

Original Article

Examining the Effect of Education Given by Roy Adaptation Model in Patients With Primary Brain Tumors on Symptoms and Coping with Stress

Altun Baksi, RN, PhD

School of Nursing, University of Dicle, Assistant Professor of Surgical Nursing Center, Diyarbakir, Turkey

Aklime Dicle, RN, PhD

Istanbul Sabahattin Zaim University, Faculty of Health Sciences, Nursing Department
Assistant Professor of Surgical Nursing Halkali, Kucukcekmece, Istanbul, Turkey

Correspondence: Altun Baksi RN, PhD, School of Nursing, University of Dicle, Assistant Professor of Surgical Nursing Center 21100, Diyarbakir-Turkey. e-mail: altun.baksi@hotmail.com

Abstract

Background: Primary Brain Tumor is a disease which ransacks the lives of both patient and family by leading to physical, psychological, social and moral problems, is difficult to treat and causes disabilities and even death.

Objective: The purpose of the research was to examine the effect of education given by Roy Adaptation Model in the patients with primary brain tumors on severity of symptoms, the situation of interference individual's life of symptoms and coping with stress.

Methodology: The conceptual framework of the research is formed by Roy Adaptation Model. In the research; quasi-experimental research design was used. In the research, as well as an approval from the ethical committee, a written permission was obtained from the institution, patients and the owner of scale. The sample of the research was constituted by 95 patients that means 45 intervention and 50 control. The data was evaluated with statistical methods.

Results: In the research; statistically a significant level of difference is determined in intervention group compared to control group in terms some dimensions of symptom/symptom's situation of interference individual's life and sub-dimensions of social support in terms of coping with stress ($p < 0.050$).

Conclusions: It is observed that the education given in accordance with Roy Adaptation Model is effective on some dimensions of patients symptom's and symptom's situation of interference individual's life and sub-dimensions of social support in terms of coping with stress.

Key Words: Brain Tumors, Roy Adaptation Model, Symptoms, Coping Behavior, Nursing Education.

Introduction

Primary Brain Tumor (PBT) grows in a skull having a certain size and leads to numerous symptoms by applying pressure on healthy tissues (Camp-Sorrell, 2006). The studies conducted so far indicate that evaluation and control of the uncontrolled symptoms are of great importance in the patients with PBT (Armstrong et al., 2004). In the literature, symptoms have been identified with different tools and different symptoms have been assessed (Hamilton & Kernick, 2007). In our country, the effect of counselling on some care outcomes in the patients with brain tumour was examined via tools created by the researcher on the based on

the literature. The recommendations that additional studies should be conducted, research should be carried out from a single centre and assessment scale testing the psychometric properties should be used are among the recommendations taken into consideration (Tuna Malak, Diramali & Yücesoy, 2010). Patients with PBT are exposed to stimulants affecting their adaptations and coping capacities during the periods of diagnosis, treatment and home care (Lepola et al., 2001). Janda et al. (2008) determined that the patients with brain tumour (n: 75) were in need of support in order to eliminate the uncertainties for the future. All the people get stressed due to unknown situations and uncertainty about the future.

When stress becomes continuous, it leads to such symptoms as tachycardia and muscle pains as well as such emotional problems as anxiety and anger (Keir et al., 2006). Studies have shown that there is a positive relationship between the knowledge levels and anxiety levels of the patients (Perks, Chakravarti & Manninen, 2009).

Roy Adaptation Model (RAM) focuses on the concept of adaptation (Roy, 2009). As for the advantages of using model in the nursing studies, it helps:

- a) generate new information by testing the existing interactions,
- b) address the patient/ individual/ group holistically and identify realistic targets and limits,
- c) provide a constant care that is suitable for individual differences,
- d) decrease the gap between the theory and practice and provide guidance on assessment of the care (McKenna, 2005).

According to RAM, nurses plan, implement and assess the nursing interventions by evaluating the stimulants, behaviours, coping mechanisms and adaptation levels of the individuals/groups (Roy, 2009).

As a conclusion, It is reported in the literature that the people diagnosed with a disease threatening the life and patients with malign brain tumours and their families, in particular, should certainly receive support, training and a comprehensive care so that their stress factors can be identified and they may cope with the disease (Ahlström, 2005; Keir et al., 2006; Gustafsson, Edvardsson & Ahlström, 2006; Goebel, Von Harscher & Mehdorn, 2011).

There is no national or international study where the effect of education intervention on symptoms, the situation of interference individual's life of symptoms and coping in the patients with PBT was examined on the basis of RAM.

Knowing the symptoms, the situation of interference individual's life of symptoms and status of coping with stress in the patients with PBT will provide scientific data in the treatment, care and follow-up of the patients. For the patients receiving home care in particular, coping skills will be improved, adaptation will be enhanced and the quality of life will be improved. It was thought in this research that training intervention provided to the patients would

prevent the symptoms and help initiate the treatment.

Purpose of the research

The purpose of this research is to examine the effect of education provided to the patients with PBT according to RAM on the severity of symptoms, the situation of interference individual's life of symptoms and coping with stress.

Hypotheses of the research

In the patients with PBT, there are differences between the scores of the intervention group and control group provided with education according to RAM in terms of severity of symptoms, the situation of interference individual's life of symptoms and coping with stress.

Methodology

Study design

A quasi-experimental research design was used

Setting and samples

The present research was conducted in a Neurosurgery Clinic of a university hospital in Turkey. Fifty five nurses were working in the Neurosurgery Clinic either between 08.00 a.m. and 16.00 p.m or between 16.00 p.m and 08.00 a.m. The clinic has a capacity of 44 beds. Every nurse provides care for 8-10 patients on average on the day shift and 20-22 patients on average on the night shift. The present study was conducted between February-November 2012. Inclusion and exclusion criteria of the PBT patients included in the study sample are given in Figure 1.

Sample size was determined to be 128 in total, 64 of whom were included in the control group while 64 of whom were included in the intervention group on the basis of strength of 80%, medial impact of 0.50, confidence interval of 95% and error margin of 0.50 in order to conduct an experimental research examining the impact of education provided to the patients with PBT on the severity of symptoms, the situation of interference individual's life of symptoms and coping with stress (Portney & Watkins, 1993). However, the research was completed with 95 patients in total, 50 patients in the control group and 45 patients in the intervention group, by considering the limited number of patients with PBT, patients excluded from the sample and limited duration of the research. In the power analysis conducted with the data of the research

on the basis of the means/standard deviations of the subdimensions of symptom and coping with stress, the power of the research was found to be 1.00 - 0.98 in terms of emotional symptoms and seeking for social support.

Ethical considerations

Approval (dated 23.06.2010, numbered 2010/05-07, with protocol number of 104/-İOC/2010) (dated 28.06.2010 and numbered 116) was taken from the ethical committee and written permission (dated 13.04.2010 and numbered B.30.2EGE.0.AJ.73.01/H-750) was taken from the institution where the study would be conducted to conduct the study while written permission was taken from the authors adapting the WCSS, one of the data collection tools, to use it in the study. The patients who met the inclusion criteria and accepted to take part in the research were provided additional information about the research process and verbal and written permissions were received.

Measurements and instruments

Patient Question Form: Demographic and Clinical Characteristics

It consists of questions related to the socio-demographic and clinical characteristics of the patients with PBT. Data concerning the patients were collected through face-to-face interviews and patient records.

Karnofsky Performance Status (KPS) Scale:It is commonly used in clinic oncology to determine functional status. KPS, functional status of an individual indicates function loss from 100 (normal function) to 0 (death) by decrements of 10 points (Mor et al., 1984). This research is used to describe the clinical characteristics of the patients with primary brain tumor.

MD Anderson Symptom Inventory-Brain Tumor Turkish (MDASI-BT^{Tr}) Form: Severity of symptoms in patients with primary brain tumor and the situation of interference individual's life of symptoms is developed to determine (Armstrong et al., 2005; Armstrong et al., 2006). To examine the reliability and validity of Turkish society of the inventory were carried out by Baksi and Dicle (2010). Internal consistency reliability coefficient of the inventory was found as 0.90 while item-total score correlation coefficients varied between 0.21 and 0.69. Model fit indexes of confirmatory factor analysis indicated that the inventory has a similar structure to the original inventory. When

examined according to KPS, it was observed that inventory was distinguishing. MDASI-BT^{Tr} contains two sections, seven sub-dimensions and 28 items in total and items are evaluated in the likert form between 0 and 10 (Baksi & Dicle, 2010).

Ways of Coping with Stress Scale (WCSS):It is a scale developed by Şahin and Durak (1995) on the basis of the Ways of Coping Inventory of Folkman and Lazarus in order to make assessments about university students in relation to their moods such as depression, anxiety and loneliness and other psychological stress indicators. The scale has two subdimensions as problem-focused/effective ways and emotion-focused/ineffective ways. In the factor analysis, these two subdimensions reflected on five factors as “*self-confident approach, helpless approach, optimistic approach, submissive approach and seeking for social support*”. The scale is a 4-point likert type scale consisting of 30 items. Internal consistency reliability coefficient (Cronbach Alpha) of the scale varies between 0.47 – 0.80 in the subdimensions. In the scale, score of each subdimension is calculated separately and the total score increase in the subdimensions means that the individual uses that way of coping more frequently (Sahin & Durak, 1995). In this research, WCSS was selected since it used Coping with Stress Theory of Lazarus and Folkman in the development of RAM, it was adapted into Turkish and it is understandable and practical.

Data collection and procedure

Data were collected firstly from the control group and then the intervention group. In the research, data of the control and intervention groups were collected three times: “*preoperative*”, “*within 24-48 hours before the discharge after the operation*” and “*within the first month following the discharge*”. Data of the patients in the 30th day following the discharge were collected through phone calls/e-mail/meeting in the polyclinic in order to be able to follow the data collection schedule. The patients with PBT included in the control group were provided with the routine care applied in the clinic in this period. In the routine care, appropriate nursing interventions are applied to the patients by the nurses as of the admission into the hospital up to the discharge; their questions, if any, are answered; no planned education is followed; education materials are not used. In the first

month following the discharge, patients come to the polyclinic and contact with the physician for their controls or problems experienced. Implementation of the data collection tools took 20-25 minutes in each session in the control group, patients were not provided with education but their questions related to the ethics were answered. Data collection took 20-60 minutes in each session for the patients with PBT included in the intervention group. Phone calls took 5-40 minutes on average. Data collection process in the patients of the intervention and control groups is shown in the Figure 1.

Education provided to the patients in the intervention group

Content of the Education; Education booklet, special to the patients with PBT, was prepared by the researchers. Education booklet was based on the basic books special to the patients with PBT, up-to-date evidence-based guides (Smith & Schnell, 2003; AANN, 2006), examples of patient education materials (NBTF, 2010) and stimulus and adaptive/maladaptive behaviours identified in the literature concerning the patients with PBT (Lepola et al., 2001; Roy, 2009; Baksi Simsek & Dicle, 2013).

Experts opinions on the education booklet; After the education booklet was prepared, it was submitted to the opinion of six experts in order to test the reliability of the content. It was determined in the analysis (Kendall's Coefficient of Concordance) that there was consensus among the experts ($p = 0.075$). In line with the opinions of the experts, the training manual was reviewed and finalised.

Education method; After the initial data of the patients with PBT in the intervention group were collected, they were provided with education on the basis of the adult education principles and education booklet. In this method, education was provided in two phases as:

- a) content relating to the preoperative period and early postoperative period *in the preoperative period* and
- b) content relating to the postoperative period and discharge *after the operation and before the discharge*.

In the intervention group, education was provided to the patients with PBT through face-to-face interviews. Considering the readiness levels of the patients included in the intervention group, they were interviewed once or twice in the

preoperative period and the education booklet was given to the patient/family for use in case of need. Patients in the intervention group were interviewed at least once or twice at most in the postoperative period. These patients were followed through phone calls every seven or ten days (at least three times) in the first month following the discharge, their questions were answered and additional information was provided on the subjects they need. Phone calls made with the patients included in the intervention group in the first month took about 5-40 minutes. Trainings were provided face to face at a specific distance at the same level with the patient beside the bed in the room of the patient and lasted 30-120 minutes.

Roy adaptation model concepts and relations between the variables of the research and experimental indicators

Conceptual, Theoretical and Empirical (CTE) structure of the research based on the nursing practices was developed according to RAM (Fawcett, 2005). Theoretical, conceptual and empirical structure of the research based on Roy Adaptation Model is shown in the Figure 2.

Data analysis

Data of the patients with PBT included in the intervention and control groups were analyzed through the statistical software program in the computer environment. Statistical analysis methods used in the analysis of the data in line with the purpose of the research are given in the Figure 1.

Limitations of the research

In the present study, randomised controlled experimental research design could not be created since the interaction between the patients included in the intervention and control groups could not be prevented in the clinic environment. The targeted sample size could not be reached due to the limited number of patients with PBT and limited duration of the research.

Results

Socio-demographic/clinical characteristics of the patients with PBT included in the intervention and control groups are given below (Table 1,2). There were not significant differences between the socio-demographic-clinical characteristics of the patients included in the intervention and control groups apart from distribution of age groups and tumour resection shape ($p > 0.050$).

Examination of initial data

There are not statistically significant differences between the patients of intervention and control groups apart from cognitive symptoms and submissive approach scores ($p > 0.050$).

Examination of severities of symptoms

Symptom severity scores of patients with PBT included in the intervention and control groups in the preoperative period, postoperative period and the 1st month follow-up were compared in Table 3.

In the subdimension of emotional symptoms, statistically insignificant differences were found between the preoperative scores of the intervention and control groups while statistically significant differences were found between the scores of postoperative period and 1st month follow-up. When it was examined whether there were differences in the measurements within the groups, it was found out that the intervention group had differences between the preoperative scores and postoperative scores ($p = 0.000$) and preoperative scores and scores of the 1st month follow-up ($p = 0.000$). As for the control group, difference was determined between the preoperative scores and postoperative scores ($p = 0.017$).

In the subdimension of cognitive symptoms, difference was found between the preoperative scores and postoperative scores ($p = 0.001$). *In the subdimension of focal neurological disorders*, there was no difference between the scores of the intervention and control groups. At the end of the further analysis conducted, differences were determined between the preoperative scores and postoperative scores ($p = 0.002$) and preoperative scores and scores of the 1st month follow-up ($p = 0.003$) in the intervention group. *In the subdimension of treatment assessment symptoms*, in the further analysis, differences were found between the preoperative scores and scores of the 1st month follow-up ($p = 0.000$) and postoperative scores and scores of the 1st month follow-up ($p = 0.007$). *In the subdimension of GIS symptoms*, in the further analysis, the difference was determined between preoperative scores and scores of the 1st month follow-up ($p = 0.009$) in the intervention group.

Examination of the situation of interference individual's life of symptoms

Comparison of the scores of the patients with PBT included in the intervention and control

groups in relation to situation of interference in the preoperative period, postoperative period and 1st month follow-up was given in Table 4.

Interference in daily activities, difference was found between the postoperative scores of the intervention and control groups. When it was examined whether there were differences between the measurements within the groups, differences were found between the preoperative scores and postoperative scores ($p = 0.000$) and postoperative scores and scores of the 1st month follow-up ($p = 0.001$) in the intervention group. As for the control group, differences were determined between preoperative scores and postoperative scores ($p = 0.000$), postoperative scores and scores of 1st month follow-up ($p = 0.001$) and preoperative scores and scores of the 1st month follow-up ($p = 0.013$) in the control group. *In relation to interference of mood*, difference was found between the postoperative scores of the intervention and control groups. The further analysis showed that differences existed between preoperative scores and postoperative scores ($p = 0.000$) and preoperative scores and 1st month follow-up ($p = 0.000$).

In relation to interference in the (household) works, at the end of the further analysis, it was determined that there were differences between the preoperative and postoperative scores ($p = 0.000$) and postoperative scores and scores of the 1st month follow-up ($p = 0.001$) in the control group. *In relation to interference in the relations with other people*, at the end of further analysis, differences were found between the preoperative scores and postoperative scores ($p = 0.007$) and preoperative scores and scores of the 1st month follow-up ($p = 0.006$). *In relation to interference in walking*, the further analysis conducted on the intervention group indicated that the difference was between the postoperative scores and scores of the 1st month follow-up ($p = 0.004$) while differences were determined between preoperative scores and postoperative scores ($p = 0.000$) and postoperative scores and scores of the 1st month follow-up ($p = 0.000$).

In relation to interference in enjoying life, at the end of the further analysis, difference was found between the preoperative scores and

scores of the 1st month follow-up ($p = 0.009$) in the intervention group.

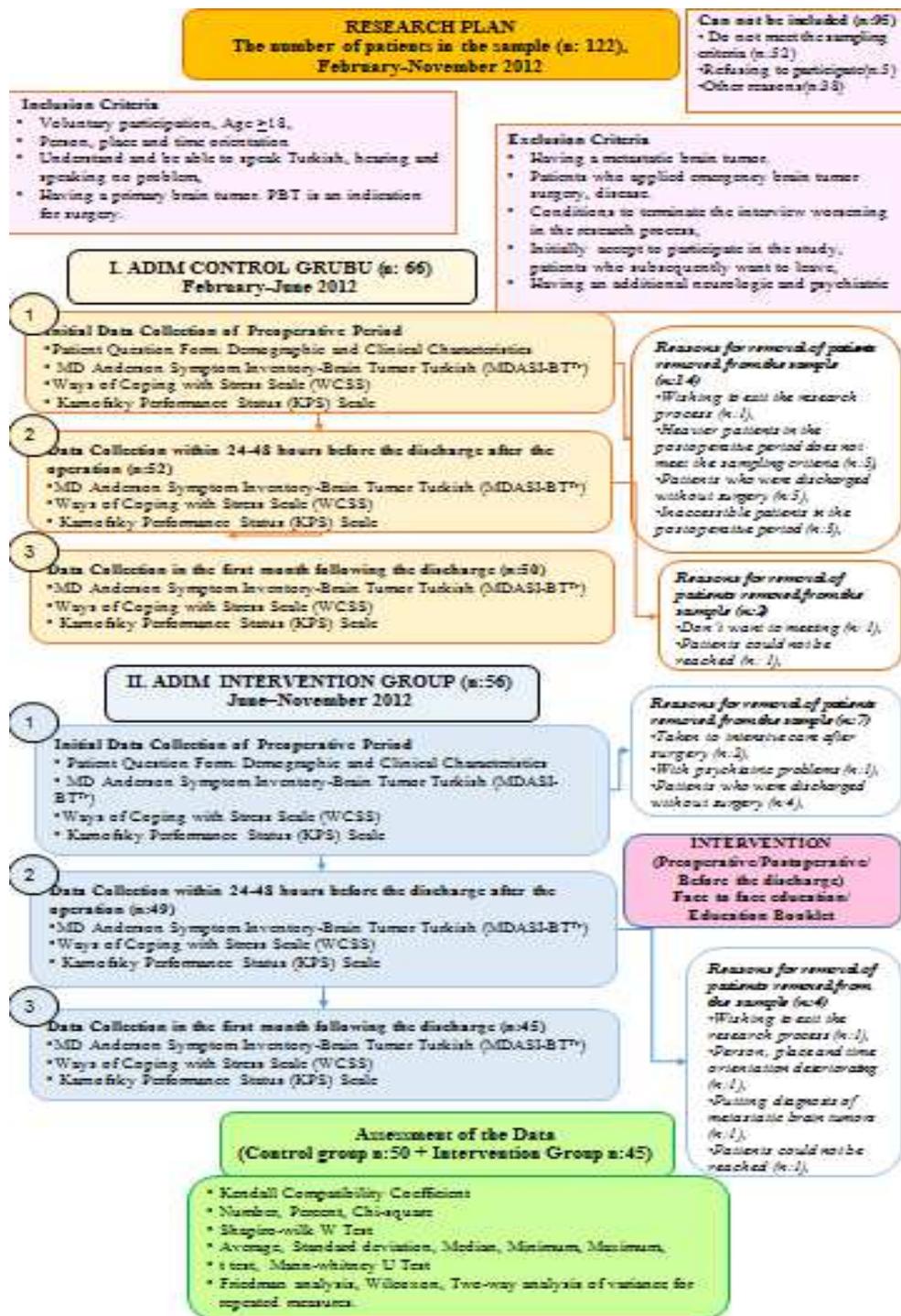


Figure 1. Research plan

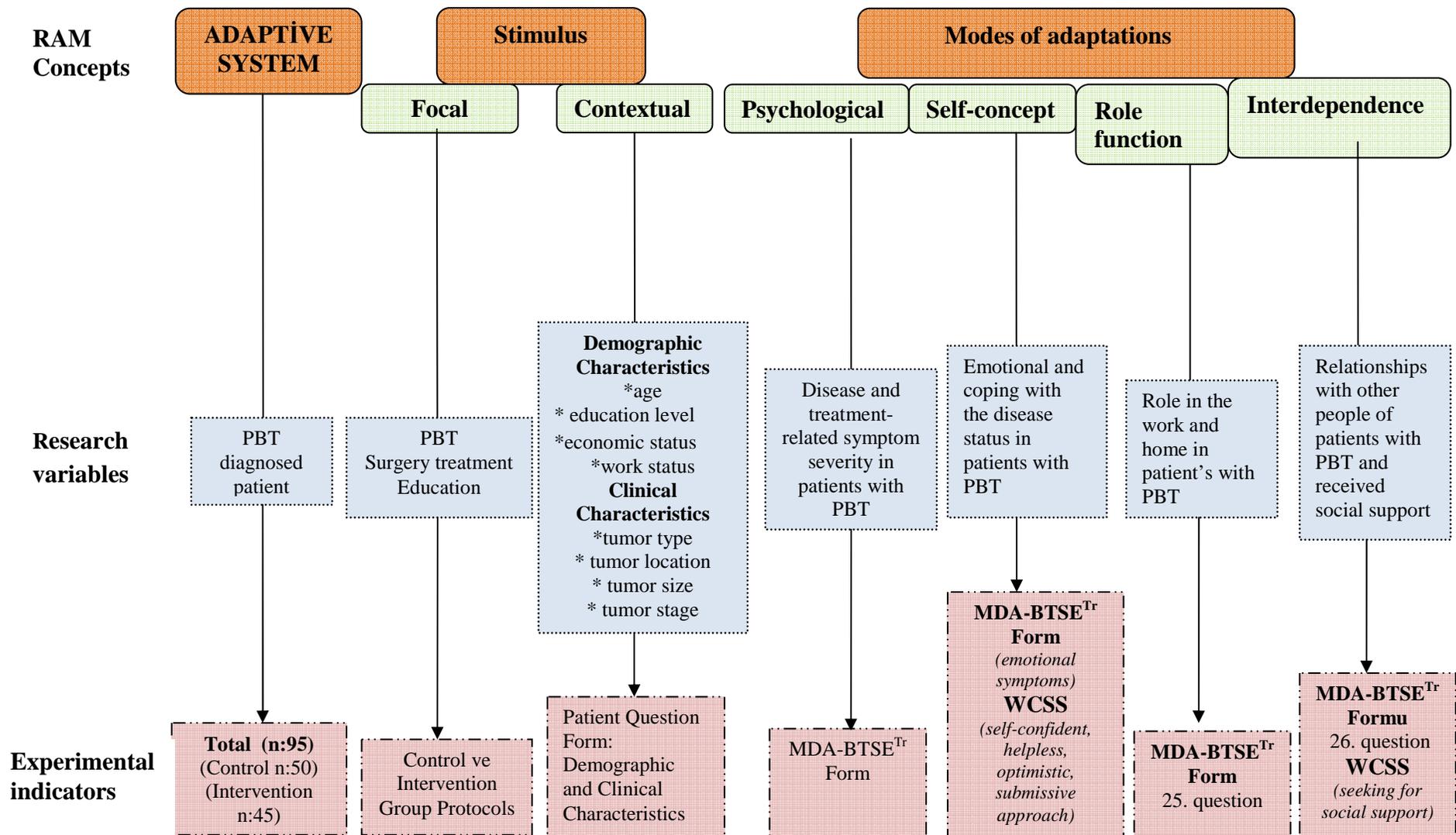


Figure 2. Theoretical, conceptual and empirical structure of the research based on Roy Adaptation Model* *Note. Figure is formed by researchers

Table 1. Socio-demographic characteristics of the patients with PBT received in the intervention and control groups (N = 95).

Socio-Demographic Characteristics	Intervention Group	Control Group	* <i>p</i>
	(<i>n</i> : 45)	(<i>n</i> : 50)	
	<i>n</i> (%)	<i>n</i> (%)	
Age (years)			†0.031
18-44	17 (37.8)	24 (48.0)	
45-64	20 (44.4)	25 (50.0)	
65 and over	8 (17.8)	1 (2.0)	
Sex			0.708
Female	28 (62.2)	34 (68.0)	
Male	17 (37.8)	16 (32.0)	
Marital Status			0.691
Single	9 (19.9)	9 (18.0)	
Married	36 (80.0)	39 (78.0)	
Education level			0.562
Illiterate	4 (8.9)	4 (8.0)	
Literate	1 (2.2)	2 (4.0)	
Primary school	23 (51.1)	21 (42.0)	
Middle school	5 (11.1)	2 (4.0)	
High school	7 (15.6)	12 (24.0)	
University	5 (11.1)	9 (18.0)	
Work Status			0.758
House wife	21 (46.7)	25 (50.0)	
Retired	8 (17.8)	10 (20.0)	
Student	2 (4.4)	4 (8.0)	
Working at	7 (15.6)	7 (14.0)	
Not working because of PBT	3 (6.7)	2 (4.0)	
Others‡	4 (8.9)	2 (4.0)	
Economic Status			0.447
Good	2 (4.4)	3 (6.0)	
Medium	30 (66.7)	38 (76.0)	
Insufficient	13 (28.9)	9 (18.0)	

Note. **p* > 0.05; †*p* < 0.05

Table 2. Clinic characteristics of the patients with PBT received in the intervention and control groups (N = 95).

Clinical Characteristics	Intervention Group	Control Group	* <i>p</i>
	(n: 45)	(n: 50)	
	n (%)	n (%)	
Prior treatment			0.363
Not taking any treatment	37 (82.2)	40 (80.0)	
Surgery treatment	7 (15.6)	9 (18.0)	
Surgery+radiotherapy	1 (2.2)	----	
Surgery+radiotherapy+chemotherapy	----	1 (2.0)	
Tumor type			0.090
Tumors of the meninges	11 (24.4)	16 (32.0)	
Astrocytic tumors	11 (24.4)	5 (10.0)	
Sellar region tumors	12 (26.7)	6 (12.0)	
Oligodendroglial tumors	2 (4.4)	3 (6.0)	
Oligoastroitik tumor	1 (2.2)	1 (2.0)	
Ependymal tumors	1 (2.2)	5 (10.0)	
Cranial and paraspinal tumors	----	4 (8.0)	
Others	7 (15.6)	10 (20.0)	
Tumor size			0.947
Less than 3 cm	7 (15.6)	10 (20.0)	
3-5 cm	20 (44.4)	27 (54.0)	
Greater than 5 cm	7 (15.6)	8 (16.0)	
Inaccessible	11 (24.4)	5 (10.0)	
Tumor stage[¶]			0.301
Stage 1	25 (55.6)	31 (62.0)	
Stage 2	3 (6.7)	7 (14.0)	
Stage 3	7 (15.6)	7 (14.0)	
Stage 4	10 (22.2)	5 (10.0)	
Tümör site			0.441
Supratentoryal	38 (84.4)	38 (76.0)	
İnfratentoryal	7 (15.6)	12 (24.0)	
The type of surgery or operation			0.247
Kraniyotomi	31 (68.9)	41 (82.0)	
Transfenoidal cerrahi	10 (22.2)	5 (10.0)	
Biyopsi	4 (8.9)	4 (8.0)	
Resection shape			[‡] 0.009
Total	26 (57.8)	35 (70.0)	
Subtotal	6 (13.3)	11 (22.0)	
Biopsy	4 (8.9)	4 (8.0)	
Unspecified	9 (20.0)	----	
Illness duration			0.535
0-5 months	33 (73.3)	34 (68.0)	
6-12 months	6 (13.3)	5 (10.0)	
13-24 months	----	2 (4.0)	
25-60 months	4 (8.9)	4 (8.0)	
61 months and over	2 (4.4)	5 (10.0)	
Chronic disease state			0.636
Not chronic disease	22 (48.9)	26 (52.0)	
Cardiovascular	6 (13.3)	13 (26.0)	
Chronic obstructive pulmonary disease	2 (4.4)	2 (4.0)	
Diabetes mellitus	1 (2.2)	1 (2.0)	
Hepatitis	2 (4.4)	1 (2.0)	
Diabetes mellitus+Cardiovascular	5 (11.1)	2 (4.0)	
Chronic obstructive pulmonary disease + Cardiovascular	2 (4.4)	1 (2.0)	
Others	5 (11.0)	4 (8.0)	
Caragivers			0.284
Mother	4 (8.9)	13 (26.0)	
Wife or Husband	12 (26.7)	14 (28.0)	

Daughter	11 (24.4)	11 (22.0)	
Boy child	2 (4.4)	2 (4.0)	
Sister	----	3 (6.0)	
Others	16 (35.3)	7 (14.0)	
Karnofsky Performance Scale Preoperative			
Stage			
80-100	28 (62.2)	36 (72.0)	0.426
50-70	17 (37.8)	14 (28.0)	
Postoperative Stage			
80-100	7 (15.6)	8 (16.0)	1.000
50-70	38 (84.4)	42 (84.0)	
First Month			
80-100	13 (28.9)	19 (38.0)	0.393
50-70	31 (68.9)	31 (62.0)	
0-40	1 (2.2)	----	

Note. * $p > 0.05$; † $p < 0.05$

Note. †Tumor staging was performed according to World Health Organization classification of brain tumors.

Table 3. Comparison of symptom severity scores in the preoperative period, postoperative period and 1st month follow-up of the patients with PBT included in the intervention and control groups (N = 95).

Time Groups	Preoperative Median (min -max [¶])	Postoperative Median (min -max [¶])	1. Month Follow-up Median (min -max [¶])	[‡] χ^2	<i>p</i> [*]
Affective symptoms					
Intervention Group (n:45)	4.80 (0.60-9.20)	1.80 (0.00-7.80)	1.80 (0.00-9.00)	45.84	0.000
Control Group (n:50)	3.70 (0.20-9.40)	3.30 (0.00-7.40)	3.40 (0.00-9.40)	6.89	0.032
	<i>U</i> [‡] 902.00	812.00	740.00		
	<i>p</i> [*] 0.096	0.020	0.004		
Cognitive symptoms					
Intervention Group (n:45)	2.00 (0.00-9.00)	1.00 (0.00-6.75)	1.00 (0.00-5.50)	11.74	0.003
Control Group (n:50)	0.88 (0.00-5.75)	1.00 (0.00-4.25)	1.13 (0.00-7.50)	0.09	0.956
	<i>U</i> [‡] 797.00	995.00	1122.50		
	<i>p</i> [*] 0.014	0.328	0.985		
Focal neurological disorders					
Intervention Group (n:45)	1.75 (0.00-9.50)	1.25 (0.00-6.25)	0.75 (0.00-8.00)	12.04	0.002
Control Group (n:50)	1.38 (0.00-6.50)	1.50 (0.00-6.75)	1.00 (0.00-5.50)	5.98	0.051
	<i>U</i> [‡] 1005.00	925.50	986.50		
	<i>p</i> [*] 0.367	0.135	0.295		
Therapy evaluation symptoms					
Intervention Group (n:45)	2.67 (0.00-9.00)	2.00 (0.00-6.67)	1.33 (0.00-7.33)	14.47	0.001
Control Group (n:50)	1.83 (0.00-8.00)	2.33 (0.00-10.00)	1.33 (0.00-8.33)	4.044	0.132
	<i>U</i> [‡] 886.00	983.50	1069.50		
	<i>p</i> [*] 0.074	0.289	0.674		
General symptoms					
Intervention Group (n:45)	1.75 (0.00-6.50)	1.50 (0.00-7.25)	0.75 (0.00-8.00)	5.49	0.064
Control Group (n:50)	1.75 (0.00-6.25)	1.75 (0.00-6.50)	1.50 (0.00-8.00)	4.38	0.112
	<i>U</i> [‡] 1119.00	885.50	922.00		
	<i>p</i> [*] 0.964	0.073	0.127		
Gastrointestinal system symptoms					
Intervention Group (n:45)	0.00 (0.00-10.00)	0.00 (0.00-8.00)	0.00 (0.00-7.00)	9.26	0.010
Control Group (n:50)	0.00(0.00-10.00)	0.00 (0.00-5.00)	0.00 (0.00-5.50)	1.54	0.463
	<i>U</i> [‡] 965.50	1090.50	1112.00		
	<i>p</i> [*] 0.135	0.746	0.892		

Note. **p* = 0.05, ^{||}min: Minimum, [¶]max: Maximum, [‡] χ^2 : Friedman analysis, [‡]*U*: Mann-Whitney *U* test.

Table 4. Comparison of the scores interference status in the preoperative period, postoperative period and 1st month follow-up of the patients with PBT included in the intervention and control groups (N = 95).

Time Groups	Preoperative Median (min -max [¶])	Postoperative Median (min -max [¶])	1. Month Follow-up Median (min -max [¶])	$\ddagger\chi^2$	p^*
General activity					
Intervention Group (n:45)	4.00 (0.00-10.00)	6.00 (0.00-10.00)	5.00 (0.00-10.00)	16.74	0.000
Control Group (n:50)	2.50 (0.00-10.00)	7.00 (0.00-10.00)	5.00 (0.00-10.00)	24.19	0.000
	U^{\ddagger} 1076.00	851.50	956.50		
	p^* 0.707	0.039	0.205		
Mood					
Intervention Group (n:45)	7.00 (0.00-10.00)	3.00 (0.00-10.00)	3.00 (0.00-10.00)	36.22	0.000
Control Group (n:50)	5.00 (0.00-10.00)	5.00 (0.00-10.00)	4.50 (0.00-10.00)	1.77	0.412
	U^{\ddagger} 1049.50	658.50	871.50		
	p^* 0.569	0.000	0.055		
Work (including work around the house)					
Intervention Group (n:45)	4.00 (0.00-10.00)	5.00 (0.00-10.00)	5.00 (0.00-10.00)	4.15	0.125
Control Group (n:50)	3.50 (0.00-10.00)	7.50 (0.00-10.00)	5.00 (0.00-10.00)	13.52	0.001
	U^{\ddagger} 999.00	713.50	939.50		
	p^* 0.330	0.002	0.162		
Relations with other people					
Intervention Group (n:45)	3.00 (0.00-8.00)	0.00 (0.00-10.00)	1.50 (0.00-10.00)	14.20	0.001
Control Group (n:50)	0.00 (0.00-10.00)	3.00 (0.00-10.00)	0.00 (0.00-10.00)	1.59	0.452
	U^{\ddagger} 987.50	854.00	850.50		
	p^* 0.264	0.028	0.022		
Walking					
Intervention Group (n:45)	3.00 (0.00-10.00)	4.00 (0.00-10.00)	3.00 (0.00-10.00)	8.66	0.013
Control Group (n:50)	0.00 (0.00-10.00)	5.00 (0.00-10.00)	2.50 (0.00-10.00)	29.59	0.000
	U^{\ddagger} 920.50	935.50	1100.50		
	p^* 0.105	0.153	0.851		
Enjoyment of life					
Intervention Group (n:45)	3.00 (0.00-10.00)	0.00 (0.00-10.00)	0.00 (0.00-10.00)	8.69	0.013
Control Group (n:50)	0.00 (0.00-10.00)	0.00 (0.00-10.00)	2.00 (0.00-10.00)	2.38	0.304
	U^{\ddagger} 1060.00	1067.50	861.50		
	p^* 0.598	0.626	0.032		

Note. * p : 0.05, ^{||}min: Minimum, [¶]max: Maximum, [‡] χ^2 : Friedman analysis, [‡] U : Mann-Whitney U test.

Table 5. Findings of the further analysis comparing the scores of ways of coping with stress in the preoperative period, postoperative period and 1st month follow-up of the patients with PBT included in the intervention and control groups (N = 95).

Groups	Time	Preoperative ^{††} M ± ^{‡‡} SD	Postoperative ^{††} M ± ^{‡‡} SD	1. Month Follow-up ^{††} M ± ^{‡‡} SD	[†] F	p*
Seeking for social support						
Intervention Group (n:45)		1.78±0.66	2.01±0.64	2.32±0.60	26.87	0.000
Control Group (n:50)		1.83±0.65	1.89±0.62	1.92±0.55	0.63	0.536
	t	0.35	-0.94	-3.41		
	p	0.730	0.352	0.001		
Submissive approach						
Intervention Group (n:45)		1.25±0.50	1.27±0.51	1.29±0.53	0.56	0.575
Control Group (n:50)		1.52±0.60	1.44±0.53	1.36±0.59	5.81	0.004
	t	2.37	1.58	0.61		
	p	0.020	0.117	0.541		

Note. *p: 0.05, ^{††}M: Mean, ^{‡‡}SD: Standard Deviation, [†]F: Two-way analysis of variance for repeated measures, ^{||}t: Significance test of difference between two means.

Examination of coping skills of the patients with PBT

Findings of the further analysis comparing the scores of ways of coping with stress among the patients with PBT included in the intervention and control groups in the preoperative period, postoperative period and 1st month follow-up are given in Table 5.

When the scores of ways of coping with stress among the patients with PBT included in the intervention and control groups in the preoperative period, postoperative period and 1st month follow-up were compared, a significant difference was determined in the subdimensions of seeking for social support ($p = 0.000$) and submissive approach ($p = .005$) in terms of group*time interaction. In the subdimension of seeking for social support, it was examined whether there were differences between the measurements within the intervention and control groups and it was determined that there were differences between preoperative scores and postoperative scores ($p = 0.000$), postoperative scores and scores of the 1st month follow-up ($p = 0.000$) and preoperative scores and scores of the 1st month follow-up ($p = 0.000$) in the intervention group. In the subdimension of submissive approach, it was determined that there was difference between the preoperative scores and scores of the 1st month follow-up in the control group ($p = 0.004$).

Discussion

It was seen in the research that the patients with PBT included in the intervention and control groups resembled each other and groups were homogeneous in terms of the socio-demographic/clinical

characteristics (Armstrong, 2003; Krupp et al., 2009; Goebel, Von Harscher & Mehdorn, 2011) which may influence the dependent variables apart from age groups and surgical resection shape (Table 1,2). It is thought that this finding resulted from the fact that there were a higher number of patients aged 65 and above and the records of the patients did not include information about resection shape in the intervention group.

Discussion on symptom severity findings

In the subdimension of cognitive symptoms of the patients with PBT included in the intervention and control groups, characteristics related to “difficulties in remembering, understanding, speaking and concentrating” were examined and a significant decrease was determined between the cognitive symptom severity scores of the intervention group in the preoperative and postoperative periods (Table 3). It may be thought that this resulted from the cognitive ways of coping (perceptual and informational, learning, decision making and emotional) acquired through the effectiveness of the surgery treatment and education. The fact that results were not significant in the comparison of cognitive symptom severity scores in the preoperative period and 1st month is attributed to the changes in the course of treatment and mental tiredness/weariness of the patients during the process of research (face-to-face interview, phone call, education booklet etc.) (Gehring et al., 2009). In the subdimension of focal neurological disorders, characteristics relate to “pain, numbness/lack of energy/tingling, weakness in one side of the body, seizure” were examined; At the end of further

analysis, significant differences were found between the preoperative scores and postoperative scores and preoperative scores and 1st month follow up in the intervention group and focal neurological symptom severity was found to be lower (Table 3). In this direction, the slight decrease in the difference between the scores of postoperative period and 1st month follow-up implies that symptoms regressed with the influence of the education. *In the subdimension of treatment assessment symptoms, “lack of appetite, sleepiness and dry mouth”* were examined and a significant decrease was observed between the symptom severity scores of the intervention group in the preoperative-postoperative period and postoperative period-1st month follow-up (Table 3). It was observed that the education provided within the process became effective in terms of the treatment assessment symptoms. Corticosteroid therapy leads to hyperglycaemia and increased appetite (Wen et al., 2006). In a qualitative study conducted on patients with PBT, patients reported as maladaptive behaviour that they experienced such symptoms as dry mouth due to hyperglycaemia and they were eager to find out why blood glucose increased (Baksi Simsek & Dicle, 2013). When dry mouth was examined in the patients included in the intervention group, it was thought that providing the patient with information that an intervention would be made through the nose due to transsphenoidal surgery and dry mouth could be experienced as a result of breathing through the nose depending on the nose dressing after the surgery would be useful. This is because of the fact that it was observed during the data collection phase that patients were not clinically provided with planned information. When the characteristics related to “*nausea, vomiting*” were examined *in the subdimension of GIS symptoms* in the patients with PBT in the intervention and control groups, a statistically significant decrease was observed in the difference between the scores of the preoperative period and 1st month follow-up in the intervention group (Table 3). GIS symptoms are among the early and late term findings of increased intracranial pressure (Smith & Schnell, 2003). The change observed in the GIS symptoms during the process implies that although the patients did not pay attention to their behaviours in terms of increased intracranial pressure at all during data collection, this issue was repeatedly addressed in the education, which turned out to be of great help.

When the characteristics relate to “*fatigue, sleep disorder, anxiety, distress, bad temper/anger*” were examined *in the subdimension of emotional symptoms*, significant differences were determined between the postoperative scores and scores of the

1st month follow-up in the intervention and control groups. Significant decrease was observed in the difference between the preoperative scores and postoperative scores and preoperative scores and scores of the 1st month follow-up. In the control group, a significant decrease was reported in the difference between the preoperative scores and postoperative scores (Table 3). The fact that there was difference between the postoperative scores and scores of the 1st month follow-up in the intervention and control groups made us think that education created difference in the course of the research. The decrease in the difference between the preoperative-postoperative scores may be attributed to the disappearance of the surgery-related stress. Anxiety incidence was found to be 89% in the neurosurgical patients ($n = 100$) in the preoperative period and a positive relation was established between the information requirement and anxiety level (Perks, Chakravarti & Manninen, 2009). This shows that informing the patients is of importance in terms of emotional problems and is in parallel with the findings of the study.

Discussion on the findings of the situation of interference individual’s life of symptoms

In relation to *interference of daily activities*, differences were found between the postoperative scores of the intervention and control groups. Increases observed in the preoperative-postoperative interference levels and decreases observed in the postoperative-1st month interference levels assumedly resulted from the surgery rather than the education in both groups. However, the difference between the intervention and control groups in terms of the postoperative measurements and the absence of a significant increase in the postoperative-1st month levels may be attributed to the education.

When KPS scores included in the clinical characteristics of the patients in the intervention and control groups are considered, KPS scores of the 62-72% of the patients ranged between 80 and 100 in the preoperative period while those of the 84% of the patients ranged between 50-70 in both groups in the postoperative period and those of the 69-62% of the patients ranged between 50-70 in the 1st month follow-up. They are consistent with these findings (Table 4). In relation to *interference in walking*,

The significant decrease observed in the difference between the postoperative scores and scores of the 1st month follow-up in both groups and the lack of difference between the preoperative scores and scores of the 1st month follow-up show that patients felt better by the end of the 1st month and could walk as they did before the surgery. A significant increase

between the preoperative and postoperative scores in the control group and the lack of this difference in the intervention group might be attributed to the fact that patients were informed of the importance of mobilization and monitored with follow-ups following the surgery.

In relation to *interference of mood* in the patients with PBT included in the intervention and control groups, in the further analysis, significant decreases were observed in the differences between preoperative-postoperative scores and preoperative-1st month follow-up scores (Table 4). In relation to *interference of enjoying life*, the further analysis showed that there was a significant decrease in the difference between the preoperative scores and scores of the 1st month follow-up in the intervention group (Table 4). It is reported in the literature that discussions over the meaning of the life, psychological counselling, meeting with the religious officials and antidepressants are of help (NBTF, 2010; Nixon & Narayanasamy, 2010).

In relation to *interference in the relations with other people*, at the end of the further analysis, significant decreases were observed in the difference between the preoperative-postoperative scores ($p =$ and preoperative scores and scores of the 1st month follow-up (Table 4). In this respect, it is thought that the social support provided through education is of importance. The focus group in the patients with brain tumours reported that supportive care programs and interviews were important to the quality of life and emotional and social well-being, in particular (Janda et al., 2007).

In relation to *interference in the (house) works*, at the end of the further analysis, a significant increase was observed in the difference between preoperative-postoperative scores while a significant decrease was observed in the difference between the postoperative scores and scores of the 1st month follow-up. As a conclusion, patients in the control group experienced increases in the hindrance levels in the postoperative period with the influence of the surgery. Although there are not specific interventions for the item of “works” (including the house works) included among the items related to the hindrance of the life in the area of role-function-adaptation, it is included within the secondary objectives as it may be improved with the influence of the other results. Armstrong et al. (2005) reported that assessing the effects of symptoms on the functionality is of importance in terms of the symptom management in order to enhance PBT clinical care.

Discussions on the findings related to coping with stress in the patients with PBT

It was determined in the intervention group that mean scores significantly increased in the preoperative-postoperative period, postoperative period-1st month follow-up and preoperative period-1st month follow-up in terms of the *approach of seeking for social support* (Table 5). To conclude, mean scores of the patients included in the intervention group increased significantly in the approach of seeking for social support and therefore, their coping skills improved in this subdimension. It was determined that the *submissive approach* mean score of the patients with PBT included in the control group decreased significantly between the preoperative period and 1st month follow-up. When the mean scores of the intervention group are considered, it can be seen that they remained almost at the same levels (Table 5). This may be associated with the fact that preoperative/initial mean scores of the patients with PBT included in the intervention and control groups were not homogeneous and thus, it is recommended that this research should be conducted with larger samples.

It was observed that the education provided according to RAM became effective in terms of the approach of seeking for social support included in the area of interdependence. In the literature, there is no experimental study in relation to coping in patients with PBT. It was reported that the patients with PBT should be supported via systematic methods including listening to them, answering their questions and providing them with information and training in order to solve their problems faced in the course of the disease and help them lead a better life (Ahlström, 2005; Keir et al., 2006; Gustafsson, Edvardsson & Ahlström, 2006; Goebel, Von Harscher & Mehdorn, 2011). It was emphasized that patients pass through various phases in the long term neurological disease depending on the characteristics of the disease and time plays a key role in the adaptation to this process (Ahlström, 2005).

In line with the results of the research and the information available in the literature, the training provided to the patients with PBT according to RAM did not affect the subdimensions of coping with stress except for the subdimension of seeking for social support. The reasons why it affected almost none of the subdimensions might be limited duration of follow-up, complexity of PBT, characteristics of the sample (type of tumour, duration of diagnosis etc.) and variations in the symptoms and hindrance levels resulting from the location of the brain tumour.

Conclusions

The training provided to the patients with PBT is influential on some areas in relation to the symptoms/interference levels and the approach of seeking for social support included in the area of interdependence. Basic data were obtained in relation to the assessment of the effect of intervention in the patients with PBT. RAM can be used in the research and clinical care as a method which helps easier data collection and saves time in/facilitates provision of integrated care. Managers and staff nurses should create the appropriate environment and conditions to enable the patients with PBT to receive a better care. It is recommended that the patients with benign, malign, recurrent and hypophysis tumours and those having tumours in different cerebral lobes should be studied in separate groups in the future studies. Besides, conducting studies examining the relation of adaptation with socio-demographic characteristics, histories and results of treatments and examining adaptation status through education programs carried out by multidisciplinary teams are recommendable. It is also recommended that fewer measurement instruments should be used and fewer variables should be examined due to the cognitive problems of the patients with PBT including concentration or memory related difficulties. Finally, it is recommended that the research should be repeated with larger samples and longer follow-ups in order to better understand the experiences of this patient group and further experimental studies should be carried out to examine the effect of nursing care based on RAM on the other negative psychosocial parameters.

References

- Ahlström G. (2005). Coping with long-term neurological illness: Implications for nursing. *JNN ProQuest Nursing & Allied Health Source*, 37 (6): 301-302.
- American Association of Neuroscience Nurses (AANN). (2006). Guide to the care of the patient with craniotomy post-brain tumor resection. AANN Reference Series for Clinical Practice [Internet]. [cited 2013 Mar 11]. Available from: <http://www.aann.org/pdf/cpg/aanncraniotomy.pdf>
- Armstrong TS. (2003). Symptoms experience: a concept analysis. *Oncol Nurs Forum*, 30: 601–06.
- Armstrong TS, Cohen MZ, Eriksen L, Cleeland C. (2005). Content validity of self report measurement instruments: an illustration from the development of the brain tumor module of the MD. Anderson symptom inventory. *Oncol Nurs Forum*, 32 (3): 669-76.
- Armstrong TS, Mendoza T, Gring I Coco C, Cohen MZ, Eriksen L, Hsu MA, Gilbert MR, Cleeland C. (2006). Validation of the MD. Anderson symptom inventory brain tumor module (MDASI-BT). *J Neurooncol* 80: 27–35.
- Armstrong TS, Cohen MZ, Eriksen LR, Hickey JV. (2004). Symptom clusters in oncology patients and implications for symptom research in people with primary brain tumors. *J Nurs Scholarsh*, 36 (3): 197-206.
- Baksi A, Dicle A. (2010). Validity and reliability of MD anderson brain tumor symptom inventory. *DEUHFED*, 3(3):
- Baksi Simsek A, Dicle A. (2013). Examination of the adaptation states of patients with primary brain tumor according to the roy adaptation model: a qualitative research. *J Neurol Sci [Turk]* 30 (1): 88-107.
- Camp-Sorrell DC. (2006). Brain tumors facing trouble head-on. *Nursing Made Incredibly Easy*, 4: 20–28.
- Fawcett J. (2005). Contemporary nursing knowledge analysis and evaluation of nursing models and theories. In: Roy's adaptation model. 2nd ed. Philadelphia: F. A. Davis Company; pp. 364-437.
- Gehring K, Sitskoorn MM, Gundy CM, Sikkes SA, Klein M, Postma TJ, van den Bent MJ, Beute GN, Enting RH, Kappelle AC, Boogerd W, Veninga T, Twijnstra A, Boerman DH, Taphoorn MJ, Aaronson NK. (2009). Cognitive rehabilitation in patients with gliomas: A randomized, controlled trial. *J Clin Oncol*, 27: 3712-22.
- Goebel S, Von Harscher M, Mehdorn HM. (2011). Comorbid mental disorders and psychosocial distress in patients with brain tumours and their spouses in the early treatment phase. *Support Care Cancer*, 19 (11): 1797-1805.
- Gustafsson M, Edvardsson T, Ahlström G. (2006). The relationship between function, quality of life and coping in patients with low-grade gliomas. *Support Care Cancer*, 14: 1205–12.
- Hamilton W, Kernick D. (2007). Clinical features of primary brain tumours: a case-control study using electronic primary care records. *Br J Gen Pract*; 1, 57 (542): 695–99.
- Janda M, Steginga S, Dunn J, Langbecker D, Walker D, Eakin E. (2008). Unmet supportive care needs and interest in services among patients with a brain tumour and their carers. *Patient Educ Couns*, 71: 251–58.
- Janda M, Steginga S, Langbecker D, Dunn J, Walker D, Eakin E. (2007). Quality of life among patients with a brain tumor and their carers. *J Psychosom Res*; 63(6): 617-623.
- Keir ST, Guill AB, Carter KE, Friedman HS. (2006). Stress and intervention preferences of patients with brain tumors. *Support Care Cancer*, 14: 1213–19.
- Krupp W, Klein C, Koschny R, Holland H, Seifert V, Meixensberger J. (2009). Assessment of neuropsychological parameters and quality of life to evaluate outcome in patients with surgically treated supratentorial meningiomas. *Neurosurgery*, 64 (1): 40-47.
- Lepola I, Toljamo M, Aho R, Louet T. (2001). Being a brain tumor patient: a descriptive study of patients' experiences. *J Neurosci Nurs*, 33 (3): 143-47.
- McKenna H. (2005). Applying Theories in Practice. In: *Nursing Theories and Models. USA and Canada: Taylor & Francis e-Library*

- Nixon A, Narayanasamy A. (2010). The spiritual needs of neuro-oncology patients from patients' perspective. *J Clin Nurs*, 19: 2259–70.
- Mor V, Laliberte L, Morris JN, Wieman M. (1984). The karnofsky performance status scale an examination of its reliability and validity in research setting. *Cancer*, 53: 2002–07.
- National Brain Tumor Foundation (NBTF). (2010). The essential guide to brain tumors [Internet]. [cited 2013 Mar 17]. Available from: <https://www.google.com.tr/search?q=The+essential+guide+to+brain+tumors+>
- Perks A, Chakravarti S, Manninen P. (2009). Preoperative anxiety in neurosurgical patients. *J Neurosurg Anesthesiol*, 21: 127–30.
- Portney LG, Watkins MP. (1993). *Foundations of Clinical Research: Applications to Practice*. Appleton & Lange: Norwalk, Conn.
- Roy C. (2009). *The Roy Adaptation Model*. 3rd ed. Upper Saddle River New Jersey: Pearson Education.
- Sahin NH, Durak A. (1995). Ways of coping with stress scale: adapting to university students. *Turkish Journal of Psychology*, 10(34): 56-73.
- Smith GB, Schnell S. (2003). Nursing care of patients with central nervous system disorders. In: Williams LS, Hopper PD, editors. *Understanding medical surgical nursing*. 2nd ed. Philadelphia, FA. Davis Company, p. 849–51.
- Tuna Malak, A, Diramali A, Yucesoy K. (2010). Certain care results of brain tumor patients to whom consultancy was provided: Pain, epileptic seizure, constipation, infection, transfer status. *Nobel Med*, 6(2): 25-31.
- Wen PY, Schiff D, Kesari S, Drappatz J, Gigas DC, Doherty L. (2006). Medical management of patients with brain tumors. *J Neurooncol* , 80: 313–32.