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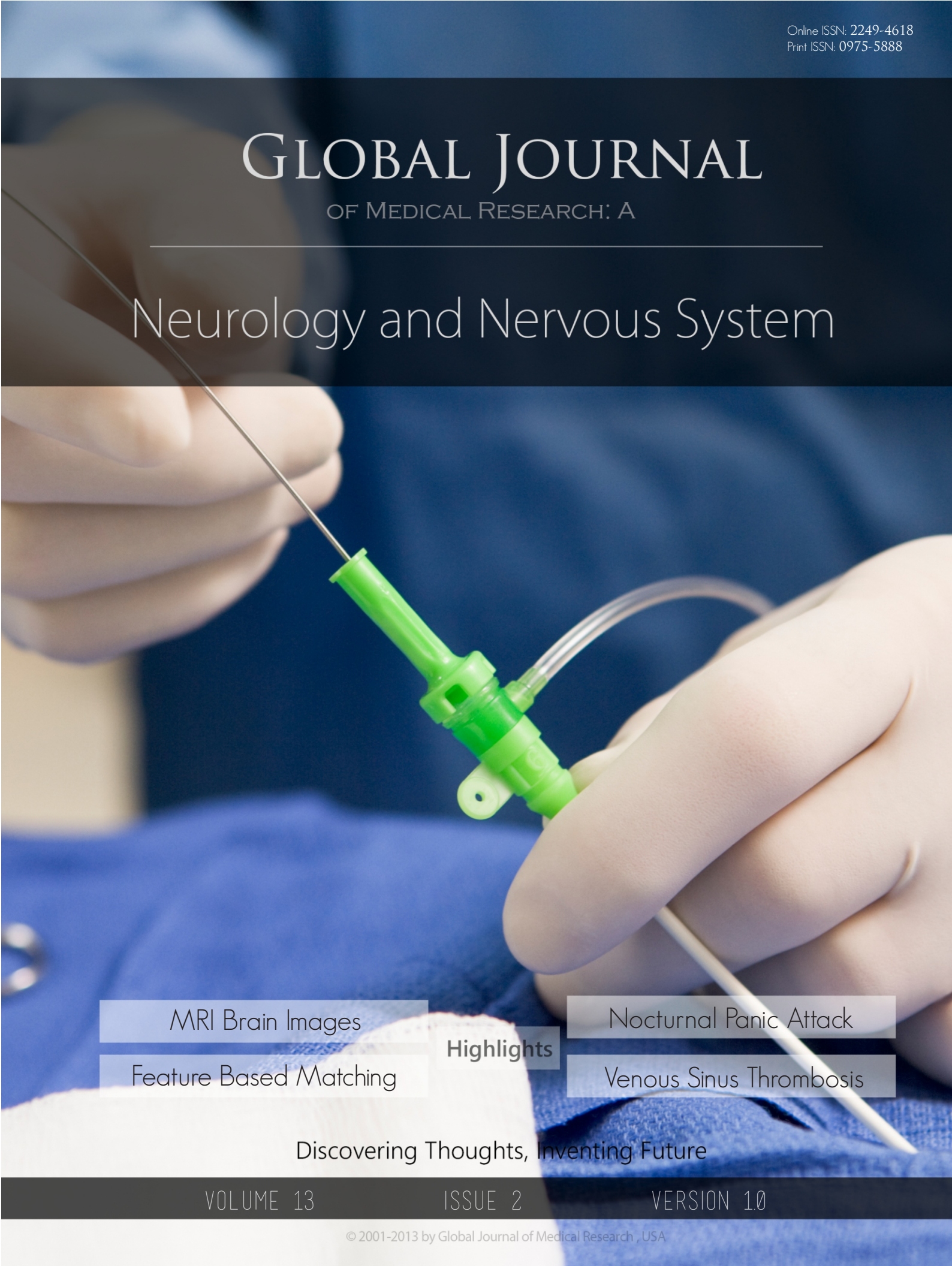
# Global Journal of Medical Research: A

## Neurology and Nervous System



MRI Brain Images

Feature Based Matching

Highlights

Nocturnal Panic Attack

Venous Sinus Thrombosis

Discovering Thoughts, Inventing Future

VOLUME 13 ISSUE 2 VERSION 1.0

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Neurology and Nervous System

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# Feature based Matching of CT & MRI Brain Images

By Ayush Dogra
*Punjabi University, India*

*Abstract-* Multimodal image matching calls or demands for feature based or object based matching. Feature used in matching can be edges ,ridges, blobs, valleys etc. Feature based matching is considered as less tedious and low level image processing task whereas object based matching is consider as high level image processing task and complex.

*GJMR-A Classification :* *NLMC Code: WI 368*


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# Feature based Matching of CT & MRI Brain Images

Ayush Dogra

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## I. Matching

While integrating two multimodal and mono modal images, first step is matching (geometrical matching) and second step is fusion (combined display of data involved). In this paper we will concentrate on first step. Matching of CT and MRI images is useful in radiation therapy planning. This type matching is also used in skull base surgery and epilepsy surgery.

## II. Difference Between CAT and MRI Scans

CAT scans are a specialized type of x-ray. The patient lies down on a couch which slides into large circular opening. The x-ray tube rotate around the patient and computer collects the results. These results are translated into images that look like a slice of a person. CT is very good for imaging bone structure. "Fig." 1 shows CT slice.

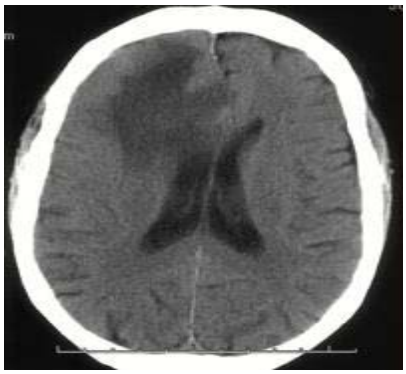

*Figure 1 :* A CT slice

MRI scan uses magnets and radio waves lo locate the images. The patient lies on the couch that looks very similar the ones used for CT. they are then placed in a very long cylinder. The machine will produced a lot of noise and examinations typically run minutes. MRI does not do very good job to bones but its advantage is ability to change the contrast of images. Most MRI machines can produced images in any plane. CT can not do this. "Fig." 2 and 3 are axial images whereas" Fig" 4 is coronal image.

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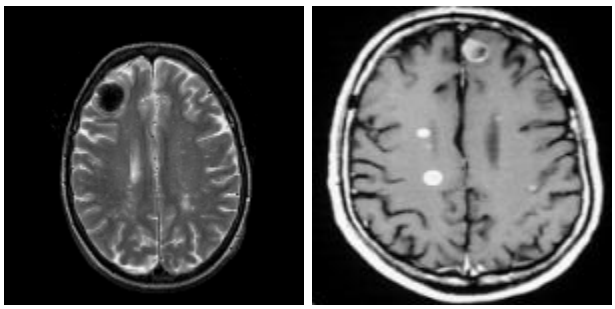

*Figure 2 & 3 :* Axial Images

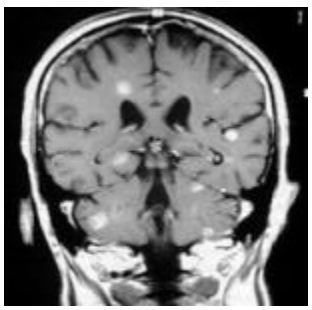

*Figure 4 :* Coronal Image

## III. Ridges

For matching of CT and MRI brain images we select skull ridge because nature of skull is in deformable. In "Fig" 5 CT slice is shown. In "Fig." 6 landscape of same depicted which is also called intensity landscape. "Fig." 7 shows the intensity of same CT slice but now smoothed by convolution with Gaussian. There are no. of geometrical invariants that extract ridges in a variety of images. Definition of Lvv[3,4] measure of 2D images

$$L_{vv} = \frac{1}{||v||^2}(v \cdot \nabla)^2 L,$$

(where ∇ is the nabla operator $(\frac{\partial}{\partial x}, \frac{\partial}{\partial y})$) and v is a right handed normal).

And the generalization of a 3D images by lvv operator can be found in[4]. When applying lvv operator to the CT set the resultant image show skull ridge. Then this ridgeness image is superimposed on to the original

CT slice to construct the 3D volume. "Fig." 8 shows ridged CT image. Similar example can be done in MRI image. "Fig." 9 shows a MRI image. "Fig." 10 shows the ridged MRI image (also called troughed image as in MRI image the skull area is dark).

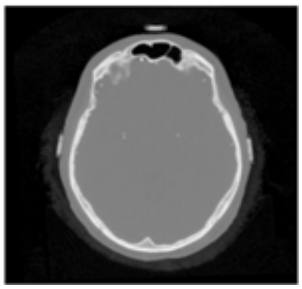

*Figure 5 :* CT slice

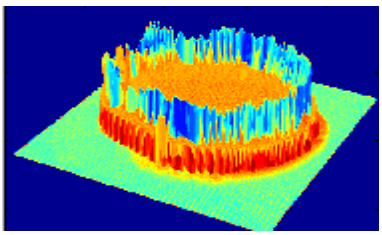

*Figure 6 :* Intensity landscape

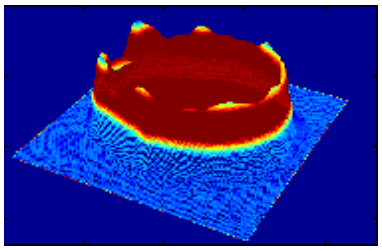

*Figure 7 :* Blurred by Gaussian Convolution

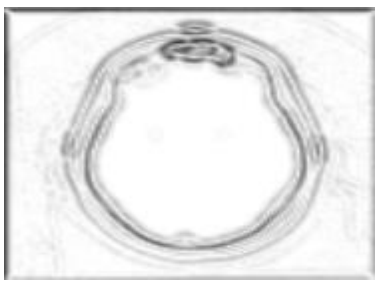

*Figure 8 :* Ridged CT image formed by superimposing the ridges on to the CT slice

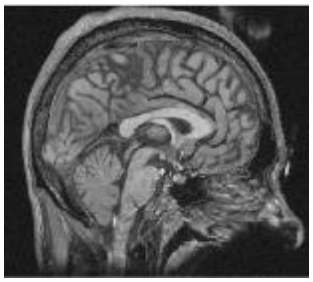

*Figure 9 :* MRI image

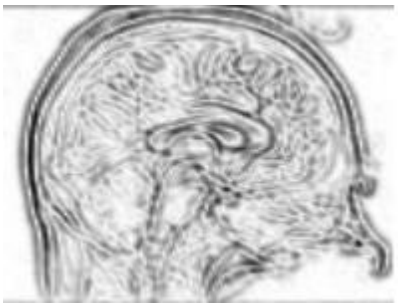

*Figure 10 :* Ridged MRI image

*Feature based matching of CT & MRI brain images*

## IV. Registration Method

Now we need to register the feature volume. The technique used is cross correlation[5] since the two images have different physical realities. By using the grey values directly [1], avoid segmentation our feature images.

The correlation value c(t) of CT feature volume L1 and MR feature volume L2 over all rigid transformations t, where c(t) is defined

$$c(t) = \sum_{(x,y,z)\in L_1} L_1(x,y,z)L_2(t(x,y,z)).$$

Here next level is formed by maximizing the trough images or minimizing the ridge images. This method is also called multi resolution correlation [2,6]. The disadvantage of this approach is high computational effort required. "Fig." 11 shows resultant image after CT and MR volume matching using ridgeness correlation.

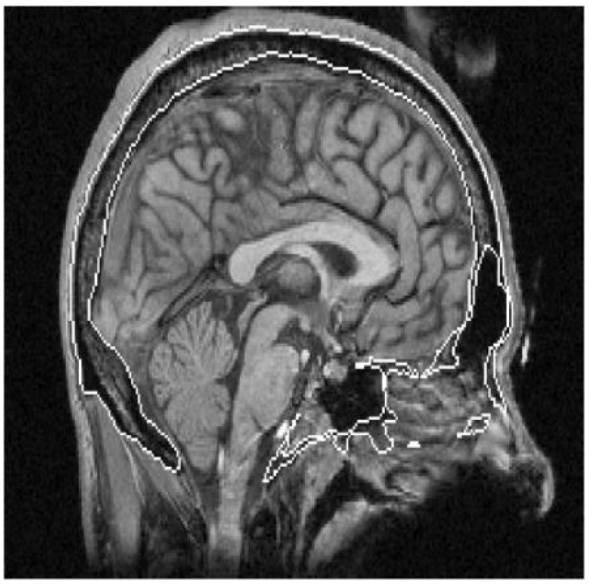

*Figure 11 :* CT and MRI matching using ridgeness correlation

## V. Conclusion

The terms matching and registration are both used to denote the process of determining a transformation that relates the contents of two images in a meaningful way. The registration of MR and CT images was one of the first application of medical image registration. Further more the applicability of MR-CT registration is restricted primarily to the head. MR-CT registration is likely to become more widely used in future.

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# A case of Foster Kennedy Syndrome (FKS) with Increase Intracranial Pressure (ICP) Attributed to Cerebral Venous Sinus Thrombosis (CVST)

By Madihah ALhubayshia & Tahir Obeidb
*King AbdulAziz Medical city, Saudi Arabia*

*Abstract-* Foster Kennedy syndrome (FKS) is a very rare neurological syndrome with a unique ophthalmological manifestation described in 1911 by Robert Foster Kennedy attributed to anterior fossa mass lesion and raised intracranial pressure (ICP) caused by the tumor's mass effect. Meningioma is the most common cause of the syndrome. Rarely vascular lesions and tuberculous meningitis had been reported as a cause of FKS.

Here we present a case of Foster Kennedy-like syndrome, in which meningioma compressed one optic nerve and cerebral venous sinus thrombosis impair cerebral venous drainage inducing intracranial hypertension, and papilledema in the other eye. This case emphasis the importance of considering of CVST as underlying pathogenesis of raised ICP in absence of cerebral edema or obstructed hydrocephalus.

*Keywords: foster kennedy syndrome (FKS), raised intracranial (pressure (ICP), cerebral venous sinus thrombosis CVST).*

*GJMR-A Classification : NLMC Code: WI 355*

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## I. Introduction

The Foster Kennedy syndrome consists of optic disc pallor in one eye, optic disc edema in the other eye, and reduced olfaction caused by space-occupying lesion. [1, 2]

Classically, The ophthalmological sign of Foster Kennedy syndrome (FKS) produced by direct compression of the ipsilateral optic nerve by basal frontal lobe, olfactory groove or sphenoid wing meningioma leading to optic atrophy with concomitant contralateral optic disc swelling secondary to raised (ICP) caused by the mass effect of the tumor. [1-6] Anosmia results from direct compression of the olfactory nerve.[1, 2]

We describe a case report regarding the different pathogenic mechanisms, for which increased intracranial pressure (ICP) resulting from CVST. This is to suggest that not all FKS cases have the same underlying pathogenesis.

Our aim is to document this unique association and to draw attention on the importance of its presence. This is because the management in such situation advocates the use of anticoagulation.

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## II. Case Study

27 year old female referred to King AbdulAziz Medical City (KAAMC), Jeddah in 2004 with one week history of headache, diplopia and visual deterioration in both eyes, particularly in the left eye. She had occasional vomiting with no nausea. She had no symptoms to suggest underlying systemic diseases.

Examination showed visual acuity of 20/30 in the left eye and no light perception in the right eye. A right relative afferent pupillary defect was present with optic disc edema in the left eye, **(fig.1.b)** and an atrophic right optic disc **(fig.1.a)**

Slit lamp examination normal for both eyes.

There was left 6$^{th}$cranial nerve palsy. Humphrey perimeter of the left eye revealed a superior nerve fiber bundle defect **(fig.2.)**. The rest examination was normal.

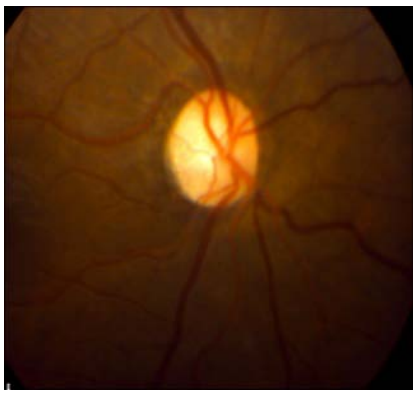

*Figure 1.a :* Atrophy of the right optic disc

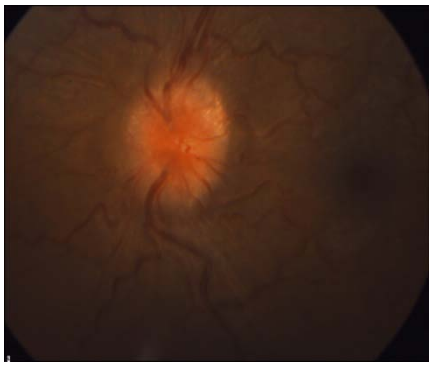

*Figure 1.b :* Edema of the left optic disc

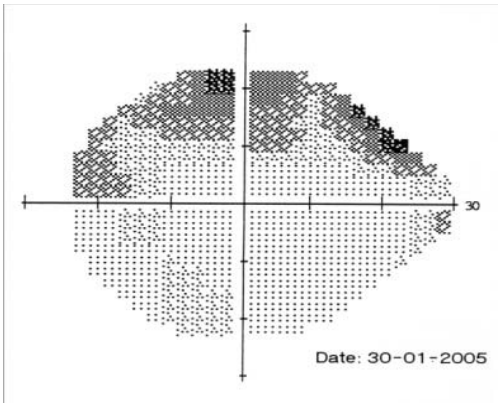


*Figure 2 :* Humphrey perimeter of the left eye disclosed an superior nerve fiber bundle defect

CT scan of the brain showed hyperostosis in right sphenoidal and right Occipitoparietal bone **(fig.3)**.

MRI/MRV**(fig.4)** showed right sphenoidal wing strongly enhanced mass that consistent with the diagnosis of meningiomatosis. It extended from the right orbital apex through the optic canal and into the intracranial space. MRV study showed thrombosis of the posterior third of the superior sagittal sinus and the right sigmoidal sinus **(fig.5)**

Diagnostic Angiogram showed tow tumor blushes highly suggestive of meningiomas **(fig.6)**

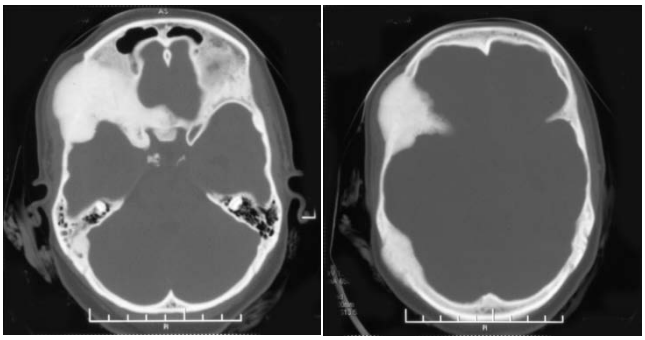

*Figure 3 :* CT scan of the brain bone window showed Hyperostosis in right sphenoidal and right Occipitoparietal bone

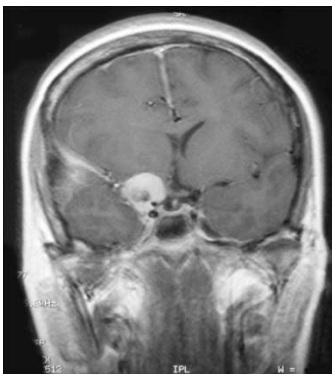

*Figure 4 :* MRI/ T1 with contrast Showing Right sphenoidal Wing strongly enhanced mass

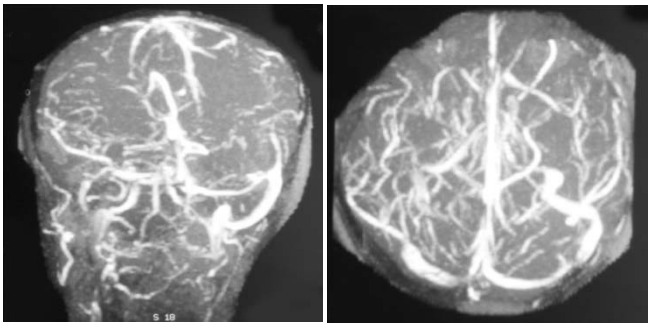

*Figure 5 :* MRVthrombosis of the posterior third of the SSS

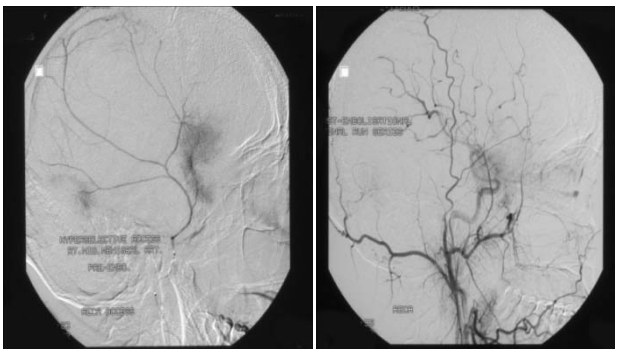

*Figure 6 :* Angiogram showed tow tumor blushes highly suggestive of meningiomas

The patient was treated with enoxoparine 1mg/kg subcutaneous BID, acetazolamid 500mg BID.

As vision of the left eye continued to deteriorate, the decision was taken to relief the pressure surgically and the patient underwent lumboperitoneal shunt, CSF examination done intra operatively showed opening pressure of 450 mm with normal compositions and negative cultures for bacterial and fungal infections, there was no evidence of malignant cell.

Other diagnostic tests including complete blood count, complete metabolic panel, erythrocyte sedimentation rate, c-reactive protein, and were unremarkable.

Post operatively, The patient received warfarin with therapeutic INR (2-3).

One month later the papilledema and visual field had improved on the left eye, and visual acuity was stable.

After 5 years, the patient vision stabilized and developed no shunt complication.

## III. Discussion

The mechanism and underlying pathology of ophthalmic feature of the FKS is variable. The classical pattern is caused by unilateral direct compression of the optic nerve fiber by meningioma and secondary increased intracranial pressure (ICP) causing papilledema of the contralateral eye. [1,2,4] Other mechanism have been suggested to explain the underlying pathology due to bilateral direct optic nerve fiber compression with normal ICP while atrophic

changes resulting from asymmetrical compression of both optic nerve by tumor. [7]

It may also results from chronic increased ICP which initially gives bilateral papelledema, with one optic disc subsequently developing pallor as a result of axonal death while the other optic disc remains swollen. [7]

This case of FKS meningioma cause direct compression of the right optic nerve, and presence of CVST impair cerebral venous drainage that round the other optic nerve by thrombus in which CSF is at a higher pressure than normal and which becomes responsible for papilloedema on the opposite side.

The treatment of visual loss due to Papilledem depends largely on the underlying pathology hence it is important to look for CVST when obvious brain edema and obstructed hydrocephalus are lacking, Prompt use of anticoagulation and cerebrospinal fluid diversion is critical in prevented visual loss in our case.

There is a previous report a patient with FKS in which meningiomas compressed the superior sagittal sinus to block cerebral venous drainage causes increased intracranial pressure, and papilledema in the other eye.[8] Our case differ from this patient by having CVST.

We may postulate that some of the previous cases of FKS may have CVST as a cause of ophthalmic feature of this syndrome rather than a direct compression and/or an intracranial hypertension while MRI, MRV were lacking it emphasizes the importance of looking for this association as adding anticoagulation among other measures.

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# Nocturnal Panic attack : Is it an Another Sub type?

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*Methods:* Socio demo graphic data form, SCID-I, SCID-II, Panic and Agoraphobia Scale (PAS), Hamilton Depression Scale (HAM-D), Beck Anxiety Scale, and Bakırkoy Panic Disorder Behavioral Changes Form we reapplied to the participants. Fifty-one of the 98 patients were suffering from Nocturnal Panic Attacks according to the inclusion/exclusion criteria.

*Results:* It was revealed that 47.9% of the panic disorder patients were suffering from nocturnal panic attacks. The most frequent symptoms in nocturnal panic disorder cas-es were experiences of feelings like drowning, lethargy, palpit-ation, vertigo, fear of death, and anxiety. The existence of noct-urnal panic attacks was found to be related with severity of the disorder and com or bid depression.

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*GJMR-A Classification :* *NLMC Code: WI 370*


*Strictly as per the compliance and regulations of:*

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*Conclusions:* Panic disorder cases with nocturnal panic attacks had more severe symptoms. From here, it can be concluded that it might be a subtype of panic disorder.

*Keywords: nocturnal panic attack, sub type, panic disorder.*

## I. Introduction

Panic disorder (PD) is an anxiety disorder characterized by spontaneous, recurrent and unexpected panic attacks and accompanying anxiety for another possible attack between attacks (anticipatory anxiety) (1). Panic attack (PA) is an intense anxiety episode primarily seen in panic disorder as well as other psychiatric disorders in anxiety spectrum disorders (social phobia, post-traumatic stress disorder, acute stress disorder, obsessive compulsive disorder, separation anxiety disorder) (2). In recent studies about panic disorder, it was reported that patients with PD had different clusters of symptoms and they presented with different characteristics accordingly (3). It is well understood that panic disorder is not a uniform disorder, rather it is a heterogeneous group of many subtypes. It is thought that every subtype might be different in terms of clinical presentation, behavioral change and socio demo graphic features (4). Identifying subtypes of panic disorder and its characteristics is essential for evaluating some elements such as severity of disorder, psychiatric and physical comorbidity and response and prognosis to different therapeutic approaches (5, 6). "Masked anxiety" or "alexithymic panic" was first defined as a subtype of panic disorder (7,8). Following years, "noncognitive" panics (8,9) and "nocturnal panic attacks" (10) which both lacked cognitions associated with fear were defined. In 1989 Mellmani Craske and Barlow began studying nocturnal panic attack and afterwards many researchers made contributions to studies of nocturnal panic attack (11-14).

Nocturnal panic attack (NPA), a subtype of panic disorder, occurs without an obvious trigger, awakens patient from his sleep and consists of recurrent frightening panic attack. Studies show that recurrent nocturnal panic attacks occur 18-33% of patients with panic disorder (8). The most common symptoms in NPA are dyspnea, flushing and subsequent palpitation (3, 15). Many researchers have reported that nocturnal panic attack cases compared with common panic disorder cases, experienced more severe symptoms, more attacks during the day and more intense somatic complaints (15-17). Norton et al. claimed that nocturnal panic attack cases experience more signs and symptoms especially more chest pain while there is no significant difference in fear of dying, shortness of breath or sensations of smothering (3). Agargun and Kara (4) reported that patients with NPA have greater comorbidity with major depression, worse prognosis and higher risk of committing suicide. Melman and Uhde (10) in their study of comparing triggering situations between classic and nocturnal panic attacks, found that both relaxation and sleep deprivation have greater roles in precipitating nocturnal panic attacks.

In this study it is aimed to define the relationship between NPA and some variables such as behavioral changes, classification and clinical presentation of the defined behavioral change, age of onset, severity, duration, avoidance and socio demo graphic characteristics and to compare these with classic-panic disorder-patients.

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## II. Methods and Material

Specimen

Study sample included 98 patients who administered to outpatient clinic of Prof. Dr. Mazhar Osman Bakirkoy Research and Training Hospital of Psychiatry, Neurology and Neurosurgery, were diagnosed with panic disorder by a psychiatry specialist during the sessions, were between the ages of 18-65, were at least an elementary school graduate and voluntarily participated. The inclusion criteria for nocturnal PD group were NPA experience at least 6 months ago and twice within previous month or 2 attacks within previous two months accompanying moderate anticipatory anxiety of NPA (13,14). Patients who had panic disorder due to general medical condition or direct physical effects of alcohol-substance abuse according to DSM-IV criteria, serious neurologic disorders, pathological electroencephalography results or physical diseases were excluded from this study.

## III. Method

In order to confirm Axis I diagnosis and to determine comorbid diagnosis, Structured Clinical Interview for DSM-IV Axis I Disorders/Clinical Version (SCID-I) were administered to all patients with panic disorder and patients with comorbid psychiatric diagnoses were excluded.

Out of 98 patients included in this study, 51 had NPA according to the criteria mentioned in the specimen section. Personal, familial and clinical features were defined by administering socio demo graphic questionnaire, developed for this study, to included participants. During psychiatric interviews, diagnosis of panic disorder was confirmed and possible com or bid diagnoses were determined by using SCID-I Clinical Version oriented with DSM-IV. Whether a personality disorder coexists or not and if exists its effects on behavior and disorder were explored by using DSM-IV oriented SCID-II Clinical Version during psychiatric interview. Moreover, in order to evaluate anticipatory anxiety, agoraphobic avoidance, familial, occupational and social functionality, and thoughts of physical illness, Panic Agoraphobia Scale; in order to evaluate behavioral changes Bakirkoy Panic Disorder Behavioral Changes Form were applied.

Hamilton Depression Rating Scale and Beck Anxiety Scale were applied to two groups in order to assess the severity of depressive symptoms and anxiety, to compare the level of depressive symptoms and anxiety of two groups and to find the relationship between severity of anxiety and depressive symptoms and if exist, behavioral changes within the same group.

## IV. Material

1. Socio demo graphic Data Form: This form, consists of 28 questions, is used by the researchers to interpret participants' socio demo graphic data and their clinical presentations.
2. DSM-IV Axis I Disorders/Clinical Version (SCID-I): It is used to scan DSM-IV criteria and to systematically inquire the symptoms (18,19).
3. DSM-IV Axis II Disorders/Clinical Version (SCID-II): It is a structured interview to diagnose personality disorders (20).
4. Panic Disorder Behavioral Changes Form (App 1): It is a questionnaire which was developed by Ozer to detect the behavioral changes of panic disorder patients in our country. This questionnaire is based upon clinical experience, patients 'statements and "Lifetime Panic Agoraphobia Scale" whose validity and confidentiality for Turkish was established by Tural et al (21). Behavioral changes are divided to three categories: avoidance behavior, prevention behavior and seeking reassurance. This questionnaire consists of 88 multiple choice questions of 4 options for each. Option a is for inexistence of any behavioral change before or after the panic disorder; option b is for any behavioral change that existed before panic disorder and has never changed after; option c is for the behavioral change that has intensified after panic disorder and lastly option d is for any new behavioral change, that has not existed before panic disorder, after panic disorder.
5. Panic Agoraphobia Scale (PAS):

It is applied to patients with panic disorder, with or without agoraphobia. It has five sub-scales:

a) Characteristics of the panic attack: 3 questions are rated and 1 question is not rated.
b) Agoraphobia/ avoidance: 3 questions.
c) Anticipatory anxiety: 2 questions.
d) Disability: 3 questions.
e) Health concerns: 2 questions.

Every subscale determines its own rating and the sum of all ratings determine the total severity. Tural et al. revised this scale for Turkish (21-23).

6. Beck Anxiety Scale: It is used to rate the anxiety. It totally includes 21 somatic and anxiety complaints (23).
7. Hamilton Depression Rating Scale (HAM-D): It is used to measure the severity of depression and the changes in severity.

## V. Statistical Analysis

SPSS for Windows Software was used for statistical analysis. For categorical data chi-square test, for non-categorical data that shows normal distribution two sample student t test and for non-categorical data showing non-normal distribution Mann-Whitney-U test are used. For all tests used, significance was evaluated at $p<0.05$ level.

## VI. Results

It was revealed that 52 patients (52.1%) out of 98 patients with panic disorder also suffer from NPA. Most of the patients with panic disorder were women (NPA group 84.3% and non-NPA group 70.2%), most of the participants were married (NPA group: 86.3% and non-NPA group 63.8%) and the average age in NPA group was found to be 40.6±8.4, in non-NPA group it was 37.7±9.5. No statistically significant difference was emerged between the groups in terms of gender ($x^2$= 2.79, p=0.09), age (t=1.62, p=0.10) and marital status ($x^2$=6.76, p=0.08).However there was statistically significant difference between two groups regarding education level (x2=8.26, p= 0.041) and occupational life (x2= 8.41, p= 0.004). 70.6% of NPA group was graduated from elementary school while of non-NPA group, 42.6% was elementary school, 14.9% was junior high school and 31.9% was high school graduates. It was found that the education level is lower and unemployment is higher in NPA group.

While average duration of illness was 104±98.3 months in NPA group, it was 99.4±92.9 months in non-NPA group. This difference was not statistically significant (Z=-0.06, p=0.94). If the groups are compared in terms of first attacks, average duration of an attack was 34.9± 27.3 minutes in NPA group and 36.2±33.5 minutes in non-NPA group. This difference was not statistically significant either (z=-0.02, p=0.85).

Clinical Characteristics Related to Background and Family History: No statistically significant difference was found between the groups in terms of loss of parents (x2=0.00, p=0.99), divorce of parents (x2=0.37, p=0.53), school phobia (x2=3.60, p=0.05), separation anxiety (x2=0.50, p=0.47), intention to suicide (x2= 1.13, p=0.28) and stress factor within last year (x2=0.07, p=0.77). However, compared with non-NPA group, NPA group reported to have more stress factor within last year (x2=3.93, p=0.04).

Alcohol and Psychoactive Substance Use: No significant difference was found between NPA and non-NPA group in terms of alcohol use (x2=0.89, p=0.34), psychoactive substance use (x2=0.93, p=0.33), panic disorder in family history (x2=0.10, p=0.74) and general medical condition (x2=0.02, p=0.86). However, there was statistically significant difference considering other psychiatric diseases in family history (x2=5.20, p=0.02).

Sleep Disorders: Significant difference was revealed between NPA and non-NPA groups regarding difficulty falling in sleep (x2=39.5, p<0.001), difficulty in maintaining sleep (x2=56.1, p<0.001) and morning fatigue (x2=56.1, p<0.001). Compared with non-NPA group, NPA group experienced more difficulty in falling and maintaining sleep, more fatigue in the morning (p<0.001) and also more avoidance in sleeping (x2=33.8, p<0.001) and living alone (x2= 39.9, p<0.001).

The hours of attacks in NPA group were found to be mostly at 3.00 A.M. (28%), more common at 02.00 A.M. (10%) and at least 04.00 A.M. (5%).

The Characteristics of First Panic Attack: There was no statistically significant difference between the NPA and non-NPA groups considering the place of first panic attack (x2=8.8, p=0.11), the activity during the first panic attack (x2=11.9, p=0.06) and the reaction towards the first panic attack (x2=2.2, p=0.82). It was found that both groups have experienced their first panic attacks at home (NPA: 68.6%, non-NPA: 44.7%), at rest (NPA: 45.1%, non-NPA=55.3%) and have administered to emergency departments (NPA: 56.9%, non-NPA: 57.4%).

Panic Agoraphobia Scale (PAS) and Hamilton Depression Rating Scale (HAM-D): There was a significant difference between NPA and non-NPA groups in terms of PAS (t=3.2, p<0.001) and HAM-D (t=4.3, p<0.01) scores. NPA group had higher scores in both of the scales.

The Relationship between the Anxiety Symptoms and Beck Anxiety Scale: Compared to non-NPA group, in NPA group numbness (t=2.17, p=0.03), feeling that bad things will happen (t=2.6, p=0.01), palpitation (t=3.2, p=0.002), loss of balance (t=2.1, p=0.04), trembling (t=2.05, p=0.04), fear of death (t=2.3, p=0.02), fright (t=3.07, p< 0.001), sensations of choking or smothering (t=3.3, p<0.001) were more frequent while hot flushes, weakness in legs, nervousness, losing control, shortness of breath, dizziness, facial flush and sweating were found to have no statistically significant difference (Table 1).

Behaviors of Avoidance-Prevention: According to the responses to 32 questions in behavior of prevention part of Panic Disorder Behavioral Changes Form, NPA patients display more behaviors of avoidance-prevention (p<0.05) such as inability to stay alone, need of an accompanier most of the time, always carrying some pills (in their bags, pockets or cars) when outside, carrying their home addresses or phone numbers or addresses of their spouses, needing someone nearby during sleep, paying attention to sit close to the exit in places like movie theaters (Table 2).

*Table 1 :* Anxiety Symptoms - Scores of Beck Anxiety Scale

| | NPA | n | Average | S.D. | t | p |
|---|---|---|---|---|---|---|
| Beck Anxiety Total Score | NPA + | 51 | 34.75 | 2.44 | 0.43 | 0.67 |
| | NPA - | 47 | 31.21 | 5.47 | | |
| Numbness | NPA + | 51 | 1.53 | 1.16 | 2.17 | 0.03 |
| | NPA - | 47 | 1.04 | 1.06 | | |
| Hot Flushes | NPA + | 51 | 1.71 | 1.24 | 1.59 | 0.12 |
| | NPA - | 47 | 1.32 | 1.16 | | |
| Weakness in legs | NPA + | 51 | 1.73 | 1.15 | 1.70 | 0.09 |
| | NPA - | 47 | 1.32 | 1.22 | | |
| Inability to relax | NPA + | 51 | 1.57 | 1.27 | 1.10 | 0.27 |
| | NPA - | 47 | 1.30 | 1.16 | | |
| Fear of “bad things will happen” | NPA + | 51 | 1.82 | 1.18 | 2.64 | <0.01 |
| | NPA - | 47 | 1.17 | 1.27 | | |
| Dizziness | NPA + | 51 | 1.61 | 1.22 | 1.96 | 0.05 |
| | NPA - | 47 | 1.15 | 1.05 | | |
| Palpitations | NPA + | 51 | 2.33 | 1.05 | 3.25 | <0.01 |
| | NPA - | 47 | 1.62 | 1.13 | | |
| Sensastions of loosing balance | NPA + | 51 | 1.47 | 1.36 | 2.10 | 0.04 |
| | NPA - | 47 | 0.94 | 1.13 | | |
| Horror | NPA + | 51 | 1.49 | 1.27 | 1.24 | 0.22 |
| | NPA - | 47 | 1.17 | 1.27 | | |
| Nervousness | NPA + | 51 | 1.63 | 1.25 | 1.01 | 0.31 |
| | NPA - | 47 | 1.38 | 1.13 | | |
| Sensations of smothering | NPA + | 51 | 2.10 | 1.22 | 3.32 | <0.01 |
| | NPA - | 47 | 1.26 | 1.29 | | |
| Tremors at hands | NPA + | 51 | 1.33 | 1.23 | 1.33 | 0.19 |
| | NPA - | 47 | 1.02 | 1.09 | | |
| Shaking | NPA + | 51 | 1.57 | 3.13 | 2.05 | 0.04 |
| | NPA - | 47 | 0.60 | 0.95 | | |
| Loosing control | NPA + | 51 | 1.10 | 1.17 | 0.99 | 0.32 |
| | NPA - | 47 | 0.87 | 1.08 | | |
| Shortness of breath | NPA + | 51 | 1.98 | 1.29 | 1.34 | 0.18 |
| | NPA - | 47 | 1.55 | 1.84 | | |
| Fear of death | NPA + | 51 | 2.59 | 2.89 | 2.33 | 0.02 |
| | NPA - | 47 | 1.51 | 1.36 | | |
| Fright | NPA + | 51 | 2.18 | 1.14 | 3.07 | <0.01 |
| | NPA - | 47 | 1.45 | 1.21 | | |
| Gastric discomfort | NPA + | 51 | 1.43 | 1.31 | 1.79 | 0.08 |
| | NPA - | 47 | 0.98 | 1.19 | | |
| Blackout | NPA + | 51 | 0.49 | 0.93 | 1.11 | 0.27 |
| | NPA - | 47 | 0.30 | 0.78 | | |
| Facial flushes | NPA + | 51 | 0.78 | 1.06 | 1.04 | 0.30 |
| | NPA - | 47 | 0.57 | 0.93 | | |
| Sweating | NPA + | 51 | 1.51 | 1.28 | 0.43 | 0.67 |
| | NPA - | 47 | 1.40 | 1.16 | | |

t: Student t test, NPA: Nocturnal Panic Attack, S.D.: Standart deviation

*Table 2 :* Behaviors of Avoidance-Prevention

| | | NPA | | Non-NPA-2 | | | DF | p |
|---|---|---|---|---|---|---|---|---|
| | | n | %n | | % | | | |
| Worrying for having a serious somatic disease | a | 14 | 27.5 | 16 | 34.0 | 4.99 | 3 | 0.17 |
| | b | 1 | 2.0 | 0 | 0 | | | |
| | c | 4 | 7.8 | 0 | 0 | | | |
| | d | 32 | 62.7 | 31 | 66.0 | | | |
| Inability to stay alone and need of an Accompanier most of the time | a | 15 | 29.4 | 28 | 59.6 | 10.04 | 3 | 0.02 |
| | b | 2 | 3.9 | 1 | 2.1 | | | |
| | c | 2 | 3.9 | 0 | 0 | | | |
| | d | 32 | 62.7 | 18 | 38.3 | | | |
| Always carrying some pills (in your car, Wallet or pocket) when you are out | a | 18 | 35.3 | 31 | 66.0 | 9.73 | 3 | 0.02 |
| | b | 2 | 3.9 | 2 | 4.3 | | | |
| | c | 2 | 3.9 | 1 | 2.1 | | | |
| | d | 29 | 56.9 | 13 | 27.7 | | | |
| Carrying some stuff in the amounts of Your lucky number | a | 41 | 80.4 | 41 | 37.2 | 2.76 | 3 | 0.43 |
| | b | 0 | 0 | 1 | 2.1 | | | |
| | c | 1 | 2.0 | 1 | 2.1 | | | |
| | d | 9 | 17.6 | 4 | 8.5 | | | |
| Carrying home address or phone Number of your spouse | a | 29 | 56.9 | 33 | 70.2 | 9.37 | 3 | 0.03 |
| | b | 1 | 2.0 | 5 | 10.6 | | | |
| | c | 1 | 2.0 | 2 | 4.3 | | | |
| | d | 20 | 39.2 | 7 | 14.9 | | | |
| Leaving bedroom lights on when you Are sleeping | a | 28 | 54.9 | 26 | 55.3 | 1.67 | 3 | 0.64 |
| | b | 3 | 5.9 | 5 | 10.6 | | | |
| | c | 1 | 2.0 | 0 | 0 | | | |
| | d | 19 | 37.3 | 16 | 34.0 | | | |
| Leaving door of the bedroom open When you are sleeping | a | 23 | 45.1 | 23 | 48.9 | 2.94 | 3 | 0.40 |
| | b | 6 | 11.8 | 2 | 4.3 | | | |
| | c | 1 | 2.0 | 3 | 6.4 | | | |
| | d | 21 | 41.2 | 19 | 40.4 | | | |
| Need of someone nearby when you Are sleeping | a | 13 | 25.5 | 28 | 59.6 | 12.21 | 3 | <0.01 |
| | b | 1 | 2.0 | 0 | 0 | | | |
| | c | 3 | 5.9 | 2 | 4.3 | | | |
| | d | 34 | 66.7 | 17 | 36.2 | | | |
| Paying attention to choose a seat close To the exit in places like movie theaters | a | 24 | 47.1 | 34 | 72.3 | 6.47 | 2 | 0.04 |
| | b | 0 | 0 | 0 | 0 | | | |
| | c | 2 | 3.9 | 1 | 2.1 | | | |
| | d | 25 | 49.0 | 12 | 25.5 | | | |
| Always eating something when going out | a | 37 | 72.5 | 39 | 83.0 | 2.21 | 3 | 0.53 |
| | b | 1 | 2.0 | 1 | 2.1 | | | |
| | c | 1 | 2.0 | 0 | 0 | | | |
| | d | 12 | 23.5 | 7 | 14.9 | | | |
| Avoidance in wearing valuable jewelry Due to worry about fainting or loosing Consciousness and be robbed afterwards | a | 41 | 80.4 | 38 | 80.9 | 2.49 | 3 | 0.48 |
| | b | 0 | 0 | 1 | 2.1 | | | |
| | c | 0 | 0 | 1 | 2.1 | | | |
| | d | 10 | 19.6 | 7 | 14.9 | | | |

2: Ki square test, NPA: Nocturnal Panic Attack, D.F.: Degree of Freedom

Seeking Reassurance: The patients were assessed according to the responses to 18 questions in seeking reassurance part of Panic Disorder Behavioral Changes Form. NPA patients needed more reassurance ($x2=9.9$, $p=0.02$) from their friends and families for "nothing bad will happen to them" and more frequently they try to find out a doctor, hospital or a pharmacy nearby when they are out ($x2=9.7$, $p=0.02$).

## VII. Discussion

Nocturnal panic attack is a very common clinical situation among patients with panic disorder nevertheless it is not well appreciated. Some studies report that nocturnal panic attacks indicate a more severe prognosis. It is considered that nocturnal panic attack is a separate syndrome or disorder which has unique etiological, psychopathological and biological pathways (24). Norton et al. (3) observed no difference in terms of age and age of onset when they compared the patients with and without nocturnal panic attacks. These findings are parallel to the outcomes of our study.

When gender is taken into consideration, panic disorder is much more frequent in women than men (2). In our study, the number of women patients dominated both NPA (84.3%) and non-NPA (70.2%) groups. The ratio of female and male patients in our study is consistent with the same ratio (62%/38%) in the study of Briggs et al (25). Out of their study of 1168 multinational patients, 62% were women and 38% were men (25). In our study, level of education was significantly different across the groups. The level of education of patients with NPA was found to be lower. In two studies, conducted in 2007 and 2008, no difference emerged in terms of the level of education (11,13).

There were more unemployed patients in NPA group. Besides, most of the patients included in our study were housewives of low socioeconomic class. This may be caused by the fact that patients who administer to our hospital are mostly from low socioeconomic class. It was declared that low socioeconomic level causes a tendency to panic disorder and patients from low socioeconomic class were exposed to more traumatic life events that were supposed to have an important role in the etiology of panic disorder (26). The sociodemographic data in our study supports the hypothesis of that panic disorder is more common among people from low socioeconomic class. However more extensive research is needed to prove this.

The data about the prevalence of NPA from other studies shows a wide range from 18% to 69% (5,27-30). In our study, we found a prevalence of 47.9% which is consistent with a wide range found in other studies.

On the other hand, it was asserted that separation anxiety in childhood, experienced loss and separations might have contributed to the etiology. In their studies Tweed et al. (31) showed that the risk of panic disorder was increased in people who have lost their mothers or separated from their families below the age of 10. Different researchers reported that separation from mother or father due to death or other reasons was significantly associated with bad prognosis (32). However in our study, no difference emerged across the groups in terms of loss of parents, divorce of parents, school phobia, separation anxiety and suicide attempt. Also some studies revealed that patients with nocturnal panic attack history have anxiety difficulties in their childhood and were less healthy compared to patients with panic attack of daytime only (33). However, contrary results in our study may be due to the acquirement of childhood experiences via self-report and to the difficulties in recall. Also patients may not have shared childhood difficulties since researchers were not patients' regular physicians. In order to get more precise results, follow-up studies should be done.

It was suggested that panic disorder usually occurs after a loss and a trauma and these life events may trigger the onset of disorder (34). Moreover, 64% of patients with panic disorder have experienced unfavorable life events in preceding year of onset of the disorder while in control group this ratio was 35%. It was reported that people from low socioeconomic class were exposed to more severe stress in longer durations (35,36). In our study we found no significant difference between groups in terms of stressful life events in the preceding year, which was not consistent with the literature. However, the observation of more frequent stressful life events only within the last month supports the literature.

In NPA group it was observed that the attacks occurred mostly at 03:00 AM (28%), less frequently at 02:00 AM (10%) and 04:00 AM (5%). Therefore, one can say that nocturnal panic attack is more frequent in the first hours of night. As a matter of fact, this result of our study is parallel to the reports of 18% of panic attacks occurring during sleep between 01:30-03:00 AM in literature (37). In their studies, Craske et al. (38) showed that panic disorder patients with regular nocturnal panic attacks represent the severe side of the scale and sleep disturbances are at higher rates compared to patients not having nocturnal panic attacks. Similarly, in this study it was observed that compared to non-NPA group, NPA group had more problems in initiating and maintaining sleep and more complaints of morning fatigue. Also it was found that NPA group more frequently avoided going to bed and sleeping alone. The decrease in sleep quality may cause negative effects on the clinical presentation (38-40). It was asserted that just similar to the patient with daytime panic attack who develop sagoraphobia, patients with NPA might have developed secondary early anxiety and avoidance (41).

Also it was suggested that once the patient had experienced NPA, s/he might develop conditioned fear to sleep and this might cause worse daytime and nocturnal panic attacks which intensifies behaviors of fear and avoidance (41). Besides, low quality in sleep, shorter sleep duration in total, lack of sleep in middle and late phases and poor quality in subjective sleep and waking were reported in NPA patients (42). In one of the studies conducted in our country, it was declared that recurrent NPA caused lack of sleep in patients with PD (4). These findings are consistent with our study. Same researchers found that compared with non-NPA patients, PD patients with NPA had higher frequency of major depression and they suggested that NPA might have contributed to the risk of suicidality by altering severity of the disease (4). This situation is consistent with the findings of other studies showing that patients with NPA have worse prognosis compared with patients without NPA (4,5,13,14). In our study, compared with non-NPA patients, patients with NPA have higher scores on PAS and HAM-D. In literature, there are many studies that have similar results (4,5,13,14). Although no significant difference emerged in terms of total scores on Beck Anxiety Score, numbness, feelings of bad thing will happen, palpitation, loss of balance, trembling, dear of death, fright and sensations of choking or smothering were significantly different as anxiety symptoms are separately assessed. These symptoms are more severe in NPA group. Same findings were reported in the studies of Craske and Burlow (15). Craske and Barlow found out that patients with NPA history had declared two folds increase in diurnal attacks as compared with non-NPA patients and attacks were worse in terms of chest pain or tightness and nausea. Moreover, the greater part of NPA patients reported sensations of smothering and choking. It was observed that the greater part of NPA group had palpitations, irregular pulse, loss of pulse, chest tightness and flatus. Norton et al. (3) too found that NPA patients had more symptoms than non-NPA patients and NPA patients had more complaints of chest pain during daytime attacks as compared with non-NPA patients.

Other important findings in our study are discussed in the subtitles of avoidance, seeking reassurance and prevention which are under behavioral changes. Patients with nocturnal panic attacks more frequently report that when they are out they always carry some pills, telephone number or address of their homes or spouses in their bags, pockets, wallets or cars.

In literature it was reported that PD cases had complaints of carrying “objects of security” in order to deal with anticipatory anxiety (8). These “objects” which are never used and which make patients feel more secure may have symbolic meanings. The similarity between this situation and little children who always carry their favorite toys or blankets and feel insecure when they are lost is remarkable (8).

In our research, as compared to non-NPA patients, NPA patients more frequently reported that they needed their friends and families to reassure them that “nothing bad will happen to them” and they tried hard to find a doctor, hospital or a pharmacy nearby when they were out. This finding is consistent with the reports in literature that patients with panic disorder may exaggerate their symptoms, display tricky behaviors and pretend in order to have reassurance they need (30). It may be observed that these patients seek reassurance by frequently administering to emergency departments, running medical tests and establishing “friendship relationships” with physicians (30, 43). Many patients with panic disorder ask for help from their friends, families, neighbors and physicians in order to deal with the feelings of insecurity. In NPA group the higher frequency of these findings, compared with non-NPA group, represent more severe disease.

One of the most important limitations in this study was assessing NPA by self-reports of patients and not assessing the sleep by polysomnography. The other weaknesses might be exaggeration and difficulties in recalling the symptoms, superficial discussion about separation anxiety, life events and triggering stressors whish are all due to retrospective questioning.

## VIII. Conclusion

The group of patients with nocturnal panic attack (NPA), compared with the group of without nocturnal panic attacks, experience more difficulties in falling asleep and maintaining sleep, more fatigue in the mornings and decreased quality of sleep which cause negative effects on clinical presentations. Therefore, in clinical practice, considering these factors in the treatments of NPA patients is crucial for prognosis. Besides, higher frequency of prevention behavior in NPA patients and more severe symptoms, as compared with patients with daytime panic attacks only, suggest that this phenomenon might be a separate subgroup of panic disorder. A follow-up study focused on this subject will help to clarify whether NPA patients are a subgroup of panic disorder.

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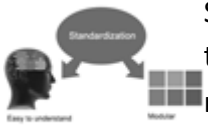


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Complete support for both authors and co-author is provided.

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Original research paper: Such papers are reports of high-level significant original research work.

Review papers: These are concise, significant but helpful and decisive topics for young researchers.

Research articles: These are handled with small investigation and applications

Research letters: The letters are small and concise comments on previously published matters.

**5.STRUCTURE AND FORMAT OF MANUSCRIPT**

The recommended size of original research paper is less than seven thousand words, review papers fewer than seven thousands words also.Preparation of research paper or how to write research paper, are major hurdle, while writing manuscript. The research articles and research letters should be fewer than three thousand words, the structure original research paper; sometime review paper should be as follows:

**Papers**: These are reports of significant research (typically less than 7000 words equivalent, including tables, figures, references), and comprise:

(a)Title should be relevant and commensurate with the theme of the paper.

(b) A brief Summary, "Abstract" (less than 150 words) containing the major results and conclusions.

(c) Up to ten keywords, that precisely identifies the paper's subject, purpose, and focus.

(d) An Introduction, giving necessary background excluding subheadings; objectives must be clearly declared.

(e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition; sources of information must be given and numerical methods must be specified by reference, unless non-standard.

(f) Results should be presented concisely, by well-designed tables and/or figures; the same data may not be used in both; suitable statistical data should be given. All data must be obtained with attention to numerical detail in the planning stage. As reproduced design has been recognized to be important to experiments for a considerable time, the Editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned un-refereed;

(g) Discussion should cover the implications and consequences, not just recapitulating the results; conclusions should be summarizing.

(h) Brief Acknowledgements.

(i) References in the proper form.

Authors should very cautiously consider the preparation of papers to ensure that they communicate efficiently. Papers are much more likely to be accepted, if they are cautiously designed and laid out, contain few or no errors, are summarizing, and be conventional to the approach and instructions. They will in addition, be published with much less delays than those that require much technical and editorial correction.

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Standard Usage, Abbreviations, and Units: Spelling and hyphenation should be conventional to The Concise Oxford English Dictionary. Statistics and measurements should at all times be given in figures, e.g. 16 min, except for when the number begins a sentence. When the number does not refer to a unit of measurement it should be spelt in full unless, it is 160 or greater.

Abbreviations supposed to be used carefully. The abbreviated name or expression is supposed to be cited in full at first usage, followed by the conventional abbreviation in parentheses.

Metric SI units are supposed to generally be used excluding where they conflict with current practice or are confusing. For illustration, 1.4 l rather than 1.4 × 10-3 m3, or 4 mm somewhat than 4 × 10-3 m. Chemical formula and solutions must identify the form used, e.g. anhydrous or hydrated, and the concentration must be in clearly defined units. Common species names should be followed by underlines at the first mention. For following use the generic name should be constricted to a single letter, if it is clear.

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Search engines for most searches, use Boolean searching, which is somewhat different from Internet searches. The Boolean search uses "operators," words (and, or, not, and near) that enable you to expand or narrow your affords. Tips for research paper while preparing research paper are very helpful guideline of research paper.

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- It may take the discovery of only one relevant paper to let steer in the right keyword direction because in most databases, the keywords under which a research paper is abstracted are listed with the paper.
- One should avoid outdated words.

Keywords are the key that opens a door to research work sources. Keyword searching is an art in which researcher's skills are bound to improve with experience and time.

Numerical Methods: Numerical methods used should be clear and, where appropriate, supported by references.

*Acknowledgements: Please make these as concise as possible.*

References

References follow the Harvard scheme of referencing. References in the text should cite the authors' names followed by the time of their publication, unless there are three or more authors when simply the first author's name is quoted followed by et al. unpublished work has to only be cited where necessary, and only in the text. Copies of references in press in other journals have to be supplied with submitted typescripts. It is necessary that all citations and references be carefully checked before submission, as mistakes or omissions will cause delays.

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## TECHNIQUES FOR WRITING A GOOD QUALITY RESEARCH PAPER:

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**12. Make all efforts:** Make all efforts to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in introduction, that what is the need of a particular research paper. Polish your work by good skill of writing and always give an evaluator, what he wants.

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**22. Never start in last minute:** Always start at right time and give enough time to research work. Leaving everything to the last minute will degrade your paper and spoil your work.

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**26. Go for seminars:** Attend seminars if the topic is relevant to your research area. Utilize all your resources.

**27. Refresh your mind after intervals:** Try to give rest to your mind by listening to soft music or by sleeping in intervals. This will also improve your memory.

**28. Make colleagues:** Always try to make colleagues. No matter how sharper or intelligent you are, if you make colleagues you can have several ideas, which will be helpful for your research.

**29. Think technically:** Always think technically. If anything happens, then search its reasons, its benefits, and demerits.

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**31. Adding unnecessary information:** Do not add unnecessary information, like, I have used MS Excel to draw graph. Do not add irrelevant and inappropriate material. These all will create superfluous. Foreign terminology and phrases are not apropos. One should NEVER take a broad view. Analogy in script is like feathers on a snake. Not at all use a large word when a very small one would be sufficient. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Amplification is a billion times of inferior quality than sarcasm.

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**33. Report concluded results:** Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

**34. After conclusion:** Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print to the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects in your research.

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**Key points to remember:**

- Submit all work in its final form.
- Write your paper in the form, which is presented in the guidelines using the template.
- Please note the criterion for grading the final paper by peer-reviewers.

**Final Points:**

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of prior workings.

Writing a research paper is not an easy job no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record keeping are the only means to make straightforward the progression.

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Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear

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- Insertion a title at the foot of a page with the subsequent text on the next page
- Separating a table/chart or figure - impound each figure/table to a single page
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· Keep on paying attention on the research topic of the paper

· Use paragraphs to split each significant point (excluding for the abstract)

· Align the primary line of each section

· Present your points in sound order

· Use present tense to report well accepted

· Use past tense to describe specific results

· Shun familiar wording, don't address the reviewer directly, and don't use slang, slang language, or superlatives

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Choose a revealing title. It should be short. It should not have non-standard acronyms or abbreviations. It should not exceed two printed lines. It should include the name(s) and address (es) of all authors.

**Abstract:**

The summary should be two hundred words or less. It should briefly and clearly explain the key findings reported in the manuscript--must have precise statistics. It should not have abnormal acronyms or abbreviations. It should be logical in itself. Shun citing references at this point.

An abstract is a brief distinct paragraph summary of finished work or work in development. In a minute or less a reviewer can be taught the foundation behind the study, common approach to the problem, relevant results, and significant conclusions or new questions.

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- Fundamental goal
- To the point depiction of the research
- Consequences, including definite statistics - if the consequences are quantitative in nature, account quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

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- Center on shortening results - bound background information to a verdict or two, if completely necessary
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The **Introduction** should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable to comprehend and calculate the purpose of your study without having to submit to other works. The basis for the study should be offered. Give most important references but shun difficult to make a comprehensive appraisal of the topic. In the introduction, describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will have no attention in your result. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here. Following approach can create a valuable beginning:

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- Explain materials individually only if the study is so complex that it saves liberty this way.
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- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

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- Report the method (not particulars of each process that engaged the same methodology)
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- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in every other part of the paper - avoid familiar lists, and use full sentences.

What to keep away from

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings - save it for the argument.
- Leave out information that is immaterial to a third party.

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The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.

Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.
- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to your results, and put the whole thing in a reasonable order.
- Put figures and tables, appropriately numbered, in order at the end of the report
- If you desire, you may place your figures and tables properly within the text of your results part.

Figures and tables

- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
- Despite of position, each figure must be numbered one after the other and complete with subtitle
- In spite of position, each table must be titled, numbered one after the other and complete with heading
- All figure and table must be adequately complete that it could situate on its own, divide from text

**Discussion:**

The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a argument should be. Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly described. Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved with prospect, and let it drop at that.

- Make a decision if each premise is supported, discarded, or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
- Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work
- You may propose future guidelines, such as how the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

- When you refer to information, differentiate data generated by your own studies from available information
- Submit to work done by specific persons (including you) in past tense.
- Submit to generally acknowledged facts and main beliefs in present tense.

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| Topics | Grades | | |
|---|---|---|---|
| | **A-B** | **C-D** | **E-F** |
| ***Abstract*** | Clear and concise with appropriate content, Correct format. 200 words or below | Unclear summary and no specific data, Incorrect form<br><br>Above 200 words | No specific data with ambiguous information<br><br>Above 250 words |
| ***Introduction*** | Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited | Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter | Out of place depth and content, hazy format |
| ***Methods and Procedures*** | Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads | Difficult to comprehend with embarrassed text, too much explanation but completed | Incorrect and unorganized structure with hazy meaning |
| ***Result*** | Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake | Complete and embarrassed text, difficult to comprehend | Irregular format with wrong facts and figures |
| ***Discussion*** | Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited | Wordy, unclear conclusion, spurious | Conclusion is not cited, unorganized, difficult to comprehend |
| ***References*** | Complete and correct format, well organized | Beside the point, Incomplete | Wrong format and structuring |

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