

Therapeutic compliance in adolescent with epilepsy (single case clinical study)

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Abstract: The current study aimed to find out the therapeutic compliance behavior in an adolescent with epilepsy, a clinical study based on a single-case model conducted at the multiservice health clinic of Baloua Hospital located in Tizi Ouzou. The case was selected purposively, and for data collection, research tools such as the semi-structured clinical interview and the therapeutic compliance scale prepared by Morisky 2008 were used. The results found that the adolescent with epilepsy follows the therapeutic compliance behavior at an intermediate level.

Keywords: therapeutic compliance; adolescent; epilepsy.

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1. INTRODUCTION:

Epilepsy is one of the most common chronic diseases worldwide, characterized by recurrent seizures due to abnormal electrical activity in the brain. It impacts without the health, psychological well-being, and social aspects of those affected. In this context, therapeutic compliance is crucial for managing epilepsy, controlling seizures, and ensuring a largely normal life. This includes regular medication intake, following medical recommendations, attending medical appointments, and maintaining a healthy lifestyle. However, patients, especially adolescents, may face obstacles such as medication side effects, difficulty adapting to the illness, peer pressure, societal stigma, and a desire for independence. Non-adherence leads to increased seizure frequency and risks, causing health, psychological, and social issues, as well as academic difficulties.

Therapeutic compliance remains a significant factor in psychology, particularly in health psychology, due to its crucial role in the physical and psychological well-being of individuals, Patients - especially adolescents. However, the study of therapeutic compliance in epilepsy patients is limited, despite its status as a global issue. This research focuses on therapeutic compliance behavior in adolescents with epilepsy, aiming to determine whether they adopt or follow therapeutic compliance behaviors. The study is based on a clinical case approach, with the sample obtained from a clinic at the Balou Hospital in Tizi-Ouzou. Methods include clinical interviews, observation, and the application of the Morisky therapeutic compliance scale.

2. Problem of the study:

Epilepsy is one of the most common neurological disorders globally, resulting from disturbances in the cerebral cortex, which consists of various regions responsible for the manifestations of the illness. When electrical discharges occur in these regions and spread to other parts of the cortex and the rest of the body through nerves, seizures can occur. A seizure is a sudden clinical manifestation (motor, sensory, or psychological) that may be accompanied by loss of consciousness. Recurrent seizures are termed epilepsy (baroudi abdelkarim, 2016, p. 8) .

According to the "World Health Organization Statistics," approximately 50 million people worldwide suffer from epilepsy, making it the most widespread neurological disorder globally. Around 80% of people with epilepsy live in low- and middle-income countries, where about three-quarters of them do not receive adequate treatment (WHO, 2019, p. 9).

Epilepsy is also one of the most prevalent chronic disorders nationally, specifically in Algeria, where statistics indicate that 1 in 200 Algerians has epilepsy (Taourirt nourdine & Zagaar fathi, 2013, p. 40). The disorder affects individuals across all ages and genders but is particularly common among adolescents. This period is characterized by significant physical, psychological, and social changes, making it a critical stage for identity formation. The presence of a chronic illness during this pivotal time can be a source of stress, particularly due to the differences from peers (Agustin Rousselle, 2016, p. 12).

According to Louis Verret (2013), epilepsy is among the most common neurological disorders during adolescence, affecting 1.5% to 2% of adolescents, with an incidence rate of 20 to 50 per 100,000 person-years (Louis Verret et al., 2013, pp. 50-51).

Epilepsy has social repercussions due to widespread misconceptions about the disease, including erroneous beliefs about its infectious nature and societal aversion to

those with the condition. This leads to significant family burdens in managing and protecting the patient, which can disrupt family and personal stability. Additionally, the illness places considerable psychological pressure on patients, leading to anxiety, depression, reduced self-esteem, and social stigma. Economic impacts also arise from the high costs of medications and prolonged treatment periods, particularly in developing countries (Abdelkarim Brodi, 2013, p. 9).

Despite these challenges, epilepsy, like other chronic diseases, requires ongoing treatment, with medication being a fundamental aspect of healthcare. Adherence to treatment, known as “therapeutic compliance” is crucial for managing the illness. This term, introduced into medical literature in 1975, is defined by R.B. Haynes and colleagues as the degree of agreement between an individual's behavior (in terms of medication intake and lifestyle adjustments) and medical prescriptions (Séverine Lhote, 2011, p. 34).

Therapeutic compliance poses a significant challenge for healthcare professionals, as many patients- particularly adolescents- do not adhere to medication schedules or other treatment instructions. A study by Cramer et al. (2002) found that 71% of epilepsy patients admitted to missing at least one dose of their medication, with 45% experiencing secondary seizures due to forgetfulness. The average number of missed doses was 1.99 per month (Rikir et Grisar., 2010, p. 367). Age is also a critical factor, with adolescents often following their treatment inconsistently and struggling to understand the importance of regular medication, compounded by a desire for independence and social acceptance (ibid p. 367).

Thus, therapeutic compliance among patients with chronic illnesses remains a major challenge for the healthcare sector. The World Health Organization reports that only about 50% of patients in developed countries adhere to treatment, with even lower rates in developing countries (WHO, 2003, p. 7).

Therapeutic compliance in patients with epilepsy is an essential element in improving the effectiveness of treatment and reducing seizures. It is based on the extent to which patients follow and adhere to taking medications and comply with medical directives, and the advantages of therapeutic compliance include improving treatment outcomes, reducing seizures and increasing overall therapeutic effectiveness. However, therapeutic compliance faces shortcomings including the high cost of medications, which is an additional burden for patients in developing countries, as well as psychosocial challenges such as social stigma and community pressure, which may negatively affect treatment adherence (Who, 2019). Therefore, although therapeutic compliance plays a vital role in epilepsy management, improving adherence requires addressing these shortcomings comprehensively.

Previous studies have been interested in determining how treatment adherence affects health outcomes, noting that non-adherence is a major issue that can lead to increased seizures, as Cramer et al. (2002) showed that about 45% of patients experience seizures due to forgetting to take medications and not taking them regularly, which is exacerbated among adolescents who may have difficulty adhering due to their desire for independence and avoiding discrimination (Rikir et al., 2010). This highlights the importance of regular follow-up treatment.

Louis Verret's study (louis verret, 2013) shows that adolescents are more prone to epilepsy, and this stage is very difficult and sensitive, and having a chronic disease at this pivotal time in life can be a source of stress, compared to their peers. Here, it is difficult to accept and live with the disease and thus the treatment process is difficult.

In addition to the health impacts, epilepsy not only affects physical health but also causes significant psychosocial and economic burdens, especially in developing countries

where about 75% of patients do not receive adequate treatment (WHO, 2019). Although improving patient adherence to treatment can significantly improve treatment outcomes, high costs and psychosocial challenges remain key shortcomings that need to be addressed to improve the overall effectiveness of treatment.

Based on these data and studies, we try through the current study to know the behavior of therapeutic appropriateness in adolescents with epilepsy, within the framework of health psychology, and therefore the following question was asked:

- Does the adolescent with epilepsy follow the behavior of therapeutic compliance?

Based on this question, the following hypothesis was formulated:

3. Hypothesis:

- The adolescent with epilepsy follows the therapeutic compliance behavior to a low degree.

4. Reasons for the Study:

The main factor as to why we chose the topic of the study is :

The suffering experienced by adolescents with epilepsy and the psychological pressures and obstacles they face in their daily lives.

- Teenagers' ignorance of the seriousness of epilepsy and the effects of epilepsy if it is not met with psychological and health care.

- Identify the behavior of therapeutic compliance in adolescents with epilepsy.

- The incomplete and common understanding of epilepsy among adolescents and the risks associated with not following up on treatment.

5. Importance of the Study :

- The study of therapeutic compliance in adolescents with epilepsy is of great importance, in improving disease management and ensuring the stability of health status, as it helps to reduce the frequency and severity of seizures by modifying the treatment that is in line with the adolescent's physical changes, which increases the effectiveness of treatment and reduces the side effects caused by medications, and understanding psychosocial factors can help support adolescents in dealing with the challenges of the disease and thus enhance their adherence to treatment and improve their quality of life in general.

6. Objectives of the Study:

The study of therapeutic adherence behavior among adolescents with epilepsy is important for understanding how this age group manages their illness, with the following objectives:

- To determine the extent to which adolescent with epilepsy adhere to therapeutic behaviors.
- To understand how adolescents respond to therapeutic compliance behavior.

- To assess how epilepsy medications affect adolescents.
- To identify factors influencing the extent to which adolescents follow therapeutic compliance behavior.
- To explore ways to increase and improve therapeutic compliance among adolescents.

7. Key Terms of the Study:

• **Therapeutic compliance:** It is the degree of compatibility between the behavior of an adolescent with epilepsy and compliance with medical instructions.

• **Adolescence :** is a person who falls between childhood and adulthood, where he reaches the age of 18 years, and suffers from epileptic seizures caused by abnormal electrical activity in the brain. the adolescent period is characterized by multiple psychological, physical and social changes. The individual begins to develop his identity, take on more responsibility, desire greater independence and form new social relationships and interests along with some challenges related to growth and development.

• **Epilepsy:** It is that chronic neurological disease that affects the brain and manifests itself in the form of seizures that occur in the adolescent at irregular intervals as a result of increased electrical charges in the brain and is accompanied by a set of symptoms according to each seizure, and is medically diagnosed by a doctor specialized in neurological diseases.

8. Study Methodology:

In this study, we adopted a clinical method based on a case study approach. According to the researcher Witmer, this method involves using the results from the examination of several patients and studying them one by one to derive general principles based on observing their competencies and deficiencies (Mustafa Abdel-Moati, 2003, p. 31).

9. Tools of the study:

9.1. Semi-structured clinical interview:

In this type of interview, the researcher prepares a set of questions to ask the participants, sometimes providing options, all while staying within the scope of the interview's subject (Khalil Omar, 1983, p. 211).

In our research, we used a semi-structured clinical interview with six main topics serving the purpose of the study. See Appendix No. (1).

The topics of the interview are as follows:

- **Topic 1:** Personal Information
- **Topic 2:** Health Status and Epilepsy
- **Topic 3:** Therapeutic compliance Behavior
- **Topic 4:** Future Outlook

9.2. therapeutic compliance Scale:

1. Description of the Scale: This is a translation of the Morisky Medication Adherence Scale: MMAS (8-item). We used this scale in our study to assess adherence behavior based on the Morisky et al. (2008) scale, referred to as MMAS-8, which consists of 8 items. Seven of these items can be answered with "Yes" or "No," and the eighth item is measured using a 5-point Likert scale.

2. Scoring the Morisky Medication Adherence Scale: A score of 1 is given for answers of "No" and a score of 0 for answers of "Yes," except for item 5, where the scoring is reversed. The scores on the MMAS-8 range from 0 to 8:

- A score of less than 6 indicates low adherence (low therapeutic adherence level).
- A score between 6 and 8 indicates moderate adherence (moderate therapeutic adherence level).
- A score of 8 indicates high adherence (high therapeutic adherence level) (S.T. Ashur, K. Shamsuddin, S.A. Shah, S. Bosseri, and D.E. Morisky, 2015).

9.3. Data collection tools (validity and stability of the scale):

A- Validity of the study scale:

-To verify the validity of the scale, the method of content validity, subjective validity, and internal consistency validity was used to extract the validity of the scale to measure what it was designed to measure.

In content validity, we presented it to the aforementioned group of raters.

For subjective validity, the validity of the test results, subjective validity was obtained by calculating the square root of the scale's reliability value.

Self-Reliability = ScaleReliability

- As for internal consistency, correlation coefficients were calculated between the scores of each item or phrase and the total score of the scale.

B-Scale reliability:

The split-half method was used, which is one of the most commonly used methods in estimating stability, which depends on applying the test only once, as this method requires dividing the test into two statistically equivalent halves after unloading the scores using the SPSS statistical program, to facilitate the calculation using the following methods:

- Spearman-Brown coefficient (split-half)
- Gutman's coefficient
- Cronbach's coefficient
- Method of application and re-application

c- The scale was translated by the researcher from its original English language into Arabic, taking into account the following factors: ease of the language used and the use of direct questions and phrases. She applied it to a sample of 30 adolescents (both male and female) with epilepsy at a multiservice clinic in the Neurology Department of Baloua Hospital in Tizi Ouzou, in order to detect the significance of the reliability of the scales in addition to their stability and calculate their psychometric properties, which are as follows:

9.4. Psychometric Properties of the Morisky 8-Item Medication Adherence Scale:

a- Validity of the scale:

The results of the validity assessment by experts for the Morisky 8-Item Medication Adherence Scale are shown in Table 1, as follows:

Table 1: Validity Results from Experts for the Morisky 8-Item Medication Adherence Scale

Study Scale Areas	Morisky 8-Item Medication Adherence Scale
Accepted Items (Items that were accepted)	1-2-3-5-6-7-8
Revised Items (Items that were revised)	4
Rejected Items (Items that were removed)	/

The expert opinions indicate that the Morisky 8-Item Medication Adherence Scale is relevant to the topic, with only minor adjustments.

b- Self-Validity :

The results of the self-validity for the Morisky 8-Item Medication Adherence Scale, calculated using the self-validity coefficient, are shown in Table 2:

Table 2: Self-Validity of the Morisky 8-Item Medication Adherence Scale

Study Scale	Medication Adherence Scale
Self-Validity Value	0.86

The results indicate high self-validity coefficients for the Morisky 8-Item Medication Adherence Scale, which means it is valid for final application on the main study sample.

c-Internal Consistency of the Morisky 8-Item Medication Adherence Scale:

The internal consistency results of the Morisky 8-Item Medication Adherence Scale were obtained by calculating the correlation coefficients between each item or statement and the total score of the scale, as shown in Table 3:

Table 3: Correlation Coefficients between Each Item and the Total Score of the Morisky 8-Item Medication Adherence Scale

Item Number	Correlation with Total Score	Item Number	Correlation with Total Score
1	0.66**	5	0.73**
2	0.69**	6	0.52*
3	0.59**	7	0.57*
4	0.44	8	0.50*

*Significant at 0.05 level; **Significant at 0.01 level

The table shows that the correlation coefficients between the total score and each item of the Morisky 8-Item Medication Adherence Scale are high and significant functional, ranging from 0.44 to 0.73. This means that it is valid in terms of internal consistency on the final application to the main sample of the study.

d. Reliability: The split-half method was used, which is one of the most commonly used methods in estimating stability, which depends on applying the test only once, as this method requires dividing the test into two statistically equivalent halves after unloading the scores using the SPSS statistical program, to facilitate the calculation using the following methods:

The reliability results of the Morisky 8-Item Medication Adherence Scale are presented in Table 4:

Table 4: Reliability Results of the Morisky 8-Item Medication Adherence Scale

Calculation Method	Medication Adherence Scale
Spearman-Brown Coefficient	0.60*
Gutman Coefficient	0.77**
Cronbach's Alpha	0.73**
Test-Retest Method	0.67**

From Table 4, we can see that the results indicate very high reliability coefficients and a high degree of internal consistency for the **8 items** of the **Morisky Therapeutic compliance** Scale, where the values range between 0.60 and 0.77, which means that the scale is applicable to the main sample of the study

10. Study group:

The study group consisted of a single case study, which was intentionally selected based on the criteria that the individual was an adolescent with epilepsy, and did not have any mental disability.

11. Where and when the study was conducted :

The study was conducted at a multi-service clinic affiliated with the Baloua Hospital in Tizi Ouzou Province, during February 2024.

Table 5: Characteristics of the Study Sample

Variable s and Conditio ns	Gend er	Ag e	Numb er of Siblin gs	Birt h Orde r	Education al Level	Econom ic Status	Econom ic Status	Type of Seizure
Case No. 1	Male	18	5	3	First Year Universit y	Average	12 years	Nocturn al Tonic- Clonic Seizures

From the table (5), we can conclude that the case is an 18-year-old adolescent with epilepsy who is the third among his siblings. He adheres to his treatment regularly, has an average educational level, and has never repeated a year, currently being in his first year of university due to stable health. The onset of his illness began during adolescence at the age of 12, and he experiences nocturnal seizures, making him unaware during the seizures.

12. Presentation, Analysis, and Discussion of Results

Presentation and Analysis of the Semi-Structured Clinical Interview Results

Case Presentation: case (m) is an 18-year-old adolescent with five siblings, where he is the third-born. He is currently in his first year of university, studying Law, and has an average socioeconomic status.

Content Presentation and Analysis of the Interview: As for his health condition, he has had epilepsy since he was 12 years old, during puberty. His seizures occur exclusively during sleep. He described his seizures saying: “Tajini la crise ki nkoun raked exact f lfadjr,” meaning “I experience seizures while I am asleep, specifically at dawn. During these seizures, he is unaware, and after frequent occurrences, his family took him for examination, which confirmed he suffers from epilepsy with major seizures.

As a child, he experienced loss of consciousness and also reported unusual tremors during urination. He has no other health issues apart from epilepsy, and no family history of the disease. However, he experiences psychological distress, stating: “Hassit rouhi mkhnuq bzaf ou bzyada nenssa bzaf ou mhedartch m3a heta wahad, ou manheb nahader m3a heta wahad,” meaning “I feel very suffocated, I forget a lot, haven’t talked to anyone, and don’t want to talk to anyone.” He also mentioned: “Blak andi depression ki rani mrid bsah mashi haja,” meaning “I might be depressed due to the illness but it's not severe.” He has not received any treatment for these symptoms. This indicates that the case suffers from mood disorders, which is one of the most common mental illnesses in epilepsy patients, as he is aware of this but did not try to treat himself, and this is illustrated by a study conducted by (Grabowska-Gryzb et al, 2006) found that the rate of depression

represents 49.5% in 203 patients with intractable epilepsy, the rates of depression are higher in refractory epilepsy and range between 40 to 60% compared to 20% in types of epilepsy that respond to treatment. Therefore, the detection and treatment of depression in epilepsy patients is an important topic that has been widely discussed in scientific journals and conferences recently and needs attention (Davies et al, 2003). **Therefore**, the case needs psychological follow-up in addition to antidepressants in order to alleviate the severity of the disease and thus improve his health condition.

As for the behavior of his Therapeutic compliance, he follows his treatment regularly, as he said: “ih natb3 dwa dayman,” meaning “Yes, I adhere to the treatment.” He takes two medications daily on his own, without any assistance from his family. He does not complain about the medication and takes it willingly, but he finds it bothersome due to its impact on his ability to form relationships: “Biensur ydiroujini bzaf bsabto manqdirch natsahb” meaning “Of course, it bothers me a lot because of the illness, I can’t have a relationship ” This indicates that the case is not satisfied with the medication that he always takes, as this matter bothers him and considers his illness as an obstacle for him because he was not allowed to establish a relationship with the opposite sex and prefers to isolate from others, as he feels inadequate in himself for fear of stigmatization. This is what a study shows that social isolation and poor social adaptation can result from perceived stigma or over-dependence caused by excessive parental protection in people with epilepsy often also fears the process of embarrassment before a seizure occurs, causing him to not want to enter the process of social interaction, with low self-esteem and academic performance, and these things can lead to a shrinking support network, through fewer friends, less likelihood of marriage and greater likelihood of antisocial behavior (Buchanan,2002,p.115)

As for his outlook on the future, he wants to succeed in his studies and build a family in the future, but he is concerned about how women perceive him due to his epilepsy, saying: “Makach mara li taqder takbel wahad andou cise’,” meaning “There is no woman who would accept someone with epilepsy.” Despite his negative outlook, he still desires a relationship, considering it a normal part of his life.

The situation, based on the information gathered about the behavior of therapeutic compliance, shows that the individual adheres to the therapeutic behavior. This is evident in their regular follow-up of the treatment and their self-administration of medication without assistance from any family members. They have not encountered any issues related to the medication and do not find any obstacles in continuing the treatment. However, they consider taking the medication daily as a bothersome matter in their personal life, particularly in relation to engaging in relationships with the opposite sex. As we know, during adolescence, individuals of each gender become interested in the opposite sex and are attracted to them. This is evident in social development, where adolescence is characterized by a set of traits, one of which is the adolescent's attraction to the opposite sex. This attraction, in turn, influences their behavior and activities, as they attempt to attract the attention of the other party in various ways (Badr Ibrahim Al-Shaibani, 2000, p. 202).

The effect of taking the medication remains evident, especially in terms of its psychological impact, as the individual feels depressed, in addition to the difficulty of forming relationships with the opposite sex due to their illness. In this context, the study

by Mula & Sandeer (2007) suggests that antiepileptic drugs play a role in causing depression in patients after the introduction of modern epilepsy treatment compounds.

Presentation and Analysis of the Morisky Adherence Scale Results

After conducting the semi-structured clinical interview, the Morisky Medication Adherence Scale was administered to case The results are summarized in Table 6:

Table 6: Results of the Morisky Medication Adherence Scale

scale	Score	Interpretation
Medication Adherence	7	7-6 > Average

The table shows that the total score for the scale is 7.8, which reflects the responses on the scale. The subject answered "No" to items 1, 2, 3, 4, and 6, which are positive responses giving a value of 1. Examples include (1- Do you sometimes forget to take your anti-seizure medication? and 4- When you travel or leave home, do you sometimes forget to bring your anti-seizure medication with you?). Negative responses with "Yes" were given for questions 5 and 7, representing (5- Did you take your anti-seizure medication yesterday? and 7- Taking medication daily might be bothersome to some people, do you sometimes feel annoyed by your daily medication adherence?). These are negative answers giving a value of 0; however, item 5 is counted inversely, so it became positive. The eighth and final question was answered with "rarely" or "never," which is positive, reinforcing the previous positive responses, meaning the subject does not find it difficult to remember their anti-seizure medication.

Thus, it appears that the case follows a moderate level of medication adherence behavior,(and the hypothesis: "The adolescent with epilepsy follows medication adherence behavior at a low level. is not confirmed)

13. Verification of the Hypothesis and Discussion of Results:

- The hypothesis that: "The adolescent with epilepsy has a low degree of therapeutic appropriateness behavior." was not met, as the case received a score of 7/8, which is a moderate score. The results of the study indicate that the adolescent with epilepsy follows the therapeutic compliance behavior to a moderate degree, This is due to a number of factors, including the difficulty of daily compliance with medication regimens. This is evident in the results that showed negative responses to some questions such as feeling uncomfortable taking medications on a daily basis on the one hand.

- On the other hand, it can be said about the statements of the case that he suffers from mental health issues, as he feels depressed and wants to isolate from others and also suffers from forgetfulness, and this affected the suitability of treatment, as the study of Tellez-Zenteno et al, 2007 shows that a third of epilepsy patients suffer from depression or anxiety, and one in four patients suffer from suicidal thoughts, and half of these patients suffer from impaired attention and cognitive abilities.

- Also, epilepsy affected the case, especially in terms of social relations, as it suffers from poor social adaptation and feels stigma, which means an attitude, trait, characteristic or behavior that distinguishes an individual, which makes him socially

unacceptable, which requires treatment or a way to get rid of “stigma” during social interaction in different situations (Bomlitz, L. J., & Brezis, M., (2008:202).

- Based on the results obtained, it is necessary to strengthen psychosocial support programs in adolescents with chronic diseases, especially epilepsy, which requires more health care.

CONCLUSION:

Based on the obtained data, it can be concluded that the case shows significant awareness of his condition by adhering to his treatment regularly. However, he often feels frustrated by his daily medication regimen and perceives epilepsy as an obstacle in his life, particularly in forming relationships. The medication side effects also impact his mental health, leading to occasional depression and memory issues. These factors negatively affect the case, highlighting the need for a better understanding and support for adolescents with epilepsy, especially from a psychological aspect, and therefore some suggestions were built as follows:

- Developing strategies to improve medication adherence behavior in adolescents with epilepsy.
- Evaluating health education programs to enhance adherence in these adolescents.
- Studying variables such as depression and anxiety in adolescents with epilepsy.
- Providing psychological and social support to help adolescents accept and adapt to their condition.
- Establishing strong support networks for adolescents and their families.
- Increasing health awareness and educating the community about epilepsy.

References :

- Abdel Karim Brody, 2016, *Summary of Epilepsy, Its Causes, Types, and Treatment Methods*, a thesis for the doctorate in medicine degree, Kingdom of Morocco, Sidi Mohammed Ben Abdellah University, Faculty of Medicine and Pharmacy in Fas.
- Abdel Moati Hassan Mustafa (2003), *Clinical Research Methodology: Foundations and Applications*, First Edition, Zahraa El-Sharq Library, Egypt.
- Augustin Rousselle (2016), *Épilepsies chez les adolescents à la Réunion, comparaison entre le vécu de l'adolescent et le ressenti de ses parents*, Thèse pour l'obtention du DIPLOME D'ETAT DE DOCTEUR EN MEDECINE, Université de Bordeaux, France.
- Badr Ibrahim Al-Shaibani (2000), *The Psychology of Development (Development from Conception to Adolescence)*, Center for Publications, Heritage, and Documents, Kuwait.
- bomlitz, L. J., & Brezis, M. (2008). Misrepresentation of Health Risks by Mass Media. *Journal of Public Health*, 30, 202-204.
- Buchanan, N. (2002). *Understanding epilepsy: what it is and how it can affect your life* (p.115). Sydney. Australia: Simon & Schuster.
- Davies S, Heyman I, Goodman R (2003). A population survey of mental health problems in children with epilepsy.

• E.Rikir(1),T.Grisar(2),B.SADZOT(3),le défaut d'observance thérapeutique du patient souffrant d'épilepsie un probleme frequent et complexe,Rev Med Liège 2010;65:56:366-369.

• Khalil Omar (1983), *Objectivity and Analysis in Social Research*, First Edition, Dar Al-Afaq Al-Jadida, Beirut, Lebanon.

• louis verret, Laila Vahjah et Renée-Myriam Boucher (2013), l'épilepsie à travers les ages, article le médecin du Québec, Volume 48, numéro07, p56 .

• Mula M, Monaco F, Trimble MR (2004). Use of psychotropic drug in patient with epilepsy: interactions and seizure risk. *Expert Review of Neurotherapeutics*, 4:953-964.

• Organisation Mondiale de la Santé. (2019). Agir contre l'épilepsie Un impératif de santé publique. Résumé. Genève, 1–16.

• s.t.ashur, k.shamsuddin,s.a.shah,s.bosseri and d.e.morisky. « reliability and know-group validity of the arabic version of the 8-item morisky medication adherence scale among type 2 diabetes mellitus parients, la revue de santé de la méditerranée orientale.2015,vol.21,no.10.

• Séverine Lhote,2011, Etude de l'observance chez des épileptiques pharmaco-résistants au C.H.U. de Nancy, T H E S E pour obtenir le Diplôme d'Etat de Docteur en Pharmacie, UNIVERSITÉ Henri Poincaré, NANCY 1 FACULTÉ DE PHARMACIE.

• Smith, K. B. R. (2015). *Adherence to Antiepileptic Drug Therapy in Adolescents with Epilepsy*. *Journal of Pediatric Neurology*, 12(3), 178-185.

• Taweririt Nour Eddine and Zaqaar Fathi (2013), "The Role of Auditory Stimulation Using Music in Reducing Depression in Epilepsy Patients," *Journal of Humanities*, Issue 30/31, pages 93-54.

- Tellez-Zenteno J, Dhar R, Hernandez-Ronquillo L et al (2007). Long term outcomes in epilepsy surgery: antiepileptic drugs, mortality, cognitive and psychosocial aspects. *Brain*,130:334-345.

• World health organization (WHO), (2003), adherence to long term therapies evidence forraction,,Switzerland.