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Research Paper

Impact of Anxiety and Depression on Quality of Life in Elderly Patients with Brain Tumor

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ABSTRACT

Background: Psychological health plays a crucial role in the well-being and quality of life. Diagnosis of brain tumor and subsequent surgery can have a significant impact on a patient's well-being especially with the natural course of ageing. The uncertainty of the diagnosis, the potential impact on daily functioning, after effects of the surgery can all contribute to psychological distress, including anxiety and depression in an elderly person. The aim of the present study is to find the influence of depression and anxiety on the quality of life of elderly people who underwent brain tumor resection. **Method:** Using descriptive research design a sample of 50 post operative patients between age group 55-75 were selected. The Malayalam version of HADS and WHOQOL-BREF were administered along with exploring other sociodemographic variables. **Results:** Correlational analysis, ANOVA and post hoc tests were employed. The results showed that high anxiety levels were associated with a lower QoL (p = .006). However, depression levels did not have a significant impact on QoL. Additionally, there was a positive correlation between general health and QoL score (r = 0.685, p < .001), indicating that better general health was associated with a better QoL. **Conclusion:** Study suggest that psychological and physical factors should be considered when assessing and treating the elderly people who underwent brain tumor resection. The results might help the rehabilitation professionals, doctors as well the caregivers of post operative patients to understand their psychological well-being and adapt appropriate measures to support them for speedy recovery as well.

Keywords: *Anxiety, Depression, Quality of life, Brain tumors, Rehabilitation*

Anxiety and depression can play a significant role in the quality of life of people who undergo tumor resection.[1] Brain tumor resection is a major surgical procedure that involves removing a portion of the brain affected by a tumor. The surgery can have physical, cognitive, and emotional effects on the patient, which can impact their quality of life.[2] Physical effects of brain tumor resection can include pain, fatigue, and difficulty with movement and coordination. These physical symptoms can be distressing and may contribute to feelings of anxiety and depression. Patients may also experience emotional

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changes, including changes in mood, personality, and coping abilities, which can contribute to feelings of anxiety and depression.[1] Cognitive effects of brain tumor resection can include difficulties with learning, memory, attention, and executive function. These changes can be particularly challenging for patients, as they can impact their ability to perform daily activities and affect their overall quality of life.[3]

Anxiety and depression can also have a negative impact on recovery post-surgery. Patients who experience anxiety and depression may have reduced motivation to engage in physical therapy or other aspects of their recovery plan, which can lead to longer recovery times and poorer outcomes.[4] Studies show that the prevalence of depression and anxiety in cancer patients was 56.7% and 64.7%, respectively. The high prevalence of depression and anxiety among cancer patients highlights the importance of routine screening and management of these mental health conditions.[1] It's been found that significant proportion of patients reported symptoms of anxiety and depression both before and after surgery. Anxiety symptoms were more common than depression symptoms.[4]

Despite the vast literature, there is lack of studies that specifically investigate the impact of anxiety and depression on the quality of life of elderly people who undergo brain tumor resection. In India, the elderly population is expected to reach 340 million by 2050, which highlights the need for more research in this area.[5] This is an important area of research, as the elderly population is growing, and brain tumors are more common in older age groups. According to a study published in the Journal of Geriatric Oncology in 2022, there is a significant lack of research on the impact of cancer and its treatment on the quality of life of elderly individuals in India.[6] Studying the impact of depression and anxiety on the quality of life in elderly people who have undergone brain tumor resection is important for several reasons such as better patient outcomes, enhanced quality of life, early intervention and to provide most effective wholistic treatment. Hence, it is essential to address anxiety and depression in patients who undergo brain tumor resection. It all starts from acceptance of the diagnosis and moving forward. Patients who require in-depth interventions should be given priority. Treatment may involve a combination of medication, therapy, and other supportive interventions to address both the physical and emotional aspects of recovery. By addressing these issues, elderly patients may be better able to cope with the challenges of recovery and improve their overall quality of life.

METHOD

The study adopted descriptive research design with convenient sampling technique, comprising of a sample size of 50 patients between age 55-75 years (N=50, 25 males and 25 females, mean age- 64 years) who were diagnosed as having brain tumors and has undergone surgical management as first line of management. The data was obtained through the private outpatient clinic, not through any institution. Hence the cognitive debriefing was done and informed consent from every patient and bystander (as witness) was obtained for conducting the study.

Inclusion criteria
Patients diagnosed with brain tumor were recruited for the study and they must be within the age range of 55-75 years. Patients who have undergone surgical management and those who are residing in the state of Kerala are included for participation.

Exclusion criteria

Patients with history of psychiatric disturbances or other medical illness, who did surgery after few months of diagnosis, who have undergone other modes of treatment for tumor management (such as radiation therapy and chemotherapy instead of surgical management), patients with recurrent tumor and also patients previously diagnosed with other neurological conditions such as epileptic disorder, stroke, multiple sclerosis, dementia, motor disorders and other neurodegenerative disorders were excluded from participating in the study.

Instruments used:

1. **WHOQOL-BREF- The WHOQOL-BREF** is a shorter version of the WHOQOL-100. Both were developed by the World Health Organisation (WHO) and published in 1995. The WHOQOL-BREF is a self-administered questionnaire comprising 26 questions on the individual's perceptions of their health and well-being over the previous two weeks. Responses to questions are on a 1-5 Likert scale where 1 represents "disagree" or "not at all" and 5 represents "completely agree" or "extremely". The WHOQOL-BREF instrument consists of four domains: physical health (7 items), psychological health (6 items), social relationships (3 items), and environmental health (8 items); it also contains QOL and general health items. The Malayalam version of the tool was done by Sreedevi et al., in 2015. The translated version of WHOQOL-BREF was found to be internally consistent (Cronbach's α = .86) and demonstrated discriminant and construct validity.[7]

2. **Hospital Anxiety and Depression Scale (HADS)-** The hospital anxiety and depression scale (HADS) is a self-assessment scale has been developed and found to be a reliable instrument for detecting states of depression and anxiety in the setting of an hospital medical outpatient clinic. It was originally developed by Zigmond& Snaith (1983). The tool has been validated in Malayalam by Thomas et al., (2015). It is a 14 items scale; the Cronbach's alpha was found to be 0.81 for the HADS anxiety subscale, 0.71 for the HADS depression subscale, and 0.85 for HADS tool.[8]

3. **Sociodemographic scale-** Information like age, marital status, family type, financial status, educational qualification, employment nature will be collected via this form.

Procedure of the study

The sample for the study was selected as per the inclusion and exclusion criteria. They were called up for a face-to-face session (online or offline) where they were explained about the research purpose. The queries were addressed. After obtaining their written consent, the questionnaires were administered.

Statistical analysis

The statistical analysis was performed using IBM SPSS (Version 21). Descriptive statistics was employed to find out the mean, and standard deviation of the sample selected for the study. ANOVA and Correlational analysis were done to explore the relationship among the variables.

RESULTS

After sorting and filtering the data, skewed and incomplete data was removed to attain a normal distribution. The data collected was then analyzed and the following results were obtained.

Correlational analysis
Below is the Pearson correlation matrix, showing the correlations between different variables in a sample of 50 cases (Table no.1).

Table no.1 Pearson Matrix correlation for Anxiety, Depression, QoL and subdomains of QoL.

Variables	Anxiety	Depression	Physical health	Psychological health	Social relationship	Environmental health	General Health	QoL Total
Correlations								
Anxiety	()	-.202	-.554**	-.393**	-.114	-.507**	-.330*	-.458**
Depression		()	-.030	-.100	-.397**	-.214	.096	-.210
Physical health			()	.663**	.311*	.625**	.334*	.720**
Psychological health				()	.535**	.671**	.604**	.871**
Social relationship					()	.551**	.358*	.759**
Environmental health						()	.572**	.876**
General Health							()	.685**
QoL Total								()
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

The table shows the correlations between different psychological and health-related variables, including anxiety, depression, physical health, psychological and social constructs, environmental context, general health, and quality of life (QoL) total. The table also provides information on the statistical significance of each correlation, with significance levels marked by asterisks (* for p < 0.05 and ** for p < 0.01).

The Pearson correlation analysis suggests that anxiety is negatively correlated with the quality-of-life total score of the elderly patients who had undergone brain tumor surgery (r = -.458, p = .001). This means that as anxiety levels increase, the quality of life of the elderly patients tends to decrease. The findings implicate that there was no statistically significant correlation (r= -.210) found between depression and the quality of life of elderly people who underwent brain tumor surgery.

Anxiety is negatively correlated with physical health (r=0.554, p=.001), psychological constructs (r=0.393, p=.001), environmental context (r=0.507, p=.001), and general health (r=0.330, p=.005). This implies that participants who experience higher levels of anxiety may have poorer physical and psychological health. They could be more sensitive to their environment, and may also experience poorer overall health outcomes following brain tumor resection.

It was found that depression is negatively correlated with social relationship (r=0.397, p.001) domain stating that low mood or having depressive tendencies can affect the social relationship and interactions of the individual.

The overall QoL score is positively correlated with all the sub-domains of QoL such as physical health (r=0.720, p=.001), psychological health (r=0.871, p=.001), social relationship (r=0.759, p=.001), environmental health (r=0.876, p=.001) and general health (r=0.685, p=.001) as well.

ANOVA

Quality of life among high, medium, and low anxiety and depression groups were assessed using ANOVA. Using the descriptive statistics, the mean anxiety score obtained was 12.90 with a standard deviation of 3.57, while the mean depression score was 10.16 with a standard deviation of 2.802. Based on the severity of anxiety or depression scores three groups were created.

For anxiety scores:
- Low anxiety group: Scores less than one standard deviation below the mean (score < 9.33)
- Moderate anxiety group: Scores within one standard deviation of the mean (9.33 ≤ score < 16.27)
- High anxiety group: Scores greater than one standard deviation above the mean (score ≥ 16.27)

For depression scores:
- Low depression group: Scores less than one standard deviation below the mean (score < 7.36)
- Moderate depression group: Scores within one standard deviation of the mean (7.36 ≤ score < 13.92)
- High depression group: Scores greater than one standard deviation above the mean (score ≥ 13.92)

Table no. 2 Comparison of High, Medium, and Low Anxiety groups on QoL: Results of one-way ANOVA

Variable	Sum of squares		Mean of squares		F ratio	Sig.
	Between	Within	Between	Within		
Physical health	52.786	141.934	26.393	3.020	8.740	.001
Psychological health	32.229	254.191	16.114	5.408	2.980	.060
Social relationships	25.376	485.904	12.688	10.338	1.227	.302
Environmental health	95.064	291.816	47.532	6.209	7.656	.001
General health	10.404	130.316	5.202	2.773	1.879	.164
QoL total	878.862	3652.118	439.431	77.705	5.655	.006

The ANOVA table indicate that there is a significant difference in anxiety levels across the three groups of quality of life, as evidenced by the significant F-statistics for physical health (F=8.740, p=.001), environmental health (F=7.656, p=.001), and overall quality of life (F=5.655, p=.006). This implies that at least one of the means of anxiety levels in the three groups is different from the others.

However, for psychological health, social relationships, and general health, the F-statistics are not found to be significant (p>.05), indicating that there is no significant difference in anxiety levels across the groups for these variables.

Post hoc tests
The post hoc tests were conducted to investigate which groups differed significantly from each other in relation to the significant one-way ANOVA results obtained for physical health, environmental health, and overall quality of life.

Table no. 3 Post Hoc analysis for Anxiety groups on the physical health, environmental health and quality of life.

Sl no	Group	N	Mean	Group		
Physical health				1	2	3
1	Anxiety (High)	8	11.25	()	*	*
2	Anxiety (Moderate)	34	13.21		()	*
3	Anxiety (Low)	8	14.88			()
Environmental health				1	2	3
1	Anxiety (High)	8	12.88	()	*	*
2	Anxiety (Moderate)	34	15.32		()	*
3	Anxiety (Low)	8	17.75			()
Quality of life				1	2	3
1	Anxiety (High)	8	57	()	*	*
2	Anxiety (Moderate)	34	65.26		()	--
3	Anxiety (Low)	8	71.75			()

The post hoc Duncan test compared the mean scores of three anxiety groups (High, Moderate, and Low) on physical health. The results demonstrate that the Low anxiety group's mean score was considerably higher than the High and Moderate anxiety groups' mean scores. However, the High and Moderate anxiety groups were not statistically different from one another. With p-values smaller than .05., the differences between the groups were statistically significant. These findings imply that anxiety levels may have an effect on physical health, with lower levels of anxiety connected with better physical health.

With relation to the environmental health, the results of post hoc indicate that the mean score for the Low anxiety group was significantly higher than the mean scores for the High and Moderate anxiety groups. The High and Moderate anxiety groups did not differ significantly from each other. The differences between the groups were statistically significant with p-values less than .05. This shows that anxiety levels may have a connection to the aspects of Environmental health, with lower levels of anxiety being associated with better Environmental health outcomes for the individual.

There was a statistically significant difference in mean scores between the three levels of anxiety against quality of life. Participants with higher anxiety levels reported substantially poor quality of life than those with moderate or low anxiety levels. Further implying that people with low anxiety levels had considerably higher quality of life scores than those with moderate anxiety levels.

Table no.4 Comparison of High, Medium, and Low Depression groups on QoL: Results of one-way ANOVA

	Sum of Squares		Mean Square		F	Sig.
	Between	Within	Between	Within		
Physical health	3.352	191.368	1.676	4.072	.412	.665
Psychological health	20.149	266.271	10.075	5.665	1.778	.180
Social relationships	35.991	475.289	17.996	10.113	1.780	.180
Environmental health	17.857	369.023	8.928	7.852	1.137	.329
General Health	14.089	126.631	7.045	2.694	2.615	.084
QoL Total	257.138	4273.842	128.569	90.933	1.414	.253

No significant difference in depression levels between the different quality of life groups were found in the ANOVA, as all the p-values are greater than the typical alpha level of 0.05. Hence, no further post hoc test was performed.

DISCUSSION

Experience of anxiety and depression are common emotional reactions to a cancer diagnosis in any individual. They can have a significant impact on the quality of life especially in elderly people. The necessity to undergo further surgery, radiation and chemotherapies can elevate the emotional turmoil of these individuals. In accordance with the existing literature, the correlation analysis, ANOVA, and post hoc tests of the present study show a significant negative relationship between anxiety and quality of life. Indicating that a rise in anxiety has an impact on overall quality of life, which may be explained by a number of factors. Anxiety, in particular, can result in physical symptoms such as sleep disturbances, exhaustion, and gastrointestinal issues, all of which can reduce overall quality of life.[1] Second, anxiety can impede cognitive performance, memory, and attention, all of which are essential determinants in the aged population's ability to retain independence and social engagement.[3] Third, anxiety can lead to social isolation, which can lower the quality of life even more.[9] It is essential to understand that anxiety is a curable condition, and there are numerous therapeutical techniques that can equip elderly population to control their anxiety symptoms. Addressing anxiety in older people who have had brain tumor surgery may enhance their quality of life and help them cope with the challenges of their condition.

The significant differences in anxiety levels across the groups for physical health, environmental health, and overall quality of life suggest that these factors may be important predictors of anxiety. This finding is consistent with previous research that has shown that physical and environmental factors can have a significant impact on mental health and well-being. For instance, studies have found that individuals who have better physical health or live in more supportive environments tend to have lower levels of anxiety and other mental health problems.[10]

The study shows, no significant relationship between the depression and the quality of life of elderly people underwent tumor resection. This implies that the level of depression experienced by these individuals does not seem to be strongly associated with their overall quality of life. Contradictory to this finding, there are several studies that shows the relationship of depression and quality of life.[11] In the present study, depression is found to have a lesser impact than the anxiety in the quality of life. It is important to note, however, that this does not necessarily mean that depression has no impact on their quality of life at

all. Other factors, such as anxiety or physical health, may play a more significant role in determining quality of life for these individuals. Further research may be needed to better understand the relationship between depression and quality of life in this population, as well as to identify potential interventions or treatments that could improve overall quality of life for elderly individuals who have undergone brain tumor surgery.

The negative correlation between depression and the 'social relationship' subdomain of QoL in elderly individuals who underwent brain tumor resection suggests that addressing depression and its impact on social relationships may be an important part of improving overall quality of life in this population.

The individuals who experience higher levels of depression may have poorer social relationships and may struggle to maintain meaningful connections with others following brain tumor resection. Depression can lead to feelings of isolation and social withdrawal, making it more difficult for individuals to maintain close relationships with others. This may be particularly true for individuals who have undergone brain tumor resection, as they may already be experiencing physical and cognitive changes that can affect their ability to interact with others. depression can also lead to negative thinking patterns and self-doubt, which may cause individuals to feel like they are a burden on others or that they are not worthy of close relationships. This can further exacerbate feelings of social isolation and lead to decreased social support and connectedness. Finally, depression can also have physical symptoms that may make it more difficult for individuals to engage in social activities. For example, fatigue, loss of interest in activities, and changes in appetite or sleep patterns can all make it more challenging to participate in social events or maintain relationships with others.

Implications of the study
The study findings were discussed with the caregivers, rehabilitation professionals as well as the treating physician. Elderly patients who required support and attention were provided with appropriate assisstance to adapt to the recent physiological as well as cogntive changes. The caregivers were also psychoeducated regarding the behvaioural changes of the patient and the possible techniques to help them adapt speeding the recovery process. The patients will be closely monitotred on the psychological aspects as well based on the findings of the study.

CONCLUSION
Based on the results of the study, it can be concluded that anxiety levels and general health are important factors to consider when assessing the quality of life (QoL) of elderly people who underwent brain tumor resection. The study found that high anxiety levels were associated with a lower QoL score. Furthermore, the study suggests that improving physical health, and environmental health and thus overall quality of life could lead to an improvement in anxiety levels for these individuals. These findings highlight the importance of considering both psychological and physical factors when assessing and treating the QoL of elderly people who underwent brain tumor resection. The study also found that higher levels depression leads to reduced social relationships of these individuals. Improving the social relationships and increasing the opportunity social involvement can help in reduction of depressive features and may also enhance the sense of belongingness of the individual.

Limitations

- The study could have been comparative, as a comparison between the preoperative status and post operative status.
- The cognitive functioning of the patients could also have been considered.
- The sample size could have been more so that the study findings could have been generalized.
- Tumor types and grades could have been considered.
- More psychological variables could have been considered such as perceived support and care.
- Periodical evaluation of the psychological status of the patient would have given a comprehensive picture regarding them as well as the intervening variables for such a change.

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Conflict of Interest
The author(s) declared no conflict of interest.

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