression, supporting previous evidence that mental health disorders are highly prevalent among individuals with ESRD. These similarities may be explained by the chronic nature of kidney disease, long-term dependence on dialysis treatment, physical discomfort, and lifestyle limitations experienced by hemodialysis patients.

The present findings also correspond with the work of Xia et al. (2024), who reported that depressive symptoms and physical symptom burden significantly lowered the quality of life among hemodialysis patients (28). In the current study, participants commonly reported feeling slowed down, lacking cheerfulness, losing interest in activities, and experiencing emotional distress, which are common manifestations of depression. Likewise, anxiety-related symptoms such as panic feelings, tension, and excessive worrying were highly prevalent. However, some differences were observed when comparing the present findings with studies conducted by Alshelleh et al. (2023), Meng et al. (2022), and Haider et al. (2024), where comparatively lower levels of severe psychological distress were reported (22,26,29). These variations may be related to differences in healthcare facilities, socioeconomic conditions, cultural backgrounds, availability of psychological counseling services, and family or social support systems among different study populations.

Overall, the current study emphasizes that anxiety and depression are major psychological problems among patients undergoing hemodialysis and can significantly influence their quality of life. The findings highlight the importance of incorporating mental health assessment and supportive psychological interventions into routine dialysis care. Regular screening for anxiety and depression using standardized tools such as the Hospital Anxiety and Depression Scale (HADS) may help in the early identification of patients at risk. In addition, counseling services, family support programs, patient education, and psychiatric referrals should be integrated into dialysis management to improve emotional well-being and treatment outcomes. Addressing psychological health alongside physical treatment may ultimately enhance the quality of life and overall health status of patients living with End-Stage Renal Disease.

## CONCLUSION

This study concluded that anxiety and depression are highly prevalent among patients undergoing hemodialysis and significantly affect their psychological well-being and overall quality of life. The findings revealed that a large proportion of participants experienced borderline or abnormal levels

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of anxiety and depression. Many patients also reported symptoms such as restlessness, sadness, worrying thoughts, and loss of interest in activities. These psychological challenges may negatively influence patients' ability to cope with long-term dialysis treatment. Therefore, early identification and regular screening of mental health problems are essential in dialysis centers. Providing psychological support and counseling services can help improve the quality of life and overall health outcomes of hemodialysis patients.

The present study recommends that dialysis centers should adopt routine psychological screening for early identification of anxiety and depression among hemodialysis patients. Standardized assessment tools such as the Hospital Anxiety and Depression Scale (HADS) should be incorporated into routine clinical practice to ensure timely detection and management of mental health issues. In addition, healthcare providers should integrate structured counseling services, mental health education, and psychological support programs within dialysis units to improve patients' emotional well-being and coping abilities. Strengthening patient-caregiver communication and involving family support systems may further enhance psychological resilience. Future research should be conducted on larger sample sizes across multiple regions to improve generalizability and to develop more effective, evidence-based mental health interventions for this vulnerable population.

The study has certain limitations that should be considered when interpreting the results. The relatively small sample size limits the extent to which the findings can be generalized to the broader population of hemodialysis patients. In addition, the cross-sectional study design provides only a snapshot of data at a single point in time, making it impossible to establish causal relationships between anxiety, depression, and quality of life. Furthermore, the study was conducted only in selected dialysis centers in Lahore, which may restrict the applicability of the findings to other healthcare settings or regions. Despite these limitations, the study provides valuable insights into the psychological burden experienced by hemodialysis patients and highlights the need for integrated mental health care.

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