

Assessment of Learning Needs for Patients Undergoing Brain Tumors Surgeries at Al Mansoura General Hospital

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Abstract

Background: Assessment of learning needs can help in responding such needs and affects patients' lifestyle. *Aim:* Assess learning needs for patients undergoing brain tumors surgeries. *Study design:* A descriptive research design was followed in this study. *Subjects:* A purposive sample composed of 72 adult patients who met inclusion criteria were included in this study. *Setting:* The study was carried out at Al Mansoura General Hospital affiliated to Ministry of Health and Population. *Tools:* One tool was used for data collection. A structured interview questionnaire included two parts: Part I:Socio-demographic data and health history Part II: Learning ne eds assessment of patients undergoing brain tumor surgeries. *Results:* The results revealed that all studied brain tumor patients had high learning needs in all investigated domains. There were a statistical significance relation found between patients' learning needs and age ($P=0.001$), education ($P=0.001$), occupation ($P=0.03$) and marital status ($P=0.001$).*Conclusion:* All studied brain tumor patients require learning needs in all investigated domains. There were a significance relation found between patients' age, level of education, occupation and marital status and their learning needs. *Recommendations:* Patients learning needs should be assessed by nurses constantly and periodically. Simple booklet written in simple Arabic language should be available for all brain tumor patients included all needed information.

Keywords: Assessment, Brain, Learning Needs, Surgeries, Tumors.

Date of Submission: 13-05-2020

Date of Acceptance: 26-05-2020

I. Introduction

Cancer is a major public health problem worldwide affecting all ages. It is the second commonest cause of death in developed countries and among the three leading causes of death in developing countries. WHO reported that about 24.6 million people live with cancer worldwide. There are 12.5% of all deaths are attributable to cancer and if the trend continues, it is estimated that by 2020, 16 million new cases will be diagnosed per year out of which 70% will be in the developing countries [1].

Despite decades of research, brain tumors remain among the deadliest of all forms of cancer. Worldwide around 500,000 new cases of head and neck cancers are estimated annually[2,3]. Brain tumor affects nearly 10 000 adults per year in the United Kingdom and has a devastating impact. In Egypt the brain tumor rates according to National Cancer Control Plan of Egypt, 2016 - 2020 are about 5.48% in males and about 5.18% in females which reflects the magnitude of the problem here in Egypt[4,5,6].

Brain tumor referred to the aggregation of abnormal cells in some tissues of the brain. Brain tumor affects not only the body but also the psychological and social status of the patient in myriad ways. Brain tumor has a devastating impact, this is due to the poor prognosis as well as a significant symptom burden, which often includes neurocognitive deficits. Therefore, it is essential, to have a comprehensive way to determine the learning needs of these patients[6, 7, 8].

Learning needs vary according to the stage of patient compliance. Studies reported learning needs were about complications and medications; others were about activities of living and enhancing quality of life. While, a number of studies have reported that the least important learning needs were about skin care, feeling in relation to condition and follow up. Assessment of each patient individually by nurses is essential in the treatment process. As learning needs during hospitalization differ from that during self-caring at home. Assessment of learning needs can help in responding to such needs and can affect patients' lifestyle. So, learning content should be designed based on learning needs and abilities of the patients [9].

Nurses should strengthen health education for brain tumor patients; patiently explain related knowledge about the condition to the patients, so as to make patients actively cooperate with the hospital. Nurses should develop targeted health education based on characteristics of personality and educational level of the patients [10]. Nurses play a pivotal and increasingly important role in delivering high quality, safe, effective and efficient

healthcare to patients affected by brain tumor. As the nurses are the backbone of the health care delivery system, the nurse assesses a patient's health status and then plans care and interventions based on what the patient needs. [11].

II. Significance of the Study

Brain tumors are an important health problem for all age groups and data suggest their incidence is increasing worldwide [12]. In Egypt the brain tumor rates according to National Cancer Control Plan of Egypt, 2016-2020 are about 5.48% in males and about 5.18% in females. Patients presenting with brain tumors or space occupying lesions often face serious challenges including difficulties with overall symptoms. [4,13].

So, the importance of this study that the well-informed patient generally participate in tests, treatments and self-care more effectively, more comfortably and more safely than poorly or non-informed patient. However, what patients actually want to know has not been substantiated. Thus there is a need to investigate the learning needs of patients undergoing brain tumor surgery.

III. Aim of the Study

The aim of this study is to assess learning needs for patients undergoing brain tumors surgeries at Al Mansoura General Hospital.

3.1. Research question

To fulfill the aim of the study the following research question is formulated: What are the learning needs of patients undergoing brain tumors surgeries at Al Mansoura General Hospital?

IV. Subjects and Methods

4.1. Research Design

A descriptive research design was followed in this study.

4.2. Research Setting

The study was conducted at neurosurgical ward at Al Mansoura General Hospital affiliated to Ministry of Health and Population, Egypt. The capacity of the ward is 18 beds. This ward receives patients with neurosurgical problems. The nurse - patient's ratio in the selected ward is nearly 1: 4.

4.3. Subjects

The study was conducted on a purposive sample of 72 adult patients undergoing brain tumor surgeries using MedCalc Statistical Software version 14.8.1, a sample size of 65 patients was required to detect a difference of 26% (from 40% to 66%) in the satisfactory assessment level assuming a significance level of 0.05 and 80% study power. Thus the sample size would be further adjusted to account for 10% expected dropout rate. So, the final sample would be 72 patients with the following criteria:

Inclusion criteria: Brain tumor patients aged between 20 to 60 years, with TNM staging (1, 2 stage), from both genders, scheduled for brain tumor surgery, had the ability to understand simple instructions and agreed to participate in the study.

Exclusion criteria: Critically and mentally ill patients.

4.4. Tools for Data Collection

One tool was used in this study:

Learning needs assessment for patients undergoing brain tumor surgery structured interview questionnaire: This tool was developed by the researcher after reviewing relevant literatures [14,15]. It included two main parts:

Part 1: Patients' demographic data and health history sheet:

It included demographic characteristics of the patients (age, sex, Level of education, occupation, marital status, monthly income and co-morbid diseases). And Patients' health history: It included information about duration of the disease, data related to previous hospitalization due to other tumor, sign and symptoms of the disease, methods of treatment, complaining from any chronic diseases and family history.

Part 2: Patients' Learning Needs Assessment Sheet:

This part constructed of forty two multiple-choice questions arranged into four categories:

Patients' knowledge regarding nature of the disease (brain tumor):

It included five questions to assess knowledge and actual learning needs related to nature of the disease "meaning of brain tumor, possible causes and risk factors, sign and symptoms of brain tumor and different methods of treatment".

Patients' knowledge regarding preoperative preparation:

It included seventeen questions to assess patients' knowledge and actual learning needs related to indication for the surgery, advantages and complications and preparation for brain tumor surgery such as (laboratory investigations, radiological studies, pre-operative medications, stopping anticoagulant drugs, fasting

period before the surgery, skin preparation, types of anesthesia, allergy from any drug or dye, explanation of the surgery and explanation of the complementary plan of treatment after the surgery). And assessment of patient's intraoperative learning needs that includes (duration of the surgery, site of the surgical incision in the head).

Patients' knowledge regarding postoperative care:

It included fourteen questions to assess patients' knowledge and actual learning needs after brain tumor surgery and it was divided into:

- i. Post-operative food and fluids** "when he/she started food and fluid intake, amount of fluid intake, intake and output measurement".
- ii. Post-operative medications and wound care** "types of postoperative medications, postoperative usage of anticoagulants, dates of wound care, signs of wound infection, benefits of drains inside the wound, time of wound healing and removal of surgical sutures".
- iii. Post-operative physical activities** "correct position after the surgery, when to start movement after surgery.

Patients' knowledge regarding postoperative complications & how to deal with it:

It included six questions to assess patients' knowledge and actual learning needs related to post discharge such as "possible complications after the surgery, methods to prevent it, time of resuming normal activities and follow up visits".

Scoring system:

A score of one was given for each correct answer, and zero for incorrect answers. A total score of each area was calculated which summed together to give total score. All scores were transformed into score % as following: $\text{score \%} = (\text{the observed score} / \text{the maximum score}) \times 100$. Then score % was transformed into categories as follows:

Poor: score < 50 %

Fair: score 50% - < 75%

Good: score \geq 75%

4.5. Operational Design

The operational design includes the preparatory phase, ethical considerations, validity and reliability, pilot study, and fieldwork.

4.5.1. Preparatory Phase

Included reviewing of recent related literature to develop the assessment tool of learning needs. An informed consent was taken from the study sample before inclusion in the study. The researcher emphasized that they had the right to withdraw from the study at any time.

4.5.2. Ethical Considerations

An ethical approval was obtained from the Research Ethics Committee, Faculty of Nursing-Mansoura University. Informed consent was obtained from patients after providing them with complete information about the study including the aim, benefits, risks and procedures. Patients were informed that participation is voluntary and if they refused to participate in the study this will not affect their care or treatment. They were also informed that they had the right to seek to withdraw from the study at any time.

4.5.3. Validity and Reliability

The validity of the tool tested for content by seven experts (jury) from Mansoura University "five experts of Medical-Surgical Nursing, one specialist professor of neurosurgery from Faculty of Medicine-Mansoura University and one specialist professor in biostatistics from Faculty of Medicine- Mansoura University, who reviewed the tool for clarity, relevance, understanding and applicability for implementation. All comments and suggestions were considered, rewording and revising of the tool was carried out.

Reliability of the developed tool was estimated using Cronbach alpha reliability test in Statistical Package for the Social Science (SPSS) program, to test its internal consistency to evaluate how well the tool consistency measure what they are designed to measure. The reliability test was estimated ($r = .80\%$) for all competencies of the tool. its maximum value is (1.0), which indicate highest reliability and the minimum accepted value is (0.7).

4.5.4. Pilot Study

A pilot study was conducted on 7 patients (10% of the sample size) fulfilling the research criteria in order to assess the feasibility, clarity and applicability of the developed tool, and the necessary modification were done prior to data collection. Those patients were excluded from the study sample.

4.5.5. Field Work

The actual field work started from the beginning of January 2019 to the end of July 2019 (for all phases). The study goes through two phases: first is Preparatory phase which includes tool development, validation, reliability, and pilot study. In addition to the official permission attaining; a formal letter was issued from the Faculty of Nursing Mansoura University to the director of Al-Mansoura General Hospital to obtain approval for conducting this study. The second phase includes the selection of the study subjects, who met the inclusion and exclusion criteria.

4.5.6. Intervention

The intervention included an initial interview with the patients in which the researcher explained the nature and the purpose of the study. Then the researcher started data collection following certain schedule of five days/week, from 9 am to 2 pm.

So, the Patients are interviewed daily during hospitalization before operation in the neurosurgical department to assess patients who are undergoing brain tumor surgery knowledge and their actual needs regarding the nature of the disease, pre-operative preparation and provided brief explanation of the surgical procedure. Then the brain tumor patients interviewed after the operation to assess their knowledge and actual needs regarding "post-operative correct position, wound care and when to start movement after the surgery".

4.6. Data Analysis

SPSS version 21 was used to analyze the collected data. Data were presented as frequency and percentages (qualitative variables) and mean \pm 1 SD (quantitative continuous variables). Comparison of continuous quantitative variables (two groups) using Mann Whitney (Z) test as the data is not normally distributed and chi square of Xruskal- Wallis test for comparison of more than two groups. The difference was considered significant at P 0.05

V. Results

Table(1) shows the characteristics of the studied patients. It can be noticed that males were 47.2% and females 52.8%. The average Age of patients was 43.6 ± 11.6 years. The most frequent age group was from 51 – 60 years (33.3). Nearly half(46%) were illiterate & read and write. The working patients were 55.6% and the majority (66.7) was married.

Table (2) shows distribution of studied patients according to tumor characteristics, it can be noticed that about two thirds (66.7%) of studied sample suffered from brain tumor about six months before. Episodes of headache reported by most patients (68.1%) whereas dizziness, vomiting and irrational nausea and seizures reported by 48.6%, 37.5%, and 29.2 respectively.

Most of studied sample treated with combination of chemotherapy, radiotherapy, and surgery (70.8%), family history of brain tumor documented by 26.4 of those percentage 63.2 first degree relatives. And more than half(56.9) have chronic diseases.

Table (3) demonstrates that the average of total knowledge scores is (18.79 ± 17.35) with average percent (15.03 ± 13.88). This reflects that the total knowledge of patients regarding all studied domains of the brain tumor just reach 15%.

Table (4) shows the levels of knowledge among the studied sample. It can be noticed that the majority of patients have poor knowledge (< 50.0%). Regarding nature of disease (86.1%), preoperative knowledge (90.3%), postoperative knowledge (100%) and post discharge care (95.8%).

Figure (1): It is clear that the vast majority of brain tumor patients have poor knowledge (97.2%) compared to only 2.8% have fair knowledge.

Table (5) shows the relationship between average knowledge score and socio-demographic characteristics of the studied patients. It can be noticed that, there were a statistical significant relation between average knowledge and patients age (P=0.001), education (P=0.001), occupation (P=0.03), and marital statues (P=0.001).

Table 1. Distribution of brain tumor patients regarding their socio-demographic data (No= 72).

Characters	Items	No	%
Sex	Males	34	47.2
	Females	38	52.8
Age (years)	20-30	12	16.7
	31-40	20	27.8
	41-50	16	22.2
	51-60	24	33.3
	Range: 20.0 – 60.0 Mean ± SD = 43.60 ± 11.61		
Education	Illiterate	21	29.2
	Read and write	12	16.7
	Intermediate	22	30.6
	University	17	23.6
Occupation	Working	40	55.6
	Not working	32	44.4
Marital status	Single	9	12.50
	Married	48	66.7
	Divorced	3	4.2
	Widow	12	16.7

Table 2. Distribution of the brain tumor patients regarding health history and characteristics of the tumor (No= 72).

Characters	Items	No	%
Duration	0 – 6 months	48	66.7
	6 – 12 months	17	23.6
	>one year	7	9.7
Symptoms	Episodes of headache	49	68.1
	Dizziness	35	48.6
	Vomiting or irrational nausea	27	37.5
	Seizures	21	29.2
	Seeping problems	15	20.8
	Loss of sensation or movement in the arm or leg	6	8.3
	Vision problems such as unclear vision	21	29.2
History of admission due to other tumor	Yes	3	4.2
	No	69	95.6
Method of treatment	Surgery with Chemotherapy	13	18.1
	Surgery with Radiotherapy	8	11.1
	Surgery with chemo and radiotherapy	51	70.8
Family history of brain tumor	Yes	19	26.4
	No	53	73.6
Degree of relation	First degree	12	63.2
	Second degree	7	36.8
Complaining from any chronic diseases?	Yes	41	56.9
	No	31	43.1
What are these diseases?	Hypertension	16	22.2
	DM	8	11.1
	Cardiac	7	9.7
	others	10	13.9

Table (3): Average scores of knowledge among the brain tumor patients for different studied domains (No= 72).

Items	Average Score			Percent Score		
	Max	Mean± SD	Median	Max	Mean±SD	Median
A. Patients' knowledge regarding the nature of the disease (brain tumor)	26.0	5.15 ± 5.04	3.0	100.0	19.82 ± 19.38	11.5
B. Patients' knowledge regarding pre brain tumor surgery (brain tumor eradication)	43.0	8.04 ± 8.28	4.0	100.0	18.70± 19.26	9.3
C. patients' knowledge regarding post brain tumor surgery (brain tumor eradication)	43.0	3.35 ± 3.37	2.0	100.0	7.78 ± 7.84	4.65
D. patients' knowledge regarding post discharge care	13.0	2.15 ± 2.80	0.0	100.0	16.56 ± 21.55	0.0

Total Score	125.0	18.79±17.35	11.5	100.0	15.03±13.88	9.2
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Table 4. Distribution of brain tumor patients according to their levels of knowledge for different studied domains (No= 72).

Items	Poor (< 50.0%)		Fair (50.0-<75.0%)		Good (≥75.0%)	
	No	%	No	%	No	%
A. Patients' knowledge regarding the nature of the disease (brain tumor)	62	86.1	10	13.9	0	0.0
B. Patients' knowledge regarding before brain tumor surgery (brain tumor eradication)	65	90.3	7	9.7	0	0.0
C. patients' knowledge regarding after brain tumor surgery (brain tumor eradication)	72	100.0	0	0.0	0	0.0
D. patients' knowledge regarding about post discharge care	69	95.8	1	1.4	2	2.8
Total Score	70	97.2	2	2.28	0	0.0

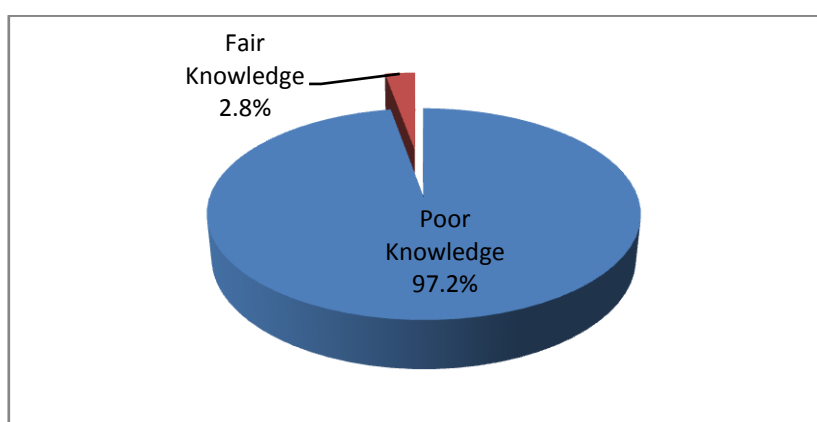


Figure (1): Level of total knowledge

Table 5. Relationship between average percent knowledge score and socio-demographic characteristics of the brain tumor patients (No= 72).

Demographic data	Items	No	Percent Score		Significance test
			Mean±SD	Median	
Sex	Males	34	16.61±15.21	9.60	Z [*] =0.943, P0.346
	Females	38	13.62±12.60	9.20	
Age (years)	20-30	12	25.80±13.89	30.40	χ ^{2**} =18.044, P<0.001
	31-40	20	21.36±16.37	18.80	
	41-50	16	07.60±07.45	5.20	
	51-60	24	09.33±08.77	5.60	
Education	Illiterate	21	04.95±06.07	2.40	χ ^{2**} =42.488, P<0.001
	Read and write	12	09.93±08.28	6.40	
	Intermediate	22	12.98±08.47	10.00	
	University	17	33.74±16.90	32.80	
Occupation	Working	40	17.60±14.90	13.60	Z [*] =2.065, P0.039
	Not working	32	11.85±11.95	7.20	
Marital status	Single	9	30.49±11.37	31.20	χ ^{2**} =16.217, P0.001
	Married	48	13.65±12.14	8.80	
	Divorced	3	24.00±29.20	14.00	
	Widow	12	06.73±07.94	3.20	

Z^{*} of Mann Whitney test

χ^{2**} of Kruskal-Wallis Test

VI. Discussion

Brain tumor is a life-threatening illness, which causes significant disruption in individual functioning. Brain tumor patients have multifaceted physiological and psychosocial needs.[16]. Health education theory suggests that just because information is available does not mean that it is in a format that will be useful. An understanding of how people seek, use, and process information can help health practitioners structure and deliver information more effectively [17].

Few studies have examined the evolution of cancer patients' information needs over the course of the illness. Therefore, the current study concentrated on assessment of learning needs for patients undergoing brain tumors surgeries.

The demographic background of the present study showed that, the mean age of the studied sample was 43.6 ± 11.6 years. Highest percent of the current study sample were females, married and working. Illiteracy prevailed among the majority of them, and about two thirds suffered from brain tumor about six months before and hypertension, DM and cardiac disease reported by more than half of them.

First degree relative's family history of brain tumor reported by the majority of them. And more than two third treated with combination of chemotherapy, radiotherapy, and surgery.

Regarding to age, brain tumor was found to be more common among those more than 50 years of age, in this respect **Cancer Research UK, (2012)[18]** reported that brain tumors present across all age groups from infancy to old age with a bimodal distribution with increased incidence between 45 to 60 years. Another study by **Arber, (2010)[19]** found that a peak incidence of brain tumors in the 45–64 year age group. However this finding contradicts with **Khanet al., (2015)[20]** who revealed that there is evidence to support the increasing overall incidence of primary brain tumors, with the highest increase noted in patients over 60 years of age. This difference may be attributed to change in geographical area and personal traits.

In relation to gender, highest percent of the current studied sample were females. The finding contradicted with **Amaresha et al., (2015)[21]** who found that men are more prone to developing cancerous (malignant) tumors than women.

Regarding symptoms, episodes of headache reported by most patients followed by dizziness, vomiting and irrational nausea and seizures this may be attributed to focal brain swelling and increased intracranial pressure. These findings are in agreement with the findings of **Parvataneni et al., (2011)** and **Englot et al., (2016)[22,23]** they reported that, the most common symptoms experienced by brain tumor patients are headaches, seizures, nausea or vomiting, and impairments in speech, vision or hearing.

Another studies carried out by **Schmidt-Hansen et al., (2015)** and **Owsworth et al., (2011)[24,25]** found that most brain tumor patients can present with a wide range of different symptoms which may be common as headache, epilepsy, nausea and vomiting, and slowing or changing of psychomotor functions. However this finding contradicts with **Omuro & DeAngelis, (2013)[26]** who stated that approximately 50% of patients with brain tumor present with headaches, and other common symptoms include confusion, hemiparesis, gait imbalance, language difficulties and personality changes.

Upon diagnosis, brain tumor patients must deal with the implications of a life limiting illness while coping with the symptoms, which can be severe and progressive [27]. The lack of detection of needs for all cancers is problematic, but possibly more significant in patients with brain cancers, as they have one of the highest rates of depression, and this in combination with their significant and unique needs necessitates targeted mechanisms to deliver appropriate supportive care **Hartung et al., (2017)[28]**.

Considering average scores of knowledge among our studied sample. the current results stated that there were low mean score of knowledge regarding nature of disease, preoperative knowledge, postoperative knowledge, and knowledge regarding post discharge care, among studied sample representing low total mean score of knowledge. These findings highlight that healthcare services should focus on the specific needs based on the individual patient.

These results come in accordance with **Hartung et al., (2017)** and **Fordet et al., (2012)[28,29]** they documented that, brain tumor patients need additional resources and information on coping with the emotional burden of the disease and improve their quality of life and in turn improve the overall care of the patient. **Mitchell et al., (2011)[30]** indicated that, patients with brain tumor showed information needs on various topics including support services and information about the mechanism of treatment. This strongly suggests the need for providing educational interventions especially for caregivers in neuro-oncology settings.

Communication is a fundamental part of the care of patients with cancer and influences well-being and that information should be adapted to the needs of each patient. anxiety was found to be lower in patients who wanted to know everything about their illness, understood the information better, and were more satisfied with the information that they received **Lobb et al., (2011) [31]**.

Moreover, the present study found learning gap between patient's average knowledge level and maximum level that should be reached. From my opinion, this may be because the greater part of health care providers worked with the task-based system in which their responsibilities concentrated on patients care, neglecting educational role. These findings go well together with **Wasner et al., (2013)[32]** who stated that, there were gaps in the evidence about how much patients wanted to know and how best to disclose diagnosis and prognosis. The guidance recognized that patients with brain tumors had specific information needs.

These findings are similar to the findings of **Keir, (2011)[33]** who reported that, Brain tumor patients had a greater need for information and appreciated being given time to ask questions and receive honest answers from health care providers. Because they found decision making was difficult because of receiving an unclear

prognosis and being given a lack of alternatives to the treatments proposed. **Whiting et al., (2012)[34]** hypothesized that fear and anxiety may not be caused by brain tumor symptoms but by the perception of the threat posed by the symptoms. They suggested, therefore, that communication is fundamental to alleviate this anxiety, by improving predictability and feelings of control.

VII. Conclusion

Assessment of learning needs of brain tumor patients undergoing brain tumor surgery is very important in which enabling them to be aware about the journey of the disease and its treatment and can guide health care professionals in planning and education which helps in the treatment process and reduce recurrent hospitalization and complications.

VIII. Recommendations

Based on the results of the study, the following recommendations are suggested:

1. Patients learning needs should be assessed by nurses constantly and periodically.
2. Nurses working in neurosurgical department should update their knowledge to provide patients with the latest and most important information.

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Asmaa Ebrahim Glal, et. al. "Assessment of Learning Needs for Patients Undergoing Brain Tumors Surgeries at Al Mansoura General Hospital." *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*, 9(3), 2020, pp. 40-48.