THE EFFECTIVENESS OF GROUP TRAINING OF REE(RATIONAL EMOTIVE EDUCATION) ON ANXIETY AND SELF-EFFICACY AMONG YOUTH WITH TYPE1 DIABETES IN MASHHAD CITY

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ABSTRACT

Purpose: The purpose of this study is to investigate the effectiveness of group rational-emotive education on reducing anxiety and increase self-efficacy in adolescents with type 1 diabetes.

Method: To this end, 10 people were selected based on the entry criteria and based on availability selection and purposive sampling. They were then divided into two groups of 5 to form a test and a control group. Participants in the test group received rational-emotive therapy and the controls were placed in the waiting list. In this research, Revised Children Manifest Anxiety Scale (RCMAS) and Self-Efficacy for Diabetes questionnaire were used to measure independent and dependent variables. In order to analyse the results, descriptive and inferential statistics of multivariate covariance analysis and determination of the effect of D-Cohen index were used.

Results: The results showed that there was no significant difference between the two, test and control, groups in the post-test stage in reducing anxiety and increase self-efficacy with a significance level of α=0.05. But in the review conducted with the Cohen D effect index, there was a significant difference in the magnitude of the effect between the mean of both groups in post-test stage in reducing anxiety and increasing self-efficacy.

Conclusion: Group therapy based rational-emotive education has been able to reduce anxiety and increase self-efficacy, but these changes were not significant due to the low volume of the sample.

Keywords: Diabetes, Anxiety, Self-efficacy, Rational-Emotive Education.

I. INTRODUCTION

Diabetes is one of the most common and costly chronic diseases worldwide. This medical disorder is characterized by hyperglycemia, a disorder in the metabolism of carbohydrates, fats, and proteins, along with a complete or partial defect in the secretion of insulin in the body. Type-1 diabetes and type 2 diabetes are the main and important forms of this disease. According to studies, about 5 to 10% of people with diabetes are people with type 1 diabetes [1]. 90% of people with type 1 diabetes are under 25 years old at the time of diagnosis [2]. Diabetes is one of the most common chronic diseases in which the role of psychological factors has been considered in various studies. [3]. Diabetes is a major cause of morbidity, mortality, and rising health care costs worldwide, which, if combined with stress, depression, and anxiety, will increase in severity, and its complications. The high prevalence of the mentioned psychological problems in diabetics can make the prognosis of diabetes more unfavorable [4].

Adolescence is important in terms of biological changes and intelligence, as well as the relationship that the adolescent has with the social environment around him. Failure to adapt to these changes can lead to emotional turmoil or depression and anxiety. Having a chronic illness can play an important role in the quality of adolescents' psychological and emotional states and overshadow their ability to perform daily tasks. Therefore,
adolescents with a chronic illness need to adapt to biological, mental, etc. changes during the transformation, and at the same time cope with the concern about the existence of the disease. Hence, it becomes difficult for adolescents to balance and adapt and can expose them to disorders such as depression, anxiety, or other psychological problems. [5] Adolescents with diabetes have poorer blood sugar control than children before puberty which can be related to their physical, mental, and social changes in this period of life. Adolescence is the most difficult stage for metabolic control and management of type-1 diabetes in patients [1].

The effect of diabetes mellitus on the quality of life of both sexes is evident, but this effect is more prominent in all aspects of a teenage girl's life. Diabetes affects girls' emotional and mental functioning; Also, diabetes affects puberty and pregnancy in girls and can cause problems for mother and child [6]. Blood sugar is difficult to control in diabetic girls during puberty. Part of this difficulty is related to the natural changes of adolescence that are associated with rapid physical and hormonal changes because some of these hormones play a key role in blood glucose homeostasis. The other part is due to the complications of diabetes. Growth hormone secretion is increased in diabetic girls, which can lead to increased blood glucose and insulin resistance. [7]

Living with a chronic illness is one of the risk factors for psychological problems [8]. Diabetes is a common metabolic disease that hurts physical function, mental status, interpersonal, family, and social relationships and in general, general health and psychological well-being of patients [9].

Many studies have examined psychological problems among diabetics. Gulseren, L, Hekimsoy, Z, Gulseren, S et al. (2001) [10]. They found that depression and anxiety accounted for approximately 45% of the psychiatric disorders seen in diabetics. Fettahoglu, EC, Koparan, C and Ozatalay, E et al. (2007) [11] concluded in a study that; Diabetics are 40 percent more likely to develop psychiatric disorders. The prevalence of depression is higher among diabetics than in the general population. It has been estimated that diabetics have twice as much depression as the non-diabetic population. [12] A meta-analysis also shows that; Anxiety syndrome and generalized anxiety disorder are very common in these patients [13]. The results of various researches indicate that; chronic disorders, especially diabetes, lead to a large number of negative problems such as increased anxiety and depression and decreased self-esteem [14].

During adolescence and puberty, people with diabetes not only need to accept the physical and hormonal changes caused by puberty, instead, but they should also consider its effects on good blood sugar control and relationships with family members. Adolescents also need to maintain a sense of independence; As a result, families are less likely to be involved in adolescent diabetes management issues.Previous research has shown that; Twenty-five percent of teens do not take medication properly and often overlook its importance; On the other hand, more than half of adolescents Have HbA1C higher than 9% (Hemoglobin A1c), which is a problem [15]. Trying to properly manage diabetes, the chronic nature of the disease, and the possibility of various complications are the main causes of psychological problems in children and adolescents with diabetes [16, 17, and 18].

Factors affecting blood sugar control in adolescents include self-efficacy, family support, and adaptive style education. Self-efficacy refers to the confidence of individuals in performing a behavior successfully [19]. Anderson et al. (2003) quoted Mazlum et al. (2015) in their study as finding that diabetics who had high self-efficacy were more adaptable and experienced fewer mental problems. Self-efficacy can be an important predictor of the symptoms of anxiety and depression and has a negative correlation with anxiety and depression [20]. Self-efficacy is one of the factors affecting anxiety and these two are inversely related to each other [21].

On the other hand, Moayedi, Zare, and Nikbakht (2017) [22] state that anxiety disrupts the process of blood sugar control. Anxious life events are significantly positively associated with poor diabetes control, and even minor daily stresses are associated with poor metabolic control, even more so than significant stress. Having diabetes is significantly associated with anxiety in people with diabetes, especially adolescents; The lifetime prevalence of anxiety disorders in diabetics is 20% higher than in non-diabetics [23] In a study by Meurs, Roest, A.M, Wolfenbuttel, B.H.R et al. (2016) [24]; The prevalence of anxiety disorders was estimated at 9.9% and depression at 0.2% and it was stated that anxiety is the most common psychiatric disorder in those diagnosed with diabetes. Recent documentation on the relationship between diabetes and anxiety states that; the prevalence of anxiety disorders in people with type 1 diabetes is increasing. It is estimated that about 14% of people with diabetes have a generalized anxiety disorder. Also, 40% of them have at least some symptoms of anxiety, and fear of hypoglycemia is common among them. Anxiety disorders can be associated with poor glycemic control [25].
Self-efficacy is always considered as an important factor for both short-term and long-term changes in the behaviors and health beliefs of children and adolescents. According to Social-cognitive theory, adolescents with higher self-efficacy are stronger against the barriers to self-management of diabetes. Adolescents who believe they can control their blood sugar even when they are very busy; in situations such as participating in after-school activities or eating with their friends in fast food, they better regulate their blood sugar levels [26]. Beliefs about one's ability or self-efficacy are one of the most important psychosocial elements for diabetes self-management and lead to better treatment outcomes [27]. On the other hand, increasing information about diabetes does not always lead to improved self-care behaviors, blood sugar control, and greater adaptation to the disease. When, instead of lack of knowledge or skills, cognitive barriers to attitude are the main barriers to self-management; Cognitive-behavioral intervention is necessary. Such an approach may be particularly helpful for patients who have had recurrent failures in their efforts to control diabetes and so they believe that they cannot or have little ability to adequately meet the requirements of the treatment regimen. In other words, those who have strongly negative beliefs about the effectiveness of their control over diabetes; are a good choice for cognitive-behavioral intervention [28].

It has been experimentally proven that; there are significant differences between two people who are in the same medical and traumatic situation in terms of the reactions and disabilities they experience, as well as their social and physical functioning. One of the factors that can be crucial in explaining this difference is the psychological components such as the thoughts and Core beliefs of diabetics. White (2000) [29] writes: people who have a negative attitude towards their disease and consider it serious, uncontrollable and chronic, act very passively and have poor social functioning and many disabilities. Therefore, it is expected that changes in people's cognitions, beliefs, and attitudes will lead to a series of behavioral changes to increase self-care behaviors [30].

Given what has been said, this study aimed to evaluate the effectiveness of Rational-Emotive Education on increasing self-efficacy and reducing anxiety in adolescents with type 1 diabetes.

II. METHODOLOGY

This is experimental applied research with pre-test and post-test with a control group. The statistical population of the study was all adolescent girls and boys aged 11 to 16 years with type 1 diabetes referred to the office of the Iranian Diabetes Foundation in Mashhad. The sample was selected by 10 people by Convenience sampling method from adolescents willing to participate in the research project. Due to the small number of boys volunteering to participate in the study, they were excluded from the sample group and the study was conducted only on the group of girls with a history of more than one year of diabetes and having no diabetes complication of diabetes or other psychological or physical illness.

The tools used to collect information from the research sample are:

**Diabetes Self-Efficacy Scale:** This scale has eight terms, each of which is a description of activities and treatment recommendations for people with diabetes, and is scored on a Likert scale. The Diabetes Self-Efficacy Questionnaire is a standard questionnaire developed by the Standford Institution. This Scale has 8 Item. Scoring based on the Likert scale is 10 options that adolescents express their confidence in doing the things mentioned in the questionnaire phrases as 1 (not at all sure) to 10 (completely sure). The minimum and maximum points are between 8 and 80. This questionnaire has been used in various studies in Iran and its reliability has been reported from 0.71 to 0.85 [1]. The internal consistency coefficient declared by the scale maker is reported to be 0.82 in the English version and 0.85 in the Spanish version. In Najmi, Ahadi, Delavar et al. (2007) [31] after preparing the instrument for an Iranian study and preparing a Persian version, the reliability was calculated by the retest method equal to 0.83. Also, the validity of the instrument structure by calculating its correlation with the general self-efficacy scale of Jerusalem and Schwarzenegger, which was prepared in 10 items in 27 languages, including Persian, and for study in different groups, including chronic patients, was equal to 0.92.

**Childhood Manifest Anxiety Scale:** The Revised Children’s Manifest Anxiety Scale (RCMAS) is used to measure participants' anxiety. This questionnaire is a self-report tool that has 37 items and is answered as yes / no [32].

Its purpose is to study the apparent anxiety of children (6-19 years old) from different dimensions (physiological factors, extreme sensitivity, and concentration, anxiety). The score of this scale is calculated from the sum of all the yes answers to the items. Taghavi and Alishahi (2003) [33] in their study examined the validity of revised children manifest anxiety scale through Two ways tests - re-test and Split-half method and obtained coefficients.
of 0.67 and 0.66, respectively. Concurrent validity of this scale with the STAIC (Stait-Trait Anxiety Inventory for Children) (Spielberger, 1973) shows a correlation coefficient of 0.85 [33]. Reynolds and Richmond reported the internal stability of its three subscales from 0.56 to 0.80 and the internal stability of the whole scale from 0.80.

Ostovar and Razavieh, citing Ostovar and Taghavi (2006) [34], reported the four-factor structure of this scale by a retest method with an interval of one to four weeks of 0.89. The homogeneity of this scale has been reported to be 0.65, 0.64, and 0.60 using the Kuder-Richardson method for the subscales of physiological anxiety, worry, and concentration. The reliability of this test in the study of Ebrahimi Moghadam et al. (2013) [35] was obtained using Cronbach's alpha coefficient of 0.84.

### III. FINDINGS

The individual characteristics (age and duration of infection) of the participants are shown in Table 1.

<table>
<thead>
<tr>
<th>group</th>
<th>mean ± SD</th>
<th>Maximum</th>
<th>minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>test</td>
<td>12.7 ± 2.10</td>
<td>16</td>
<td>11</td>
</tr>
<tr>
<td>Control</td>
<td>12.20 ± 0.75</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>Duration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>test</td>
<td>6.60 ± 2.60</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Control</td>
<td>3.60 ± 1.1</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 2 shows the mean and standard deviation of the variables of self-efficacy and manifest anxiety in the two groups.

<table>
<thead>
<tr>
<th>mean ± SD</th>
<th>Manifest anxiety</th>
<th>Self-efficacy in diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>12.40 ± 6.65</td>
<td>53.40 ± 14.18</td>
</tr>
<tr>
<td>post-test</td>
<td>10.00 ± 5.83</td>
<td>59.20 ± 14.76</td>
</tr>
<tr>
<td>Pre-test</td>
<td>9.80 ± 6.30</td>
<td>51.00 ± 12.62</td>
</tr>
<tr>
<td>Post-test</td>
<td>15.20 ± 5.76</td>
<td>45.20 ± 12.15</td>
</tr>
</tbody>
</table>

To investigate the effect of REE on reducing anxiety and increasing self-efficacy, analysis of covariance was used, the results of which are shown in Tables 3 and 4:

Table 3. The result of analysis of covariance post-self-efficacy test in diabetes

<table>
<thead>
<tr>
<th>Statistical indicators</th>
<th>sum of squares</th>
<th>Degrees of freedom</th>
<th>Mean Square</th>
<th>Ratio</th>
<th>Significance level</th>
<th>d Cohen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected model</td>
<td>490.191</td>
<td>2</td>
<td>245.095</td>
<td>2.517</td>
<td>0.150</td>
<td></td>
</tr>
<tr>
<td>pre-test group</td>
<td>0.191</td>
<td>1</td>
<td>0.191</td>
<td>0.002</td>
<td>0.966</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>483.248</td>
<td>1</td>
<td>483.248</td>
<td>4.964</td>
<td>0.061</td>
<td>1.22</td>
</tr>
<tr>
<td>Total</td>
<td>28420.000</td>
<td>10</td>
<td>28420.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected total</td>
<td>1171.600</td>
<td>9</td>
<td>1171.600</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Outcome of covariance analysis after manifest anxiety test

<table>
<thead>
<tr>
<th>Statistical indicators</th>
<th>sum of squares</th>
<th>Degrees of freedom</th>
<th>Mean Square</th>
<th>Ratio</th>
<th>Significance level</th>
<th>d Cohen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected model</td>
<td>181.002</td>
<td>2</td>
<td>90.501</td>
<td>4.077</td>
<td>0.067</td>
<td></td>
</tr>
<tr>
<td>pre-test group</td>
<td>113.402</td>
<td>1</td>
<td>113.402</td>
<td>5.108</td>
<td>0.058</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>107.185</td>
<td>1</td>
<td>107.185</td>
<td>4.828</td>
<td>0.064</td>
<td>0.85</td>
</tr>
<tr>
<td>Total</td>
<td>1924.000</td>
<td>10</td>
<td>1924.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected total</td>
<td>336.400</td>
<td>9</td>
<td>336.400</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As can be seen, a significant level for anxiety and self-efficacy of 0.064 has been obtained.

According to P>0.05, it is concluded that REE has not reduced anxiety and increased self-efficacy. But to answer these two questions, whether the manifest anxiety test in the experimental group was lower than the control group...
and the self-efficacy posttest in diabetes in the experimental group was higher than the control group; Given that we intend to compare the mean of a quantitative variable in two independent groups, the independent t-test was used, the results of which are presented in Table 5:

<table>
<thead>
<tr>
<th></th>
<th>F</th>
<th>Significance level</th>
<th>t</th>
<th>Degrees of freedom</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manifest anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variance</td>
<td>0.011</td>
<td>0.919</td>
<td>1.418</td>
<td>8</td>
<td>0.194</td>
</tr>
<tr>
<td>assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variance</td>
<td></td>
<td></td>
<td>2.398</td>
<td>8</td>
<td>0.043</td>
</tr>
<tr>
<td>not assumed</td>
<td>1.964</td>
<td>0.199</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-efficacy in</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>diabetes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variance</td>
<td>1.964</td>
<td>0.199</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variance</td>
<td>2.398</td>
<td>0.201</td>
<td></td>
<td></td>
<td>0.060</td>
</tr>
<tr>
<td>not assumed</td>
<td>1.418</td>
<td>0.799</td>
<td></td>
<td></td>
<td>0.194</td>
</tr>
</tbody>
</table>

According to the values presented in the table ($t = 2.398$, $sig = 0.043$), it is found that the self-efficacy of the group that received the training is higher than the control group; but in the case of manifest anxiety ($t = -1.418$, $sig = 0.194$) there is no significant difference in the post-test of the two groups.

### IV. DISCUSSION AND CONCLUSION

This study aimed to investigate the effectiveness of Rational-emotive education on reducing anxiety and increasing self-efficacy in diabetic adolescents. Results show that Rational-emotive education has only been able to increase self-efficacy in the sample group; however, the size of the effect obtained by the Cohen D index indicates the high impact of research intervention on both variables studied and thus confirms the correct choice of this research method.

In explaining these findings, we can say: A sense of self-efficacy enables people to do extraordinary things using their skills in dealing with obstacles. Effective performance requires both having the skills and believing in the ability to perform those skills. Managing constantly changing, ambiguous, unpredictable, and stressful situations requires multiple skills [36]. Controlling diabetes and keeping your blood sugar in the near-normal range is one of those situations. According to various researches and studies, self-efficacy is one of the most important factors for both short-term and long-term changes in the behaviors and health beliefs of children and adolescents [37]. On the other hand, there is a difference between what skills a person has and what they will do with these skills in different circumstances. That is, a person may perform unsuccessfully due to poor self-efficacy beliefs, despite having the necessary skills to act and despite mastering how to perform that action. [38] Therefore, teaching rational-emotive education as a method of intervention in this study, by influencing the beliefs of adolescent girls with type 1 diabetes participating in the study and modifying or changing them, and creating a sense of empowerment to diabetes control and self-care has been able to increase their self-efficacy; On the other hand, in explaining this finding, it can be stated that using this approach by changing inconsistent and negative thoughts and perceptions has led to the logic in the female adolescents of the sample group that they have control over their behavior in different situations in general and diabetes control in particular, and the formation of such an attitude may cause increased self-efficacy. These results are in line with the results of the study of Dehghani, Fani, and Ghaderi (2011) [39] who, using a rational-emotional-behavioral approach as a group, 're able to see an increase in self-efficacy in female students. The results of Vosoughi, Poursharifi, and Alilou (2012) [40] also showed that cognitive-behavioral group therapy reduces anxiety and increases self-efficacy. The results of research by Bermejo, T, and Prieto, U.M (2005) [41] and Warren, J.M (2010) [42] also indicate the effectiveness of Ellis' therapeutic approach in increasing self-efficacy and self-confidence.

On the one hand, about the large effect of educational intervention on reducing anxiety and on the other hand, the lack of significance of statistical analysis, it can be said that there is a significant relationship between psychological problems and the duration of diabetes. Duration of illness has been suggested as a risk factor for depression and other psychological problems [44, 43]. This is also true of diabetes Due to the chronic side effects of the disease over time, diets and dietary restrictions and frequent use of medications (injectable or oral), The need for frequent visits to the doctor to follow and control the disease, multiple tests during the disease and
possible disabilities caused by chronic complications of diabetes in these people can be justified [45]. The longer it takes to develop diabetes, the greater the prevalence of psychological disorders among patients. This can be due to the tedious nature of ongoing disease control, which is a constant concern - whether or not the disease is controlled. Due to this issue and the higher mean age of diabetes in the experimental group (Table 1), more anxiety in these people and difficulty in overcoming it can be considered as possible reasons for the ineffectiveness of the intervention method in reducing anxiety. Therefore, it seems that more time was needed to reduce anxiety as one of the target variables in this study using the method of Rational-emotive education or even if the treatment was conducted individually, it would be more desirable to deepen the training for each individual according to his / her unique circumstances.

The economic status of the participants in this research project is also an important element. Since the Iranian Diabetes Foundation is one of the charitable organizations in the field of diabetes management, its members are people who do not have a very good economic situation and the people in the sample group are no exception. The unfavorable economic situation with concerns about the provision of drugs and supplies related to diabetes control such as regular visits to the diabetes doctor, periodic tests, referral to other specialists such as ophthalmologists to check the patient's condition, the cost of buying blood sugar test strips, needles and ... Creates, directly and indirectly, affects the control of diabetes in terms of imposing exorbitant costs on the family. When a person with diabetes does not have to worry about paying for treatment, they will feel less anxious about the disease and its conditions and will have higher self-confidence due to being closer and more in touch with the treatment staff and performing accurate and timely medical examinations. Doing things related to self-care will gain more self-efficacy. McLaughlin et al. (2012) [46] found in their research that; There is a significant relationship between low economic status and psychological disorders in children and adolescents. Also, depression and anxiety have been reported less in people with good socioeconomic status and older age [13]. For low-income families who have more limited access to health care services, and given the high cost of diabetes health care, the economic situation can affect diabetes control and family stability. Therefore, it seems that if the research was done on a group of diabetics with better economic status, perhaps the results would be different.

Although diabetes is a medical condition caused by a defect in physical function, the influence of psychological factors on both the onset and control of the disease has been confirmed. As mentioned earlier, diabetes is divided into two general categories: type 1 (insulin-dependent) and type 2 (non-insulin-dependent). Although people with type 1 diabetes make up only 5 to 10 percent of the diabetic population since this group includes children and adolescents, the issue becomes doubly important; because the physical and mental health of children and adolescents is an important issue for them to become healthy and efficient adults.

Therefore, in this study, we aimed to reduce anxiety and make them more self-effective by Rational-emotive education (REE) by developing Rational thinking skills in adolescents and reducing their irrational beliefs.REE is an educational method derived from Ellis's Rational emotional approach, which is one of the first cognitive-behavioral methods.

Cognitive-behavioral therapy in chronic patients is based on the idea that there is a connection between thoughts, emotional feelings, physical symptoms, and behavior. This means that dysfunctional or unhelpful negative thoughts about the disease provoke negative emotions, inappropriate behavior, and a more intense and severe sense of physical symptoms [47]. Ellis et al. (2005) [48] also state that; Patients 'perception of chronic disease has a strong relationship with patients' adaptive outcomes. Patients with positive perceptions and assumptions about the nature and outcome of the disease had a better physical, psychological, social, and sexual function. For this reason, in this study, among all possible interventions, this method was chosen for teaching. The results of various researches show that; Using Ellis' approach has been shown to reduce anxiety, increase self-confidence, reduce depression, and increase self-efficacy, as well as affect beliefs and mental health [50,42,43,49].

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