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ORIGINAL

Exploring the Psychosocial Issues in Brain Cancer Patients during Initial Treatment Stages

Exploración de los aspectos psicosociales en pacientes con cáncer cerebral durante las fases iniciales del tratamiento

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ABSTRACT

Introduction: brain cancer patients suffer severe damage and deterioration to their mental and emotional well-being, which leads to various psychosocial concerns such as isolation, hopelessness, and fear. This process of diagnosing and providing treatment generates more such tensions by intruding into the patients' support mechanisms and management techniques. To investigate the patient's brain cancer with psychosocial issues during the early stages of treatment. It attempts to identify factors such as psychological, social, and emotional domains that could hinder their overall well-being and response to treatment.
Method: data was collected from 60 patients with brain cancer using a validated psychometric survey at baseline and follow-up for their psychosocial experiences during initial treatment. In the early stages of their therapy, brain cancer patients have their anxiety levels, depression levels, quality of life, social support, and coping strategies evaluated. The analysis was conducted by using SPSS software, incorporating descriptive statistics, the t-tests for independent samples and multiple linear regressions to evaluate demographic differences and predictors of psychosocial outcomes.
Result: the research highlights the influence of demographic characteristics on the mental health of brain cancer patients by revealing considerable psychosocial issues it experienced throughout the early phases of therapy.
Conclusion: the results demonstrate the significance of focused intervention strategies to deal with these problems and enhance patient outcomes, which are neutral such as anxiety level- 50 %, depression level-40 %, quality of life-45 %, social support-50 % and coping strategies – 55 %. The research emphasizes the significant psychological difficulties that patients with brain tumors face during early stages of their therapy.

Keywords: Brain Cancer; Psychosocial Issues; Mental Health; Treatment Stages; Psychometric Survey; Descriptive Statistics.

RESUMEN

Introducción: los pacientes con cáncer cerebral sufren graves daños y deterioro en su bienestar mental y emocional, lo que conduce a diversas preocupaciones psicosociales como el aislamiento, la desesperanza y

el miedo. El proceso de diagnóstico y tratamiento genera más tensiones de este tipo al inmiscuirse en los mecanismos de apoyo y las técnicas de gestión de los pacientes. Investigar el cáncer cerebral del paciente con problemas psicosociales durante las primeras fases del tratamiento. Se intenta identificar factores como los ámbitos psicológico, social y emocional que podrían dificultar su bienestar general y su respuesta al tratamiento.

Método: se recogieron datos de 60 pacientes con cáncer cerebral mediante una encuesta psicométrica validada al inicio y durante el seguimiento de sus experiencias psicosociales durante el tratamiento inicial. En las primeras fases de su terapia, se evaluaron los niveles de ansiedad, depresión, calidad de vida, apoyo social y estrategias de afrontamiento de los pacientes con cáncer cerebral. El análisis se realizó mediante el programa SPSS, incorporando estadísticas descriptivas, las pruebas t para muestras independientes y regresiones lineales múltiples para evaluar las diferencias demográficas y los predictores de los resultados psicosociales.

Resultados: la investigación pone de relieve la influencia de las características demográficas en la salud mental de los pacientes con cáncer cerebral, revelando considerables problemas psicosociales que experimentó a lo largo de las primeras fases de la terapia.

Conclusiones: los resultados demuestran la importancia de las estrategias de intervención centradas para hacer frente a estos problemas y mejorar los resultados de los pacientes, que son neutros, como el nivel de ansiedad - 50 %, el nivel de depresión - 40 %, la calidad de vida - 45 %, el apoyo social - 50 % y las estrategias de afrontamiento - 55 %. La investigación hace hincapié en las importantes dificultades psicológicas a las que se enfrentan los pacientes con tumores cerebrales durante las primeras fases de su terapia.

Palabras clave: Cáncer Cerebral; Problemas Psicosociales; Salud Mental; Fases del Tratamiento; Encuesta Psicométrica; Estadística Descriptiva.

INTRODUCTION

The brain is the most complicated organ, composed of the cerebrum, cerebellum, brain stem, and four lobes: frontal, parietal, occipital, and temporal. It is an important and remarkable organ weighing three pounds and housed inside the skull, as shown in figure 1. It controls memory, sensitive motor functions, and numerous other processes.[1]

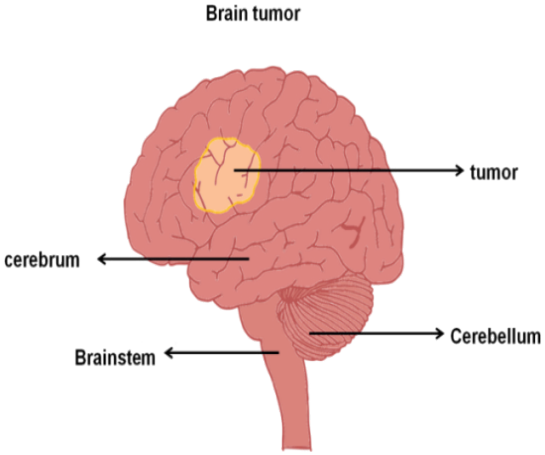

Figure1. Brain Tumor

The cerebellum, the biggest region of the brain, coexists with the cerebrum, which specializes in muscle, posture, and movement coordination, and supports the higher sensory and motor functions of the left and right hemispheres of the brain as well as controls movement. Brain tumors, or expansion of brain cells, are lumps in the brain that are referred to as primary brain cancer.[2] It originates in another region of body and progresses to brain, causing cancer to develop. It is referred to as secondary or metastasized brain cancer when that occurs. Certain kinds of brain tumors that are dangerous can develop extremely fast. The way body functions can be affected by these malignant tumors.[3] Brain tumors must be treated as soon as it is discovered it can be fatal. Brain tumors, lesions, and cysts can be classified into more than 120 distinct forms based on their location and the sorts of cells it consist of certain tumor forms are usually malignant (cancerous), and others are usually harmless (noncancerous). Some could have a 50 % probability of developing cancer.[4] The location and size of the brain tumor affect the symptoms of brain cancer. Particularly in its early stages, brain cancer shares many

symptoms with several less dangerous illnesses. Common signs of brain cancer include numbness or tingling in the arms or legs, unusual eye movements, headaches that are generally greater in the morning, etc.[5]

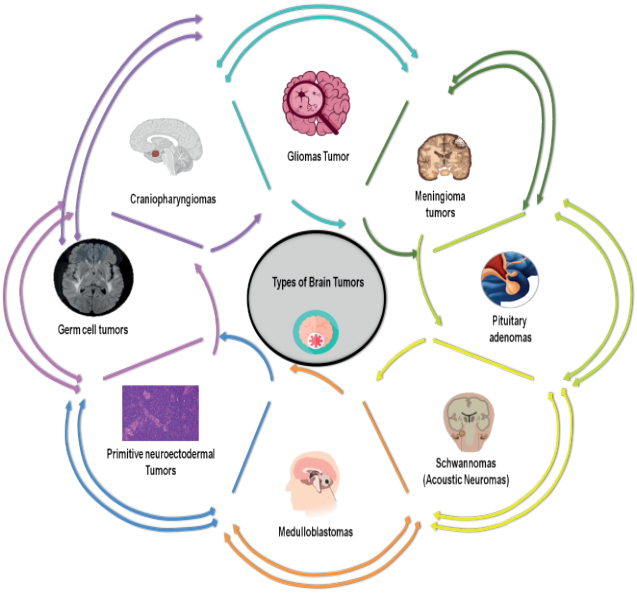

Figure 2. Types of Brain Tumors

Emotional, mental, and social difficulties are frequently combined in brain cancer patients' psychosocial problems and figure 2 shows the types of brain cancer in human beings. Because of the uncertainty surrounding their prognosis and the severity of their therapies, patients can suffer worry, anxiety, and sadness.[6] Cognitive deficits, including issues with memory and focus, can exacerbate the stress associated with day-to-day living. Social exclusion and shifting roles can also cause emotional pain during a cancer patient's process by straining relationships with family and friends.[7] To investigate the psychological problems that patients with brain cancer suffer in the initial stages of their therapy.

The following analyses are categorized into the following phrases: Phrase 2 depicts related works, Phrase 3 describes the methodology, Phrase 4 has the results, and Phrase 5 depicts the conclusion.

LITERATURE REVIEW

The investigation aimed to assess behavioral outcomes in children who had survived brain tumors, [8] to compare them with those who had survived leukemia, and to determine the characteristics associated with their diagnosis, treatment, and demographics that influenced their behavior. The necessity for specialized psychological support interventions was highlighted by the results, which indicated poor social difficulties and attention issues among tumor survivors.

resilience's effect on brain tumor patients' coping mechanisms in [9] was assessed, to suggesting that resilience strongly affected both problem-focused and total coping, accounting for 27 % and 16 % of the variations in predicting these strategies, according to a cross-sectional research of 95 patients. The results indicated that resilience plays a critical role in determining how well patients cope, and members of the health team should devise plans to help these patients become more resilient.

In cancer treatment, distress management [10] plays a critical role in lowering anxiety, enhancing patients' quality of life, and lowering medical expenses. But a lot of sick folks don't get the care it need. Consolidated Framework for Implementation Research described individual characteristics, intervention challenges, implementation processes, organization-inner and external settings, and evidence-based strategy and intervention recommendations as well as barriers and facilitators to implementation.

Art therapy has been shown [11] to enhance pilot experiment comprising cancer patients revealed that art therapy relieved emotional distress, despair, anxiety, and pain in fifty chemotherapy users. Hispanic individuals did, however, exhibit greater levels of depression during the follow-up periods and following art therapy. The results emphasize how critical it was to comprehend and apply art therapy in cancer care.

Research investigate 50 % of breast cancer survivors, suffer cognitive problems after treatment [12] are mostly related to post-traumatic stress symptoms, age, sleep issues, psychiatric medications, and chemotherapy. Reducing chronic cognitive problems and improving survivors' quality of life can be achieved by early identification of modifiable risk factors.

To investigate individuals with brain tumors with intact motor evoked potential (MEP) monitoring,[13] suggested

that patients who have temporary impairments are likely to have gains in their motor function over time after surgery. The research discovered the first postoperative period, the sensitivity, and specificity. According to the research, patients with intact MEP monitoring could encounter brief deficiencies that gradually get better.

The relationship between frailty and early postoperative outcomes [14] for patients with brain tumors discovered that pulmonary insufficiency, mental status changes, and in-hospital surgical complications were all independently correlated with frailty. Frail patients had higher in-hospital death rates; however, multivariate analysis didn't find a significant difference in this outcome. According to the research, more investigation was required to determine rehabilitation or in-hospital procedures that can enhance the treatment and results for patients.

The failure of potential chemotherapeutic drugs has complicated the discovery of curative treatment for glioblastoma [15] suggested providing pharmacokinetic information on drug penetration and metabolic information to determine treatment response; cerebral micro dialysis (CMD) was essential for neuro-oncology. Though there were dangers and drawbacks to the existing CMD approaches, future applications have a substantial influence on drug delivery to tumor cells in vivo, which can result in a successful treatment for malignant brain tumors.

METHOD

The methodology begins with data collection from brain cancer patients through validated psychometric surveys. Psychosocial factors, including anxiety, depression, quality of life, social support, and coping strategies, were evaluated. Multiple linear regressions, independent samples t-tests, and descriptive statistics were used in the analysis, which was carried out with SPSS software. figure 3 illustrates the visualization of the flow for conducting the assessment of psychological problems of patients suffering from brain cancer.

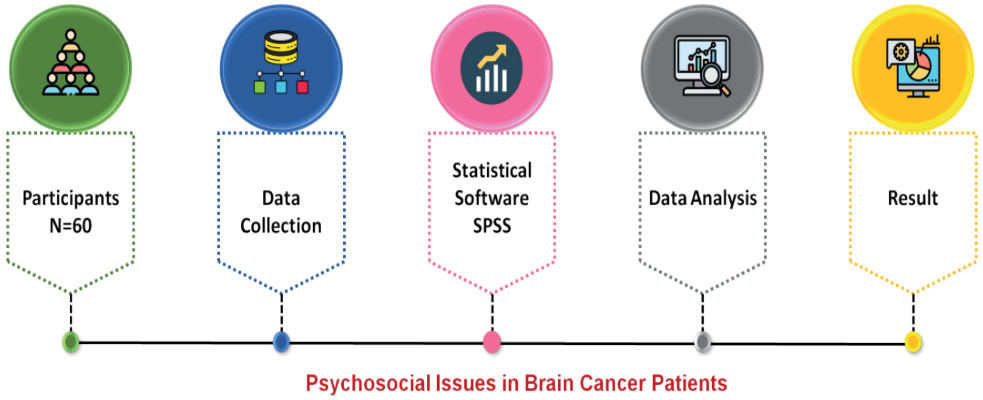

Figure 3. Methodological flow for assessing psychological issues in brain cancer patients

Data Collection

The process of data collection was performed from a sample of 60 patients diagnosed with brain cancer in the earlier phases of cancer therapy. The surveys included those aimed at measuring core psychosocial indicators such as anxiety levels, depression levels, quality of life, social support, and a patient's coping strategies. The psychometric instruments utilized include anxiety and depression scale used in the evaluated survey to assess the emotional and psychological conditions of the patients for completeness of the psychosocial data collected.

Research Instrument

The Hospital Anxiety and Depression Scale (HADS) is one of the psychometric tools that examine levels of anxiety and depression in a patient population, most especially in hospital practice. Each item is scored on a three-point scale in addition to a week, which requires the respondents to show how it felt in the week. HADS is good at detecting clinically relevant symptoms while being short enough for everyday clinical practice, which enhances its usefulness for screening in diverse health care settings, cancer care included.

Psychometric Survey

To measure the psychological and emotional well-being of patients diagnosed with brain cancer, the required psychometric estimates are standard questionnaires. These include the assessment of several psychosocial aspects including coping strategies and their effectiveness, quality of life, presence of anxiety and depression, and social support. The medical professional in tailoring treatment and the provision of care throughout treatment, as it provides important information concerning the mental state of the patient.

The psychometric survey used to evaluate important psychosocial factors in patients with brain tumors is shown in table 1. Two particular questions are included with each variable, and the response styles are

intended to measure the degree of anxiety, depression, quality of life, social support, and coping mechanisms. For additional analysis, the replies are gathered in open-ended or 3-point Likert format.

Table 1. Psychometric Questionnaire for Anxiety, Depression, Quality of Life, Social Support, and Coping Strategies

Variable	Questions
Anxiety Levels	Often feel restless or unable to relax.
	Worry about different aspects of my life more than used to.
Depression Levels	Find it difficult to motivate myself to do things used to enjoy.
	Feel hopeless about situation.
Quality of Life	How would describe overall emotional well-being over the past week?
	How much difficulty have experienced in daily activities during the past week?
Social Support	Who do turn to for emotional support when feeling down?
	How would rate the level of support received from family and friends?
Coping Strategies	Engage in physical activities to help manage my stress.
	Talk to someone trust when feeling overwhelmed.

Data Analysis

Descriptive statistics offered an analysis of demographic information and psychosocial scores. To find significant differences in psychosocial factors, means between various demographic groups were compared using independent samples t-tests. Furthermore, multiple linear regression analysis evaluated the impact of several variables on psychosocial outcomes, providing information about the connections between the variables under examination. These analyses were performed using SPSS software.

RESULTS

The results indicate that the mental health outcomes of brain cancer sufferers are highly demographic dependent, as there is a variation in the quality of life, level of anxiety, and depression among different groups. In the early phase of treatment, a large proportion of patients reported tremendous psychosocial problems, which were signs of the emotional and psychological problems it faced. These findings emphasize the need for the development of demographic-oriented support plans to enhance the quality of life of such patients.

Demographic Statistics

Demographic information of patients diagnosed with brain cancer usually encompasses variables such as age, gender, stage of treatment, stage of cancer, treatment history, and duration of illness, all of which have a bearing on the disease incidence and prognosis. Such assessment is important in determining the risk factors, changing patterns, and the availability of health care services and their interventions for treatment. These populations are important for implementing strategies and for the enhancement of patient care.

Table 2. Demographic Data of Brain Cancer Patients.

Demographic Variables		Frequency (n)	Percentage (%)
Gender	Male	30	50,0
	Female	30	50,0
Duration of Illness	> 6 months	20	33,3
	6 months - 1 year	25	41,7
	1 - 2 years	10	16,7
	< 2 years	5	8,3
Age (years)	18-30	15	25,0
	31-45	20	33,3
	46-60	15	25,0
	61 and above	10	16,7
Stage of Treatment	Early Stage (I-II)	40	66,7
	Advanced Stage (III-IV)	20	33,3
Stage of Cancer	Stage I	15	25,0
	Stage II	25	41,7
	Stage III	10	16,7
	Stage IV	10	16,7
Treatment History	No Previous Treatment	25	41,7
	Surgery Only	15	25,0

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	Chemotherapy Only	10	16,7
	Combined Treatment	10	16,7

Table 2 and figure 4 show the demographic features of the sample of brain cancer patients, including age, sex, treatment stage, cancer stage, treatment, and duration of illness. These factors and demographics are important to analyze when understanding the psychosocial issues prevalent, especially in the initial stages of treatment for the patients, as it can affect determining one's conditions and strategies of coping. This variation in the variables is important, as it shows the heterogeneity of the patient population which is useful in the design of appropriate psychosocial interventions and provision of services.

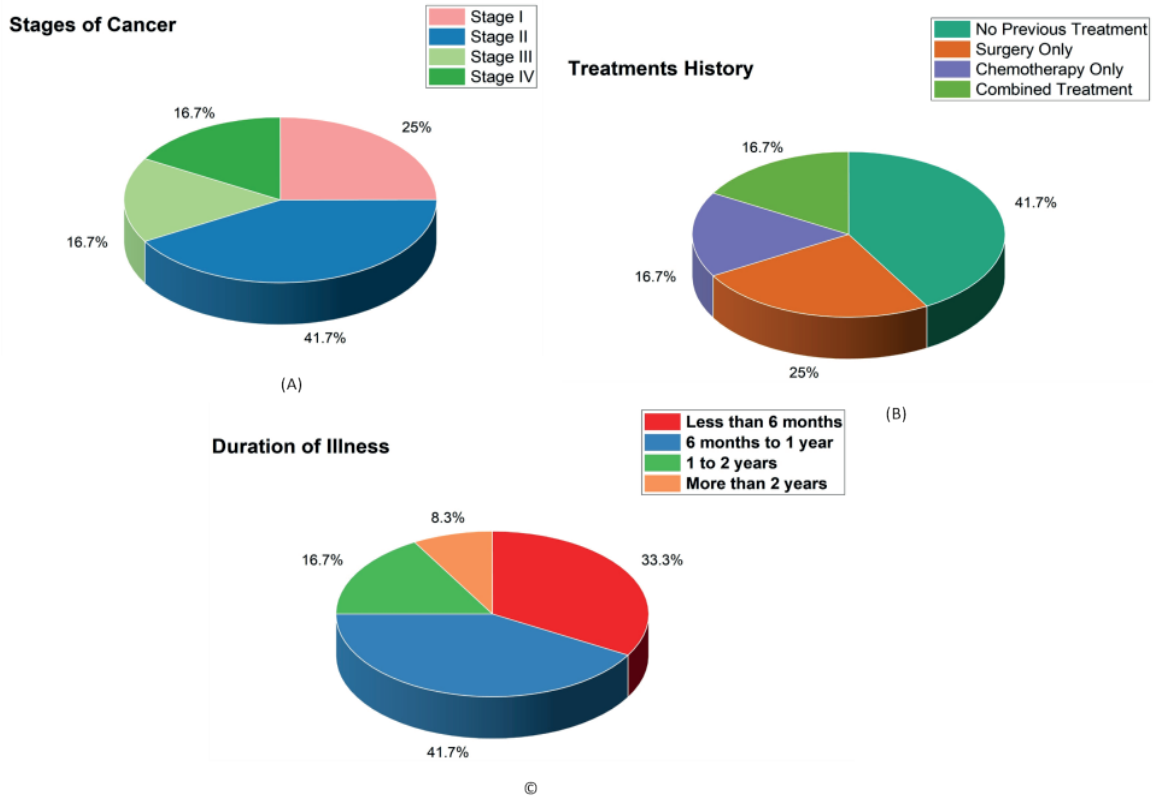

Figure 4. Demographic statistics (A) Stages of cancer, (B) Treatments History, (C) Duration of illness

Descriptive Statistics

For patients suffering from brain tumor-related psychosocial issues, descriptive statistics are employed to summarize such variables as emotional distress, quality of life, and coping strategies. Most of the algorithms used in assessing anxiety, depression, cognitive function, etc., include mean, median, and standard deviation. The summary statistics provide a comparison of the levels of psychosocial challenges experienced by different patient population groups to assist in developing targeted strategies.

Table 3. Descriptive Statistics for Psychosocial Variables in Brain Cancer Patients.

Variable	Anxiety Levels	Depression Levels	Quality of Life	Social Support	Coping Strategies
Mean	14,5	11,3	3,2	3,5	2,8
Median	14	11	3	4	3
Standard deviation	5,2	4,8	0,9	0,7	1,0
Minimum	6	4	1	2	1
Maximum	27	22	4	4	4

Table 3 presents the descriptive data relating to major psychosocial factors among the 60 patients diagnosed with brain cancer. The mean scores represent the mean scores of patients with anxiety, depression, quality of life, social support, and coping scores recorded. The variation in the scores is represented by the standard deviation, while the median values reflect the central tendencies for each variable. Furthermore, the minimum and maximum numbers are useful in providing information concerning the recorded responses. Overall, these statistics give a clear insight into the psychological challenges that patients face in the early stages of treatment.

T-Test for Independent Samples

The assessment measures t-statistic, where the difference between the mean ages of different samples, their variation and sample sizes are considered, and is then subjected to a relevant distribution to determine the level of significance. This is often used to research different medical conditions, for instance, comparing the sizes of tumors or the effects of treatments on individuals with brain tumors.

Table 4. Independent Samples t-Test Results for Psychological Variables.

Variables	Anxiety Levels	Depression Levels	Quality of Life	Social Support	Coping Strategies
N	60	60	60	60	60
p-value	0,003	0,013	0,041	0,001	0,063
Mean	12,5	10,1	65,0	25,0	18,2
SD	3,1	2,9	10,5	5,0	4,0
t-value	3,12	2,56	-2,11	-3,50	1,90

Table 4 and figure 5, respectively, describe the results of the t-test in independent samples conducted on two groups across five psychological dimensions: the degree of anxiety and depression, the quality of life, social support, and coping techniques. To evaluate the significance of differences between the groups, sample size, mean, standard deviation, t, and p values are provided for each variable. The presence of significant p-values (≤ 0,05) shows that the means of the respective variables are different.

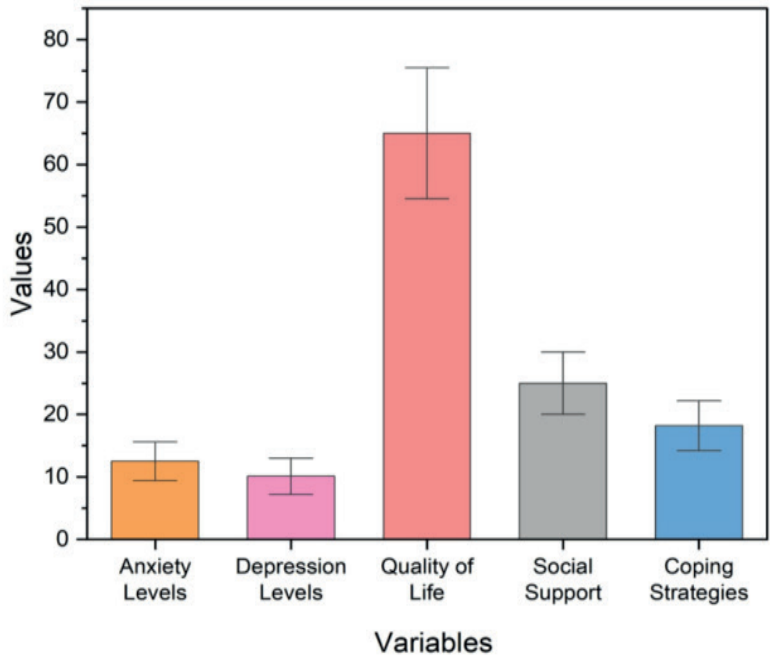

Figure 5. Performance of t-test for independent

Multiple Linear Regressions

In psychosocial issues regarding brain cancer patients, the effect of many independent variables, like anxiety, depression, or social support, on a dependent variable, for instance, quality of life, is studied using multilane regression analysis. It helps to understand what factors affect the mental well-being of the patients significantly. This approach explains the interaction of different psychological stresses.

Table 5 presents the results obtained from multiple linear regressions in terms of interacting psychosocial variables and mental health outcomes in brain cancer patients. The impact of each predictor variable on the outcome variable is provided by the ß coefficients ranging from strength to direction in the case of each predictor variable. The standard error (SE) indicates how precise the estimates of the coefficients are. T-values and p-values are used to test each predictor's significance, with values lower than 0,05 showing statistical significance. In general, the results emphasize the role of anxiety, depression, quality of life, social support, and coping mechanisms on the patients' mental well-being.

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Table 5. Multiple Linear Regression Analysis of Psychosocial Variables.

Predictor Variable	Anxiety Levels	Depression Levels	Quality of Life	Social Support	Coping Strategies
B (Coefficient)	-0,45	-0,30	0,60	0,35	0,40
SE (Standard Error)	0,10	0,12	0,15	0,11	0,14
t-value	-4,50	-2,50	4,00	3,18	2,86
p-value	<0,001	0,015	<0,001	0,002	0,005

Likert Scale

The scale is designed to measure the extent of agree or disagree or neutral of the respondents with a set of given statements on a scale ranging, for instance, from strongly disagree to strongly agree. Considered one of the psychometric tools at the request of the researcher, it is often used in surveys to measure the respondents' degree of dislike for a given subject. As it provides ordinal data, the scale assists in the measurement of subjective feelings as shown in figure 6.

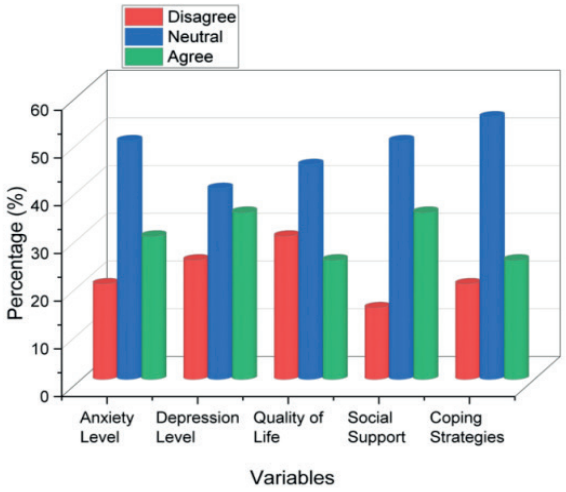

Figure 6. Performance of variables in the Likert scale

CONCLUSION

Demographic characteristics can be used to explain the differences in anxiety, sadness, and quality of life that brain cancer patients suffer. The subjects' psychosocial functioning was adversely impacted in the first weeks of treatment and this requires intervention. The results highlight the necessity of adjusting the support plans to one's demographic particularities for better overall welfare. Moreover, the various linear regressions conducted enabled the identification of significant relationships and complemented the findings that are neutral, such as anxiety level- 50 %, depression level-40 %, quality of life-45 %, social support-50 % and coping strategies – 55 % of psychosocial factors on mental health outcomes. The evidence supports expanding the psychosocial aspects of brain cancer care during treatment. Brain cancer patients are often plagued with severe depressive and stressful symptoms, which are usually not addressed as more emphasis is laid on medical treatment than psychological care. Some of the assessments can also fail because patients have the failure to assume clearly due to the effect of brain tumors. Enhancing the long-term health and quality of life of brain cancer patients can be achieved by integrating routine mental health assessments and patient-focused psychosocial care in treatment modalities for such patients.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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