

**The level of self-control and its relationship to health adherence among university students with celiac disease.  
(A field study on a sample of university students with Celiac disease at Mohamed Kheidar University-Biskra-)**

**Received date: 03/07/2023 Accepted date:15/09/2023 Published date: 31/12/2023**

**Amel HAMDI <sup>1</sup>, Sabah SAAD <sup>2</sup>**

<sup>1</sup> University of Biskra, Algeria, **Email:** [amel.hamdi@univ-biskra.dz](mailto:amel.hamdi@univ-biskra.dz)

<sup>2</sup> University of Biskra, Algeria, **Email:** [s.saad\\_univ@yahoo.com](mailto:s.saad_univ@yahoo.com)

**Abstract:**

The study aimed to reveal the relationship between the level of self-control and health adherence among a sample of students with celiac disease at the University of Biskra. The descriptive correlative approach was adopted; the sample consisted of (27) chosen students in an intentional way, they underwent to each of: the self-control scale, and a health-adherence scale. The psychometric properties of the two scales were confirmed. We found that there is a positive statistically significant correlation between the level of self-control and both: health adherence and the dimension of adherence to the diet. While there it has no statistically significant correlation with the dimension of commitment to medical follow-up, among university students with celiac disease.

**Keywords:** health commitment; self-control; Celiac disease.

**Corresponding Author:** Amel HAMDI, **Email:** [amel.hamdi@univ-biskra.dz](mailto:amel.hamdi@univ-biskra.dz)

## **1. INTRODUCTION**

The immune system is the primary defensive barrier that protects the human body from everything foreign that threatens the safety of its health. However, sometimes a defect occurs at the level of this system; It mistakenly attacks certain organs of the body, which is known as autoimmune diseases. One of those diseases is Celiac disease, which is the body's sensitivity to gluten. When this substance reaches the small intestine, the immune system is stimulated and attacks the intestinal villi responsible for nutrients' absorption, which causes its damage and affects its functionality. There is no known treatment other than a strict gluten-free diet for life.

Due to the recent wide spread of the disease, the seriousness of its symptoms, and the dire consequences of non-compliance with the diet; The interest in the factors and methods that enhance the individual healthy adherence increases significantly. Additionally, many studies have shown that a high level of self-control is a defensive barrier for the individual against destructive and unwanted behaviors, such as smoking and drug use. A high level of self-control enables the individual to control and modify his behavior, by controlling himself and his environment.

Individuals suffering from Celiac disease should follow a very strict diet, since gluten is present in most edibles, and it causes a sever damage to them; they are authorized to eat specific foods, which they must adhere to, and this requires that the patient has a high level of

self-control to keep his emotions and actions in range and be patient. Accordingly, the current study came to investigate the nature of the relationship between the level of self-control and Health adherence in a sample of students with Celiac disease.

## **2. The problem of the study**

The Celiac disease is spreading dramatically in the globe, eventhough many people have not been diagnosed, its international rate ranges from (01 to 03)% and is expected to be higher in Algeria (Al Gomhouria newspaper, 01.07.2017). Some studies indicated that the prevalence rate in the Middle East, North Africa and India reaches 20.3% (Tuati, 2015, p. 25), which is a significant rate.

Celiac disease poses life-threatening menaces to individuals and their wellbeing. The risks are even more serious if the patient is not following a gluten-free diet. In advanced cases, the patient may develop bowel cancer, infertility, and others. In fact, Celiac is a window to countless other diseases. So, doctors and specialists call for serious health adherence, which helps the patient maintain his health by avoiding those diseases and getting rid of the symptoms associated with Celiac disease. Health adherence refers to following complete health instructions and guidelines correctly, especially following a strict gluten-free diet. This puts the patient in a daily challenge to control him-self so that he stays away from everything that deteriorate his health.

Self-control is a cognitive method for the individual to control



his behaviors, actions, and emotions through self-monitoring, self-assessment, and self-enhancement, and applying this method in different situations.(Al-Rabee' and Attia, 2016, pg. 1119). Based on this, the current study came to reveal the relationship between the level of self-control and Health adherence among students with celiac disease at the University of Biskra, by answering the following questions:

**-The first question:** What is the level of self-control among students with Celiac disease at the University of Biskra?

**-The second question:** What is the level of Health adherence among students with celiac disease at the University of Biskra?

**- The third question:** Is there a correlation between the level of self-control and Health adherence among students with celiac disease at the University of Biskra? It includes two sub-questions:

➤ **The first sub-question:** Is there a correlation between the level of self-control and the adherence to the diet dimension among students with celiac disease at the University of Biskra?

➤ **The second sub-question:** Is there a correlation between the level of self-control and the commitment to medical follow-up dimension among students with celiac disease at the University

### **3. Objectives of the study**

The current study seeks to:

**-Determine the level of self-control among students with celiac**

disease at the University of Biskra.

-Determine the level of health adherence among students with celiac disease at the University of Biskra.

-Identify the relationship between the level of self-control and Health adherence among students with celiac disease at the University of Biskra.

-Identify the relationship between the level of self-control and the adherence to the diet dimension among students with celiac disease at the University of Biskra.

-Identify the relationship between the level of self-control and the commitment to medical follow-up dimension among students with celiac disease at the University of Biskra.

#### **4. Importance of the study**

The importance of this study can be summarized in:

- Shedding light on a chronic disease and a marginalized group of society, which is the group of Celiac patients. Despite its prevalence in our society, it has not yet been included in the list of chronic diseases in Algeria, which –if done- allows at least Celiac patients to obtain some support to facilitate the acquisition of gluten-free products, as they are known to be expensive.

- Designing a standardized test of health adherence for Celiac patients, which other researchers may benefit from in similar studies.



- Enriching the base of knowledge on this subject.
- Helping those related -directly or indirectly- to this disease, whether preserving their own health or that of their beloved ones.
- Emphasizing the necessity of health adherence for Celiac patients.
- Draw the attention of Celiac patients to raise the levels of self-control, and to apply some strategies to empower health adherence.
- Draw the attention of the educational community ,in general, to the necessity to focus on raising the levels of self-control among individuals, which serve as a barrier against destructive self-desires.

## **5. Introducing the study concepts and their procedural definition**

### **5.1 Celiac disease**

Celiac disease was defined for the first time by (Samuel Gee, 1988) as: “an inflammatory intestinal disease characterized by an intestinal malabsorption syndrome, caused by gluten protein present in (wheat, barley, and some foods). It results in atrophy complete or relative to the intestinal villi, the intestinal lining responsible for absorption is damaged, so the process of absorbing nutrients and all the vitamins and minerals the body needs is disrupted. In order to avoid hypersensitivity of the immune system, the patient have to follow a gluten-free diet (Hamoudeh, 2018, pp. 1-2).

Hammouda (2018) indicated that the diagnosis of this disease is made by observing the symptoms at first, then it is confirmed by a medical examination. The definitive diagnosis is made by taking a

biopsy of the duodenum, before removing gluten from the diet. She also added that the diagnosis can be made by analyzing the antibody (IgA) in the blood due to its clear association with degrees of atrophy (p. 06).

Accordingly, a celiac patient is an individual whose infection has been confirmed through both : blood tests for antibodies, and a biopsy of the small intestine to show the extent of damage to it. Currently, this disease has no cure other than a lifelong commitment to a gluten-free diet.

## **5.2 Health adherence**

The American Organization for Health defines health adherence as: “The extent to which the patient’s behavior is consistent with the recommendations agreed upon by the health care provider, such as taking medication according to the dose, time and frequency, following the proper diet, following the instructions and implementing changes in his lifestyle (Al-Alluim, 2010, p).

### **5.2.1 Dimensions of health adherence**

Based on the idiomatic definition of health adherence and its projection on the specificity of Celiac disease, its dimensions were defined as follows:

**a-Diet adherence:** Most studies indicate that the only treatment for celiac disease is to follow a gluten-free diet. Also, the only solution is to "avoid all substances that contain gluten, and this matter may seem

easy, but in reality it requires a lot of discipline by the patient, support and understanding from family and friends. Because adherence to a gluten-free diet needs a lifestyle change. (Bahmam, 2021)

Note that there are foods that clearly contain gluten, such as bread made from wheat and pasta made from wheat, but it must be known that gluten may be hidden in some foods such as sauces, instant coffee, etc., and in some food additives. “Therefore, it is necessary to read the content of each canned food carefully, and caution should be exercised when eating outside the home, because adherence to a gluten-free diet for a Celiac patient must be strict. There are special foodstuffs made for Celiac patients that are gluten-free, but unfortunately their prices are very high.” (Bahmam, 2021, p.)

**b- Commitment to medical follow-up:** since this disease does not require any medications for treatment, only a gluten-free diet. It is necessary to consult a nutritionist to find out which food is allowed and which is prohibited. By doing so, the patient simply avoids many mistakes which lead to other health problems. Also, medical follow-up includes the periodic examination by specialized doctors, in order to evaluate the improvement of the intestinal villi, by conducting a spectroscopy or analyzing a biopsy of the intestine, or even through special antibody analyzes to determine the atrophy degree of the intestinal villi, and to determine whether the diet is respected or not.

In fact, following the instructions of the specialized doctors and nutritionists and committing to implementing them is essential for celiac patient, it will help them avoid mistakes that may lead to



catastrophic consequences including death. It also relieves them from suffering both symptoms and complications associated to this disease, so they continue their lives as any ordinary person.

Therefor, health adherence can be defined procedurally as: the extent to which the patient's behavior is compatible with the recommendations and advice provided to him by the specialists in terms of commitment to the diet and medical follow-up. It is measured by the total score obtained by a sample member on the health adherence scale used in the current study.

### **5.3 Self-control**

Before addressing the variable self-control, it is necessary to refer to the term 'self' first. The 'self' is defined as follows: "it is what the individual carries of values and judgments related to his personality, and realizes them through his relationship with the world and others around him." It is also defined as: the individual's attitude and self-assessment according to his perceptions, emotional perceptions, abilities and abilities that he sees in himself (Mubarak, 2008, p. 71). As for self-control, the term refers to "the emotional restriction that is imposed on motives, whims, inclinations, desires, and others, and means suppressing instincts and emotions." (Desouki, 1998,p311). However, Baumeister et al defines self control as : "the capacity to alter one's responses, such as by overriding some impulses in order to bring behavior in line with goals and social standards, and support the pursuit of long-term goals". (Al-Rabeeh and Attia, 2016, p.

1119).

Skafir's definition came as: a cognitive method through which the individual controls his behaviors, actions, and emotions through self-monitoring, self-assessment, and self-reinforcement, then employing this method in different situations. (Al-Rabee' and Attia, 2016, p. 1119) . In the other hand, el Janabi defines it is as “the process of rewarding the self in order to increase or enhance a behavior, and punishing the self in order to reduce or stop undesirable patterns of behavior.” (Makki, 2016, p. 209)

Despite the multiple definitions of self-control, they did not differ much among themselves, as they all indicate that self-control is the individual's ability to control his actions and emotions in line with what is commonly known, through reward or punishment.

### 5.3.1 Stages of self-control

The process of self-control includes three stages: (Maali, 2015, p. 80)

**a-The stage of self-monitoring:** It includes an accurate description, and careful identification of the individual 's behavior. At this point the individual deliberately pays attention to his behavior, and collects information about the reasons that direct it.

**b- The stimulus control stage:** The individual sets standards or expectations for what his behavior should be according to the information he obtained in the previous stage. Then, he compares the previous information with the criteria he set for this behavior.

**c- The stage of self-reinforcement:** It is the main stage of self-

control. In this stage, either the individual obtains gains as a result of his correct behavior and reinforces himself, or punishes it if he fails to achieve his goals. The individual must monitor his behavior periodically, without exaggeration or negligence, in order to improve himself, to know how he should be, and to adjust what is not desirable to achieve balance.

### **5.3.2 Strategies for self-control**

There are multiple strategies to apply in order to enhance the individual levels of self-control, which are: (Maali, 2015, p. 80)

**a-Physical restriction:** For example : closing doors in order to restrict the space within which they move.

**b- Changing the stimuli:** by controlling the environmental stimuli that provide an opportunity for the unwanted behavior to occur.

**c- Using repulsive stimuli:** such as using repulsive or painful stimuli to prevent performing a certain behavior. This is one of the most used strategies by individuals to control themselves.

**d- Reinforcement or self-punishment:** In this case, the focus is on reinforcement after a desirable act that is intended to be strengthened. Conversely, the use of punishment after an unwanted behavior, or failure to perform a desired one.

**e-Preoccupation with something else:** The individual occupies himself with certain things in order to keep himself busy, and get away from the unwanted behavior.

**f- Contracts:** It is in the form of a pledge that the individual makes with himself or others (such as the counselor) verbally or in writing, and it is a common strategy in behavioral therapy. Or conditional contracts, by specifying the individual for the type and method of reward and the time period in which these contracts will be implemented (Al-Rabee' and Attia, 2006, p. 119)

Regardless of these strategies' simplicity, they are extremely effective in improving the level of self-control. Therefore, it is necessary to raise awareness of them, especially among individuals who suffer from problems related to self-control.

It is important to mention that practicing self-control enhance self-control. A model of self-control strength suggested that it is possible to improve people's self-control by the regular practice (interspersed with rest). Later studies shows that it could be done gradually, starting with small acts of inhibiting moods, urges, thoughts or feelings. This increased strength should generalize to any and all tasks that require self-control.( Muraven, 2010)

### **5.3.3 Ways to resist temptations that impede self-regulation**

In this element, the main points addressed by Darrag (2019) are mentioned, and clarifications are added by the two researchers to be in line with the privacy of Celiac patients. These methods are as follows:

**a- Reducing the degree of temptation to the lowest possible level:**  
For example, a Celiac patient can eat until he is satisfied before going out on a picnic with his friends, thus greatly reduce his desire to eat

food containing gluten.

**b- Remembering the damage that will befall the individual if he does not resist the temptations:** As mentioned previously, the consequences of not adhering to the diet are severe. For example, the individual recall the scene of vomiting, pain, and fatigue that he gets after eating gluten, or think of the extreme harm that could happen if he continued to eat gluten: bowel cancer and infertility, etc.

**c-Thinking about the desired goal and avoiding thinking about the tempting aspects:** Good health is the main requirement, the individual must continue to remind himself the importance of following a gluten-free diet, which is the only way to enjoy healthy life.

**d- Avoiding situations that cause temptation:** such as attending traditional sweets exhibitions while the individual is a fan of sweets and cannot control himself.

**e-Focusing on the achievements by the method of self-control compared to the temptations:** The individual can be proud of himself for his ability to follow the diet strictly, enjoy his well being and the disappearance of the bad symptoms associated with the disease (anemia, stress, and many others) (Darraj, 2019, p-p. 85- 86)

These methods are very effective if followed, the individual can resist the temptations that destroy his health. Accordingly, self-control can be defined procedurally as: a cognitive method through which the individual controls his behaviors, actions, and emotions through self-

monitoring, self-evaluation, and self-reinforcement, and then employing this method in different situations. It is measured by the total score obtained by each respondent on the self-control scale used in the current study.

## **6. Study hypotheses**

Based on what was identified in the study problem, stating its objectives, and defining its variables procedurally and with reference to the literary heritage, the following hypothesis was formulated:

- **General Hypothesis:** There is a statistically significant correlation between the level of self-control and health adherence among students with Celiac disease at the University of Biskra.

➤ **The first sub-hypothesis:** There is a statistically significant correlation between the level of self-control and the dimension of adherence to the diet among students with celiac disease at the University of Biskra.

➤ **-The second sub-hypothesis:** There is a statistically significant correlation between the level of self-control and the dimension of commitment to medical follow-up among students with celiac disease at the University of Biskra.

## **7. Study Approach**

The current study seeks to identify the relationship between the level of self-control and health adherence among students with celiac disease at the University of Biskra. In order to achieve this goal, the study relied on the descriptive correlational approach, which is

defined as: "a type of research method by which it is possible to know whether there is a relationship between two or more variables, and then determine the degree of that relationship." (Melhem, 2010, p. 50).

## **8. Study limits**

The limits of the current study are as follows:

**8.1 Objective Limitations:** The current study is limited to examining the relationship between the level of self-control and health commitment among students with Celiac disease.

**8.2 Spatial boundaries:** The current study was applied at Mohamed Kheidar University- Biskra-

**8.3 Temporal limits:** The current study took the time period between February 01 and April 15, 2021.

**8.4 Human Limitations:** The study was limited to students with celiac disease who are present at the University of Biskra. It was possible to reach them through the social media "Facebook".

## **9. The study sample**

The sample of the study consisted of (27) male and female students, including (07) males and (20) females, from students with celiac disease at the University of "Biskra", who were chosen in an intentional way. They were reached through the Facebook platform.

## **10. Study tools**

To achieve the objectives of the study, two tools were used:



## 10.1 The self-control scale

The original scale is prepared by Tanguy, Baumeister, and Boone, it consisted of (36) items whose paragraphs are answered according to the five-point Likert scale, which are: (always, sometimes, often, rarely, never). In this research, we use a twisted version of thz scale, it is translated and modified by Faisal Khalil Al-Rabee and Ramzi Muhammad Attia. The scale became composed of (35) items. The student responds to these items by choosing an answer from three graded answers. The highest score is (3) for the alternative (always applies), two degrees for the alternative (sometimes applicable), one score for the alternative (not applicable), and vice versa in negative statements. Its psychometric properties were recalculated as it is applied to the study's sample. Structural validity and reliability coefficient were calculated using the half-partition and Cronbach's alpha methods.

**a-Validity:** We calculate constructive validity, where the correlation coefficients were calculated between the total score of the test and the score of each item. The results found shows that the correlation coefficients varies between (0.47) and (0.73), which is significant at the level of (0.05). So the test has internal consistency honesty.

**b- Reliability:** It was calculated by two methods: (half-partition and Cronbach's alpha). The following table explains this:



**Table 1.** Reliability coefficient for the half-partition and Cronbach's alpha methods

Number of items	Reliability coefficient	Cronbach's alpha
35	0.70	0.72

we notice that the scale is characterized by high reliability and is acceptable for purposes.

**Scale correction key:**

The range of appreciation on the entire scores varies in the range [35,105] degrees. It determines the levels of self-control (low, medium, high), as shown in Table2 .

**Table 2.** The key to correcting the total scores of the self-control scale

Scores	Level of self-control
From 35 to 58,33	Low
From 58.34 to 81.66	Medium
From 81,67 to 105	High

## 10.2 - Health adherence scale

This scale is prepared by the two researchers, as it consists of (22) items distributed in two dimensions: The first one is the dimension of adherence to the diet, it includes (16) item. The second is the dimension of commitment to medical follow-up , it includes (06) items. They were formulated according to various references about Celiac disease. Each one is answered On the scale within three alternatives (always apply; sometimes apply; does not apply).

### Psychometric properties of the health adherence scale:

**a- Validity:** The validity of the internal consistency was calculated by extracting the correlation coefficients between the total score of the test and the score of each item. As showing in Table 3.

**Table 3.** Correlation coefficients between the total score of the test and the score of each item

Item	Coefficient	Item	coefficient	Item	coefficient	item	coefficient
01	0.52**	07	0.71**	13	0.52**	19	0.46**
02	0.71**	08	0.64**	14	0.47**	20	0.47*
03	0.62**	09	0.52**	15	0.41*	21	0.47**
04	0.45**	10	0.45**	16	0.66**	22	0.37**
05	0.71**	11	0.52**	17	0.65**		
06	0.56**	12	0.62**	18	0.56**		

From Table 3, we notice that the correlation coefficients for items (15) and (20) are respectively equal to (0.41) and (0.47). So, they are significant at the level of (0.05). Meanwhile, the rest of the correlation coefficients for other items varies from (0.37) to (0.71), and they are significant at the level (0.01). There for, it is clear that the test is characterized by the validity of the internal consistency.

**b- Reliability:** It was calculated in two ways: (half-partition and Cronbach's alpha), and the following table shows that:

**Table 4.** The reliability coefficient of the health adherence scale using half-partition and Cronbach's alpha

Number of items	Half-partition	Cronbach's alpha
22	0.63	0.64

The results indicates that the scale is characterized by acceptable reliability.

**Scale correction key**

In the current study, only three alternatives were used. The highest score (3) is for the alternative (always applies), one score for (not applicable), and two degrees for (sometimes applicable). All of the scale statements are positive. The range of appreciations on the entire scale are in the range [22,66] degrees. In order to achieve the

aimed objectives, which determines the health commitment levels (low, medium, high), the correction key, which determines the health adherence levels, was extracted as shown in the following table :

**Table 5.** The key to correcting the total scores for the health adherence scale

<b>Scores</b>	<b>Level of health adherence</b>
From 22 to 36.66	Low
From 36.67 to 51.33	Medium
From 51.34 to 66	High

## **11. Presentation and discussion of the results of the study**

After the statistical analysis of the data, the results of the study will be presented to answer the study's questions and verify its hypotheses.

### **11.1 Presenting and discussing the results of the study questions**

**a-Presenting the results of the first question:** What is the level of self-control among students who suffer from Celiac disease at the University of Biskra? To answer this question, the arithmetic mean and standard deviation of the responses were extracted.

**Table 6.** shows the arithmetic mean and standard deviation of the answers on the self-control scale

Variable	Sample	Arithmetic mean	Standard deviation	Decision
Self-control	27	69.33	14.61	Medium

In comparison between Table 6. And Table 2, we note that the level of self-control among students who suffer from Celiac disease at the University of Biskra is average.

**b- Presenting the results of the second question:** What is the level of health adherance among students who suffer from Celiac disease at the University of Biskra? To answer this question, the arithmetic mean and standard deviation of the responses were extracted (Table 7).

**Table 7.** shows the arithmetic mean and standard deviation of the responses to the health adherence scale

Variable	Sample	Arithmetic mean	Standard deviation	Decision
Health adherence	27	43.96	09.34	Medium
First dimension		34.03	9.92	Medium
Second dimension		9.10	1.10	Low

Noting both tables(5 and 7) we determine that the level of health adherence among students who suffer from Celiac disease at the University of Biskra is average. This result is considered unsatisfactory compared to the risks that result from non-adherence to a gluten-free diet, as (Bahmam ,2021) indicates that not following a diet may expose patients to tumors in the digestive or lymphatic system. We also note from Table 7, that the first dimension of the scale (Diet Adherence) falls within the average level. This result differs from what It was expected given the nature of the disease.

This result is primarily due to the patients' ignorance of the correct gluten-free diet, their ignorance of the dire consequences of not following the diet, their negligence or even their ignorance of hidden gluten, for example: the patient avoids foods that clearly contain gluten, while he eats in restaurants Inside and outside the university campus, ignoring the fact that the kitchen and its utensils are contaminated with gluten.

In addition, the high prices of gluten-free materials and their unavailability prevent many from obtaining them, especially since the disease is not included in the list of chronic diseases in Algeria. Also, the specificity of the respondents makes it difficult for individuals to adhere to the diet, especially those witha residence grant, as they are far from their homes and families, and they share rooms with individuals who do not understand the nature of their illness and diet.

We also note from Table 7. that the commitment to medical follow-up falls within the low level. The researchers explain this result to the absence of a culture of periodic examinations, and the sufficiency of most of the patients to adhere to a gluten-free diet, and the fact that Celiac disease is chronic makes them negligent in visiting the doctor, as most of them suffice with self-observation of the disappearance of symptoms and the improvement of body health.

It has been noted from the responses of some patients that there is an aversion to re-visiting the specialist doctor, and re-visiting the doctor because of the pain it causes. The high cost of living also prevents regular check-ups. Purchasing gluten-free items exhausts many patients, and this low level is also attributed to the tendency of patients to inquire about their disease and its symptoms. In addition, lists of what is permitted and prohibited are available on the Internet, and questions are asked about what is permitted and prohibited on social media platforms instead of going to nutritionists and specialized doctors.

## **10.2 Presenting and discussing the results of the study hypotheses**

In this section, each result is presented by the statistic values, and we discuss the result it self and the reasons of obtained it.

**10.2.1 Presenting the results of the first sub-hypothesis:** There is a statistically significant correlation between the level of self-control and the dimension of adherence to the diet among students with celiac disease at the University of Biskra. To test the hypothesis, the

correlation coefficient between the two variables was calculated as follows:

**Table 8.** The value of the correlation coefficient between self-control and adherence to the diet

Variables	Sample	Freedom degree	Correlation coefficient	Signifiquent level	Explained variance	alienation coefficient
Self-control and adherence to the diet	27	25	0.90	0.01	81%	0.43

We note from Table 8, that the correlation coefficient between self-control and the dimension of adherence to the diet estimated at (0.90) is positive and greater than the tabulated value, which is estimated at (0.48), and a degree of freedom (25). Therefore, there is a statistically significant relationship at the level of Significance ( $\alpha =0.01$ ). We also note that the value of the explained variance percentage amounted to (81%), which indicates a strong relationship between the two variables, meaning that the change in the degrees of the adherence to the diet dimension as a result of exposure to the independent variable (the level of self-control) is (81%).

In addition, we notice that the alienation coefficient is (0.43), which is lower than the correlation coefficient which is estimated at (0.90). the obtained results indicates that the correlation of the two variables more than their independence. Accordingly, we are able to accept the first sub-hypothesis, which states that: There is a



statistically significant correlation between the level of self-control and the adherence to the diet dimension among students with celiac disease at the University of Biskra. This relationship can be explained by the fact that adhering to a gluten-free diet and avoiding everything that is prohibited requires a high level of self-control, so that the diet instructions are applied accurately, because any defect, even if it is small, affects the recovery of the intestinal villi. The patient with high self-control finds himself automatically applying the stages of self-control in the three basic stages as follows:

**a-The self-monitoring stage:** It includes describing and identifying the undesirable symptoms and of the disease, such as fatigue, gastrointestinal disturbances, pain... and others. Here, the patient realizes that eating gluten is the cause and that the only solution is a lifelong gluten-free diet.

**b-The stage of controlling stimuli:** he takes the list of permissible and forbidden things that he gets from a specialized doctor as a standard and applies them in the expectation that his health will improve.

**c-The stage of self-reinforcement:** The patient notices the improvement of his health, the disappearance of his unwanted symptoms, so that he can practice the activities that he loves without getting tired, and he feels satisfied with himself because he was able to achieve a good result, so this behavior is reinforced and he continues to adhere to his diet for life..

10.2.2 Presenting the results of the second sub-hypothesis

It states: There is a statistically significant correlation between the level of self-control and after commitment to medical follow-up among students with celiac disease at the University of Biskra. To test the hypothesis, the correlation coefficient was calculated between self-control and after adherence to medical follow-up (Table 8.).

**Table 9.** shows the value of the correlation coefficient between self-control and the dimension of commitment to medical follow-up

Variables	Sample	Freedom degree	Correlation coefficient	Signifiq uent level	Explain ed varianc e	aliena tion coeffi cient
Self-control and commitment to medical follow-up	27	25	0.001	0.05	/	/

We notice from Table 9 that the correlation coefficient between self-control and commitment to medical follow-up is almost non-existent, and it is a very weak correlation coefficient. Which means rejecting the second sub-hypothesis, and accepting the null hypothesis, which states: There is no statistically significant correlation between the level of self-control and after commitment to medical follow-up among university students with celiac disease.

This result is explained by the absence of a culture of periodic examinations, and referring to the doctor only in extreme cases of illness. The fact that periodic examinations are not important in the

eyes of many does not motivate the patient to do them. The patient is satisfied with monitoring the improvement of his condition by observing the change in the severity of unwanted symptoms and their self-disappearance without resorting to the doctor and examinations.

10.2.3 Presentation of the results of the general hypothesis

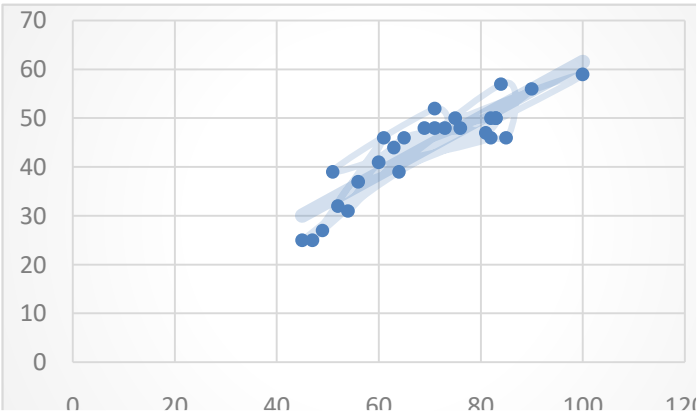
There is a statistically significant correlation between the level of self-control and health commitment among students with celiac disease at the University of Biskra. To test the hypothesis, the correlation coefficient between self-control and health commitment was calculated. As shown in the following table:

**Table 10.** The value of the correlation coefficient between self-control and health adherence

Variables	Sample	Freedom degree	Correlation coefficient	Signifiquent level	Explained variance	Alienation coefficient
Self-control and healthy adherence	27	25	0.89	0.01	79.21%	0.45

The relationship between self-control and healthy adherence can be represented by the following chart:

**Fig 1.** The results of the sample on the self-control scale and the health adherence scale.



From Table 10 we notice that the correlation coefficient between self-control and health adherence estimated at (0.89) is positive and greater than the tabulated value, which is estimated at (0.48), and a freedom degree of (25), which is a statistically significant value at the level of significance ( $\alpha = 0.01$ ) . That the percentage of the explained variance amounted to (79.21%), which expresses a strong correlation coefficient. So, the change in the degrees of health adherence as a result of exposure to the independent variable (the level of self-control) is at a rate of (79.21%). We also note that the alienation coefficient is (0.45), which is a smaller value than the correlation coefficient estimated at (0.86), which indicates the correlation of the two variables is more than their independence. We note that the correlation of the two variables is more than their independence.

Through Fig.1, we notice that the higher the individual's level of self-control, the higher his degree of health adherence, and vice

versa, which means accepting the general hypothesis of the study, and obtaining a result that states: There is a positive correlation with statistical significance between the level of self-control and health commitment among university students with celiac disease.

This result can be explained by the patient's perceptions of this disease, the fact that it's incurable makes him feel the necessity of health adherence, as it is the only way to survive. Consequently, he sought to control himself, as health safety is one of the necessary needs that Maslow referred to in the pyramid of needs.

Additionally, patients with a high level of self-control have a greater ability to change their own responses to fulfill their needs within the requirements of the disease. So, they have the power to aspire to long-term goals. Unlike those with a low level of self-control, who are less resistant to temptations. Therefore, despite their knowledge, they have no respect to restrictions.

#### **4. CONCLUSION**

Celiac disease is considered one of the chronic diseases that have no treatment other than a gluten-free diet. Health adherence is the only way to maintain good health, and it is only done through self-control. The patient could apply some self-control strategies and some methods of resisting temptations to enjoy a healthy body and prevent the dangers that result from not following the diet.

On the other hand, periodic medical follow-up remains a must,



although it seems a kind of luxury, but it helps the patient to notice minor changes in his condition, and thus recover before he reaches an advanced stage with strong symptoms, which is usually the only motivation for the patient to submit for medical examination or to visit a specialist. In fact, developing the level of self-control among individuals is a fortress and a psychological barrier against a large number of deviations and behavioral problems, as well as it is primordial to patients with chronic diseases.

## 5. Bibliography List :

### 5.1 Arabic references

1. باهمام، احمد سالم (2012)، السيلياك ... عدم اتباع نظام غذائي قد يعرض المريض لاورام في الجهاز الهضمي او اللفاوي، جريدة الرياض، العدد 15914، تم الاسترجاع من :  
<https://www.alriyadh.com/702367>
2. تواتي، فايزة (2015)، علامات التكيف النفسي لدى المراهق المصاب بالسيلياك من خلال تطبيق اختباري الرورشاخ وتفهم الموضوع، مذكرة مكملة لنيل شهادة الماستر في علم النفس العيادي، كلية العلوم الانسانية والاجتماعية، قسم العلوم الاجتماعية شعبة علم النفس، جامعة محمد خيضر، بسكرة.
4. حمودة، سليمة (نوفمبر 2018)، العلاج بالتقبل والالتزام ACT لعلاج المشكلات النفسية المصاحبة لمرض السيلياك، المؤتمر الدولي الاول للتطبيقات الحديثة لعلم النفس الصحة من اجل ترقية صحة الفرد والمجتمع، قسم علم النفس، جامعة الجزائر 2.
5. دراج، سامح عبد الحميد (2019)، القابلية للايحاء وعلاقتها ببعض المتغيرات لدى طلبة الجامعة، رسالة ماجستير في التربية، كلية البنات للاداب والعلوم والتربية، جامعة عين الشمس، مصر.

6. الربيع , فيصل خليل و عطية, رمزي محمد ( 2016 ) ، الاتزان الانفعالي وعلاقته بضبط الذات لدى طلبة جامعة اليرموك , مجلة دراسات , المجلد 43 .

7. جريدة الجمهورية، (01.07.2017) تم الاسترجاع من:

8. Eldjoumhouria.dz/art=5303

9. اللويم ، زهراء، عوائق التزام المريض بجلسات العلاج الطبيعي، تم الاسترجاع من:

10. <https://www.essentra.com/ar-AE/industries/.../patient-capabilities>

11. مبارك , سليمان سعيد (2008)، الاتزان الانفعالي وعلاقته بمفهوم الذات لدى الطلبة المتميزين و اقرانهم العاديين, مجلة ابحاث كلية التربية الاساسية، العدد2, جامعة الموصل.

12. معالي , ابراهيم باجس ( 2015 ) ، فعالية برنامج تدريبي في تحسين الضبط الذاتي وخفض العزلة لدى الطلبة المراهقين , مجلة دراسات، العدد1, الاردن.

13. معلوف، يوسف(ب س)، المنجد في اللغة والأدب والعلوم، ط 17، بيروت- لبنان، المطبعة الكاثوليكية.

14. مكي , لطيف غازي (2016)، الايثار وعلاقته بضبط الذات لدى طلبة الجامعة , مجلة كلية التربية للبنات، المجلد 27 , مركز البحوث النفسية.

15. ملحم، سامي محمد، (2010)، مناهج البحث في التربية وعلم النفس، ط 6، عمان- الأردن دار المسيرة.

## 5.1 English references

1. Muraven, Mark. 2010. *Building self-control strength: Practicing self-control leads to improved self-control performance*. Journal of Experimental Social Psychology. (Volume 46, Issue 2), Pages 465-468