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STUDY OF PSYCHOLOGICAL CHARACTERISTICS (STATE ANXIETY, DEPRESSION) IN LIGHT OF SOME PERSONAL VARIABLES (GENDER, AGE, DURATION OF ILLNESS) AMONG SURVIVORS OF STROKE WITH BROCA'S APHASIA

دراسة الخصائص النفسية (قلق الحالة، الاكتئاب) في ضوء بعض المتغيرات الشخصية (الجنس، العمر، مدة المرض) لدى الناجين من السكتة الدماغية المصابين بحبسة بروكا

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ملخص:

تهدف هذه الدراسة إلى فحص الخصائص النفسية (قلق الحالة والاكتئاب) لدى الناجين من السكتة الدماغية الذين تم تشخيصهم بحبسة بروكا، مع الأخذ في الاعتبار بعض المتغيرات الشخصية (الجنس، العمر، ومدة المرض). شملت العينة 100 فردًا مصابًا بحبسة بروكا من كلا الجنسين (57 ذكورًا و 43 إناثًا) من مختلف الفئات العمرية وفترات مرض مختلفة. لتحقيق ذلك، تم تطبيق أداتين للتقييم: مقياس قلق الحالة لسبيلبرجر وقائمة بيك للاكتئاب (النسخة المختصرة). أشارت النتائج إلى مستويات مرتفعة من القلق والاكتئاب بين الناجين من السكتة الدماغية تميزت بالمتغيرات التالية: العمر أقل من 35 عامًا، ومدة المرض أقل من ستة أشهر وقت التقييم، وبشكل سائد لدى الإناث مقارنة بالذكور.

الكلمات المفتاحية:

حبسة بروكا، سكتة دماغية، قلق الحالة، اكتئاب.

Abstract:

This study aims to examine the psychological characteristics namely (state anxiety and depression) among stroke survivors diagnosed with Broca's aphasia, considering certain personal such as (gender, age, and duration of illness). The sample comprised 100 individuals with Broca's aphasia of both sexes (57 males and 43 females) from various age groups and differing durations of illness. To achieve this, two assessment tools were administered: the State Anxiety Scale by Spielberger and the Beck Depression Inventory (short form). The findings indicated elevated levels of anxiety and depression among stroke survivors characterized by the following variables: age under 35 years, illness duration of less than six months at the time of assessment, and predominantly females compared to males.

Keywords:

Broca's aphasia, depression, stroke, state anxiety,

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1. INTRODUCTION:

The world faces significant health challenges threatening human life, such as the widespread prevalence of pandemics, infectious and non-infectious diseases. Added to these are health crises resulting from wars and political conflicts, which deteriorate healthcare infrastructure. Moreover, malnutrition and the rising prevalence of mental health disorders have become critical due to the intense pressures individuals endure amid these crises. Infectious diseases and pandemics represent major global health threats; the COVID-19 pandemic, in particular, exposed the limitations of healthcare infrastructure and medical resources worldwide. Its repercussions extended beyond human losses to economic decline, exacerbation of unemployment and poverty, and profound socio-economic effects leaving lasting scars across all facets of life (World Health Organization, 2025).

Non-communicable diseases also constitute a critical health crisis threatening populations worldwide, including cardiovascular diseases and cerebrovascular incidents. Lifestyle patterns and environmental conditions globally, and in Algeria specifically, combined with a cultural inclination toward unhealthy habits, contribute to exacerbating this problem's scope. This leads to increased disabilities and health impairments, along with rising mortality rates, as observed in stroke cases. Stroke increasingly affects younger populations, often resulting in sequelae such as aphasia—most notably Broca's aphasia.

Problem Statement:

The increasing global population and rising proportion of elderly individuals have led to a significant and marked rise in the number of stroke patients worldwide, particularly in recent years. Statistics indicate that approximately 16.9 million people suffer a stroke annually. Moreover, the number of stroke cases doubled between 1990 and 2010, reaching 33 million worldwide by 2016, with an annual death toll of 5.9 million. Survivors often face varying degrees of consequences and complications, including motor and cognitive functional disabilities such as Broca's aphasia, which are frequently accompanied by psychological stresses like depression and anxiety, lowered self-esteem, and deterioration in social and occupational functioning (Bejot et al., 2016).

Multiple studies have highlighted that individuals with Broca's aphasia often experience despair and hopelessness, with reports of acute psychotic episodes, delirium, severe depression, and repeated suicide attempts. Depression is one of the most common disorders, affecting approximately 40% of stroke survivors within the first year post-stroke, with prolonged treatment needed for 17% of patients (Chemrinski and Robinson, 2000; Donell et al., 2010; Bour et al., 2009; Sarno, 1993; Carota, 2002). A study by Bruggiman and Ammont (2007) concluded that anxiety ranks second among the psychological stresses faced by those with Broca's aphasia,

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due to extreme fatigue, exhaustion, and especially feelings of helplessness and inferiority following the loss of speech and communication abilities, as well as difficulty being understood by others.. (2008) reported that stroke survivors with Broca's aphasia suffer from generalized anxiety, manifesting in new fears, hallucinations, sleep and mood disturbances, decreased vitality and activity, irritability, panic, social phobia, obsessive-compulsive behaviors, and post-traumatic stress disorder. A study by Shimoda and Robert (1998) found that women under the age of 59 are more prone to experiencing anxiety (Shimoda and Robert, 1998, p. 46).

Similarly, Dossa et al. (2011) examined the relationship between psychological disorders and quality of life among stroke survivors with Broca's aphasia. Their results indicated depression in 35% of the sample, with anxiety prevalence estimated at 27%.

Saxena et al. (2007) conducted a study involving 141 stroke survivors with Broca's aphasia in Singapore (77 males, mean age 71). The study revealed depression in 60% of participants and anxiety in 45%, with higher rates among females. No statistically significant differences were found regarding age or educational level (Saxena et al., 2007, p. 58).

Other researchers have explored the impact of aphasia post-stroke, including Broca's aphasia, on quality of life and mental health, considering variables such as age, gender, and severity of aphasia. These studies concluded that women and older adults are more susceptible to reduced quality of life and higher rates of anxiety and depression compared to men and younger individuals (Hilari et al., 2012).

Arab studies by Howaida Shukri Abdel Aal (2008) and Tarek Al-Arjan et al. (2015) reported the prevalence of mood disorders following stroke in Egypt and Saudi Arabia, noting statistically significant differences in anxiety and depression levels among Broca's aphasia patients attributable to gender, age, and educational level.

In Algeria, Zelal (1986) described, classified, and interpreted the first and second phonetic levels using the neuro-linguistic assessment tool by Ducarne, adapted to the Algerian sociocultural context. This tool aims to alleviate the suffering of stroke survivors with Broca's aphasia and facilitate treatment, rehabilitation, and communication by addressing the neuropsychological dimension to improve quality of life (Zelal, 1986).

In a related qualitative study, Bousbata (2007) conducted interviews with Broca's aphasia patients and their families to identify the challenges and difficulties faced following the onset of aphasia as a significant stroke sequela (Bousbata, 2007).

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Zeggar's (2010) study aimed to explore methods to reduce depression in adults with Broca's aphasia post-stroke in Algerian hospital settings through a therapeutic vocal program involving listening to Quranic recitations. The study sample included four purposively selected cases from the University Hospital of Asaad Hassani, Beni Messous, and Mustafa Pasha Hospital in Algiers. The research employed pre- and post-assessments using neuropsychological evaluations, Beck Depression Inventory, EEG, and serotonin neurotransmitter levels measured at the CERBA laboratory in French. Results indicated moderate to severe depression levels among all participants, affecting both genders, with women experiencing higher severity than men (Zeggar, 2010).

Based on the findings of the studies reviewed, the present study seeks to address the following research questions:

1. What is the level of state anxiety among stroke survivors diagnosed with Broca's aphasia?
2. What is the level of depression among stroke survivors diagnosed with Broca's aphasia?
3. Are there differences in the experience of state anxiety among stroke survivors with Broca's aphasia attributable to personal variables (gender, age, duration of illness)?
4. Are there differences in the prevalence of depression among stroke survivors with Broca's aphasia attributable to personal variables (gender, age, duration of illness)?

2. Study Hypotheses:

1. The level of state anxiety is elevated among stroke survivors with Broca's aphasia.
2. The level of depression is elevated among stroke survivors with Broca's aphasia.
3. There are significant differences in the experience of state anxiety among stroke survivors with Broca's aphasia attributable to personal variables (gender, age, duration of illness).
4. There are significant differences in the prevalence of depression among stroke survivors with Broca's aphasia attributable to personal variables (gender, age, duration of illness).

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3. Study Objectives:

The current study aims to achieve the following objectives:

- To assess the level of state anxiety among individuals with Broca's aphasia.
- To assess the level of depression among individuals with Broca's aphasia.
- To identify differences in state anxiety among stroke survivors with Broca's aphasia attributable to personal variables (gender, age, duration of illness).
- To identify differences in depression among stroke survivors with Broca's aphasia attributable to personal variables (gender, age, duration of illness).

4. Significance of the Study:

This study is important in highlighting the psychological and social needs of stroke survivors with Broca's aphasia. These patients require not only pharmacological treatment but also comprehensive psychosocial support to effectively adapt to the neurological injury and its consequences. The findings may provide valuable insights for professionals in psychology and speech therapy regarding the psychological characteristics—such as anxiety and depression—prevalent in this patient group.

Moreover, the study addresses a notable gap in the literature concerning the psychosocial aspects of neurological injuries, particularly in Arab societies in general and the Algerian community specifically, where such research remains scarce.

5. Definition of Study Terms:

5.1 Anxiety:

An acquired emotional state and unpleasant affective response to an emotional or symbolic threat that endangers an individual's security and tranquility. It is characterized by tension, distress, and a vague fear of the unknown (Hamed Zahran, 2001, p. 71).

Operationally, it is defined as the scores obtained by the study sample on the Spielberger State Anxiety Scale.

5.2 Depression:

A frequent emotional state in which the individual feels unhappy, miserable, bad-tempered, pessimistic, sad, and inwardly withdrawn due to disappointment (Abdel Ghaffar Al-Dimyati and Ahmed Abdel Khalek, 1990).

Operationally, it is defined as the scores obtained by the study sample on the Beck Depression Inventory.

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5.3 Broca's Aphasia:

A multifaceted linguistic disorder but a singular cognitive impairment regardless of symptom constellation, neurological lesion nature, or patient age. The condition causes fluctuations and dysregulation in language control (Zelal, 2011, pp. 81-82).

Operationally, it is defined as the percentage of correct responses obtained by the study sample on item (MTA 2000) of the naming subscale.

5.4 Stroke:

According to the World Health Organization, stroke results from interrupted blood flow to the brain, usually when blood vessels rupture or become blocked by a clot, leading to cessation of oxygen and nutrient supply and resulting in brain tissue damage (Who, 2013).

Operationally, it is defined by findings in medical records and final reports from diagnostic examinations including computed tomography (CT) and magnetic resonance imaging (MRI).

6. Study Methodology:

This study employed a descriptive methodology, consistent with its aim to determine the levels of anxiety and depression among stroke survivors with Broca's aphasia.

6.1 Study Sample:

The study sample consisted of adult patients (aged 18 and above) diagnosed with Broca's aphasia following a cerebrovascular stroke, receiving treatment at hospitals in the Algiers province (Mustafa Pasha University Hospital, Mohamed Saghir Neqqach University Hospital, and the Specialized Hospital Abdelkader Boukharouba). Participants were purposively selected based on criteria aligned with the study's objectives (age, gender, and duration of illness). The final sample included 100 individuals—57 males and 43 females—varying in age and duration of illness (chronicity).

Out of 120 distributed questionnaires related to the study instruments, 100 were returned completed and included in the analysis. The remaining 10 incomplete questionnaires were excluded from data processing due to missing information.

6.2 Study Instruments:

6.2.1 Anxiety Scale (Spielberger State Anxiety Inventory)

Validity and Reliability in the Current Study:

- *Validity:*

  To assess internal consistency validity and the correlation of individual items with the total scale score, Pearson's correlation coefficient was calculated between each item score and the total score, as well as the corrected item-total correlation. The correlation coefficients between the items comprising the State

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Anxiety Scale and the total score were statistically significant at the 0.01 level, except for item 20, which was not statistically significant. However, due to its importance in the scale's construction, item 20 was retained. Corrected item-total correlations ranged between 0.062 and 0.795.

- *Reliability:*
  Cronbach's alpha was calculated to assess the reliability of the State Anxiety Scale, yielding a value of 0.895, indicating excellent reliability and suitability for field application. All items contributed positively to the internal consistency except for item 20, whose removal would increase alpha to 0.902. Nevertheless, given the already high reliability with item 20 included, there was no strong justification for its exclusion.

6.2.2 Beck Short Form Depression Inventory:

Validity and Reliability in the Current Study:

- *Validity:*
  Using the extreme groups method, the calculated t-value was 8.77, which was less than the critical t-value of 13.47 at 20 degrees of freedom and a significance level of 0.01. This indicates that the instrument effectively discriminates between groups, confirming its validity for application to the study sample.
- *Reliability:*
  Cronbach's alpha for the overall scale was calculated as 0.73, indicating good internal consistency reliability, statistically significant at the 0.01 level.

6.2.3 Neuro-Linguistic Test (MTA 2000):

This is the Algerian adaptation of the original Montreal-Toulouse Aphasia Battery (1986), originally developed in French by a multidisciplinary Canadian team. It has been adapted and standardized for the multilingual sociocultural context of Algeria by researcher Nasira Zelal and Nespoulous with the aim of calibrating and regulating the neuro-linguistic test (Montreal-Toulouse Algeria 2000).

Zelal and her research team sampled 460 individuals of both sexes, aged between 20 and 70 years, from different linguistic backgrounds (monolingual, bilingual, trilingual, or multilingual), to adapt the MTA 2000 to the Algerian linguistic and sociocultural reality. Thus, the test demonstrates both validity and reliability within this context (Zelal, 2000).

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7. Data Analysis Tools:

In the present study, non-parametric statistical methods were employed due to the non-normal distribution of the study variables and the non-random sampling method. The statistical tests used included:

- Chi-square test (χ^2)
- Mann-Whitney U test
- Kruskal-Wallis test
- Pearson correlation coefficient
- Cronbach's alpha coefficient for assessing the reliability of the study instruments.

8. Presentation and Discussion of Study Results:

8.1 Presentation and Discussion of the First Hypothesis Results:

The first hypothesis stated: *The level of state anxiety is elevated among stroke survivors with Broca's aphasia.* To verify this hypothesis, a Chi-square (χ^2) test was conducted, and the results are presented in the following table:

Level of State Anxiety	Frequency	Percentage	χ^2 Value	Statistical Significance
Moderate	27	27%	21.16	Significant at $\alpha = 0.01$
High	73	73%		
Total	**100**	**100%**		

It is evident from the table that 73% of stroke survivors with Broca's aphasia exhibit a high level of state anxiety, compared to 27% who fall within the moderate range. No participants scored within the low anxiety level. The Chi-square test value was 21.16, which is statistically significant at $\alpha = 0.01$, confirming the validity of the first hypothesis. This indicates that stroke survivors with Broca's aphasia are characterized by elevated levels of state anxiety.

These results align with the theoretical framework and prior research. For instance, Bruggiman and Ammont (2007) identified anxiety as the second most prevalent psychological consequence following Broca's aphasia post-stroke, closely linked to intense fatigue, exhaustion, and heightened anger due to the inability to express oneself verbally and to be understood by others. Similarly, Campbell et al. (2011) found a high prevalence of severe anxiety in this population, accompanied by new fears, sleep disturbances, profound lethargy, irritability, anger, panic, obsessive-compulsive behaviors, social phobia, and post-traumatic stress disorder.

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It is well established that individuals with Broca's aphasia lose the ability to speak despite intact comprehension, making normal verbal communication a profound psychological and neurological challenge, thereby exacerbating anxiety levels. The stroke-induced damage to the brain's speech centers and adjacent regions responsible for emotion regulation and attention disrupts risk assessment and emotional control mechanisms, which likely explains the elevated anxiety observed.

Injury to the limbic system following stroke can cause an imbalance in activity between the frontal lobe and limbic system, resulting in heightened feelings of threat and danger. Neurochemical imbalances (e.g., norepinephrine and serotonin) may also activate the brain's "fight or flight" centers, producing feelings of anxiety companied by heightened arousal and vigilance (Chemrinski et al., Robinson et al., 2000).

Psychological and social factors also contribute to heightened anxiety in this group. Patients are acutely aware of their inability to communicate clearly, leading to constant social vigilance and fear of embarrassment or failure in family and professional settings. The expectations and pressures from these social environments may intensify feelings of anxiety and reduce the patient's sense of comfort and security.

8.2 Presentation and Discussion of the Second Hypothesis Results:

The second hypothesis stated: *The level of depression is elevated among stroke survivors with Broca's aphasia.* To verify this hypothesis, a Chi-square (χ^2) test was conducted, and the results are shown in the following table:

Level of Depression	Frequency	Percentage	χ^2 Value	Statistical Significance
Low	6	6%	47.12	Significant at $\alpha = 0.01$
Moderate	32	32%		
High	62	62%		
Total	**100**	**100%**		

The table reveals that 62% of stroke survivors with Broca's aphasia exhibit a high level of depression, while 32% show moderate levels, and only 6% fall within the low depression range. The Chi-square test value of 47.12 is statistically significant at $\alpha = 0.01$, confirming the validity of the second hypothesis. This means that individuals with Broca's aphasia who survived stroke are characterized by elevated levels of depression.

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These findings are consistent with theoretical frameworks and previous research. Numerous studies (Chemrinski and Robinson, 2000; Donell et al., 2010; Bour et al., 2009; Sarno, 1993; Carota, 2002) have reported that stroke survivors with Broca's aphasia are highly susceptible to severe depression, with some cases involving acute psychiatric episodes and delirium, including suicide attempts. The results align with Saxena et al.'s (2007) study on a sample of 141 individuals with Broca's aphasia following stroke, which found a depression prevalence rate of 60%. Similarly, Dossa et al. (2011) confirmed a significant correlation between psychological disorders and quality of life among stroke survivors with Broca's aphasia, noting that 35% of the sample were exposed to severe depression.

The vulnerability to depression in this patient group is attributed to complex neuropsychological and psychosocial factors. Broca's aphasia results from damage to the left frontal lobe, an area responsible for speech motor functions, while adjacent blood vessels and neurons play critical roles in regulating mood and emotions through the release of specialized neurotransmitters such as serotonin and dopamine. These neurotransmitters are essential for maintaining emotional and mood balance.

Furthermore, individuals with Broca's aphasia retain a high level of awareness, which makes them acutely conscious of their linguistic deficits and their inability to express even the simplest thoughts. This heightened awareness often leads to profound psychological frustration, compounded by feelings of inferiority as others fail to understand their speech, despite the clarity of their thoughts. This dynamic adversely affects their social communication, reinforcing feelings of loneliness, isolation, and marginalization. Added to this is the loss of independence and increased reliance on others for basic daily needs in both family and professional contexts, rendering stroke survivors with Broca's aphasia more susceptible to depression.

8.3 Presentation and Discussion of the Third Hypothesis Results:

The third hypothesis stated: *There are differences in the experience of state anxiety among stroke survivors with Broca's aphasia attributable to personal variables (gender, age, duration of illness).* To test this hypothesis, the Mann-Whitney U test and Kruskal-Wallis test were applied, and the results are summarized in the following tables:

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8.3.1 Regarding Gender:

Table 03: Significance of Differences in State Anxiety Scores among Stroke Survivors with Broca's Aphasia by Gender

Gender	N	Mean Score	Mean Rank	Mann-Whitney U Value	Statistical Significance
Male	57	60.79	33.54	258.5	Significant at α = 0.01
Female	43	69.56	72.99		

The table shows a difference between the mean anxiety scores of females (69.56) and males (60.79). The Mann-Whitney U test yielded a value of 258.5, which is statistically significant at the 0.01 level. Therefore, females with Broca's aphasia who survived stroke experience higher levels of state anxiety compared to their male counterparts.

8.3.2 Regarding Age:

Table 04: Significance of Differences in State Anxiety Scores among Stroke Survivors with Broca's Aphasia by Age Group

Age Group	N	Mean Rank	Kruskal-Wallis Test Value	Statistical Significance
≤ 35 years	18	51.72	10.31	Significant at α = 0.01
36 – 65 years	51	58.22		
≥ 66 years	31	37.10		

The table indicates a difference in mean anxiety ranks among stroke survivors with Broca's aphasia aged ≤35 years (51.72), those aged 36–65 years (58.22), and those aged ≥66 years (37.10). The Kruskal-Wallis test value was 10.31, which is statistically significant at the 0.01 level. Thus, stroke survivors with Broca's aphasia aged between 36 and 65 years exhibit higher levels of state anxiety compared to their older peers.

8.3.3 Regarding Duration of Illness:

Table 05: Significance of Differences in State Anxiety Scores among Stroke Survivors with Broca's Aphasia by according to disease duration.

Duration of Illness	N	Mean Rank	Kruskal-Wallis Test Value	Statistical Significance
3 – 5 months	28	65.79	29.82	Significant at α = 0.01
6 – 11 months	45	56.06		
≥ 12 months	27	25.39		

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The table shows a significant difference in mean anxiety ranks between stroke survivors with Broca's aphasia who have had the condition for less than six months (65.79), those between six and eleven months (56.06), and those with the condition for twelve months or longer (25.39). The Kruskal-Wallis test yielded a value of 29.82, statistically significant at the 0.01 level. Therefore, patients with Broca's aphasia who survived stroke and have recently (between 3 and 5 months) developed the condition exhibit higher levels of state anxiety than those with a longer illness duration.

Referring to the results in Tables 15, 16, and 17, it is evident that elevated state anxiety among stroke survivors with Broca's aphasia is associated with the following personal characteristics: aged between 36 and 65 years, having suffered the condition less than six months before the study, and being female. This confirms the validity of the third hypothesis.

These findings align with theoretical and empirical studies such as Saxena et al. (2007), which investigated depression and anxiety in stroke survivors with Broca's aphasia. Their sample included 141 individuals (77 males, 64 females) with a mean age of 71.5 years in Singapore. The study reported depression prevalence at 60% and anxiety at 45%, with higher depression rates among women and higher anxiety rates among men. Quality of life was reduced across both genders, and no significant differences were found related to age or educational level.

Ostir et al. (2011) explored various psychological stresses in stroke survivors during the first year post-injury and their effects on health-related quality of life. Among 40 participants, depression was observed in 27.5%, and anxiety in 37%.

The heightened anxiety levels among stroke survivors with Broca's aphasia aged 36–65 years, recently diagnosed within six months, and predominantly female, can be attributed to intertwined biological, neurological, psychological, and social factors. Female hormones such as estrogen and progesterone influence mood regulation via neurotransmitters like serotonin, which may be disrupted after stroke, contributing to anxiety. Furthermore, women often experience additional pressure to maintain an ideal social and familial image, intensifying anxiety. Given women's natural propensity for social communication relying heavily on language, the loss of speech and expression due to Broca's aphasia constitutes a significant social and psychological shock, especially if accompanied by other stroke sequelae such as hemiplegia, further exacerbating anxiety.

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Additionally, the 36–65 age group represents the peak productive and active phase of life professionally and socially. Stroke-related motor, linguistic, and cognitive impairments threaten these roles, increasing anxiety due to fears of social role loss. Difficulties in verbal expression lead to social withdrawal, reducing emotional support and psychological relief, thereby intensifying anxiety. This group often expects rapid recovery of physical and cognitive functions to return to pre-stroke life; delays in rehabilitation foster anticipatory anxiety and fear of worsening or stagnant health.

Anxiety is particularly elevated within six months post-stroke due to the neurobiological and psychosocial turmoil during this critical reorganization period. Chemical imbalances such as increased cortisol in the frontal and cingulate circuits involved in emotion and attention regulation emerge due to reduced linguistic stimulation and social interaction caused by speech impairments. Patients increasingly grasp the severity and permanence of their deficits, leading to frustration, helplessness, social isolation, and increased anxiety within the first six months following aphasia onset.

8.4 Presentation and Discussion of the Fourth Hypothesis:

The fourth hypothesis stated: *There are differences in the prevalence of depression among stroke survivors with Broca's aphasia attributable to personal variables, namely (gender, age, duration of illness).* To test this hypothesis, the Mann-Whitney U test and Kruskal-Wallis test were applied, and the results are presented in the following tables:

8.4.1 Regarding Gender:

Table 06: Significance of Differences in Depression Scores among Stroke Survivors with Broca's Aphasia by Gender

Gender	N	Mean Rank	Mann-Whitney U Value	Statistical Significance
Male	57	35.10	347.50	Significant at α = 0.01
Female	43	70.92		

The table reveals a significant difference between the mean depression ranks of females (70.92) and males (35.10). The Mann-Whitney U test value of 347.50 is statistically significant at the 0.01 level. Thus, females with Broca's aphasia who survived stroke are more susceptible to depression than their male counterparts.

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8.4.2 Regarding Age:

Table 07: Significance of Differences in Depression Scores among Stroke Survivors with Broca's Aphasia by Age Group

Age Group	N	Mean Rank	Kruskal-Wallis Test Value	Statistical Significance
≤ 35 years	18	72.22	27.57	Significant at α = 0.01
36 – 65 years	51	55.41		
≥ 66 years	31	29.81		

The table shows differences in mean depression ranks among stroke survivors with Broca's aphasia: those under 35 years have a mean rank of 72.22, those aged 36–65 years have a mean rank of 55.41, and those aged 66 years or older have a mean rank of 29.81. The Kruskal-Wallis test value was 27.57, statistically significant at the 0.01 level. Therefore, younger stroke survivors with Broca's aphasia (under 35 years) are more prone to depression than their older counterparts.

8.4.3 Regarding Duration of Illness:

Table 08: Significance of Differences in Depression Scores among Stroke Survivors with Broca's Aphasia by Duration of Illness

Duration of Illness	N	Mean Rank	Kruskal-Wallis Test Value	Statistical Significance
3 – 5 months	28	72.41	50.90	Significant at α = 0.01
6 – 11 months	45	56.06		
≥ 12 months	27	18.52		

The table indicates a significant difference in mean depression ranks between patients who developed Broca's aphasia less than six months ago (72.41), those with the condition for less than a year (56.06), and those with the condition for a year or longer (18.52). The Kruskal-Wallis test value of 50.90 is statistically significant at the 0.01 level. Hence, stroke survivors with Broca's aphasia who are recent cases (3 to 5 months post-onset) are more susceptible to depression than those with longer durations of disease.

Referring to the results in Tables 18, 19, and 20, it is clear that depression among stroke survivors with Broca's aphasia is elevated in those who are younger than 35 years, were diagnosed less than six months prior to the study, and are predominantly female. This confirms the fourth hypothesis of the study.

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These findings align with theoretical reports such as the study by Howaida Shukri Abdel Aal (2008) titled "Contributing Factors to Post-Stroke Depression in a Sample of Egyptian Patients." The study aimed to highlight factors contributing to post-stroke depression and assess their relationship with depression severity and quality of life. The sample included 120 Egyptian stroke patients (both genders), aged 40–65 years. The researcher employed the Hamilton Depression Rating Scale (HAM-D, HRSD), the Barthel Index for functional motor ability in daily activities, and the Quality of Life in Depression scale (QLDR) to assess depression's impact on life quality and efficiency.

The study found increased incidence of post-stroke depression among men (63%), while women exhibited greater depression severity. Notably:

- There was a statistically significant negative correlation between younger age and depression presence in stroke survivors.
- No statistically significant association was found between marital status and depression occurrence or severity.
- A significant positive correlation existed between social status and depression severity.
- Twenty-two percent of depressed stroke survivors reported experiencing severe psychological stress prior to the stroke.
- Seventy-three percent of severely depressed stroke survivors faced major difficulties in functional performance and daily living activities (Howaida Shukri Abdel Aal, 2008).

The elevated levels of depression observed among females who survive stroke and develop Broca's aphasia may be attributed to a range of neurobiological and psychosocial factors. From an anatomical and functional perspective, men and women utilize different neural networks and pathways for processing language, emotions, and affective responses. This difference may render women more sensitive to damage in Broca's area and adjacent regions, disrupting neurochemical balance through altered secretion of neurotransmitters such as serotonin and dopamine. Moreover, hormonal fluctuations related to estrogen and genetic factors may increase the susceptibility of the female brain to depression, especially following menopause or during periods of intense stress and psychological crises (Strakstein & Robinson, 1989). Broca's aphasia can also cause women to avoid family gatherings and professional environments, opting for social isolation due to the embarrassment stemming from speech and communication difficulties. Consequently, women become unable to fulfill their social roles at home and work, heightening their vulnerability to depression, particularly as women typically rely more heavily than men on verbal and linguistic communication to manage daily personal, professional, and social activities.

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The increased depression rates among individuals aged 36 to 65 may stem from the profound psychological impact of stroke and its accompanying cascade of physical, linguistic, neurological, and emotional sequelae. Broca's aphasia often leaves individuals feeling a loss of identity, transforming once active and responsible people—who were at the peak of their professional and social lives—into individuals suddenly facing an uncertain future. This generates feelings of fear and insecurity, as their roles and functions become threatened, including their professional responsibilities and family life.

At this stage of life, individuals may lack comprehensive social support, or even if such support is available, they might reject it because they are acutely aware of their diminished physical and linguistic capabilities and wish to avoid becoming a burden. Stroke survivors with Broca's aphasia in this age group often withdraw socially, severing various relationships and retreating into an isolation filled with sadness, apathy, and disinterest in the outside world. This isolation increases their risk of depression relative to stroke survivors belonging to other age groups.

It is often difficult, if not nearly impossible, for stroke survivors with Broca's aphasia to navigate the critical six months following their injury without significant psychological challenges—an outcome reflected in this study's findings. The frustration caused by the inability to speak or verbally express thoughts, despite preserved cognition and comprehension, generates feelings of helplessness and inferiority, particularly while the stroke is still fresh. This exacerbates tendencies toward social isolation, loneliness, and detachment, which are key contributors to early post-stroke depression. Additionally, the early emotional support that could mitigate these effects is often lacking due to impaired verbal communication, complicating effective psychological assistance during this critical period.

In summary, the experience of Broca's aphasia following stroke, along with its accompanying symptoms and disorders, intensifies anxiety and depression in affected individuals, who suddenly become dependent on others even for the simplest tasks. This contributes to a profound psychological upheaval impacting their personal and social lives. The differences observed in anxiety and depression levels by gender, age, and severity of illness are unsurprising given the psychological, social, occupational, and economic factors involved—areas that warrant further investigation. Meanwhile, the study's four hypotheses have been confirmed.

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9.*Conclusion*

After examining the psychological characteristics—namely anxiety and depression-of stroke survivors diagnosed with Broca's aphasia, considering personal variables such as gender, age, and duration of disease, the study's hypotheses were tested using appropriate statistical tools. The findings revealed that this patient group experiences elevated levels of anxiety and is prone to high levels of depression, with variations attributable to gender, age, and illness duration.

Based on these results, we propose the following recommendations:

1. Integrate psychological care and support for patients with Broca's aphasia and stroke survivors into treatment protocols alongside medical care, aiming to alleviate the psychological symptoms caused by cerebrovascular accidents and their sequelae. This should be implemented in all specialized hospitals and relevant departments across Algerian national healthcare facilities.
2. Address the substantial shortage of qualified, time- and cost-efficient human resources dedicated to caring for these patients by providing training opportunities and specialized programs for auxiliary healthcare workers ("Les auxiliaires de Vie").
3. Enhance the active and vital involvement of psychological specialists in the therapeutic process for these patients.
4. Develop personalized care plans tailored to the individual needs of stroke survivors, particularly those with Broca's aphasia and other linguistic, cognitive, and functional impairments.
5. Encourage psychological and speech therapy professionals to intensify their efforts in professional development, staying abreast of advances in their fields and incorporating innovative approaches.
6. Mobilize media and relevant stakeholders to raise health awareness and highlight cerebrovascular diseases and their associated psychological disorders.

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