

**“A STUDY ON THE PREDICTIVE VALUE OF SINONASAL
OUTCOME TEST (SNOT 22) IN ASSESSING THE POST SURGICAL
IMPROVEMENT IN PATIENTS WITH CHRONIC RHINOSINUSITIS”**

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BONAFIDE CERTIFICATE

This is to certify that this dissertation entailed “**A STUDY ON THE PREDICTIVE VALUE OF SINONASAL OUTCOME TEST (SNOT 22) IN ASSESSING THE POST SURGICAL IMPROVEMENT IN PATIENTS WITH CHRONIC RHINOSINUSITIS**” submitted by **Dr.OVIYA. V**, appearing for M.S. ENT., Branch IV Degree examination in May 2022 is a bonafide record of work done by her under my direct guidance and supervision in partial fulfillment of regulations of the Tamil Nadu Dr. M.G.R. Medical University, Chennai, Tamil Nadu, India.

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CERTIFICATE – II

This is to certify that this dissertation work titled “**A STUDY ON THE PREDICTIVE VALUE OF SINONASAL OUTCOME TEST (SNOT 22) IN ASSESSING THE POST SURGICAL IMPROVEMENT IN PATIENTS WITH CHRONIC RHINOSINUSITIS**” of the candidate **Dr.OVIYA. V**, with registration Number 221914018 for the award of M.S in the branch of Otorhinolaryngology. I personally verified the urkund.com website for the purpose of plagiarism check. I found that the uploaded thesis file contains from introduction to conclusion pages and result shows 4 percentage of plagiarism in the dissertation.

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**Prof.Dr.R.MUTHUKUMAR, MS., DLO., DNB.,
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DECLARATION

I solemnly declare that the dissertation “A STUDY ON THE PREDICTIVE VALUE OF SINONASAL OUTCOME TEST (SNOT 22) IN ASSESSING THE POST SURGICAL IMPROVEMENT IN PATIENTS WITH CHRONIC RHINOSINUSITIS” is done by me at the Madras Medical College and Government General Hospital, Chennai during 2019-2022 under the guidance and supervision of **Prof.Dr. R.MUTHUKUMAR M.S., D.L.O., D.N.B.**

This dissertation is submitted to The Tamilnadu Dr. M.G.R. Medical University, towards partial fulfillment of regulation for the award of **M.S. DEGREE IN OTORHINOLARYNGOLOGY (BRANCH-IV).**

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ABBREVIATIONS

CRS	:	Chronic Rhinosinusitis
CRSwNPs	:	Chronic Rhinosinusitis with Nasal Polyposis
CRSsNPs	:	Chronic Rhinosinusitis without Nasal Polyposis
SNOT	:	Sinonasal Outcome Test
FESS	:	Functional Endoscopic Sinus Surgery
EPOS	:	European Position paper On Rhinosinusitis
AFRS	:	Allergic Fungal Rhino Sinusitis
AFS	:	Allergic Fungal Sinusitis
ESS	:	Endoscopic Sinus Surgery
OCS	:	Oral Corticosteroids
DNE	:	Diagnostic Nasal Endoscopy
PND	:	Post Nasal Drip

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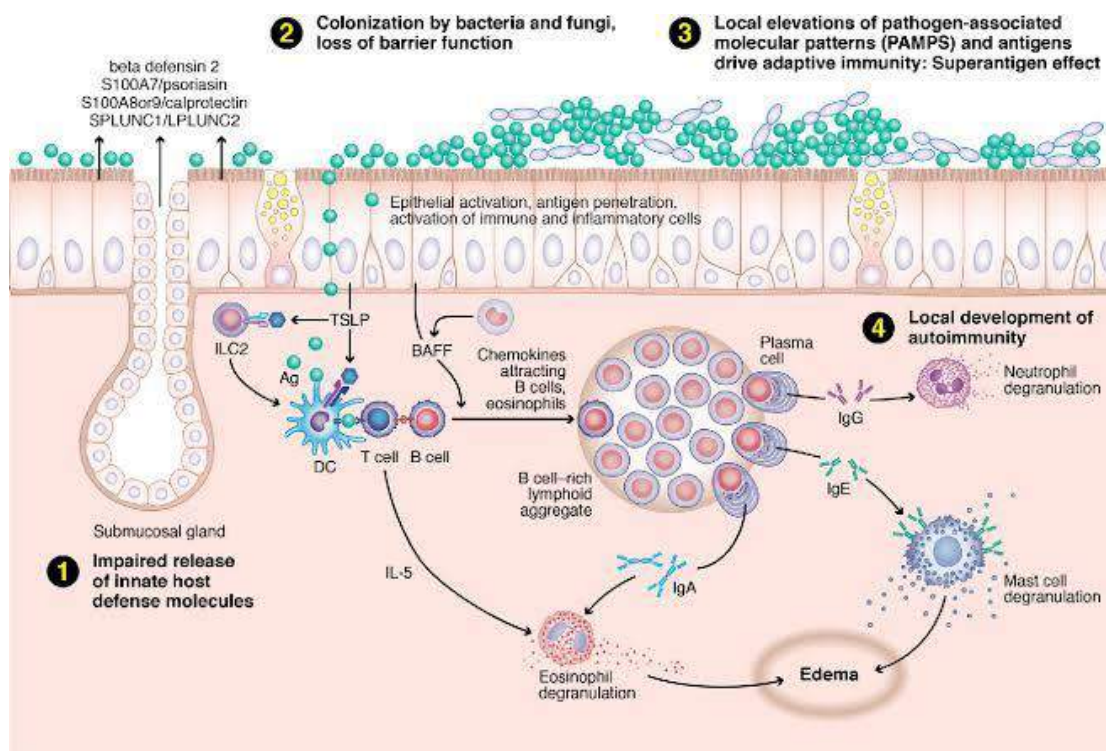
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INTRODUCTION

Rhinosinusitis is defined as acute or chronic based on the duration of symptoms .Acute being less than 12 weeks duration and chronic is more than 12 weeks^{1,2} Chronic Rhino Sinusitis is an inflammatory disorder which involves the mucosa of the nose and paranasal sinuses. Chronic sinusitis affects 1 in 8 people in India and about 5-15 % of urban population.³It's prevalence has exceeded than that of any other chronic condition .134 millions Indians suffer from Chronic Rhinosinusitis as per the estimate by the Indian Institute of Allergy and Infectious diseases (NIAID)⁴. World wide CRS affects at least 11% of the population ⁵and causes economic burden to the health care systems ,to patients and to the economy due to loss of productivity in the workplace⁶.Its prevalence is greater than Ischemic Heart Disease ,Diabetes,Chronic Obstructive Pulmonary Disease ,Heart failure and stroke and is equivalent to that of peripheral vascular disease,arthritis,back pain ,several of which has a lesser impact on patient's quality of life than CRS.⁷

Chronic Rhinosinusitis classified into cases with polyps (CRSwNPs)and cases without polyps (CRSsNPs)¹ and Allergic Fungal Rhinosinusitis (AFRS).Chronic Rhinosinusitis with polyp is characterised by an intense edematous stroma in the sinonasal epithelium with albumin deposition, pseudo cyst formation and subepithelial / perivascular

inflammatory cell infiltration. It is associated with T Helper cell (TH2) skewed eosinophilic information with high interleukin (IL-5) and eosinophil cationic Protein (ECP) concentrations in the polyp whereas CRS without polyp is characterised by fibrosis, basement membrane thickening, goblet cell hyperplasia, subepithelial edema.



PATHOPHYSIOLOGY OF CHRONIC RHINOSINUSITIS

CRS is widely accepted to be a multifactorial disease with no definitively proven single etiology. A common underlying factor in all cases of CRS, however, is chronic sinonasal mucosal inflammation. Several etiologies for chronic mucosal inflammation have been proposed, including chronic bacterial infection, allergy, immune dysregulation,

biofilms, fungus, superantigen production, ciliary dysfunction and immunoglobulin deficiency, among others. Therapies for CRS are directed at reducing sinonasal inflammation at various points along the inflammatory cascade while simultaneously eliminating or controlling the underlying source of the inflammation. Inflammation and edema of the sinonasal mucosa leads to ostial occlusion and subsequent hypoxia within the occluded sinus. This leads to goblet cell hyperplasia, increased mucus viscosity, and the accumulation of thick, sticky mucus within the sinus due to impaired mucociliary clearance. Mucostasis creates an opportunity for bacterial overgrowth and chronic bacterial infection within the sinonasal cavities, which promotes further inflammation due to intrinsic host defense factors.

Chronic rhinosinusitis (CRS) responds well to both medical and surgical management in the majority of patients. Patients with CRS who fail maximal medical therapy are candidates for Functional Endoscopic sinus surgery (FESS). Patients undergoing FESS should be counselled that surgery is not a panacea, and continued long-term medical therapy in the form of both topical and systemic anti-inflammatory and/or antimicrobial medications is likely necessary. Immunodeficiency should always be considered a possibility in patients who don't respond to standard medical care and surgical care. Many otorhinolaryngologists,

have encountered patients who continue to suffer from severe symptoms of CRS following appropriate FESS despite continued “standard” maximal medical therapy in the form of routine nasal saline irrigations, topical nasal steroids, leukotriene inhibitors, allergy therapy, and appropriate courses of systemic steroids and antibiotics, when indicated. This subset of patients may relapse quickly with frequent exacerbations despite optimal FESS and optimal standard medical therapy. This relatively small, yet challenging patient population poses a significant and often frustrating dilemma. To date, there is no consensus regarding the optimal treatment of this subset of patients suffering from recalcitrant CRS.

Our study is conducted to study the predictive value of Sino-nasal Outcome Test in assessing the post surgical improvement in patients undergoing FESS.

AIM OF THE STUDY

To study the predictive value of Sino Nasal Outcome Test (SNOT 22) in assessing the post surgical improvement in patients with Chronic Rhinosinusitis after Functional Endoscopic Sinus Surgery(FESS)

To assess the degree and impact of chronic rhino sinusitis in patients quality of life and to measure the treatment response .

REVIEW OF LITERATURE

Current estimates suggest that CRS affects 30 to 35 million people in the United States and accounts for 20 million physician office visits annually.

A study by **Knud Larsen et al**⁸ in 2002 suggested that the mean incidence of symptomatic nasal polyps was 1 case per 1000 population . The prevalence was greater in males and peaked in the 50 to 59 year age group,

Several studies have documented decreased ciliary beat frequency in patients with CRS, **Chen et al**⁹. found that the cholinergic and adrenergic stimulated ciliary beat frequency of mucosal explants from patients with CRS was also significantly diminished.

Hirschman attempted the first nasal endoscopy in 1901. He used a modified cystoscope to examine the sinonasal cavity.

Reichert performed rudimentary maxillary sinus manipulations with a 7 mm endoscope through an oroantral fistula which could be regarded as the first endoscopic procedure.

In 1925 Maltz, promoted the use of nasal endoscopes for diagnostic evaluation of the sinonasal cavity and coined the term “ sinuscopy”.The

creation of Hopkins rod optic endoscopic system in 1960 was the major turning point in the field of sinonasal endoscopy.

Functional Endoscopic Sinus Surgery subsequently emerged from the work of Messerklinger on the mucociliary pathways in paranasal sinuses and it provided vital information regarding the pathophysiology of chronic Rhinosinusitis. He conducted studies on fresh cadaver and simultaneously during sinus surgeries and observed that the mucous produced in the paranasal sinuses followed definite pathways towards the corresponding Ostia . Any factor obstructing these pathway found to play a role in the development of Chronic Rhinosinusitis.

A study by **Zinreich**¹⁰ et al found that Endoscopy and Computerised Tomography are complementary in the diagnosis and treatment of Diseases of nose and paranasal sinuses.

Recurrent sinonasal inflammatory conditions not responding to medical line of management require CT scanning of Paranasal Sinuses **Buckland JR ,et al**¹¹ conducted a study in 2003 to assess whether the Sinonasal Outcome Test(SNOT 22)be used as a reliable outcome measure for a successful septal surgery

Picrillo JF, Merritt et al¹² in 2002 conducted a study “psychometric validity of the 20 item (SNOT-20)

A 2005 study by **DelGaudio**¹³ found increased reflux in the nasopharynx and upper esophageal sphincter in patients with recalcitrant CRS when compared with healthy control subjects.

Briggs et al. reported that smoking is a predictor of poor long-term outcome among CRS patients following endoscopic sinus surgery, suggesting that smoking may also adversely affect resolution of Rhinosinusitis attributed symptoms following definitive surgical treatment.¹⁴

Chronic Rhinosinusitis not responding to medical management requires surgical intervention and Functional Endoscopic Sinus Surgery (FESS) is now considered as the surgical management of choice. In patients suffering from chronic Rhinosinusitis. The concept of opening the natural ostium of the diseased sinus was popularised by Kennedy and Stammberger. Removal of disease in the osteomeatal complex region is the principle of FESS. Wolf and Stammberger stated that FESS will provide better outcome in chronic sinonasal disease.

SNOT -22 has been translated to several languages including French, Danish, Czech, Lithuanian and Estonian and has been appropriately validated.¹⁵⁻¹⁷

Kosugi¹⁸ et al in 2011 conducted a study “translation, ,cross adaptation and validation of SNOT 22 questionnaire to Brazilian portugese .

Samy Elwany ¹⁹,department of otolaryngology ,Alexandria Egypt has done “Arabic translation and validation of SNOT-22 and observed that SNOT-22 questionnaire is a reliable and valid outcome measure for CRS patients.

A study was done by **Joshua L Kennedy** ²⁰ et al in 2013 , on SNOT 22 -A predictor of post surgical improvement in patients with chronic Rhinosinusitis.

De conde et al ²¹ have done a study in 2014 and compared the medical and surgical management using SNOT 22 scores and assessed how SNOT 22 differentially predicts treatment modality selection in chronic sinusitis.

A study was conducted by Wabnitz DA ,Nair S ,Wormold PJ in 2005 to see the correlation between preoperative symptom scores ,quality

of life-questionnaires ,and staging with Computerized Tomography in patients with chronic rhinosinusitis .²²

A pilot study of the SNOT 22 score in adults with no sino Nasal Disease was done by Gillet S ,Hopkins C et al.²³

Evaluation of the quality of life of patients with chronic rhinosinusitis by means of the SNOT 22 questionnaire was done by Pinillos Marambia ,Manuela Garcia Lima et al in 2012 and concluded that according to SNOT 22 questionnaire ,Chronic Rhino Sinusitis (CRS) reduces the quality of life of patients.²⁴

Soler et al in 2013,²⁵ concluded that questionnaires should be incorporated into clinical practice inorder to assess the quality of life.

“ A review of sinonasal outcome scoring systems :which is best ? - was the study done in 2006 ,in which (13)Thirteen Quality Of Life questionnaires were compared by **Morely** and **Sharp** and they concluded that SNOT-22 was the most accurate for the evaluation of the CRS patients.²⁶

A study by **Caulley L, Lasso A et al in 2017** among a study population of 30 patients to assess the “ Pretreatment scores of SNOT 22 predicts response to Endoscopic Polypectomy in Clinic .²⁷

Gregorio et al have conducted a study in 2015 to evaluate any influence of age and gender in normal values of Sino Nasal Outcome Test.²⁸

Analysis of the 22 item-Sino Nasal Outcome Test using item response theory was done by Crump et al in 2016²⁹.

A study was conducted by Tomislav Greguric et al in 2016 to compare the differences between Sino Nasal Outcome Test 22 and Visual analog scale symptom scores with and without nasal polyps.³⁰

Marambia PP, Lima MG et al in 2017 have done a study to assess whether SNOT 22 questionnaire can be used as a predictor for the indication of surgical treatment in chronic rhinosinusitis .³¹

Pragya Rajpurohit et al ,2021 conducted a study to assess “change in symptomatology score after functional Endoscopic Sinus Surgery in cases of Chronic Rhinosinusitis .³²

DEVELOPMENTAL ANATOMY OF PARANASAL SINUS

Maxillary Sinus

The maxillary sinus is the first sinus to appear between the 7th and 10th weeks of gestation. The maxillary sinus appears as a shallow groove expanding from the primitive ethmoidal infundibulum into the mass of the maxilla. Expansion and absorption results in a small sinus cavity present at birth. Rapid growth of this cavity occurs during childhood until age seven followed by gradual enlargement, reaching its final size by age 17–18 years. Growth may continue beyond this period with extensive pneumatization involving the entire hard palate.

Any disruption or abnormality in the development of the maxillary sinus may result in maxillary sinus aplasia or hypoplasia. Maxillary sinus hypoplasia is present in up to 10% of CT scans.

Ethmoid Sinus

During the 9th and 10th weeks of gestation, a series of folds called ethmoturbinals that are separated from each other by corresponding grooves appear in the lateral wall of the nasal capsule. Fusion of these folds leads to the development of crests, each with an ascending and descending portion. All permanent ethmoidal structures are present at birth and develop from these crests and the furrows between them. As a

result, acute sinusitis in children often involves the ethmoid cavity which can extend laterally through the lamina papyracea causing orbital complications.

Understanding the basic embryology of the four or five ethmoturbinals defines a series of lamella that must be removed in order to pass from the anterior of the sinonasal cavity to the sphenoid sinus. In order from anterior to posterior, these lamella include: FIRST: agger nasi (ascending portion) and uncinate process (descending portion), SECOND: bulla ethmoidalis, THIRD: basal lamella of the middle turbinate, FOURTH: superior turbinate and FIFTH: supreme turbinate if present.

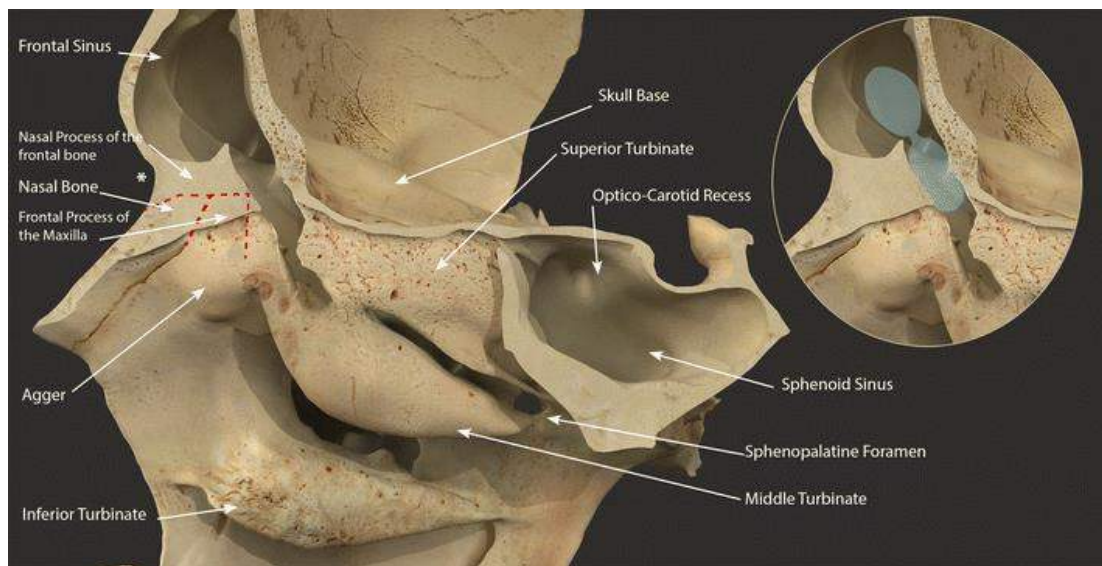
Sphenoid Sinus

The sphenoid sinus begins to develop in the twelfth week of gestation as an evagination from the sphenoethmoidal recess. A small sphenoid sinus is present at birth with progressive enlargement starting at age three during pneumatization of the sphenoid bone. Three pneumatization patterns have been described with reference to the sella turcica. These include sellar (90%), pre-sellar (9%) and conchal (1%) type pneumatization patterns. The sellar type is most common and describes sphenoid pneumatization posterior to the sella turcica. The presellar type

describes sphenoid pneumatization up to the anterior sella and the conchal type describes a shallow bowl with minimal sphenoid pneumatization and trabecular bone between the sinus and sella. The sphenoid sinuses can also pneumatize laterally into the pterygoid root resulting in the presence of a lateral sphenoid recess . This pneumatization pattern results in exposure of the neurovascular structures surrounding the sphenoid sinus.

FRONTAL SINUS : The frontal sinus is the most variable sinus in terms of size and shape. Pneumatization of the frontal bone begins during the 16th week of gestation originating from the anterior ethmoid complex. At birth, the frontal sinuses appear only as a small blind pocket that is difficult to distinguish from the anterior ethmoid air cells on imaging. With gradual pneumatization, the frontal sinuses are seen in most radiological studies by the age of 8 years. Significant frontal pneumatization does not occur until early adolescence and continues until 18 years of age. Although still developing, the relative proportions of the frontal sinus have reached adult ratios by age 10–12 years and just prior to the second growth spurt.

Lateral nasal wall and turbinates



The inferior, middle and superior turbinates are internal structures found along the lateral nasal wall. The middle and superior turbinates arise from extensions of the ethmoid bones whereas the inferior turbinate is an embryologically independent osseous structure.

The space between the lateral nasal wall and inferior, middle and superior turbinates called the inferior, middle and superior meatus respectively. Each meatus is associated with the connection between a specific anatomical structure and the nasal cavity along a series of well-defined drainage pathways.

The lacrimal duct drains into the inferior meatus approximately 1 cm posterior to the head of the inferior turbinate. Although not considered a true valve, the opening of the nasolacrimal duct is called Hasner's valve which is formed by small folds of mucosa. The middle meatus forms the

common drainage pathway of the maxillary, anterior ethmoid and frontal sinus into the nasal cavity. The superior meatus forms the common drainage pathway of the posterior ethmoid air cells.

Turbinates are structures filled with vascular channels and venous sinusoids which serve to warm and humidify air and modify nasal airflow resistance. The turbinates continuously dilate and constrict under sympathetic control in response to environmental conditions. A process occurs every 0.5–3 hours in a normal physiological phenomenon known as the ‘nasal cycle’ resulting in alternating congestion and decongestion of the nasal cavities. Turbinate hypertrophy is a common cause of nasal obstruction in which the turbinates are either congested or hypertrophied due to allergic or non-allergic triggers as part of an inflammatory rhinitis conditions.

Blood supply of the lateral nasal wall.

Both the internal and external carotid arteries supply the lateral nasal wall. The sphenopalatine artery contributes the majority of the arterial supply to the turbinates and lateral nasal wall . It enters through the sphenopalatine foramen which lies just inferior to the horizontal attachment of the middle turbinate.

The sphenopalatine foramen is formed by the sphenopalatine notch of the palatine bone in articulation with the sphenoid bone. The cristaethmoidalis is a small crest of the perpendicular plate of the palatine bone located anterior to sphenopalatine foramen and serves as a consistent and reliable landmark to identify this vessel during endoscopic dissection.

The sphenopalatine artery commonly branches lateral to the cristaethmoidalis with many variations in the branching pattern. In one cadaver study, 97% of specimens had two or more branches of the sphenopalatine artery medial to the cristaethmoidalis. It is critical that the surgeon is aware of these variations and controls all branches to ensure successful endoscopic ligation of the sphenopalatine artery for epistaxis. If more proximal vascular control is required, the internal maxillary artery can be ligated in the pterygopalatine or infratemporal fossa by removal of the posterior wall of maxillary sinus.

A small area along the anterior aspect of the lateral nasal wall is supplied by a branch of the facial artery. The inferior part of the lateral nasal wall adjacent to the palate is supplied by the greater palatine artery.

The internal carotid artery contribution is via the anterior and posterior ethmoid arteries (branches of the ophthalmic artery) which supply the superior lateral wall. The anterior ethmoid artery traverses three compartments of the head during its course from the orbit to the olfactory fossa and into the nasal cavity.

After branching from the ophthalmic artery in the orbit, the anterior ethmoid artery passes between the superior oblique and medial rectus muscles through the anterior ethmoid foramen. This portion is easily identified on pre-operative coronal CT imaging. The anterior ethmoid artery travels through the ethmoid cavity obliquely in a posterior to anterior direction either within the bone of the skull base or a mucosal mesentery.

The artery traverses intra-cranially into the olfactory fossa through the lateral lamella of the lamina cribrosa. After entering the intra-cranial cavity, it gives off anterior meningeal branches before re-entering the nasal cavity through the cribro ethmoidal foramen. Within the nasal cavity, it divides into the anterior and posterior nasal arteries. The anterior and posterior nasal arteries each give rise to lateral and medial branches that supply the lateral nasal wall and nasal septum respectively.

The anterior ethmoid artery is more difficult to access surgically, with only 20% of arteries found within a mesentery that can be successfully clipped via a transnasal approach. Endoscopic removal of the lamina papyracea allows identification of the anterior and posterior ethmoid arteries between the periorbita and skull base.

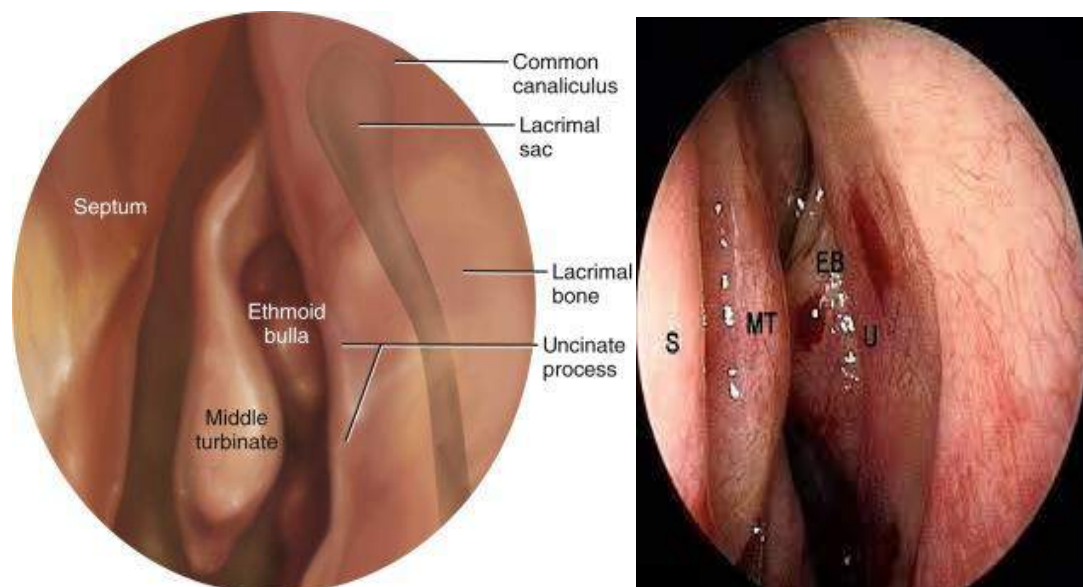
Surgical anatomy of the paranasal sinuses

An understanding of sinonasal anatomy is critical to ensure safe and complete endoscopic sinus surgery, the concept of pneumatization pathways and development is highly variable and often distorted by disease or prior surgery. Endoscopic sinus surgery is an exercise of anatomical dissection around fixed anatomical landmarks and the sinus surgeon must identify the following key anatomical landmarks in order to delineate the limits of dissection which include: (1) the maxillary sinus, (2) the orbit from the maxillary sinus roof / orbital floor and medial orbital wall (lamina papyracea) and (3) skull base identified posteriorly by the sphenoid sinus.

The concept of the sinonasal compartment or functional unit has clinical relevance during endoscopic sinus surgery. Once a compartment is entered with surgical instrumentation, all diseased mucosal cells within the compartment must be completely dissected in order to remove

obstructive phenomenon, avoid leaving behind disconnected cells from the surgical cavity, prevent mucocele formation, re-establish post-surgical mucociliary function that is free of recirculation effects, and enable maximal delivery of topical therapy. The ultimate goal of surgery (whether limited or extensive) is the creation of a new functional sinus cavity.

ETHMOID BULLA



The ethmoid bulla is the largest and most consistent anterior ethmoid air cell. It attaches to the lamina papyracea laterally and has variable attachments to the skull base and basal lamella creating a series of clefts and spaces within the middle meatus. A variant of normal anatomy in this region is called a Haller cell. A Haller cell is an infraorbital anterior ethmoid cell that pneumatizes into the maxillary

sinus and may cause obstruction of the maxillary sinus ostium. Complete removal of the ethmoid bulla is critical to define the medial orbital wall as a landmark.

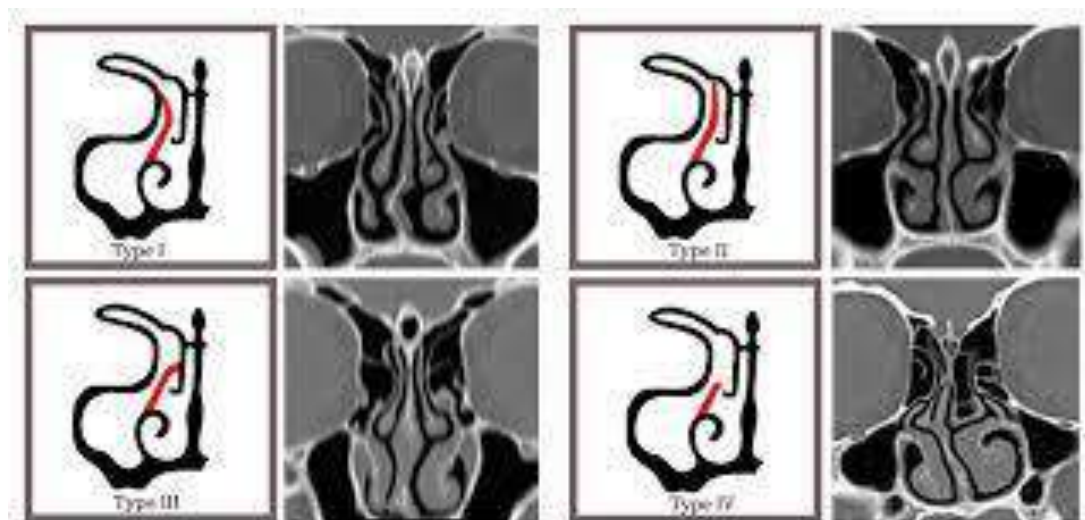
The agger nasi is the anterior most ethmoid air cell and its medial border is formed by the uncinate process. The degree of pneumatization of the agger nasi influences the position of the superior uncinate process and thickness of the bony nasofrontal beak.

The uncinate process can insert into the medial orbital wall, skull base or middle turbinate. Recent studies have demonstrated that the uncinate has multiple attachments in more than 50% of cases rather than a single attachment pattern. Classic teaching that describes three distinct attachments of the uncinate process which determines the direction of the frontal sinus drainage pathway is neither surgically relevant nor accurate. The uncinate process inserts onto the medial orbital wall in 85% of cases. Thus, the frontal recess drainage pathway is medial to the uncinate process in 85% of cases.

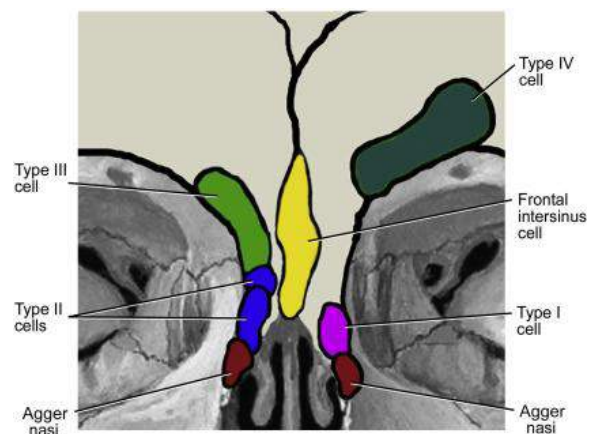
An uncinate process with an isolated attachment to either the skull base or middle turbinate (without attachment to the medial orbital wall) occurs in only 15% of cases. This attachment pattern leads to a surgically obvious frontal drainage pathway located lateral to the uncinate process

that is easily identified at the time of surgery. The surgical rule holds true that the frontal recess is medial to the remnant uncinate process or 'vertical bar' in 85% of cases with the other uncinate attachments representing easy surgical arrangements.

PATTERNS OF ATTACHMENT OF UNCINATE PROCESS



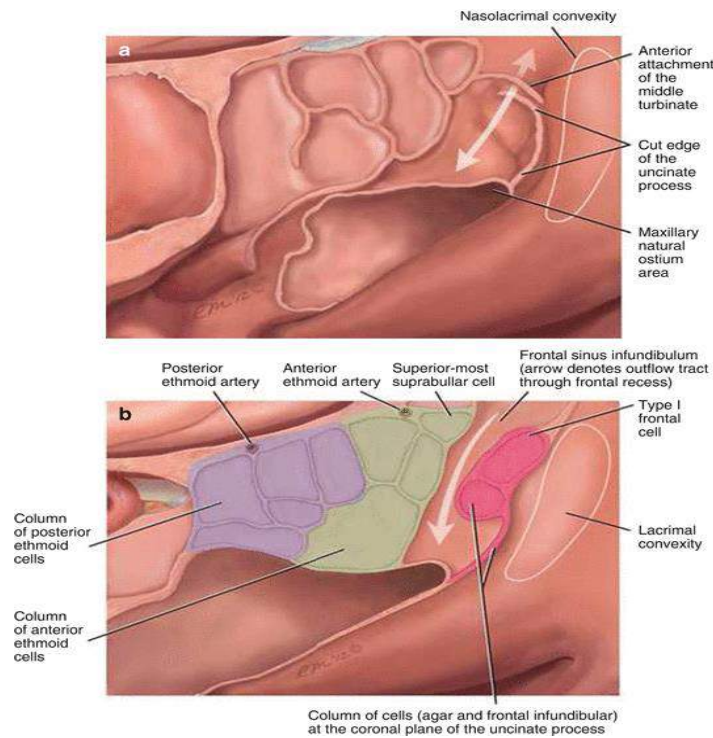
Frontal cells



They represent cells of the first ethmoturbinal that pneumatize above the agger nasi towards the frontal sinus. According to the Kuhn classification, a type 1 frontal cell is a single frontal ethmoidal cell above the agger nasi and below the frontal sinus floor, type 2 is a tier of cells above the agger nasi, type 3 is a cell pneumatizing into the floor of the frontal sinus and type 4 is an isolated frontal ethmoid cell within the frontal sinus. Using multi-planar reconstructed imaging, Wormald further modified this classification to more accurately describe type 3 cells as frontal ethmoidal cells that fill less than 50% of the frontal sinus and type 4 cells as filling greater than 50% of the frontal sinus.

These classifications of frontal cells are primarily to ensure that the surgeon's view of a large frontal recess cell lumen will not be mistaken for the true frontal sinus. Identification of these frontal cells on pre-operative imaging prevents false assumption of completion sinusotomy

Supraorbital ethmoid and suprabulla cells



Posterior structures encroaching on the frontal recess include supraorbital ethmoid cells, suprabulla cells and the ethmoid bulla . Supraorbital ethmoid cells are anterior ethmoid air cells that extend superiorly and laterally over the orbital roof. These cells are recognised on imaging giving the appearance of a septated frontal sinus on coronal view and a cell located posterior and lateral to the frontal sinus on axial view.

Supraorbital ethmoid cells have three clinically significant features relevant to the frontal recess: (1) they can cause obstruction of the frontal recess, (2) they can be falsely mistaken for the true frontal sinus leading

to incomplete surgical dissection and (3) they are associated with a low position of the anterior ethmoid artery within a mesentery because these cells pneumatize downward from the skull base behind the artery. The supraorbital ethmoid cell also creates a very narrow orbitocranial cleft posteriorly that can be very challenging to operate within. Suprabulla or frontal bulla cells are pneumatized extensions above the ethmoid bulla up the skull base and on the posterior table of the frontal sinus. These cells can become quite large and mistaken for either the skull base or posterior table of the frontal sinus. Failure to recognize these cells on pre-operative imaging will also result in incomplete surgical dissection of the frontal recess.

- Supraorbital ethmoid cells have significant features relevant to the frontal recess as they can: (1) cause obstruction of the frontal recess, (2) be falsely mistaken for the true frontal sinus leading to incomplete surgical dissection and (3) be associated with a low position of the anterior ethmoid artery within a mesentery placing this artery at risk of injury during surgery.
- Suprabulla cells pneumatize up the skull base and failure to recognize these cells pre-operatively will result in incomplete surgical dissection of the frontal recess.

Medial structures encroaching on the frontal recess include intersinus septal cells and medially inserting uncinata process. Intersinus septal cells represent pneumatization of the frontal sinus septum. Lateral encroaching structures include frontal cells, agger nasi and a lateral uncinata process attachment.

Posterior functional unit

The posterior functional unit is comprised of the posterior ethmoid air cells with drainage into the superior meatus. A variant of normal anatomy in this region is a lateral and posterior pneumatization of a posterior ethmoid cell called an Onodi cell . Onodi cells pneumatize over the optic nerve exposing this critical structure to injury during surgery. These cells can also be mistaken for the true sphenoid sinus leading to incomplete surgery.

An Onodi cell can be identified on the coronal view CT sinus as giving the appearance of a horizontal septation within the sphenoid sinus.

Sphenoid functional unit

The sphenoid functional unit is comprised of the sphenoid sinus which drains into the sphenoethmoid recess. Identification of the sphenoid sinus enables the surgeon to determine the level of the posterior skull base at its lowest position. The sphenoethmoid recess is the space between the superior meatus and septum. The supreme turbinate may be

seen here. The sphenoid ostium opens behind the superior turbinate and is neither medial nor lateral to it.

Complete removal of the anterior sphenoid wall laterally enables the surgeon to identify the medial orbital wall at its posterior position. The main structures associated with the sphenoid sinus include the optic nerve, carotid artery and sella turcica where the pituitary gland is located. The pneumatization pattern of the sphenoid sinus can be variable. The different types include sellar (90%), presellar (9%) and conchal (1%) pneumatization patterns.

The sellar type describes sphenoid pneumatization posterior to the sella turcica. The pre-sellar type describes sphenoid pneumatization up to the anterior sella and the conchal type describes a shallow bowl with minimal sphenoid pneumatization and trabecular bone

PHYSIOLOGY OF PARANASAL SINUSES

The physiological role of the paranasal sinuses is uncertain, but a number of possible functions have been suggested.

This includes the following:

- Providing a physical buffer against injury to the face
- Vocal resonance
- Reduction of skull weight

- Humidification
- Heat insulation
- Air conditioning

EFFECT OF SMOKING ON THE NOSE

Tobacco contains hundreds of noxious chemicals and when smoked can irritate the lining of the nose resulting in increased nasal secretions and congestion caused by impairment mucociliary clearance. Smoking causes a reduction in the number of cilia and change in mucous viscosity. Studies have shown that eight hours after exposure to tobacco smoke the efficiency of mucociliary clearance had reduced, with heavier smokers having more marked.

DEFINITION OF RHINOSINUSITIS:

The European position paper on rhinosinusitis (EPOS) ¹has now defined rhinosinusitis as a diagnosis made on clinical grounds based on the presence of characteristic symptoms combined with objective evidence of mucosal inflammation

Diagnostic criteria for rhinosinusitis	Symptoms should be correlated by endoscopy or radiological findings
Primary symptoms (requires at least 1 symptom to be present, but if both it is sufficient to make diagnosis.	Nasal blockage/ obstruction/congestion/ Nasal discharge (anterior/posterior)
Additional symptoms (may also be present and atleast 1 is needed if 1 of the primary symptoms is present)	Facial pain/pressure Olfactory dysfunction Hyposmia/anosmia
Duration	>10 days ,<3 months, =acute >3 months=chronic
Endoscopy (any of these)	Nasal polyps, mucopurulent discharge ,edema or mucosal obstruction in middle meatus
CT scan	Mucosal changes within the osteomeatal complex and /or sinuses

Endoscopic and CT- based staging system are used to determine the extent of disease within nose and sinuses .

The Lund and Kennedy Endoscopic staging of polyps³³

Polyp	<p>0=absence of polyp</p> <p>1=polyps in middle meatus only</p> <p>2=beyond middle meatus</p>
Odema	<p>0=absent</p> <p>1=mild</p> <p>2=severe</p>
Discharge	<p>0=no discharge</p> <p>1=clear,thin discharge</p> <p>2=thick discharge</p>
Scarring	<p>0=absent</p> <p>1=mild</p> <p>2=severe</p>
Crusting	<p>0=absent</p> <p>1=mild</p> <p>2=severe</p>

PRE OPERATIVE DIAGNOSTIC NASAL ENDOSCOPY

(DNE)IMAGES



Chronic sinusitis with Antra
Choanal polyp

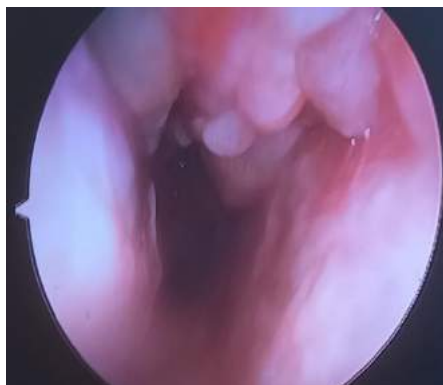


Chronic rhinosinusitis with nasal
polyposis



Crusts, secretions and polyps in a post
op FESS case, planned for revision

FESS



CRS with multiple pale polyps

Various radiological staging systems have been described. The Lund - Mackay³⁵ system gives a score of 0-2 depending on the absence, partial opacification or complete opacification of the each sinus system and of osteomeatal complex on computed tomography scanning,



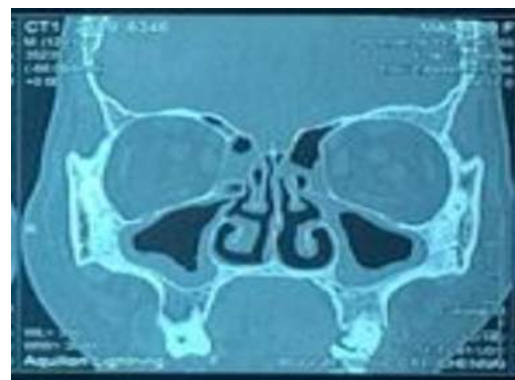
CT PNS showing Antro Choanal Polyp



Pre OP CT PNS showing bilateral maxillary sinusitis with inferior turbinate hypertrophy



CT PNS showing pansinusitis



Partial opacification of Maxillary sinus

MATERIALS AND METHODS

STUDY DESIGN: Prospective cohort study

STUDY SETTING:

Upgraded Institute of Otorhinolaryngology,

Rajiv Gandhi Government General Hospital, Chennai.

STUDY PERIOD:

November 2020- December 2021

STUDY SUBJECTS:

Inclusion criteria:

1. Age >18 years
2. Both sexes.
3. Cases diagnosed as Chronic Rhino Sinusitis who remained refractory to medical management (>3 months)including topically administered corticosteroids.

Exclusion criteria :

1. Who doesn't give informed consent
2. Patient not willing for follow up
3. Patient not willing for surgery
4. Immunocompromised patients
5. Patients with autoimmune diseases and pre existing systemic granulomatous diseases, cystic fibrosis, ciliary dyskinesias.

SAMPLE SIZE : 200

TOOLS AND TECHNIQUE :

1. Case Definition : Patients with chronic Rhinosinusitis who were refractory to medical management and not getting relieved by topical steroids and with characteristic radiological findings ,required surgical intervention by Functional Endoscopic Sinus Surgery.

2. All of them were evaluated using thorough clinical ENT examination, Computerized Tomography of the paranasal sinuses and Diagnostic Nasal Endoscopy and SNOT 22 questionnaire was used preoperatively to assess the severity of symptoms.

Functional Endoscopic Sinus Surgery was done in all patients under General Anaesthesia by following Messerklinger technique .

SNOT 22 score was applied Post Endoscopic Sinus Surgery during the follow up period within 3 months. In the post operative period the patients were advised antibiotics and alkaline nasal douching and was prescribed flomist(fluticasone) nasal spray for 3 months.

The SNOT 22 questionnaire consists of four important categories

- NOSE RELATED
 - Need to blow nose
 - Sneezing
 - Runny nose
 - Nasal obstruction
 - Loss of smell and taste
 - Post Nasal Drip (PND)

- EAR AND FACE RELATED _
 - Ear fullness
 - Dizziness
 - Ear pain
 - Facial pain and Pressure

- QUALITY OF LIFE RELATED _
 - Difficulty in falling asleep
 - Waking up at night
 - Wake up tired
 - Fatigue
 - Reduced productivity
 - Reduced concentration

- PSYCHOLOGY RELATED
 - Frustrated / Restless /Irritable/
 - Sad
 - Embarrassed

STATISTICAL ANALYSIS :

Data are presented as percentages and the number of cases. Categorical data were analyzed with Pearson chi-square test. Significance was defined by p-values less than 0.05 using a two-tailed test. Data analysis was performed using IBM-SPSS version 21.0 (IBM-SPSS Science Inc., Chicago, IL)

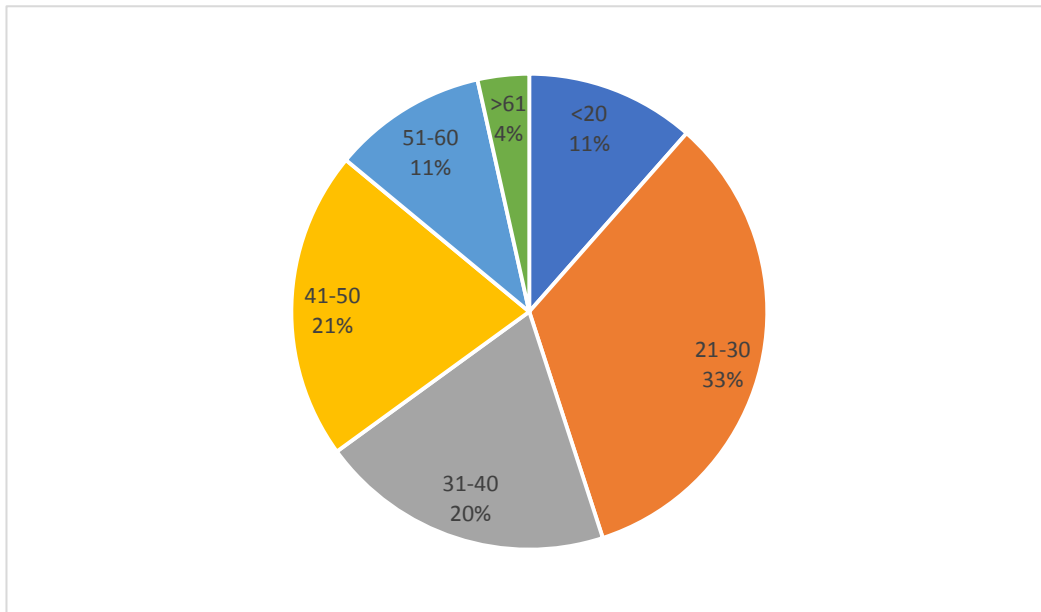
RESULTS

A) AGE WISE DISTRIBUTION :

Age wise distribution of our study group is given in the following table.

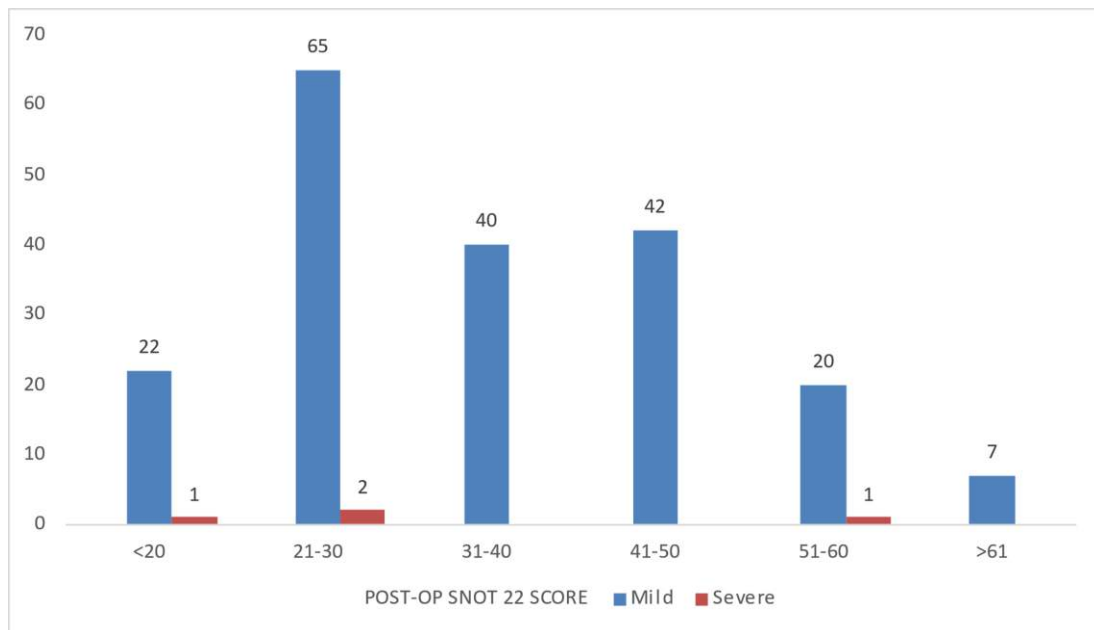
Percentage distribution of the study group by age

AGE GROUP	Frequency	Percentage
<20	23	11.5
21-30	67	33.5
31-40	40	20.0
41-50	42	21.0
51-60	21	10.5
>61	7	3.5
Total	200	100.0



Comparison of age with SNOT scores

		POST-OP SNOT 22 SCORE			Total	P value	
		Mild	Severe				
AGE GROUP	<20	Count	22	1	23	0.606	
		% within AGE GROUP	95.7%	4.3%	100.0%		
	21-30	Count	65	2	67		
		% within AGE GROUP	97.0%	3.0%	100.0%		
	31-40	Count	40	0	40		
		% within AGE GROUP	100.0%	0.0%	100.0%		
	41-50	Count	42	0	42		
		% within AGE GROUP	100.0%	0.0%	100.0%		
	51-60	Count	20	1	21		
		% within AGE GROUP	95.2%	4.8%	100.0%		
	>61	Count	7	0	7		
		% within AGE GROUP	100.0%	0.0%	100.0%		
	Total		Count	196	4		200
			% within AGE GROUP	98.0%	2.0%		100.0%



PERCENTAGE DISTRIBUTION OF AGE

Out of the 200 patients , 67 were between 21 to 30 year (33%) followed by 42 patients (21%) and 40 patients (20%) only 7 patients (3.5%) were above 60 yrs

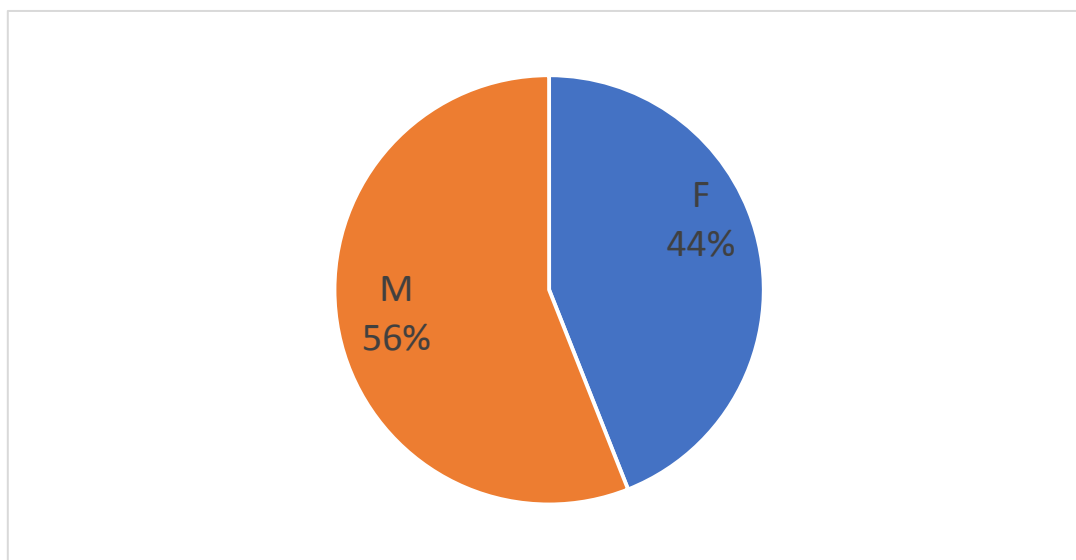
The correlation between age and SNOT 22 scores was not statistically significant.

B) GENDER WISE DISTRIBUTION :

The gender wise distribution is given in the following table.

Percentage distribution of the study group by gender

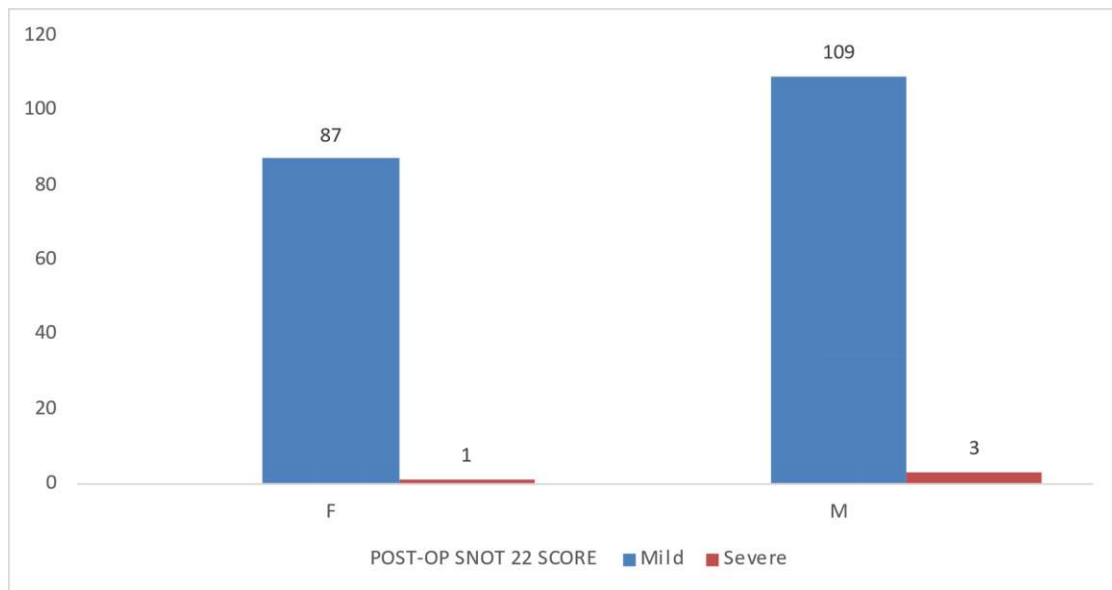
SEX	Frequency	Percentage
F	88	44.0
M	112	56.0
Total	200	100.0



Out of 200 patients Chronic Rhinosinusitis was more common in males (56%) than females (44%). There was no correlation between gender and SNOT scores .

Correlation between GENDER and SNOT 22 scores

			POST-OP SNOT 22 SCORE		Total	P value
			Mild	Severe		
SEX	F	Count	87	1	88	0.439
		% within SEX	98.9%	1.1%	100.0%	
	M	Count	109	3	112	
		% within SEX	97.3%	2.7%	100.0%	
Total		Count	196	4	200	
		% within SEX	98.0%	2.0%	100.0%	



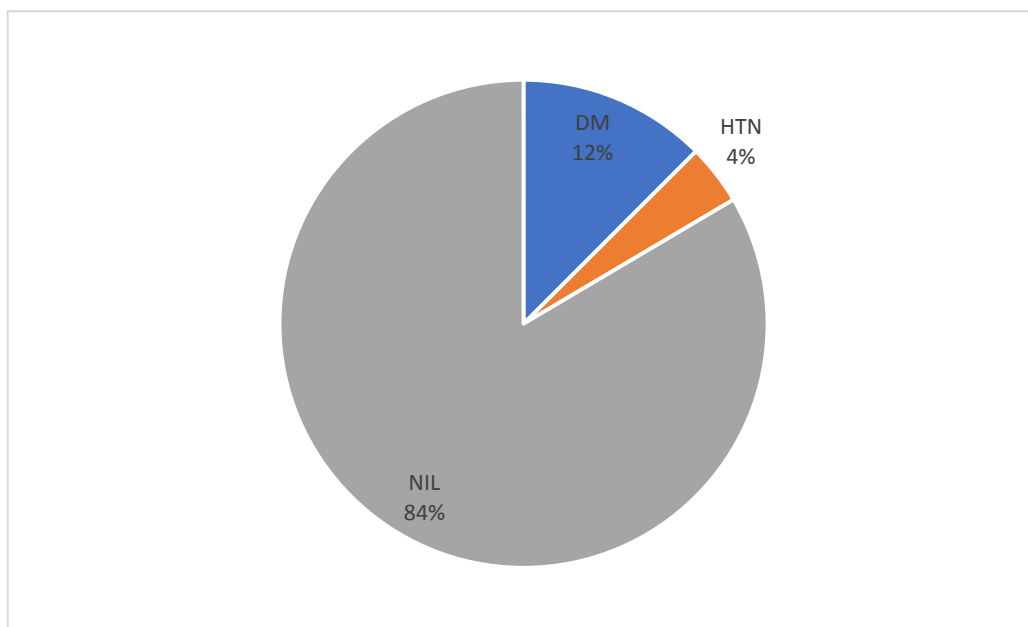
C) DISTRIBUTION OF COMORBIDITIES:

Distribution of comorbidities are given in the following table.

COMORBIDITIES : among the 200 patients 83% had no comorbidities while 12.5% were diabetic and 4% were hypertensive.

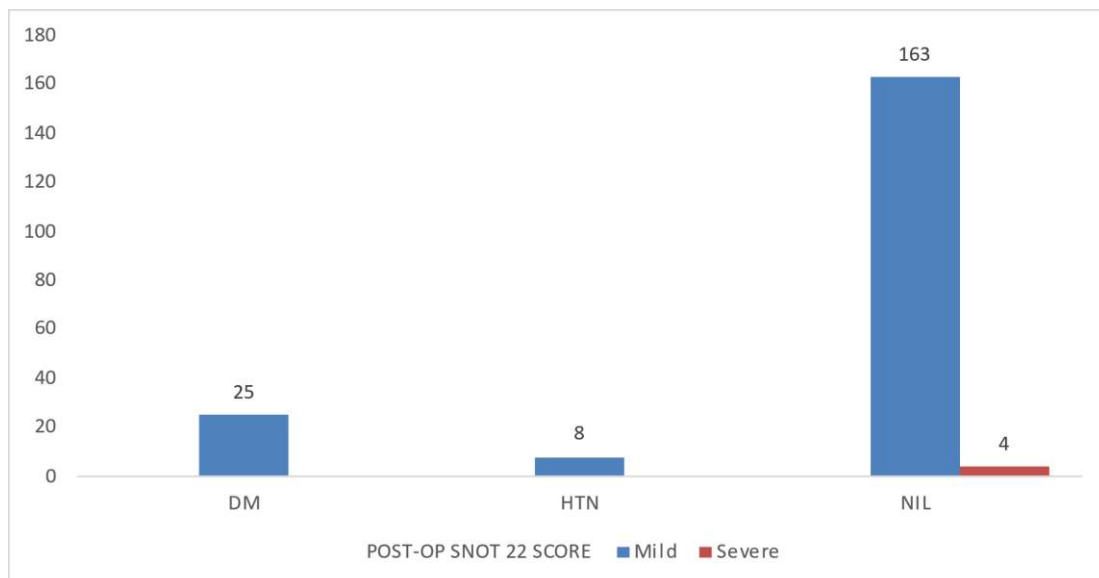
Distribution of comorbidities

COMORBIDITY	Frequency	Percentage
DM	25	12.5
HTN	8	4.0
NIL	167	83.5
Total	200	100.0



Correlation between comorbidity and SNOT 22 scores

			POST-OP SNOT 22 SCORE		Total	P value
			Mild	Severe		
COMORBIDITY	DM	Count	25	0	25	0.668
		% within COMORBIDITY	100.0%	0.0%	100.0%	
	HTN	Count	8	0	8	
		% within COMORBIDITY	100.0%	0.0%	100.0%	
	NIL	Count	163	4	167	
		% within COMORBIDITY	97.6%	2.4%	100.0%	
Total		Count	196	4	200	
		% within COMORBIDITY	98.0%	2.0%	100.0%	

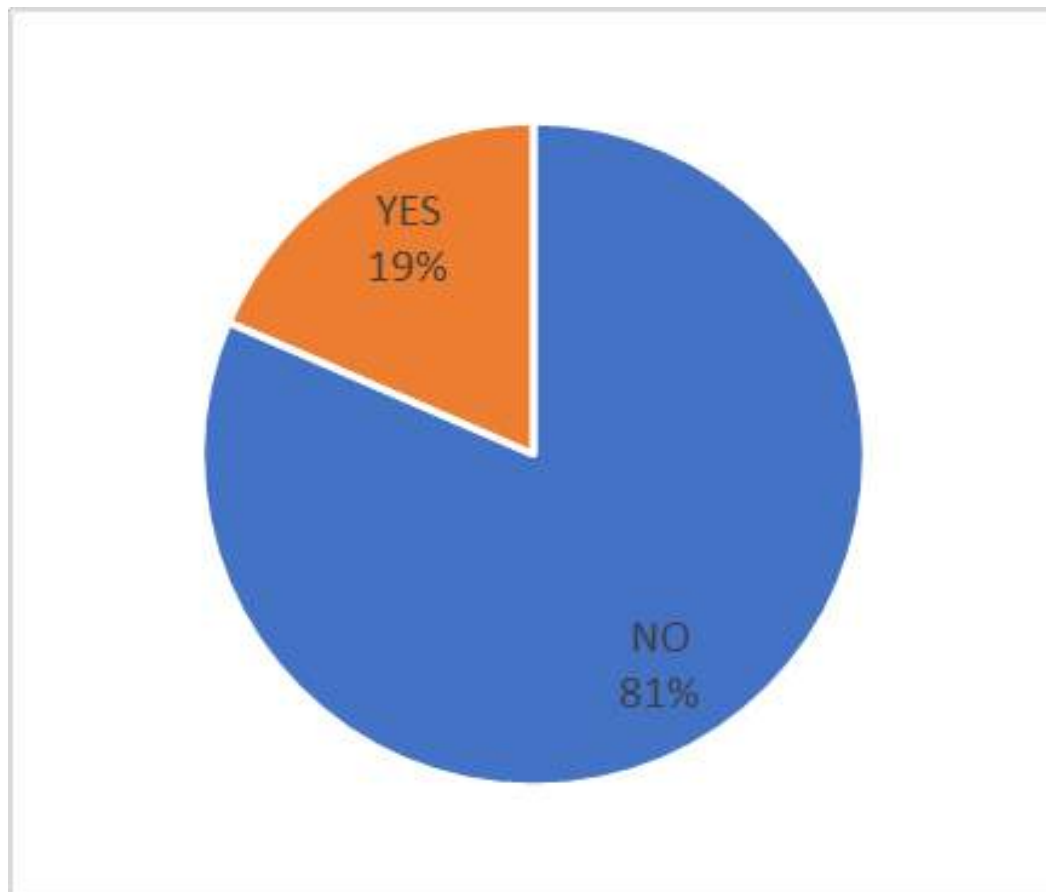


D) DISTRIBUTION OF SMOKING

SMOKING: out of our study sample of 200 patients only 18.5% were smokers and 81.5% were non smokers.

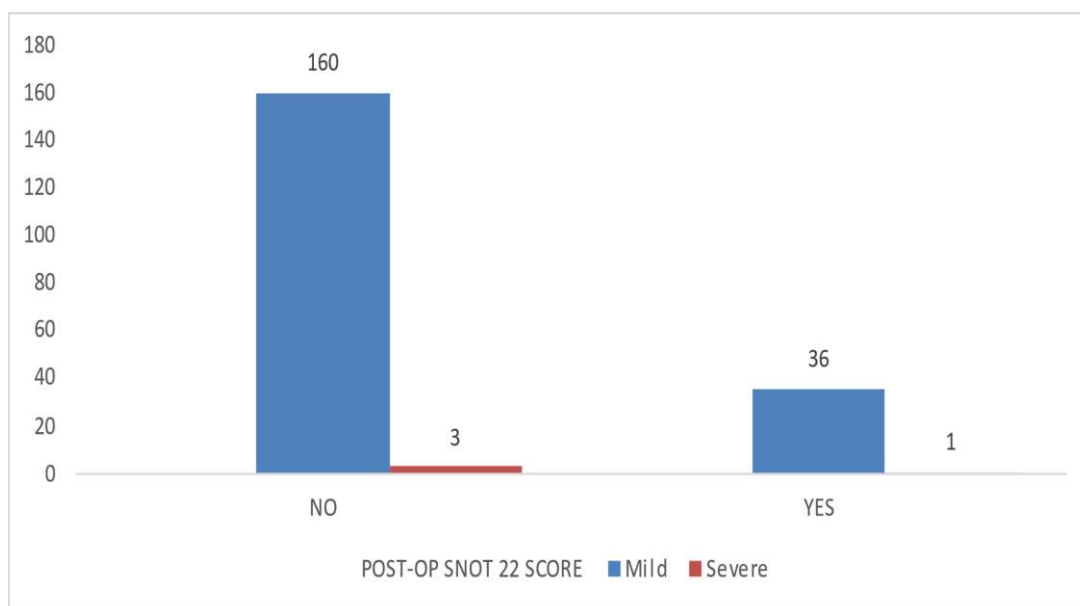
Distribution of Smoking

SMOKING	Frequency	Percent
NO	163	81.5
YES	37	18.5
Total	200	100.0



Correlation between Smoking and SNOT scores

			POST-OP SNOT 22 SCORE		Total	P value
			Mild	Severe		
SMOKING	NO	Count	160	3	163	0.735
		% within SMOKING	98.2%	1.8%	100.0%	
	YES	Count	36	1	37	
		% within SMOKING	97.3%	2.7%	100.0%	
Total		Count	196	4	200	
		% within SMOKING	98.0%	2.0%	100.0%	

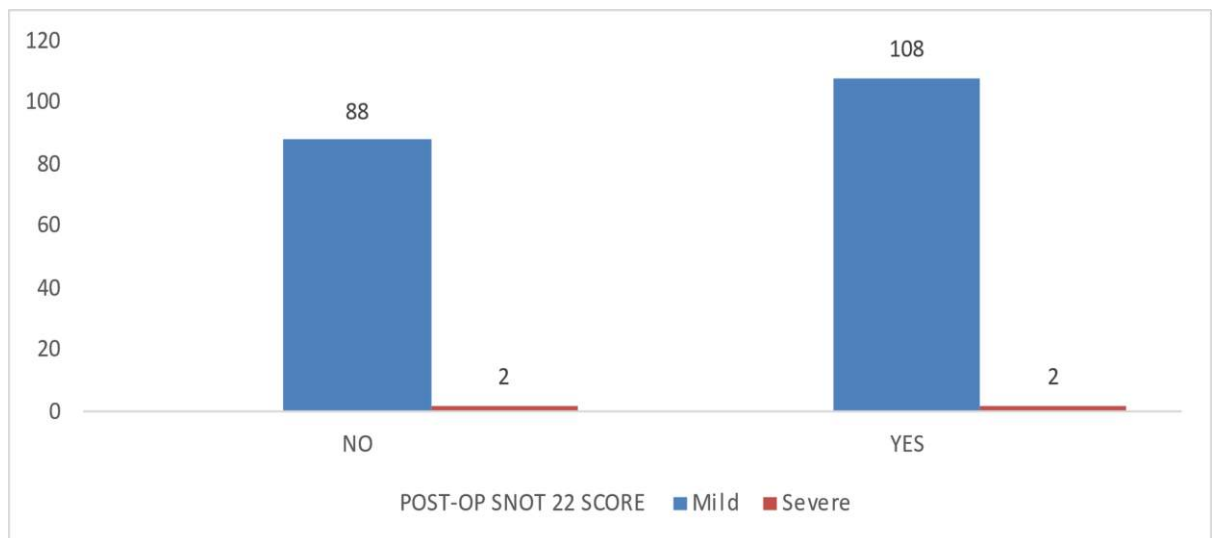


E) ALLERGY: Out of 200 patients more than half of (55%) had allergy history while 45% had no allergy history.

Distribution of allergy in our study group

ALLERGY	Frequency	Percent
NO	90	45.0
YES	110	55.0
TOTAL	200	100.0

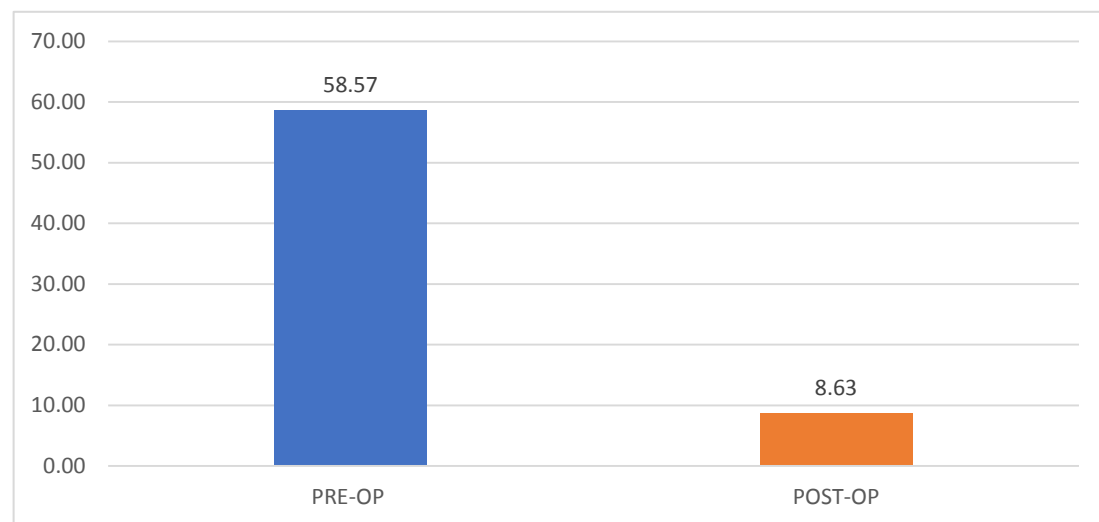
			POST-OP SNOT 22 SCORE		Total	P value
			Mild	Severe		
ALLERGY	NO	Count	88	2	90	0.839
		% within ALLERGY	97.8%	2.2%	100.0%	
	YES	Count	108	2	110	
		% within ALLERGY	98.2%	1.8%	100.0%	
Total		Count	196	4	200	
		% within ALLERGY	98.0%	2.0%	100.0%	



Mean Preop and Post op SNOT 22 score

The following table depicts the mean preoperative and mean postoperative SNOT 22 score

SNOT 22 SCORE	Mean	Std. Deviation	P value
PRE-OP	58.57	10.43	<0.0001
POST-OP	8.63	8.79	



Mean Preop and Post op SNOT 22 score

Mean pre-operative SNOT 22 score was 58.57 % and mean post operative Score was 8.63% and was statistically significant.

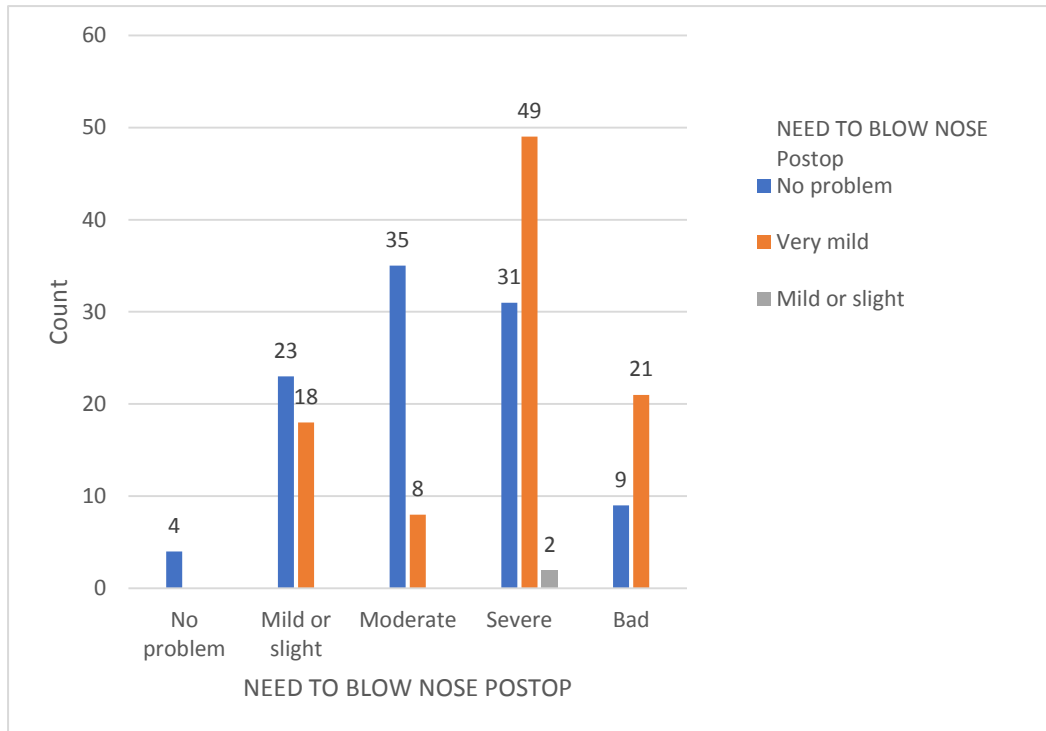
Frequency distribution of Need to blow nose PREOP Need to blow nose POST OP

	Frequency	Percent
No problem	4	2.0
Mild or slight	41	20.5
Moderate	43	21.5
Severe	82	41.0
Bad	30	15.0
Total	200	100.0

	Frequency	Percent
No problem	102	51.0
Very mild	96	48.0
Mild or slight	2	1.0
Total	200	100.0

NEED TO BLOW NOSE - PRE OP AND POST OP COMPARISON

			NEED TO BLOW NOSE POST OP			Total	P value
			No problem	Very mild	Mild or slight		
NEED TO BLOW NOSE PRE OP	No problem	Count	4	0	0	4	<0.0001
		% within NEED TO BLOW NOSE	100.0%	0.0%	0.0%	100.0%	
	Mild or slight	Count	23	18	0	41	
		% within NEED TO BLOW NOSE	56.1%	43.9%	0.0%	100.0%	
	Moderate	Count	35	8	0	43	
		% within NEED TO BLOW NOSE	81.4%	18.6%	0.0%	100.0%	
	Severe	Count	31	49	2	82	
		% within NEED TO BLOW NOSE	37.8%	59.8%	2.4%	100.0%	
	Bad	Count	9	21	0	30	
		% within NEED TO BLOW NOSE	30.0%	70.0%	0.0%	100.0%	
Total		Count	102	96	2	200	
		% within NEED TO BLOW NOSE	51.0%	48.0%	1.0%	100.0%	



NEED TO BLOW NOSE PREOP AND POST OP COMPARISON

The preop and post op comparison scores of “Need to blow nose” was statistically significant since p value was < 0.001

FREQUENCY DISTRIBUTION OF SNEEZING PREOP

	Frequency	Percent
No problem	5	2.5
Very mild	43	21.5
Mild or slight	4	2.0
Moderate	77	38.5
Severe	69	34.5
Bad	2	1.0
Total	200	100.0

FREQUENCY DISTRIBUTION OF SNEEZING POSTOP

	Frequency	Percent
No problem	108	54.0
Very mild	92	46.0
Total	200	100.0

PREOP AND POSTOP COMPARISON OF SNEEZING

		SNEEZING POST OP		Total	P value		
		No problem	Very mild				
SNEEZING PRE OP	No problem	Count	4	1	5	<0.0001	
		% within SNEEZING	80.0%	20.0%	100.0%		
	Very mild	Count	36	7	43		
		% within SNEEZING	83.7%	16.3%	100.0%		
	Mild or slight	Count	3	1	4		
		% within SNEEZING	75.0%	25.0%	100.0%		
	Moderate	Count	12	65	77		
		% within SNEEZING	15.6%	84.4%	100.0%		
	Severe	Count	52	17	69		
		% within SNEEZING	75.4%	24.6%	100.0%		
	Bad	Count	1	1	2		
		% within SNEEZING	50.0%	50.0%	100.0%		
	Total		Count	108	92		200
			% within SNEEZING	54.0%	46.0%		100.0%

The comparison of pre op and post op scores of "SNEEZING" was statistically significant and p value was <0.001

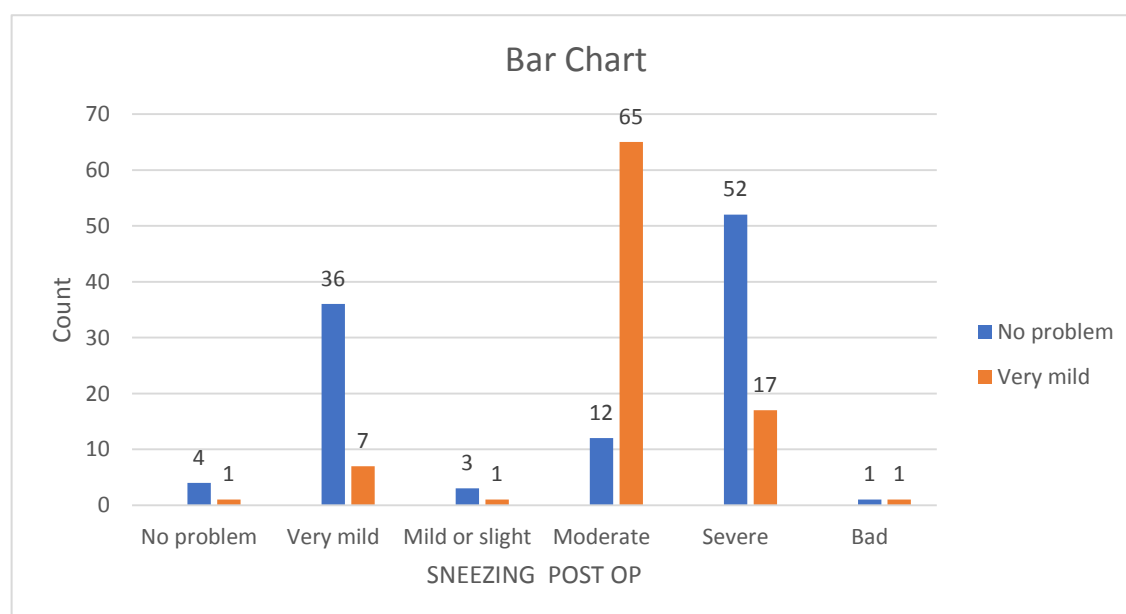


Table 7.3 PREOP AND POST OP COMPARISON OF “RUNNY NOSE ”

			RUNNY NOSE POST OP		Total	P value	
			No problem	Very mild			
RUNNY NOSE PRE OP	No problem	Count	5	0	5	<0.0001	
		% within RUNNY NOSE	100.0%	0.0%	100.0%		
	Very mild	Count	13	5	18		
		% within RUNNY NOSE	72.2%	27.8%	100.0%		
	Mild or slight	Count	29	5	34		
		% within RUNNY NOSE	85.3%	14.7%	100.0%		
	Moderate	Count	62	8	70		
		% within RUNNY NOSE	88.6%	11.4%	100.0%		
	Severe	Count	43	3	46		
		% within RUNNY NOSE	93.5%	6.5%	100.0%		
	Bad	Count	1	26	27		
		% within RUNNY NOSE	3.7%	96.3%	100.0%		
	Total		Count	153	47		200
			% within RUNNY NOSE	76.5%	23.5%		100.0%

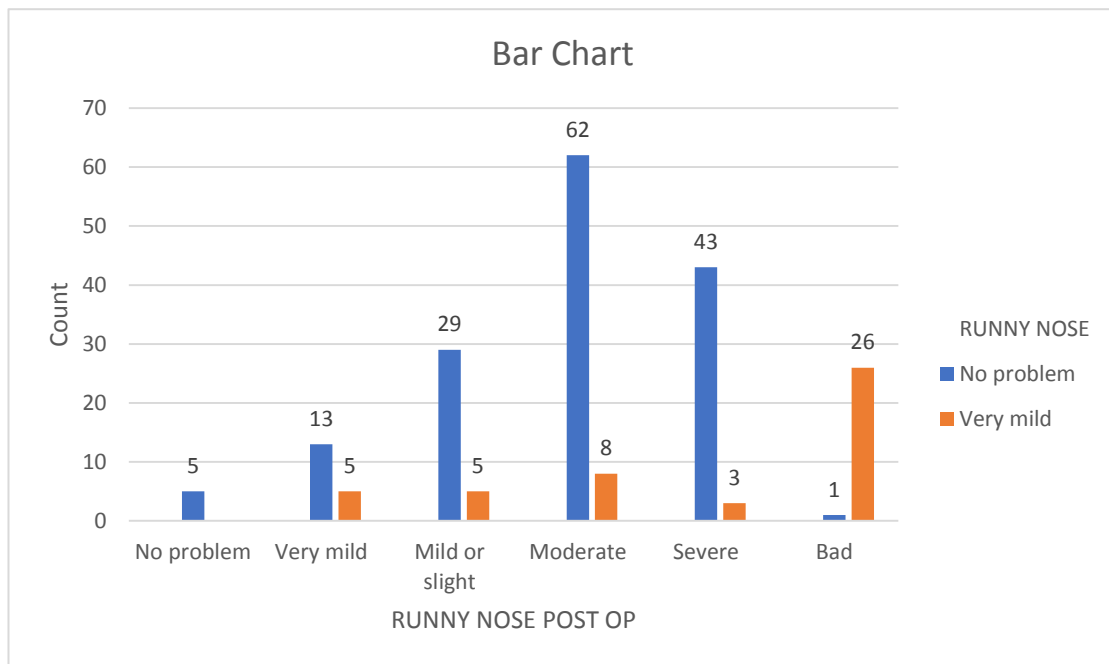
The Pre op and Post op comparison scores of Runny nose was statistically significant and p value was <0.001

FREQUENCY DISTRIBUTION OF RUNNY NOSE- PRE OP

No problem	5	2.5
Very mild	18	9.0
Mild or slight	34	17.0
Moderate	70	35.0
Severe	46	23.0
Bad	27	13.5
Total	200	100.0

FREQUENCY DISTRIBUTION OF RUNNY NOSE- POST OP

	Frequency	Percent
No problem	153	76.5
Very mild	47	23.5
Total	200	100.0



Frequency distribution of COUGH – PRE OP

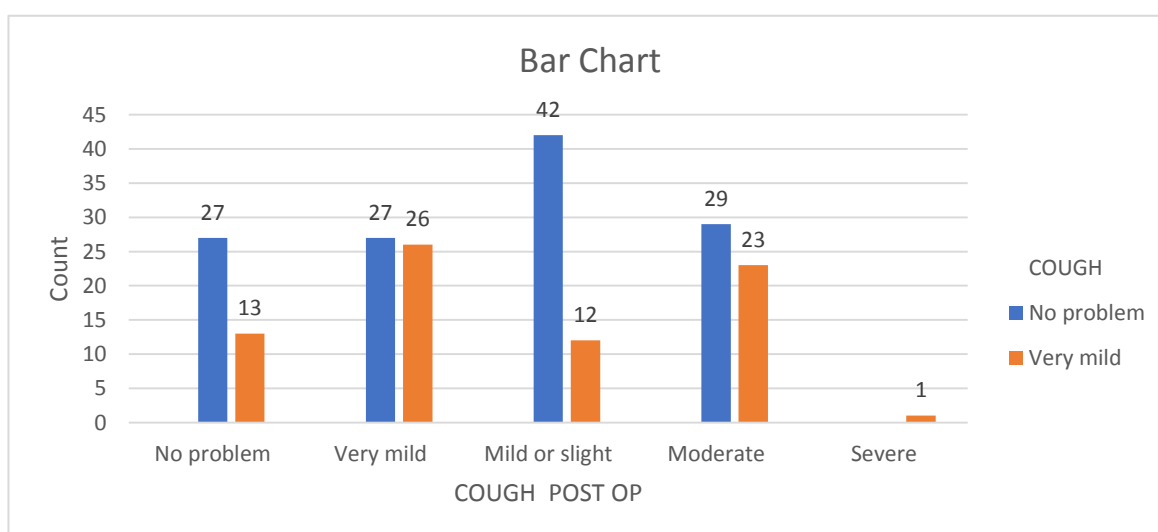
	Frequency	Percentage
No problem	40	20.0
Very mild	53	26.5
Mild or slight	54	27.0
Moderate	52	26.0
Severe	1	0.5
Total	200	100.0

Frequency distribution of Cough -Post op

		Frequency	Percentage
	No problem	125	62.5
	Very mild	75	37.5
	Total	200	100.0

Preop and Post Op Comparison of Cough

			Cough Post OP		Total	P value
			No problem	Very mild		
COUGH PRE OP	No problem	Count	27	13	40	0.022
		% within COUGH	67.5%	32.5%	100.0%	
	Very mild	Count	27	26	53	
		% within COUGH	50.9%	49.1%	100.0%	
	Mild or slight	Count	42	12	54	
		% within COUGH	77.8%	22.2%	100.0%	
	Moderate	Count	29	23	52	
		% within COUGH	55.8%	44.2%	100.0%	
	Severe	Count	0	1	1	
		% within COUGH	0.0%	100.0%	100.0%	
Total		Count	125	75	200	
		% within COUGH	62.5%	37.5%	100.0%	



PREOP & POST OP COMPARISON OF POST NASAL DRIP

			POST NASAL DRIP		Total	P value	
			No problem	Very mild			
POST NASAL DRIP	No problem	Count	0	1	1	<0.0001	
		% within POST NASAL DRIP	0.0%	100.0%	100.0%		
	Very mild	Count	19	4	23		
		% within POST NASAL DRIP	82.6%	17.4%	100.0%		
	Mild or slight	Count	19	34	53		
		% within POST NASAL DRIP	35.8%	64.2%	100.0%		
	Moderate	Count	45	21	66		
		% within POST NASAL DRIP	68.2%	31.8%	100.0%		
	Severe	Count	13	35	48		
		% within POST NASAL DRIP	27.1%	72.9%	100.0%		
	Bad	Count	4	5	9		
		% within POST NASAL DRIP	44.4%	55.6%	100.0%		
	Total		Count	100	100		200

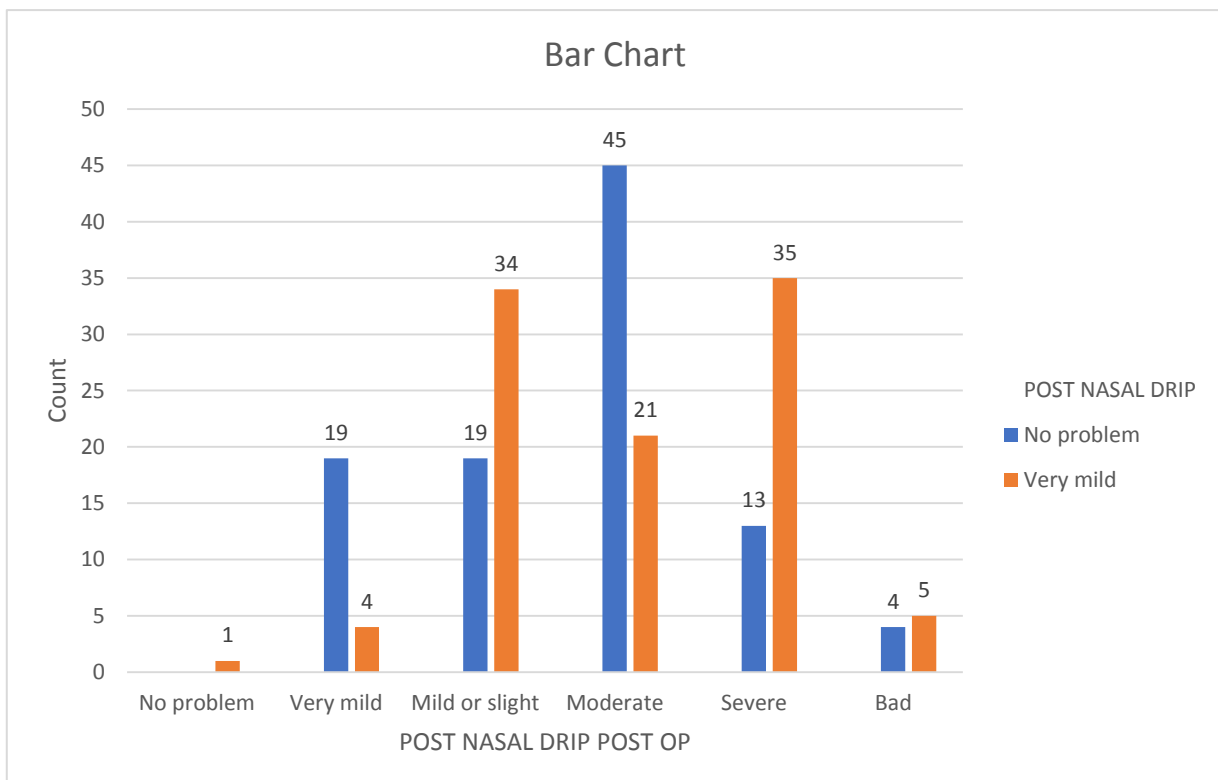
Pre op and post op comparison scores of “POST NASAL DRIP” were statistically significant since p value was <0.001

FREQUENCY DISTRIBUTION OF PREOP "POST NASAL DRIP"

		Frequency	Percentage
	No problem	1	0.5
	Very mild	23	11.5
	Mild or slight	53	26.5
	Moderate	66	33.0
	Severe	48	24.0
	Bad	9	4.5
	Total	200	100.0

Frequency distribution of post nasal drip post op

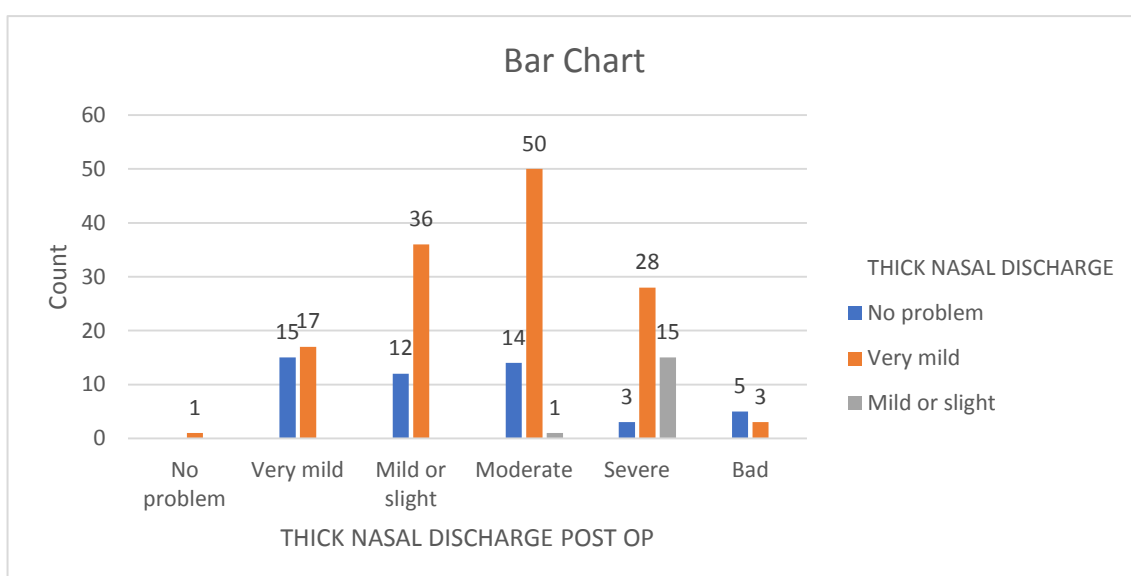
		Frequency	Percentage
	No problem	100	100
	Very mild	100	100
	Total	200	100



THICK NASAL DISCHARGE PREOP AND POST OP COMPARISON

			THICK NASAL DISCHARGE POST OP			Total	P value
			No problem	Very mild	Mild or slight		
THICK NASAL DISCHARGE PRE OP	No problem	Count	0	1	0	1	<0.0001
		% within THICK NASAL DISCHARGE	0.0%	100.0%	0.0%	100.0%	
	Very mild	Count	15	17	0	32	
		% within THICK NASAL DISCHARGE	46.9%	53.1%	0.0%	100.0%	
	Mild or slight	Count	12	36	0	48	
		% within THICK NASAL DISCHARGE	25.0%	75.0%	0.0%	100.0%	
	Moderate	Count	14	50	1	65	
		% within THICK NASAL DISCHARGE	21.5%	76.9%	1.5%	100.0%	
	Severe	Count	3	28	15	46	
		% within THICK NASAL DISCHARGE	6.5%	60.9%	32.6%	100.0%	
	Bad	Count	5	3	0	8	
		% within THICK NASAL DISCHARGE	62.5%	37.5%	0.0%	100.0%	
	Total	Count	49	135	16	200	
		% within THICK NASAL DISCHARGE	24.5%	67.5%	8.0%	100.0%	

PREOP and POST OP comparison of post nasal drip scores was statistically significant $P < 0.001$



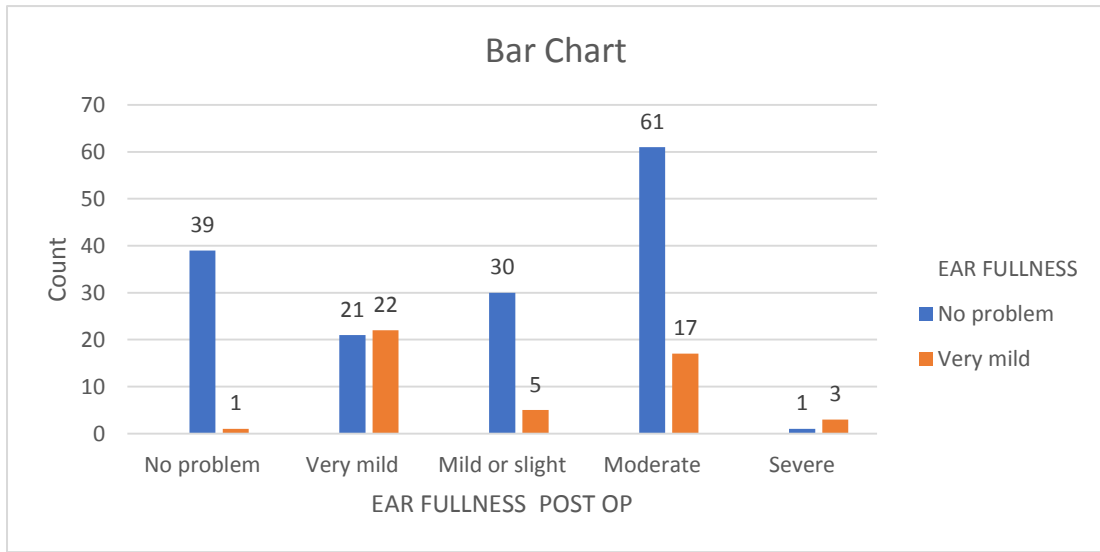
FREQUENCY DISTRIBUTION OF THICK NASAL DISCHARGE POST OP

		Frequency	Percent
	No problem	49	24.5
	Very mild	135	67.5
	Mild or slight	16	8.0
	Total	200	100.0

EAR FULLNESS PREOP AND POST OP COMPARISON

			EAR FULLNESS POST OP		Total	P value
			No problem	Very mild		
EAR FULLNESS PRE OP	No problem	Count	39	1	40	<0.0001
		% within EAR FULLNESS	97.5%	2.5%	100.0%	
	Very mild	Count	21	22	43	
		% within EAR FULLNESS	48.8%	51.2%	100.0%	
	Mild or slight	Count	30	5	35	
		% within EAR FULLNESS	85.7%	14.3%	100.0%	
	Moderate	Count	61	17	78	
		% within EAR FULLNESS	78.2%	21.8%	100.0%	
	Severe	Count	1	3	4	
		% within EAR FULLNESS	25.0%	75.0%	100.0%	
Total		Count	152	48	200	
		% within EAR FULLNESS	76.0%	24.0%	100.0%	

The comparison of preop and post op EAR FULLNESS scores was statistically significant $P < 0.001$



FREQUENCY DISTRIBUTION OF EAR FULLNESS PRE OP

		Frequency	Percent
	No problem	40	20.0
	Very mild	43	21.5
	Mild or slight	35	17.5
	Moderate	78	39.0
	Severe	4	2.0
	Total	200	100.0

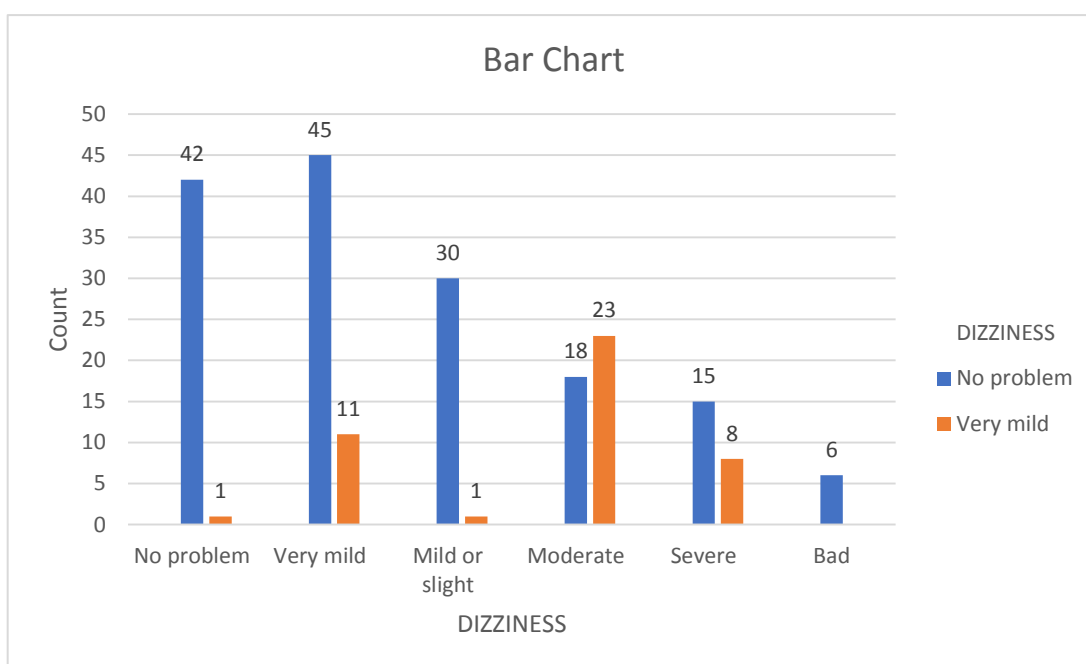
FREQUENCY DISTRIBUTION OF EAR FULLNESS POST OP

		Frequency	Percent
	No problem	152	76.0
	Very mild	48	24.0
	Total	200	100.0

DIZZINESS- PREOP AND POST OP COMPARISON

		DIZZINESS POST OP			Total	P value
		No problem	Very mild			
DIZZINESS PRE OP	No problem	Count	42	1	43	<0.0001
		% within DIZZINESS	97.7%	2.3%	100.0%	
	Very mild	Count	45	11	56	
		% within DIZZINESS	80.4%	19.6%	100.0%	
	Mild or slight	Count	30	1	31	
		% within DIZZINESS	96.8%	3.2%	100.0%	
	Moderate	Count	18	23	41	
		% within DIZZINESS	43.9%	56.1%	100.0%	
	Severe	Count	15	8	23	
		% within DIZZINESS	65.2%	34.8%	100.0%	
Bad	Count	6	0	6		
	% within DIZZINESS	100.0%	0.0%	100.0%		
Total		Count	156	44	200	
		% within DIZZINESS	78.0%	22.0%	100.0%	

Comparison of pre op and post op dizziness was statistically significant , $p < 0.001$.



FREQUENCY DISTRIBUTION OF DIZZINESS PRE OP

	Frequency	Percent
No problem	43	21.5
Very mild	56	28.0
Mild or slight	31	15.5
Moderate	41	20.5
Severe	23	11.5
Bad	6	3.0
Total	200	100.0

FREQUENCY DISTRIBUTION OF DIZZINESS POST OP

	Frequency	Percent
No problem	156	78.0
Very mild	44	22.0
Total	200	100.0

EAR PAIN /EAR PRESSURE PRE OP AND POST OP COMPARISON

			EAR PAIN /EAR PRESSURE POST OP		Total	P value	
			No problem	Very mild			
EAR PAIN /EAR PRESSURE PRE OP	No problem	Count	73	0	73	0.63	
		% within EAR PAIN /EAR PRESSURE	100.0%	0.0%	100.0%		
	Very mild	Count	55	1	56		
		% within EAR PAIN /EAR PRESSURE	98.2%	1.8%	100.0%		
	Mild or slight	Count	24	0	24		
		% within EAR PAIN /EAR PRESSURE	100.0%	0.0%	100.0%		
	Moderate	Count	44	0	44		
		% within EAR PAIN /EAR PRESSURE	100.0%	0.0%	100.0%		
	Severe	Count	3	0	3		
		% within EAR PAIN /EAR PRESSURE	100.0%	0.0%	100.0%		
	Total		Count	199	1		200
			% within EAR PAIN /EAR PRESSURE	99.5%	0.5%		100.0%

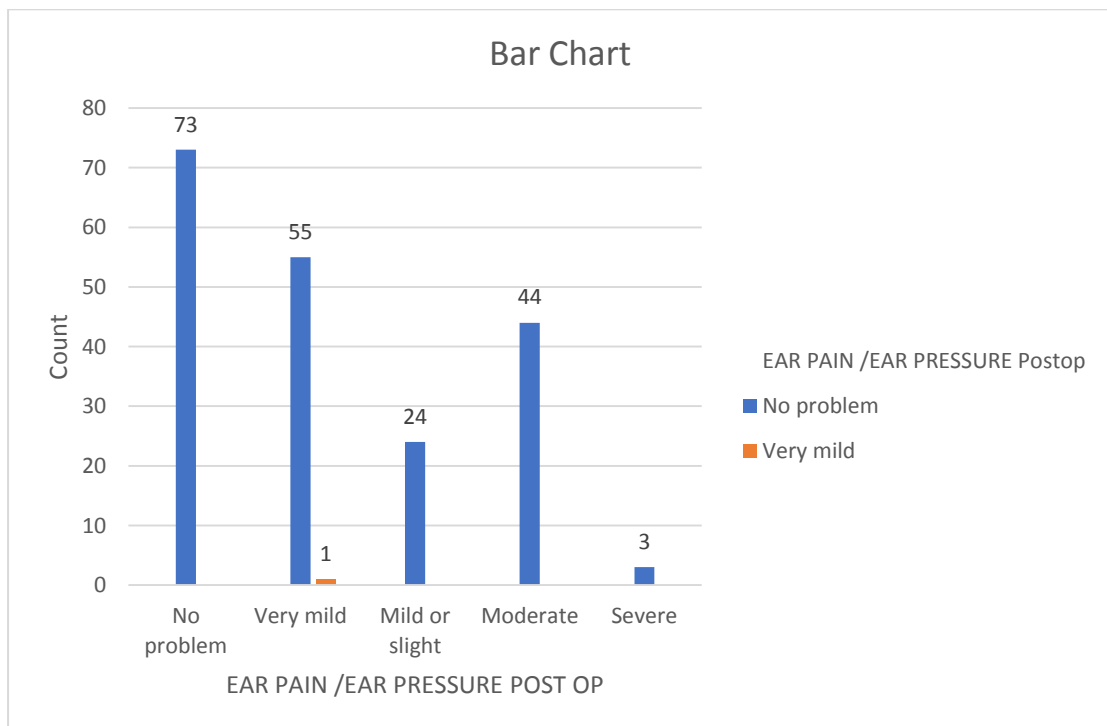
The comparison of pre op and post op scores of EAR PAIN/PRESSURE was not significant statistically.

Frequency distribution of ear pain /pressure pre op

	Frequency	Percent
No problem	73	36.5
Very mild	56	28.0
Mild or slight	24	12.0
Moderate	44	22.0
Severe	3	1.5
Total	200	100.0

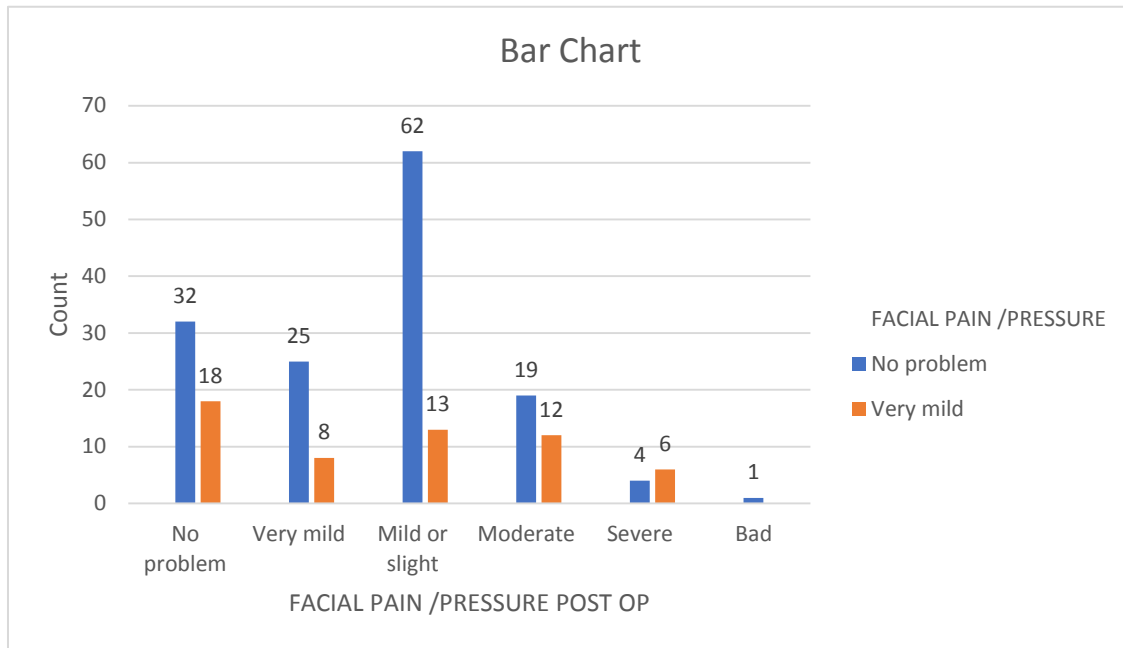
Ear pain post op

	Frequency	Percent
No problem	199	99.5
Very mild	1	0.5
Total	200	100.0



FACIAL PAIN /PRESSURE PRE OP AND POST OP COMPARISON

			FACIAL PAIN /PRESSURE POST OP		Total	P value	
			No problem	Very mild			
FACIAL PAIN /PRESSURE PRE OP	No problem	Count	32	18	50	0.022	
		% within FACIAL PAIN /PRESSURE	64.0%	36.0%	100.0%		
	Very mild	Count	25	8	33		
		% within FACIAL PAIN /PRESSURE	75.8%	24.2%	100.0%		
	Mild or slight	Count	62	13	75		
		% within FACIAL PAIN /PRESSURE	82.7%	17.3%	100.0%		
	Moderate	Count	19	12	31		
		% within FACIAL PAIN /PRESSURE	61.3%	38.7%	100.0%		
	Severe	Count	4	6	10		
		% within FACIAL PAIN /PRESSURE	40.0%	60.0%	100.0%		
	Bad	Count	1	0	1		
		% within FACIAL PAIN /PRESSURE	100.0%	0.0%	100.0%		
	Total		Count	143	57		200
			% within FACIAL PAIN /PRESSURE	71.5%	28.5%		100.0%



FREQUENCY DISTRIBUTION OF FACIAL PAIN /PRESSURE PREOP

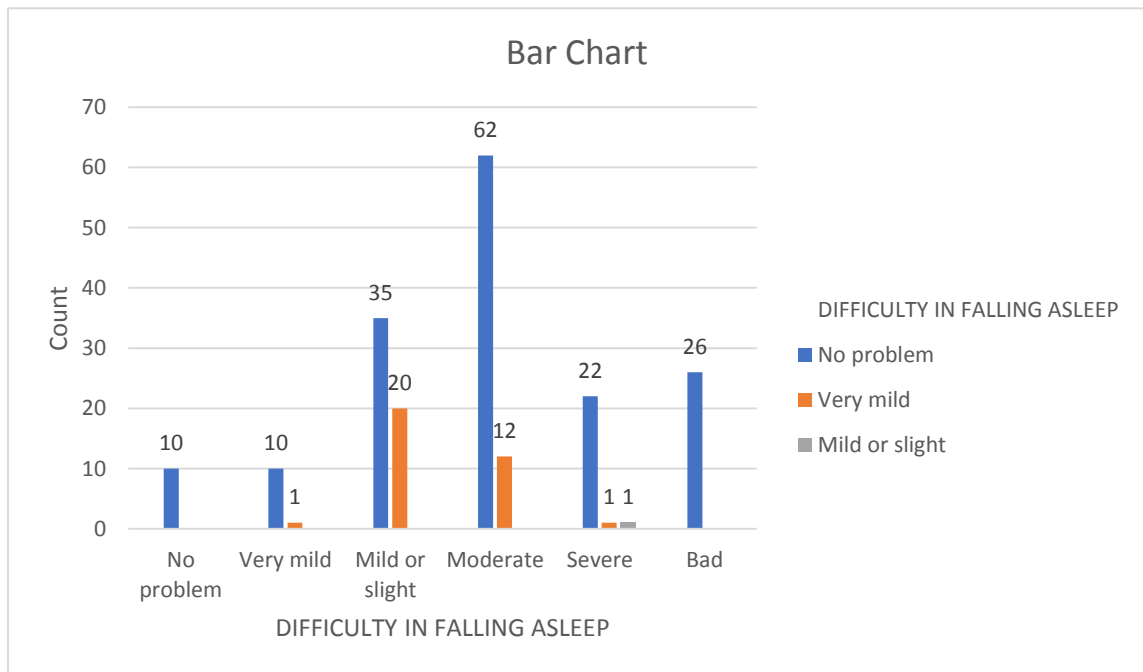
		Frequency	Percent
	No problem	50	25.0
	Very mild	33	16.5
	Mild or slight	75	37.5
	Moderate	31	15.5
	Severe	10	5.0
	Bad	1	0.5
	Total	200	100.0

FREQUENCY DISTRIBUTION OF FACIAL PAIN /PRESSURE POST OP

		Frequency	Percent
	No problem	143	71.5
	Very mild	57	28.5
	Total	200	100.0

DIFFICULTY IN FALLING ASLEEP PREOP AND POST OP COMPARISON

		DIFFICULTY IN FALLING ASLEEP			Total	P value
		No problem	Very mild	Mild or slight		
DIFFICULTY IN FALLING ASLEEP	No problem	Count	10	0	0	10
		% within DIFFICULTY IN FALLING ASLEEP	100.0%	0.0%	0.0%	100.0%
	Very mild	Count	10	1	0	11
		% within DIFFICULTY IN FALLING ASLEEP	90.9%	9.1%	0.0%	100.0%
	Mild or slight	Count	35	20	0	55
		% within DIFFICULTY IN FALLING ASLEEP	63.6%	36.4%	0.0%	100.0%
	Moderate	Count	62	12	0	74
		% within DIFFICULTY IN FALLING ASLEEP	83.8%	16.2%	0.0%	100.0%
	Severe	Count	22	1	1	24
		% within DIFFICULTY IN FALLING ASLEEP	91.7%	4.2%	4.2%	100.0%
	Bad	Count	26	0	0	26
		% within DIFFICULTY IN FALLING ASLEEP	100.0%	0.0%	0.0%	100.0%
	Total	Count	165	34	1	200
		% within DIFFICULTY IN FALLING ASLEEP	82.5%	17.0%	0.5%	100.0%



DIFFICULTY IN FALLING ASLEEP - FREQUENCY DISTRIBUTION PRE OP

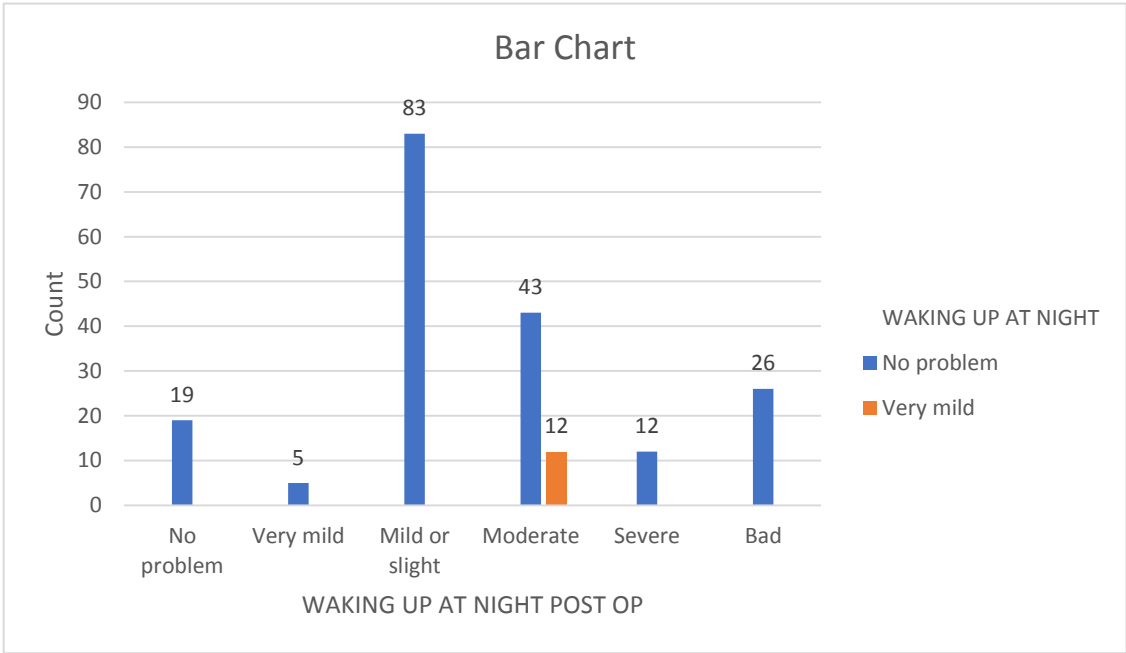
	Frequency	Percent
No problem	10	5.0
Very mild	11	5.5
Mild or slight	55	27.5
Moderate	74	37.0
Severe	24	12.0
Bad	26	13.0
Total	200	100.0

DIFFICULTY IN FALLING ASLEEP - FREQUENCY DISTRIBUTION POST OP

	Frequency	Percent
No problem	165	82.5
Very mild	34	17.0
Mild or slight	1	0.5
Total	200	100.0

WAKING UP AT NIGHT PREOP AND POST OP COMPARISON

			WAKING UP AT NIGHT		Total	P value	
			No problem	Very mild			
WAKING UP AT NIGHT	No problem	Count	19	0	19	<0.0001	
		% within WAKING UP AT NIGHT	100.0%	0.0%	100.0%		
	Very mild	Count	5	0	5		
		% within WAKING UP AT NIGHT	100.0%	0.0%	100.0%		
	Mild or slight	Count	83	0	83		
		% within WAKING UP AT NIGHT	100.0%	0.0%	100.0%		
	Moderate	Count	43	12	55		
		% within WAKING UP AT NIGHT	78.2%	21.8%	100.0%		
	Severe	Count	12	0	12		
		% within WAKING UP AT NIGHT	100.0%	0.0%	100.0%		
	Bad	Count	26	0	26		
		% within WAKING UP AT NIGHT	100.0%	0.0%	100.0%		
	Total		Count	188	12		200
			% within WAKING UP AT NIGHT	94.0%	6.0%		100.0%



FREQUENCY DISTRIBUTION OF WAKING UP AT NIGHT PRE OP

	Frequency	Percent
No problem	19	9.5
Very mild	5	2.5
Mild or slight	83	41.5
Moderate	55	27.5
Severe	12	6.0
Bad	26	13.0
Total	200	100.0

FREQUENCY DISTRIBUTION OF WAKING UP AT NIGHT POST OP

	Frequency	Percent
No problem	188	94.0
Very mild	12	6.0
Total	200	100.0

WAKING UP TIRED PREOP AND POST OP COMPARISON

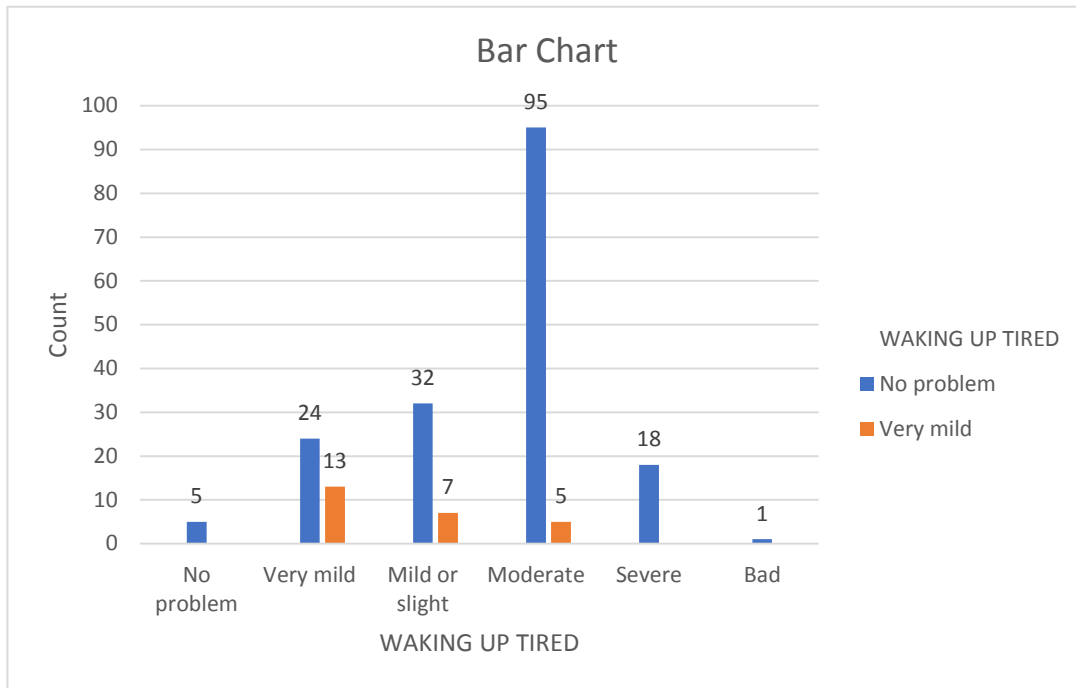
		WAKING UP TIRED		Total	P value	
		No problem	Very mild			
WAKING UP TIRED	No problem	Count	5	0	5	<0.0001
		% within WAKING UP TIRED	100.0%	0.0%	100.0%	
	Very mild	Count	24	13	37	
		% within WAKING UP TIRED	64.9%	35.1%	100.0%	
	Mild or slight	Count	32	7	39	
		% within WAKING UP TIRED	82.1%	17.9%	100.0%	
	Moderate	Count	95	5	100	
		% within WAKING UP TIRED	95.0%	5.0%	100.0%	
	Severe	Count	18	0	18	
		% within WAKING UP TIRED	100.0%	0.0%	100.0%	
	Bad	Count	1	0	1	
		% within WAKING UP TIRED	100.0%	0.0%	100.0%	
	Total	Count	175	25	200	
		% within WAKING UP TIRED	87.5%	12.5%	100.0%	

FREQUENCY DISTRIBUTION OF WAKING UP TIRED -PRE OP

	Frequency	Percent
No problem	5	2.5
Very mild	37	18.5
Mild or slight	39	19.5
Moderate	100	50.0
Severe	18	9.0
Bad	1	0.5
Total	200	100.0

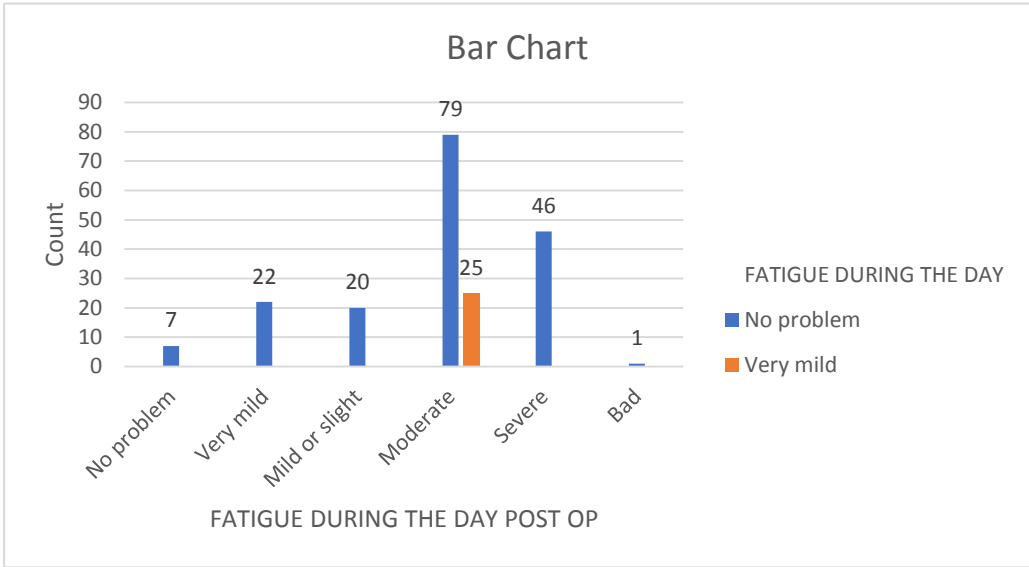
FREQUENCY DISTRIBUTION OF WAKING UP TIRED -POST OP

	Frequency	Percent
No problem	175	87.5
Very mild	25	12.5
Total	200	100.0



FATIGUE DURING THE DAY PREOP AND POST OP COMPARISON

			FATIGUE DURING THE DAY		Total	P value	
			No problem	Very mild			
FATIGUE DURING THE DAY	No problem	Count	7	0	7	<0.0001	
		% within FATIGUE DURING THE DAY	100.0%	0.0%	100.0%		
	Very mild	Count	22	0	22		
		% within FATIGUE DURING THE DAY	100.0%	0.0%	100.0%		
	Mild or slight	Count	20	0	20		
		% within FATIGUE DURING THE DAY	100.0%	0.0%	100.0%		
	Moderate	Count	79	25	104		
		% within FATIGUE DURING THE DAY	76.0%	24.0%	100.0%		
	Severe	Count	46	0	46		
		% within FATIGUE DURING THE DAY	100.0%	0.0%	100.0%		
	Bad	Count	1	0	1		
		% within FATIGUE DURING THE DAY	100.0%	0.0%	100.0%		
	Total		Count	175	25		200
			% within FATIGUE DURING THE DAY	87.5%	12.5%		100.0%



FREQUENCY DISTRIBUTION OF FREQUENCY DISTRIBUTION OF FATIGUE DURING THE DAY -PRE OP

	Frequency	Percent
No problem	7	3.5
Very mild	22	11.0
Mild or slight	20	10.0
Moderate	104	52.0
Severe	46	23.0
Bad	1	0.5
Total	200	100.0

FREQUENCY DISTRIBUTION OF FATIGUE DURING THE DAY POST OP

	Frequency	Percent
No problem	175	87.5
Very mild	25	12.5
Total	200	100.0

REDUCED PRODUCTIVITY- PREOP AND POST OP COMPARISON

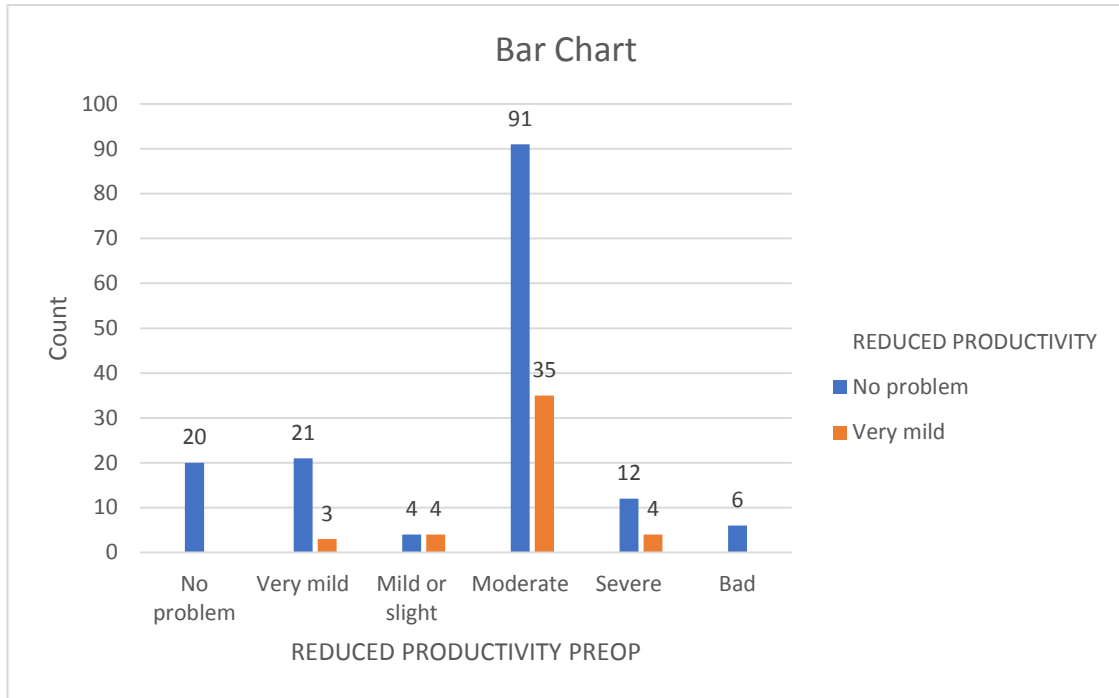
			REDUCED PRODUCTIVITY		Total	P value	
			No problem	Very mild			
REDUCED PRODUCTIVITY	No problem	Count	20	0	20	0.014	
		% within REDUCED PRODUCTIVITY	100.0%	0.0%	100.0%		
	Very mild	Count	21	3	24		
		% within REDUCED PRODUCTIVITY	87.5%	12.5%	100.0%		
	Mild or slight	Count	4	4	8		
		% within REDUCED PRODUCTIVITY	50.0%	50.0%	100.0%		
	Moderate	Count	91	35	126		
		% within REDUCED PRODUCTIVITY	72.2%	27.8%	100.0%		
	Severe	Count	12	4	16		
		% within REDUCED PRODUCTIVITY	75.0%	25.0%	100.0%		
	Bad	Count	6	0	6		
		% within REDUCED PRODUCTIVITY	100.0%	0.0%	100.0%		
	Total		Count	154	46		200
			% within REDUCED PRODUCTIVITY	77.0%	23.0%		100.0%

FREQUENCY DISTRIBUTION OF REDUCED PRODUCTIVITY -PRE OP

	Frequency	Percent
No problem	20	10.0
Very mild	24	12.0
Mild or slight	8	4.0
Moderate	126	63.0
Severe	16	8.0
Bad	6	3.0
Total	200	100.0

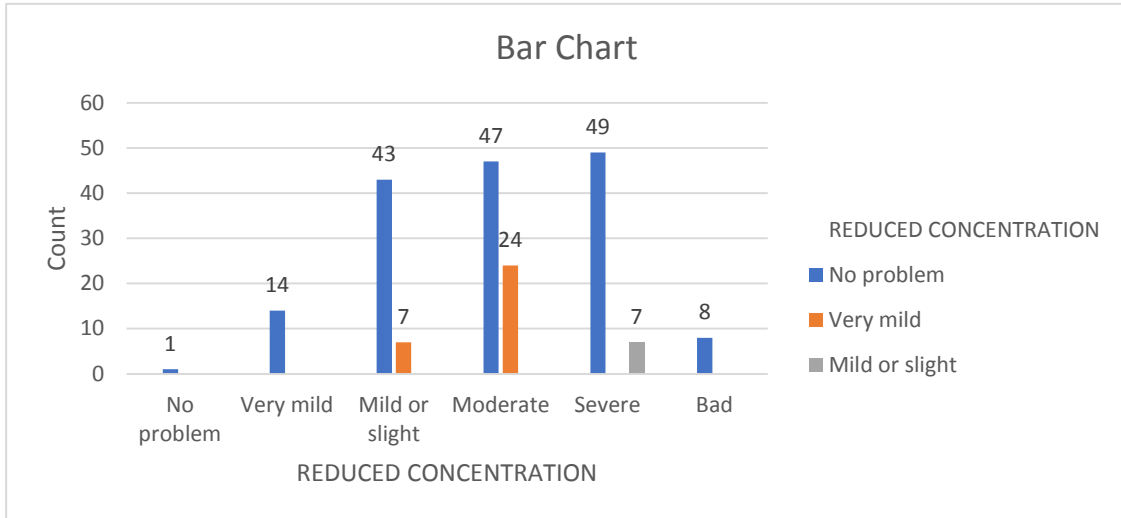
FREQUENCY DISTRIBUTION OF REDUCED PRODUCTIVITY -POST OP

	Frequency	Percent
No problem	154	77.0
Very mild	46	23.0
Total	200	100.0



REDUCED CONCENTRATION PREOP AND POST OP COMPARISON

			REDUCED CONCENTRATION POST OP			Total	P value	
			No problem	Very mild	Mild or slight			
REDUCED CONCENTRATION PRE OP	No problem	Count	1	0	0	1	<0.0001	
		% within REDUCED CONCENTRATION	100.0%	0.0%	0.0%	100.0%		
	Very mild	Count	14	0	0	14		
		% within REDUCED CONCENTRATION	100.0%	0.0%	0.0%	100.0%		
	Mild or slight	Count	43	7	0	50		
		% within REDUCED CONCENTRATION	86.0%	14.0%	0.0%	100.0%		
	Moderate	Count	47	24	0	71		
		% within REDUCED CONCENTRATION	66.2%	33.8%	0.0%	100.0%		
	Severe	Count	49	0	7	56		
		% within REDUCED CONCENTRATION	87.5%	0.0%	12.5%	100.0%		
	Bad	Count	8	0	0	8		
		% within REDUCED CONCENTRATION	100.0%	0.0%	0.0%	100.0%		
	Total		Count	162	31	7		200
			% within REDUCED CONCENTRATION	81.0%	15.5%	3.5%		100.0%



FREQUENCY DISTRIBUTION OF THE RESPONSE FOR “REDUCED CONCENTRATION ” PRE OP

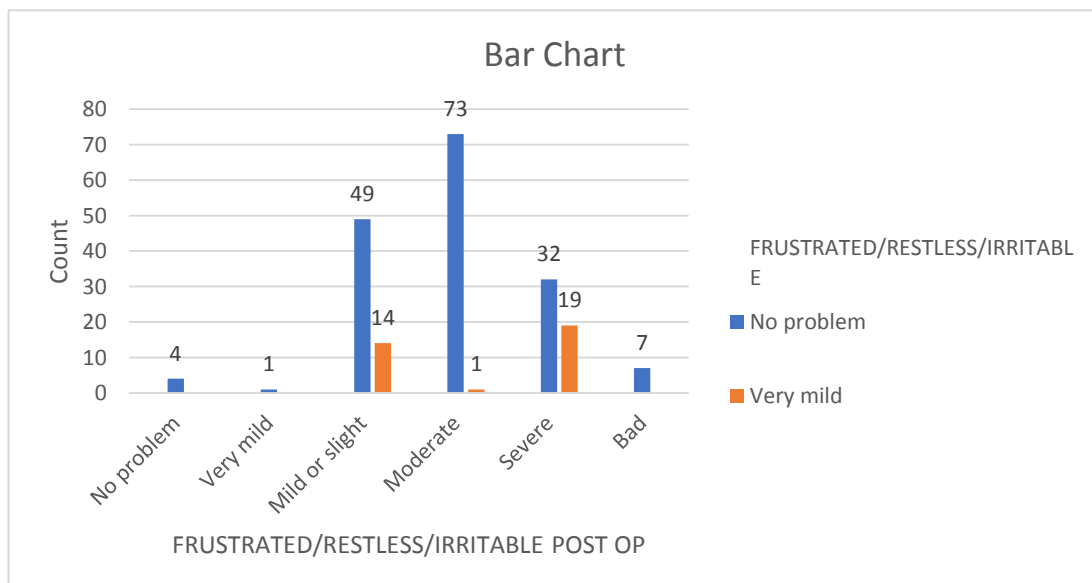
	Frequency	Percent
No problem	1	0.5
Very mild	14	7.0
Mild or slight	50	25.0
Moderate	71	35.5
Severe	56	28.0
Bad	8	4.0
Total	200	100.0

FREQUENCY DISTRIBUTION OF THE RESPONSE FOR “REDUCED CONCENTRATION ” POST OP

	Frequency	Percent
No problem	162	81.0
Very mild	31	15.5
Mild or slight	7	3.5
Total	200	100.0

FRUSTRATED/RESTLESS/IRRITABLE PREOP AND POST OP COMPARISON

			FRUSTRATED/RESTLESS/IRRITABLE POST OP		Total	P value
			No problem	Very mild		
FRUSTRATED/RESTLESS/IRRITABLE PREOP	No problem	Count	4	0	4	<0.0001
		% within FRUSTRATED/RESTLESS/IRRITABLE	100.0%	0.0%	100.0%	
	Very mild	Count	1	0	1	
		% within FRUSTRATED/RESTLESS/IRRITABLE	100.0%	0.0%	100.0%	
	Mild or slight	Count	49	14	63	
		% within FRUSTRATED/RESTLESS/IRRITABLE	77.8%	22.2%	100.0%	
	Moderate	Count	73	1	74	
		% within FRUSTRATED/RESTLESS/IRRITABLE	98.6%	1.4%	100.0%	
	Severe	Count	32	19	51	
		% within FRUSTRATED/RESTLESS/IRRITABLE	62.7%	37.3%	100.0%	
Bad	Count	7	0	7		
	% within FRUSTRATED/RESTLESS/IRRITABLE	100.0%	0.0%	100.0%		
Total		Count	166	34	200	
		% within FRUSTRATED/RESTLESS/IRRITABLE	83.0%	17.0%	100.0%	



**FREQUENCY DISTRIBUTION OF
FRUSTATED/RESTLESS/IRRITABLE PRE OP**

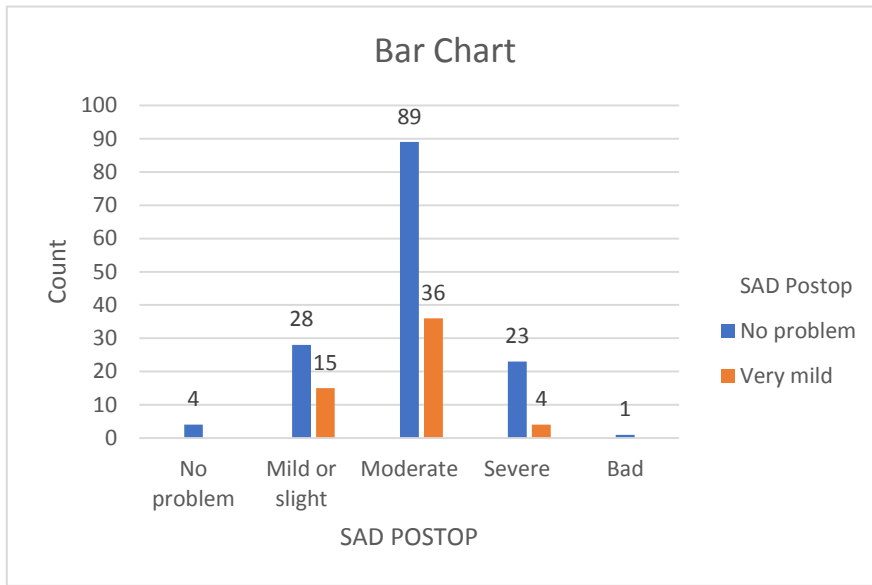
	Frequency	Percent
No problem	4	2.0
Very mild	1	0.5
Mild or slight	63	31.5
Moderate	74	37.0
Severe	51	25.5
Bad	7	3.5
Total	200	100.0

**FREQUENCY DISTRIBUTION OF FRUSTATED/RESTLESS/IRRITABLE
POST OP**

	Frequency	Percent
No problem	166	83.0
Very mild	34	17.0
Total	200	100.0

SAD PREOP AND POST OP COMPARISON

			SAD POST OP		Total	P value	
			No problem	Very mild			
SAD PRE OP	No problem	Count	4	0	4	0.253	
		% within SAD	100.0%	0.0%	100.0%		
	Mild or slight	Count	28	15	43		
		% within SAD	65.1%	34.9%	100.0%		
	Moderate	Count	89	36	125		
		% within SAD	71.2%	28.8%	100.0%		
	Severe	Count	23	4	27		
		% within SAD	85.2%	14.8%	100.0%		
	Bad	Count	1	0	1		
		% within SAD	100.0%	0.0%	100.0%		
	Total		Count	145	55		200
			% within SAD	72.5%	27.5%		100.0%



FREQUENCY DISTRIBUTION OF “SAD” -PRE OP

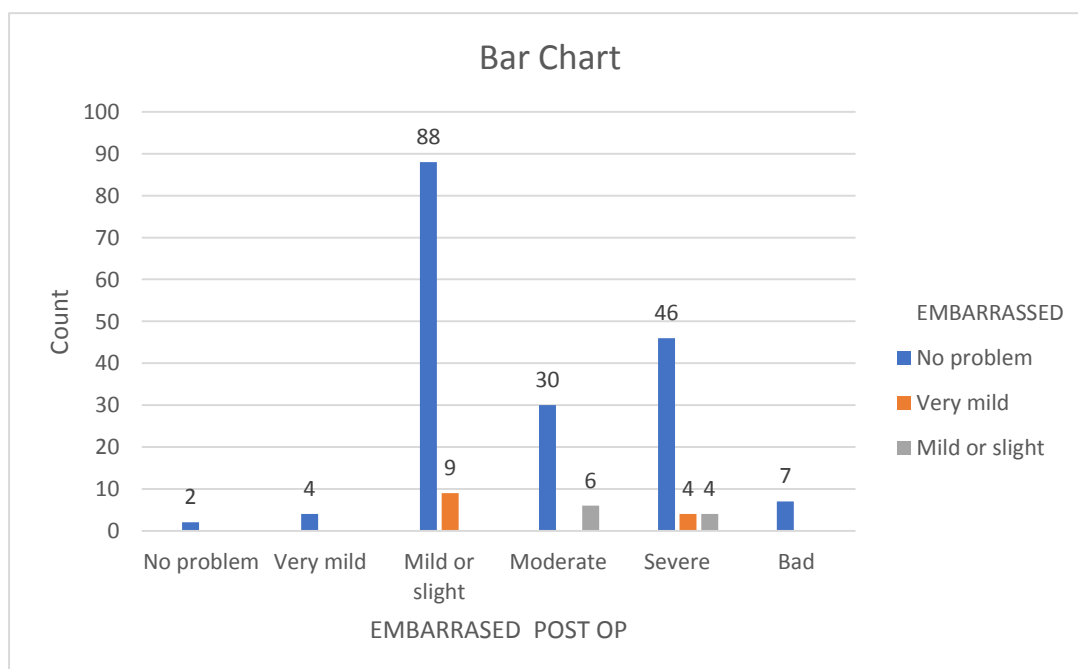
	Frequency	Percent
No problem	4	2.0
Mild or slight	43	21.5
Moderate	125	62.5
Severe	27	13.5
Bad	1	0.5
Total	200	100.0

FREQUENCY DISTRIBUTION OF “SAD” -POST OP

	Frequency	Percent
No problem	145	72.5
Very mild	55	27.5
Total	200	100.0

PREOP AND POST OP COMPARISON OF THE RESPONSE –“EMBARRASSED”

			EMBARRASSED POST OP			Total	P value	
			No problem	Very mild	Mild or slight			
EMBARRASSED PRE OP	No problem	Count	2	0	0	2	<0.0001	
		% within EMBARRASSED	100.0%	0.0%	0.0%	100.0%		
	Very mild	Count	4	0	0	4		
		% within EMBARRASSED	100.0%	0.0%	0.0%	100.0%		
	Mild or slight	Count	88	9	0	97		
		% within EMBARRASSED	90.7%	9.3%	0.0%	100.0%		
	Moderate	Count	30	0	6	36		
		% within EMBARRASSED	83.3%	0.0%	16.7%	100.0%		
	Severe	Count	46	4	4	54		
		% within EMBARRASSED	85.2%	7.4%	7.4%	100.0%		
	Bad	Count	7	0	0	7		
		% within EMBARRASSED	100.0%	0.0%	0.0%	100.0%		
	Total		Count	177	13	10		200
			% within EMBARRASSED	88.5%	6.5%	5.0%		100.0%



FREQUENCY DISTRIBUTION OF THE SCORE “EMBARRASED” PRE OP

	Frequency	Percent
No problem	2	1.0
Very mild	4	2.0
Mild or slight	97	48.5
Moderate	36	18.0
Severe	54	27.0
Bad	7	3.5
Total	200	100.0

FREQUENCY DISTRIBUTION OF THE SCORE “EMBARRASED” PRE OP

	Frequency	Percent
No problem	177	88.5
Very mild	13	6.5
Mild or slight	10	5.0
Total	200	100.0

TASTE /SMELL -PRE OP AND POST OP COMPARISON

		TASTE /SMELL			Total	P value
		No problem	Very mild	Mild or slight		
TASTE /SMELL	Very mild	Count	1	14	1	16
		% within TASTE /SMELL	6.3%	87.5%	6.3%	100.0%
	Mild or slight	Count	2	21	0	23
		% within TASTE /SMELL	8.7%	91.3%	0.0%	100.0%
	Moderate	Count	29	26	6	61
		% within TASTE /SMELL	47.5%	42.6%	9.8%	100.0%
	Severe	Count	8	8	0	16
		% within TASTE /SMELL	50.0%	50.0%	0.0%	100.0%
Bad	Count	16	38	30	84	
	% within TASTE /SMELL	19.0%	45.2%	35.7%	100.0%	
Total		Count	56	107	37	200
		% within TASTE /SMELL	28.0%	53.5%	18.5%	100.0%

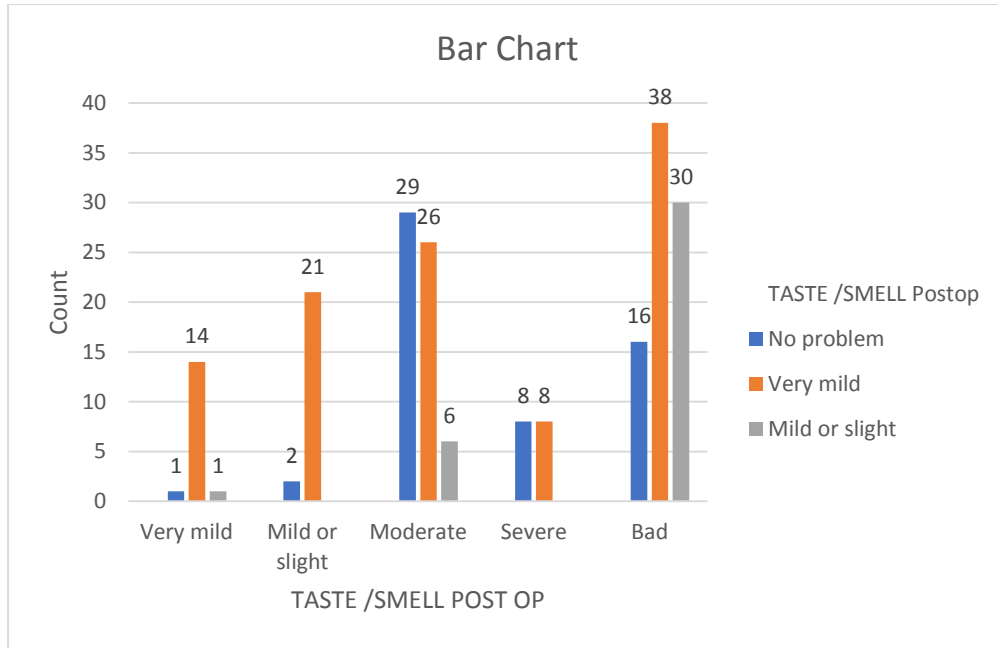
<0.0001

FREQUENCY DISTRIBUTION OF THE SCORE TASTE /SMELL PRE OP

	Frequency	Percent
Very mild	16	8.0
Mild or slight	23	11.5
Moderate	61	30.5
Severe	16	8.0
Bad	84	42.0
Total	200	100.0

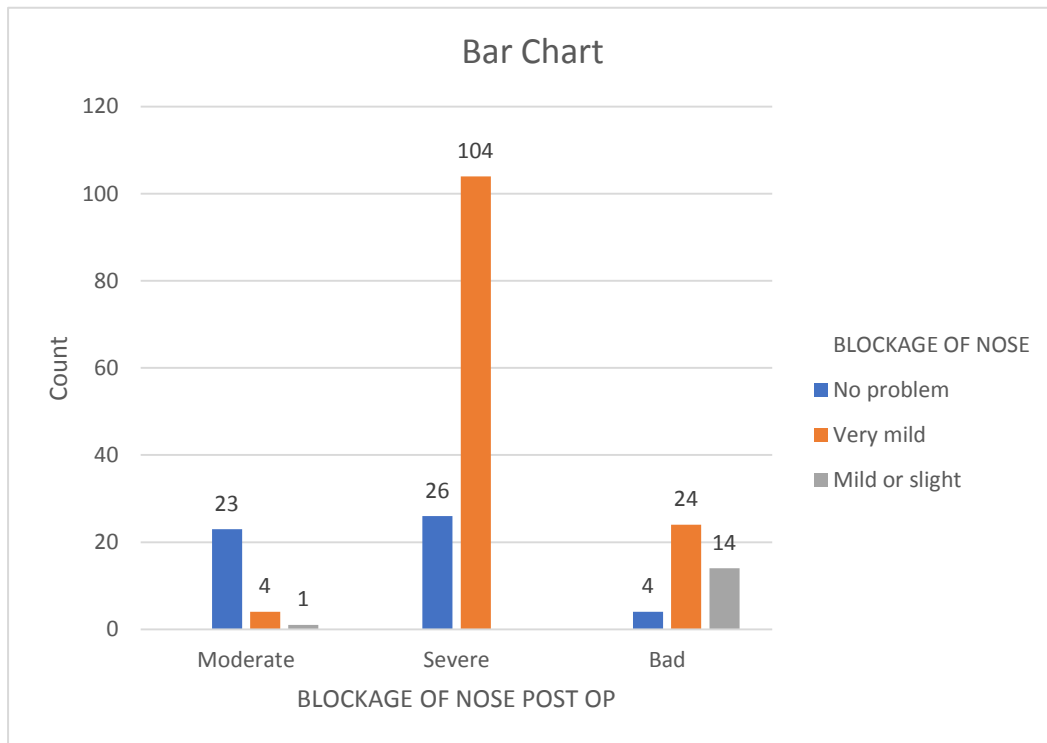
FREQUENCY DISTRIBUTION OF THE SCORE POST OP

	Frequency	Percent
No problem	56	28.0
Very mild	107	53.5
Mild or slight	37	18.5
Total	200	100.0



BLOCKAGE OF NOSE - PRE OP AND POST OP COMPARISON

		BLOCKAGE OF NOSE			Total	P value
		No problem	Very mild	Mild or slight		
BLOCKAGE OF NOSE	Moderate	Count	23	4	1	<0.0001
		% within BLOCKAGE OF NOSE	82.1%	14.3%	3.6%	
	Severe	Count	26	104	0	
		% within BLOCKAGE OF NOSE	20.0%	80.0%	0.0%	
	Bad	Count	4	24	14	
		% within BLOCKAGE OF NOSE	9.5%	57.1%	33.3%	
Total		Count	53	132	15	
		% within BLOCKAGE OF NOSE	26.5%	66.0%	7.5%	



FREQUENCY DISTRIBUTION OF PRE OP “BLOCKAGE OF NOSE”

	Frequency	Percent
Moderate	28	14.0
Severe	130	65.0
Bad	42	21.0
Total	200	100.0

FREQUENCY DISTRIBUTION OF POST OP “BLOCKAGE OF NOSE”

	Frequency	Percent
No problem	53	26.5
Very mild	132	66.0
Mild or slight	15	7.5
Total	200	100.0

MEAN PRE OPERATIVE SNOT 22 SCORES

	Mean	Std. Deviation
NEED TO BLOW NOSE Preop	3.45	1.10
SNEEZING Preop	2.84	1.21
RUNNY NOSE Preop	3.08	1.24
COUGH Preop	1.61	1.09
POST NASAL DRIP Preop	2.82	1.08
THICK NASAL DISCHARGE Preop	2.74	1.12
EAR FULLNESS Preop	1.82	1.21
DIZZINESS Preop	1.82	1.43
EAR PAIN /EAR PRESSURE Preop	1.24	1.20
FACIAL PAIN /PRESSURE Preop	1.61	1.19
DIFFICULTY IN FALLING ASLEEP Preop	2.85	1.25
WAKING UP AT NIGHT Preop	2.57	1.33
LACK OF A GOOD NIGHT'S SLEEP Preop	3.09	0.90
WAKING UP TIRED Preop	2.46	0.99
FATIGUE DURING THE DAY Preop	2.82	1.04
REDUCED PRODUCTIVITY Preop	2.56	1.20
REDUCED CONCENTRATION Preop	2.96	1.01
FRUSTRATED/RESTLESS/IRRITABLE Preop	2.94	0.95
SAD Preop	2.87	0.73
EMBARRASSED Preop	2.79	1.01
TASTE /SMELL Preop	3.65	1.34
BLOCKAGE OF NOSE Preop	4.07	0.59

MEAN POST OPERATIVE SNOT 22 SCORES

	Mean	Std. Deviation
NEED TO BLOW NOSE Postop	0.50	0.52
SNEEZING Postop	0.46	0.50
RUNNY NOSE Postop	0.24	0.43
COUGH Postop	0.38	0.49
POST NASAL DRIP Postop	0.50	0.50
THICK NASAL DISCHARGE Postop	0.84	0.55
EAR FULLNESS Postop	0.24	0.43
DIZZINESS Postop	0.22	0.42
EAR PAIN /EAR PRESSURE Postop	0.01	0.07
FACIAL PAIN /PRESSURE Postop	0.29	0.45
DIFFICULTY IN FALLING ASLEEP Postop	0.18	0.40
WAKING UP AT NIGHT Postop	0.06	0.24
LACK OF A GOOD NIGHT'S SLEEP Postop	0.44	0.55
WAKING UP TIRED Postop	0.13	0.33
FATIGUE DURING THE DAY Postop	0.13	0.33
REDUCED PRODUCTIVITY Postop	0.23	0.42
REDUCED CONCENTRATION Postop	0.23	0.50
FRUSTRATED/RESTLESS/IRRITABLE Postop	0.17	0.38
SAD Postop	0.28	0.45
EMBARRASSED Postop	0.17	0.49
TASTE /SMELL Postop	0.91	0.68
BLOCKAGE OF NOSE Postop	0.81	0.55

DISCUSSION

Our study was, a prospective study conducted at Upgraded Institute of Otorhinolaryngology in the ENT department Rajiv Gandhi Government General Hospital (RGGGH),Chennai to study the predictive value of Sino Nasal Outcome Test (SNOT 22) in assessing the post surgical improvement in patients with chronic rhinosinusitis. A total of 200 patients of both sexes who met the inclusion criteria were included in the study. After thorough history taking and ENT examination, Cases diagnosed as Chronic Rhino Sinusitis who remained refractory to medical management (>3 months)including topically administered corticosteroids were chosen for FESS. A pre validated SNOT 22 questionnaire was used to assess the pre operative scores and the patient was followed up and within 3 months post op SNOT 22 questionnaire was applied to know the post operative scores and thus the outcome of Functional Endoscopic Sinus Surgery is assessed.

The Sino-nasal outcome test (SNOT -22) is a prevalidated patient-reported measure of chronic rhinosinusitis related symptom severity and health related quality of the life .SNOT 22 is a modification of SNOT -

20. The SNOT-20 is a modification of the previously used 31 item Rhinosinusitis Outcome Measure (RSOM-31)

SNOT -22 consists of 22 individual parameters with a score range of (0-5) with 5 for each parameter and a total score ranging from 0-110. The parameters cover functional and psychological aspects of the disease.

AGE :

Out of the 200 patients , 67 were between 21 to 30 year (33%) followed by 42 patients (21%) and 40 patients (20%) only 7 patients (3.5%) were above 60 yrs. There was no correlation between age and SNOT score. This was similar to the following studies.

According to a study by Amail et al in 2015 ,there was no significant correlation between SNOT 22 scores and patient age .

A study by soler et al in 2016 says that there was no significant correlation between SNOT 22 improvement and age

SEX

In our study, out of 200 patients ,majority were 112 males (56%) than females 88 (44%).

According to a study by Amail et al in 2015 ³⁵, there was no significant correlation between SNOT 22 scores and genders

A study conducted by Lal et al 2016 also showed no difference between SNOT improvement scores and gender .

COMORBIDITY

Among the sample of 200, 167 had no comorbidities, 25 were Diabetic (12.5%) ,8 were hypertensive (4%) and there was no correlation between the comorbidities and SNOT scores.

Whereas a study “The effect of diabetes mellitus on chronic sinusitis” done by Zi Zhang et al in 2014 says there was less improvement in the post operative SNOT scores of Diabetic patients than non diabetic patients.

SMOKING

Out of 200 people included in our study ,163 (81.5%) were non smokers and 37 (18.5%) were smokers. There was no correlation between smoking and the SNOT scores.

A study by Joshua L Kennedy in 2013 ²⁰,also revealed similar findings that there was no correlation between smoking and FESS outcomes.

Smoking is regarded as a negative prognostic indicator in sinus disease due to the established negative outcome of tobacco smoke on

innate and humoral immunity^{39,40}, smoking has been associated with need for subsequent revision surgeries and poor surgical outcomes^{41,42}. Which are contradictory to our study .

ALLERGY

Among the study population of 200, history of allergy was present in 110 (55%) and no allergic history in 90 people (45%), there was no correlation between SNOT scores and allergy history which is similar to the study done by JL Kennedy et al in 2013.²⁰

MEAN PREOP AND POST OP SCORE

In our study the mean preop SNOT 22 score was 58.57 and the mean post op score was 8.63. p- value was <0.001 and was statistically significant.

In the United Kingdom , Hopkins et al validated the SNOT 22 score for the first time and the pre operative score obtained was 41.7 which is lesser than the score obtained in our study.⁴⁰

A study was conducted in 89 patients by Kosugi¹⁸ et al that validated SNOT 22 to Portuguese. He obtained a mean pre operative score 62.39 compared to 58.57 which is higher than our mean pre operative score .

According to a study done by caulley et al on 30 patients in 2016 the pre operative and post operative scores were compared. The mean pre operative score was 43.80 and the mean post operative score was 15.56 which are higher than our study.

Samy Elwany, department of otorhinolaryngology , Alexandria¹⁹,Egypt in 2017 did a study “Arabic translation and validation of the SNOT -22.This study included 178 patients with confirmed CRS and 95 asymptomatic volunteers. In this study all participants were able to complete the questionnaire with no or minimal assistance in 15 mins. All of the patients were comfortable to answer and easily understood the SNOT 22 questionnaires.

In our study also all the patients were comfortable to answer and were able to complete the SNOT 22 scores easily.

The post operative scores were significantly lower than the pre operative scores and was statistically significant <0.001 and is in agreement with our study.

A study done by Mascarenhas et al in a group of 60 patients⁴⁴ had a pre operative score of 61.3 before Functional Endoscopic Sinus Surgery which is also higher than our mean preop score.

In our study the parameters with the highest mean item scores with Blockage of nose with a mean± SD(pre op score 4.07±0.59 ,) followed

by decreased taste or smell (3.65 ± 1.34), followed by Lack of a good night's sleep (3.09 ± 0.9), Runny nose (3.08 ± 1.24), reduced concentration (2.96 ± 1).

According to a similar study by piccirillo et al in 2021 the 5 parameters with the highest mean item scores pre operatively were post nasal discharge, facial pain/pressure, the need to blow the nose, waking up tired and fatigue.

In the post operative scores there was significant improvement in the quality of life with reduction in the post operative scores of Lack of a good night's sleep pre op (3.09 ± 0.9) to 0.44 post operatively, where as Reduced concentration decreased from (2.96 ± 1.01) to (0.23 ± 0.23). Fatigue during the day pre op (2.82 ± 1.04) to (0.13) post operatively and reduced productivity pre op (2.56 ± 1) to (0.23 ± 0.5) also significantly reduced and there was improvement in their quality of life

According to a study by Birch et al in 2001, patients about to undergo a surgery must have more Chronic Rhino Sinusitis symptoms, worse endoscopic scores and worse Quality Of Life scores

A study done by Rudmik et al ⁴⁵ suggests that patients having SNOT 22 scores more than 30 points showed a 75% chance of significantly changing their clinical condition after surgery. These patients had 45% improvement in the quality of life. At the same time patients

with score less than 20 had no post surgical improvement which is similar to our study findings .

Post operative Diagnostic Nasal Endoscopy could not be done for the patients at appropriate intervals due to covid 19 pandemic and thus was not possible to trace the post operative scores over subsequent months to confirm whether it remained as decreased than the pre operative score or not.

CONCLUSION

- There was over all improvement in SNOT 22 scores post operatively when compared with preoperative scores which was statistically significant
- The patients who had high symptom score improved considerably well in the post operative period .
- This corresponds to the previous similar studies which showed greater improvement in severely affected patients.
- SNOT scores were not affected by Age, Sex, or comorbidities like Diabetes and Hypertension
- Allergic history has no influence in SNOT 22 scores
- Smoking has no effect in affecting SNOT 22 scores
- Functional Endoscopic Sinus Surgery creates an opportunity to open windows into the sinuses and improves the post operative topical steroid penetration
- SNOT 22 is a practical measure of assessing whether the patient is benefitted from surgery or not.
- As CT scans taken in the post operative period shows features suggestive of persistence of sinusitis ,SNOT 22 scores gives an actual idea about the post operative condition of the patient.

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ANNEXURE

SNOT 22 Sino-nasal Outcome Test (22 Questions)

 EAR NOSE THROAT & SINUS	No problem	Very mild problem	Mild or slight problem	Moderate problem	Severe problem	Problem as bad as it can be	Most important 5 items
1. Need to blow nose	0	1	2	3	4	5	
2. Sneezing	0	1	2	3	4	5	
3. Runny nose	0	1	2	3	4	5	
4. Cough	0	1	2	3	4	5	
5. Post nasal discharge (dripping at the back of your nose)	0	1	2	3	4	5	
6. Thick nasal discharge	0	1	2	3	4	5	
7. Ear fullness	0	1	2	3	4	5	
8. Dizziness	0	1	2	3	4	5	
9. Ear pain/pressure	0	1	2	3	4	5	
10. Facial pain/pressure	0	1	2	3	4	5	
11. Difficulty falling asleep	0	1	2	3	4	5	
12. Waking up at night	0	1	2	3	4	5	
13. Lack of a good night's sleep	0	1	2	3	4	5	
14. Waking up tired	0	1	2	3	4	5	
15. Fatigue during the day	0	1	2	3	4	5	
16. Reduced productivity	0	1	2	3	4	5	
17. Reduced concentration	0	1	2	3	4	5	
18. Frustrated/restless/irritable	0	1	2	3	4	5	
19. Sad	0	1	2	3	4	5	
20. Embarrassed	0	1	2	3	4	5	
21. Sense of taste/smell	0	1	2	3	4	5	
22. Blockage/congestion of nose	0	1	2	3	4	5	
TOTAL SNOT 22 SCORE	0						

PROFORMA –SINO NASAL OUTCOME TEST(SNOT 22)

NAME: AGE/SEX : IP.NO:

ADDRESS:

OCCUPATION:

DATE OF ADMISSION:

CHIEF COMPLAINTS:

COMORBIDITIES:

FAMILY HISTORY:

PERSONAL HISTORY :

PAST HISTORY:

H/O ALLERGY :

EXAMINATION OF NOSE:

DNE FINDINGS:

CT –PNS FINDINGS:

EXAMINATION OF EAR :

EXAMINATION OF THROAT :

ROUTINE INVESTIGATIONS:

PROVISIONAL DIAGNOSIS:

PLAN :

INTRA-OPERATIVE FINDINGS:

INTRA/POST OP COMPLICATIONS :

DISCHARGED AFTER :

POST OP FOLLOW UP :

PATIENT CONSENT FORM

Title of the Project : **“A Study on predictive value of Sino-nasal outcome Test (SNOT-22) in assessing post-surgical improvement in patients with chronic sinusitis”**

Institution : **Upgraded Institute of Otorhinolaryngology,
Madras Medical College,
Chennai – 600003.**

Name : **Date :**
Age : **IP No. :**
Sex : **Project Patient No. :**

The details of the study have been provided to me in writing and explained to me in my own language.

I confirm that I have understood the above study and had the opportunity to ask questions.

I understood that my participation in the study is voluntary and that I am free to withdraw at any time, without giving any reason, without the medical care that will normally be provided by the hospital being affected.

I agree not to restrict the use of any data or results that arise from this study provided such a use is only for scientific purpose(s).

I have been given an information sheet giving details of the study.

I fully consent to participate in the above study.

Name of the subject

Signature

Date

Name of the Investigator

Signature

Date

INFORMATION SHEET

- We are conducting “**A Study on predictive value of Sino-nasal outcome Test (SNOT-22) in assessing post-surgical improvement in patients with chronic sinusitis**” at the Upgraded Institute of Otorhinolaryngology, Madras Medical College & Rajiv Gandhi Government General Hospital, Chennai – 600003.

- In this study we study the usefulness of SNOT 22(questionnaire) in predicting the benefits of surgery in sinusitis patients.

- At the time of announcing the results and suggestions, name and identity of the patients will be confidential.

- Taking part in this study is voluntary. You are free to decide whether to participate in this study or to withdraw at any time; your decision will not result in any loss of benefits to which you are otherwise entitled.

- The results of the special study may be intimated to you at the end of the study period or during the study if anything is found abnormal which may aid in the management or treatment.

Signature of Investigator

Signature of Participant

Date :

ஆராய்ச்சி தகவல் தாள்

ஆய்வு செய்யப்படும் தலைப்பு :

“A Study on predictive value of Sino-nasal outcome Test (SNOT-22) in assessing post-surgical improvement in patients with chronic sinusitis”

ஆராய்ச்சியாளர் பெயர் :

பங்கேற்பாளர் பெயர் :

சென்னை ராஜீவ் காந்தி அரசு மருத்துவமனைக்கு, இந்த ஆராய்ச்சியின் நோக்கம்.

நீங்கள் இந்த ஆராய்ச்சியில் பங்கேற்க நாங்கள் விரும்புகிறோம். இந்த ஆராய்ச்சியால் உங்கள் சிகிச்சைக்கு பாதிப்பு ஏற்படாது என்பதை தெரிவித்துக் கொள்கிறோம்.

இந்த ஆராய்ச்சியின் முடிவுகளை அல்லது கருத்துக்களை வெளியிடும் போதோ அல்லது ஆராய்ச்சியின் போதோ தங்களது பெயரையோ அல்லது அடையாளங்களையோ வெளியிடாமட்டோம் என்பதையும் தெரிவித்துக்கொள்கிறோம்.

இந்த ஆராய்ச்சியில் பங்கேற்பது தங்களுடைய விருப்பத்தின் பேரில் தான் இருக்கிறது. மேலும் நீங்கள் எந்நேரமும் இந்த ஆராய்ச்சியிலிருந்து பின்வாங்கலாம் என்பதையும் தெரிவித்துக்கொள்ளலாம்.

இந்த ஆராய்ச்சியின் முடிவுகளையும் நோயின் தன்மைப்பற்றியும் ஆராய்ச்சியின் போது அல்லது ஆராய்ச்சியின் முடிவின் போது தங்களுக்கு அறிவிப்போம் என்பதையும் தெரிவித்துக்கொள்கிறோம்.

ஆராய்ச்சியாளர் கையொப்பம்

பங்கேற்பாளர் கையொப்பம்

தேதி:

சுய ஒப்புதல் படிவம்

ஆய்வு செய்யப்படும் தலைப்பு :

“A Study on predictive value of Sino-nasal outcome Test (SNOT-22) in assessing post-surgical improvement in patients with chronic sinusitis”

ஆராய்ச்சி நிலையம் : இராஜீவ் காந்தி அரசு பொது மருத்துவமனை மற்றும்
சென்னை மருத்துவக் கல்லூரி,
சென்னை - 600 003.

பங்கு பெறுபவரின் பெயர் :

உறவுமுறை :

பங்கு பெறுபவரின் எண். :

மேலே குறிப்பிட்டுள்ள மருத்துவ ஆய்வின் விவரங்கள் எனக்கு விளக்கப்பட்டது. என்னுடைய சந்தேகங்களை கேட்கவும், அதற்கான தகுந்த விளக்கங்களைப் பெறவும் வாய்ப்பளிக்கப்பட்டது.

நான் இவ்ஆய்வில் தன்னிச்சையாகத்தான் பங்கேற்கிறேன். எந்தக் காரணத்தினாலோ எந்தக் கட்டத்திலும் எந்த சட்ட சிக்கலுக்கும் உட்படாமல் நான் இவ்ஆய்வில் இருந்து விலகிக் கொள்ளலாம் என்றும் அறிந்து கொண்டேன்.

இந்த ஆய்வு சம்மந்தமாகவோ, இதை சார்ந்த மேலும் ஆய்வு மேற்கொள்ளும்போதும் இந்த ஆய்வில் பங்குபெறும் மருத்துவர் என்னுடைய மருத்துவ அறிக்கைகளைப் பார்ப்பதற்கு என் அனுமதி தேவையில்லை என அறிந்து கொள்கிறேன். நான் ஆய்வில் இருந்து விலகிக் கொண்டாலும் இது பொருந்தும் என அறிகிறேன்.

இந்த ஆய்வின் மூலம் கிடைக்கும் தகவல்களையும், பரிசோதனை முடிவுகளையும் மற்றும் சிகிச்சை தொடர்பான தகவல்களையும் மருத்துவர் மேற்கொள்ளும் ஆய்வில் பயன்படுத்திக் கொள்ளவும் அதைப் பிரசுரிக்கவும் என் முழு மனதுடன் சம்மதிக்கிறேன்.

இந்த ஆய்வில் பங்கு கொள்ள ஒப்புக்கொள்கிறேன். எனக்குக் கொடுக்கப்பட்ட அறிவுரைகளின்படி நடந்து கொள்வதுடன், இந்த ஆய்வை மேற்கொள்ளும் மருத்துவ அணிக்கு உண்மையுடன் இருப்பேன் என்றும் உறுதியளிக்கிறேன். என் உடல் நலம் பாதிக்கப்பட்டாலோ அல்லாத எதிர்பாராத வழக்கத்திற்கு மாறான நோய்க்குறி தென்பட்டாலோ உடனே அதை மருத்துவ அணியிடம் தெரிவிப்பேன் என உறுதி அளிக்கிறேன்.

பங்கேற்பவரின் கையொப்பம்..... இடம்..... தேதி
கட்டைவிரல் ரேகை

பங்கேற்பவரின் பெயர் மற்றும் விலாசம்.....

ஆய்வாளரின் கையொப்பம்..... இடம்..... தேதி

ஆய்வாளரின் பெயர்.....

**INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI 600 003**

EC Reg.No.ECR/270/Inst./TN/2013/RR-16
Telephone No.044 25305301
Fax: 011 25363970

CERTIFICATE OF APPROVAL

To
Dr.V.OVIYA,
MS (ENT), Post Graduate,
Upgraded Institute of Otorhinolaryngology,
Madras Medical College &
Rajiv Gandhi Government General Hospital,
Chennai – 600 003.

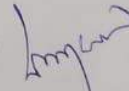
Dear Dr. V.OVIYA,

The Institutional Ethics Committee has considered your request and approved your study titled **“A STUDY ON PREDICTIVE VALUE OF SINO – NASAL OUTCOME TEST (SNOT-22) IN ASSESSING POST – SURGICAL IMPROVEMENT IN PATIENTS WITH CHRONIC SINUSITIS”- NO.15102020.** The following members of Ethics Committee were present in the meeting held on **21.10.2020** conducted at Madras Medical College, Chennai 3.

- | | |
|---|--------------------|
| 1. Prof.P.V.Jayashankar | :Chairperson |
| 2. Prof.N.Gopalakrishnan,MD.,DM., FRCP, Director, Inst.of Nephrology,MMC,Ch | : Member Secretary |
| 3. Prof. K.M.Sudha, Prof. Inst. of Pharmacology,MMC,Ch-3 | : Member |
| 4. Prof. Alagarsamy Jamila ,MD, Inst. of Pathology, MMC, Ch-3 | : Member |
| 5. Prof.Remam Chandramohan,Prof.of Paediatrics,ICH,Chennai | : Member |
| 6. Prof.S.Lakshmi, Prof. of Paediatrics ICH Chennai | :Member |
| 7. Tmt.Arnold Saulina, MA.,MSW., | :Social Scientist |
| 8. Thiru S.Govindasamy, BA.,BL,High Court,Chennai | : Lawyer |
| 9. Thiru K.Ranjith, Ch- 91 | : Lay Person |

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.


Member Secretary – Ethics Committee

MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE
CHENNAI-600 003.



Document Information

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Analysis address	droviya94.mgrmu@analysis.orkund.com

NAME	AGE	SEX	PLACE	COMORBIDITY	SMOKING	ALLERGY	1-NEED TO BLOW NOSE	2-SNEEZING	3-RUNNY NOSE	4-COUGH	5-POST NASAL DRIP	6-THICK NASAL DISCHARGE	7-EAR FULLNESS	8-DIZZY NESZ	9-EAR PAIN /EAR PRESSURE	10-FACIAL PAIN /PRESSURE	11-DIFFICULTY IN FALLING ASLEEP	12-WAKING UP AT NIGHT	13-LACK OF A GOOD NIGHT'S SLEEP	14-WAKING UP TIRED	15-FATIGUE DURING THE DAY	16-REDUCED PRODUCTIVITY	17-REDUCED CONCENTRATION	18-FRUSTRATED/RESTLESS /IRRITABLE	19-SAD	20-EMBARRASSED	21-TASTE /SMELL	22-BLOCKAGE OF NOSE	SNOT 22 SCORE	
1 GUNACHOWDARY	33	M	NELLORE	NIL	YES	YES	PRE OP POSTOP	3 0	4 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	50	
2 GANESH	20	M	CHENNAI	NIL	NO	NO	PRE OP POSTOP	2 0	3 1	0 0	0 0	3 1	1 0	3 0	0 0	0 0	0 0	4 0	1 0	2 1	0 0	0 0	1 1	3 0	0 0	1 5	5 4	3 1	4 6	
3 ARUN	27	M	CHENNAI	NIL	NO	NO	PRE OP POSTOP	0 0	0 0	1 0	1 0	5 1	5 0	5 0	5 0	0 0	0 0	3 0	0 0	3 1	1 1	1 1	1 0	1 0	5 4	5 1	5 1	5 1	47	
4 SIRIYA PUSHPAM	60	F	VELLORE	DM	NO	YES	PRE OP POSTOP	5 0	1 0	5 0	0 0	4 1	4 1	1 0	1 0	0 0	1 0	5 0	5 0	5 0	1 4	4 0	0 0	4 0	4 0	3 0	4 5	5 1	4 1	66
5 MUTHUKUMAR	41	M	CHENNAI	NIL	NO	NO	PRE OP POSTOP	4 1	1 0	1 0	1 0	1 0	3 0	1 0	4 1	1 0	2 0	2 0	0 1	3 1	1 0	1 0	1 0	2 0	2 0	2 0	5 5	5 5	45	
6 GOBI RAGHAVAN	29	M	PUDUKKO	NIL	NO	YES	PRE OP POSTOP	2 1	3 1	3 0	1 0	1 0	3 1	3 0	1 0	0 1	3 1	3 0	3 0	3 0	3 0	3 0	3 0	2 1	2 0	2 0	3 1	4 1	51	
7 AMIDHA	42	F	CHENNAI	NIL	NO	NO	PRE OP POSTOP	4 1	3 1	4 0	2 0	4 0	4 1	4 0	3 0	3 1	2 0	1 0	3 1	4 0	4 0	4 0	5 0	2 1	2 1	4 2	1 0	4 0	13	
8 RAMANATHAN	30	M	VIRALMALAI	NIL	NO	NO	PRE OP POSTOP	4 1	4 1	2 1	1 1	2 0	1 0	0 0	0 0	0 0	0 0	3 0	3 0	2 2	3 3	3 0	1 1	2 3	2 1	3 1	3 1	4 1	47	
9 PRAVEEN KUMAR	25	M	MANALI	NIL	NO	NO	PRE OP POSTOP	2 0	0 0	3 0	0 0	4 0	4 0	2 0	0 0	0 0	0 0	2 0	2 0	2 1	2 1	2 2	2 2	2 2	2 5	5 5	44	1	3	
10 VIVEK	24	M	MINJOOR	NIL	NO	YES	PRE OP POSTOP	2 1	1 0	2 0	2 0	2 1	1 0	1 1	1 0	2 0	2 0	2 0	3 0	3 1	3 1	3 1	3 1	3 2	4 1	4 1	1 1	9		
11 RANIHA	20	F	CHENNI	NIL	NO	NO	PRE OP POSTOP	4 0	3 1	4 1	3 1	3 1	0 0	1 0	0 0	1 1	3 0	2 0	3 1	2 2	2 2	3 0	3 0	3 0	3 2	3 0	3 0	3 0	52	
12 PARHIBAN	28	M	CHENNAI	NIL	YES	NO	PRE OP POSTOP	0 0	0 0	1 0	1 0	5 0	5 0	5 0	0 0	0 0	3 0	0 0	3 1	1 0	1 0	1 0	1 0	5 0	4 0	5 1	1 1	5	47	
13 AMBIKA	57	F	CHENNAI	DM	NO	NO	PRE OP POSTOP	2 1	1 1	3 1	3 0	4 0	4 0	2 0	1 0	1 0	5 0	5 0	5 0	4 1	4 0	4 1	4 0	4 1	4 1	5 1	5 1	73	10	
14 KALYANI	40	F	VELLORE	NIL	NO	NO	PRE OP POSTOP	2 0	2 1	2 0	2 0	3 1	2 0	2 0	2 0	0 0	0 0	2 0	2 0	3 0	3 0	3 0	3 0	2 0	2 0	3 0	3 2	4 1	48	
15 RAJAGURU	22	M	ARIYALUR	NIL	NO	NO	PRE OP POSTOP	4 0	1 0	3 0	3 1	3 1	0 0	2 0	0 0	0 0	1 0	1 0	1 0	1 0	0 0	0 0	0 0	0 0	2 0	3 0	4 1	0	26	
16 MANMADHAN	60	M	VILUPURAM	DM	YES	YES	PRE OP POSTOP	2 0	4 0	3 0	0 0	2 0	2 0	0 0	0 0	0 0	0 0	2 0	2 0	2 1	2 1	0 0	1 0	2 0	2 0	5 2	5 2	35	4	
17 SANGEETHA	28	F	CHENNAI	HTN	NO	YES	PRE OP POSTOP	5 0	5 0	5 1	3 0	5 1	5 0	1 0	0 0	1 0	5 0	5 0	5 0	5 0	5 0	5 5	5 5	5 5	5 0	5 0	5 0	5	90	
18 NARESH	22	M	KANCHIPURAM	NIL	NO	YES	PRE OP POSTOP	4 0	1 1	1 1	1 1	1 0	3 1	1 0	4 0	1 0	2 1	2 0	3 1	1 0	1 1	1 0	1 0	2 0	2 0	2 0	5 0	5 0	45	
19 PRAKASH	20	M	ROYAPURAM	NIL	NO	NO	PRE OP POSTOP	2 0	4 0	3 0	0 1	2 1	2 0	0 0	0 0	0 0	0 0	2 0	2 1	2 2	1 0	1 0	1 0	2 0	2 0	5 0	5	35		
20 THYAGARAJAN	38	M	TRIPULICANE	NIL	NO	NO	PRE OP POSTOP	4 1	3 0	2 0	2 0	2 0	2 0	4 1	1 0	4 0	4 0	2 1	2 1	2 1	2 1	2 1	1 0	1 0	4 0	4 0	4	50		
21 UMA	36	F	VANDAVASI	NIL	NO	YES	PRE OP POSTOP	2 0	3 1	3 0	1 0	1 0	3 1	3 0	1 0	1 0	0 1	3 0	3 0	3 3	3 0	3 0	3 0	2 0	2 0	3 0	3	4	51	
22 VIGNESH	18	M	VELLORE	NIL	NO	NO	PRE OP POSTOP	5 1	5 1	3 1	0 1	3 0	3 1	2 0	2 0	2 0	5 0	5 0	5 0	4 0	4 0	4 0	3 1	3 1	4 1	5 1	4 1	79		
23 NAZIMA BEE	42	F	CHENNAI	DM	NO	YES	PRE OP POSTOP	4 0	4 0	3 0	1 0	2 0	1 0	0 0	1 0	2 0	3 0	4 0	2 0	3 0	4 0	4 0	3 0	2 3	3 3	2 1	3	53		
24 VINILA	22	F	CHENNAI	NIL	NO	YES	PRE OP POSTOP	2 0	3 0	3 1	1 0	1 1	3 1	3 0	1 0	0 0	2 0	3 0	3 0	3 0	3 3	3 3	3 3	2 2	3 0	2 0	3	1	51	
25 GOMATHI	45	F	KANCHI	DM	NO	YES	PRE OP POSTOP	2 0	3 1	3 0	1 0	1 0	3 1	3 0	0 0	1 1	3 0	3 0	3 1	3 0	3 0	3 0	3 0	2 0	2 0	3 0	3	4	51	
26 JAWAHAR	21	M	SALIGRAMAM	NIL	NO	NO	PRE OP POSTOP	2 1	3 0	3 0	1 0	1 0	3 0	3 1	1 0	1 0	3 0	3 0	3 1	3 1	3 0	3 0	3 0	2 0	4 0	4	4	56		
27 RAVISHANKAR	44	M	CHENNAI	NIL	YES	YES	PRE OP POSTOP	2 0	3 1	0 0	0 0	3 0	1 0	3 0	0 0	0 0	4 1	1 0	2 1	0 0	0 0	1 0	1 0	3 0	3	1	5	34		
28 SADISHKUMAR	34	M	CHENNAI	NIL	YES	YES	PRE OP POSTOP	4 0	3 0	3 0	2 0	3 0	3 0	0 1	0 0	1 0	0 3	3 3	3 3	3 3	3 3	3 3	3 3	2 2	3	2	3	4	56	
29 DHARUN	31	M	CHENNAI	NIL	NO	NO	PRE OP POSTOP	4 1	1 1	1 1	1 1	1 0	3 1	1 0	4 0	1 0	2 0	2 0	3 1	3 1	1 1	1 1	1 2	2	2	5	5	45		
30 GANESAN	22	M	AVADI	NIL	NO	YES	PRE OP POSTOP	0 0	0 0	1 1	1 1	5 1	5 0	5 0	5 0	0 0	0 1	3 0	0 0	3 0	1 1	1 1	1 1	5	4	5	1	5	47	
31 DASLEEMA	20	F	CHENNAI	NIL	NO	NO	PRE OP POSTOP	2 0	3 1	3 0	1 0	1 0	3 0	3 0	1 0	1 0	0 1	0 0	3 1	3 1	3 3	3 3	3 3	2 2	3	2	3	4	51	
32 GANDHIMADHI	34	F	CHENNAI	NIL	NO	YES	PRE OP POSTOP	4 1	1 0	1 0	1 0	1 0	3 0	1 1	4 1	1 0	2 0	2 0	3 1	1 1	1 1	1 1	1 1	2	2	2	5	5	45	
33 SELVI	47	F	CHENNAI	DM	NO	YES	PRE OP POSTOP	2 1	1 0	2 0	2 0	2 0	1 1	1 0	1 0	1 0	2 0	2 0	2	3	3	3	3	3	3	2	2	3	4	40
34 KUMAR	61	M	CHENNAI	HN	YES	YES	PRE OP POSTOP	4 1	4 1	2 1	1 1	2 0	1 0	0 0	0 0	0 0	0 0	3 0	3 0	2	3	3	2	3	2	3	1	4	47	
35 ELAIYARAJA	34	M	KUMBAKONAM	NIL	NO	NO	PRE OP POSTOP	4 0	3 1	4 0	3 1	3 0	1 0	1 0	1 0	1	3	2	3	2	2	2	3	3	3	2	3	3	52	

36	RAMYA	18	F	CHENNAI	NIL	NO	YES	PRE OP	2	3	3	1	1	1	3	3	0	1	0	3	3	3	3	2	2	3	2	3	4	51	
								POSTOP	0	0	1	0	1	1	1	1	0	0	0	1	1	1	1	0	1	1	0	3	1	9	
37	VASANDHI	38	F	CHENNAI	DM	NO	YES	PRE OP	4	3	4	3	3	3	1	0	1	0	1	3	2	3	2	2	3	3	2	3	3	52	
								POSTOP	0	1	0	1	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	5	
39	KEERTHANA	21	F	CHENNAI	NIL	NO	YES	PRE OP	2	3	3	1	1	1	3	3	0	1	0	3	3	3	3	3	3	3	3	3	4	54	
								POSTOP	0	1	0	1	0	1	1	0	0	0	1	0	0	1	0	0	0	1	0	0	1	8	
40	ELUMALAI	23	M	TV MALAI	NIL	NO	YES	PREOP	4	2	2	2	2	3	1	2	1	2	2	0	3	1	1	1	2	2	2	5	5	47	
								POSTOP	1	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	1	0	1	2	8	
41	MAND	25	M	VELLORE	NIL	NO	NO	PRE OP	4	1	4	2	2	2	1	1	1	2	2	3	3	3	3	3	4	3	3	4	56		
								POSTOP	1	0	0	0	1	1	0	1	0	0	0	0	0	0	1	1	2	0	1	0	1	11	
42	MANIKANDAN	34	M	CHENNAI	NIL	NO	NO	PRE OP	4	3	3	2	3	3	3	3	3	2	1	3	4	4	4	5	2	4	1	3	67		
								POSTOP	1	1	0	1	0	2	1	0	0	1	0	1	0	0	0	0	0	0	1	1	2	13	
43	ASHOK	39	M	CHENNAI	NIL	YES	NO	PRE OP	2	4	3	0	2	2	0	0	0	0	0	2	2	2	2	1	0	1	0	2	5	35	
								POSTOP	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	5	
44	KASI	54	M	CHENNAI	NIL	NO	YES	PRE OP	4	3	4	3	3	3	1	0	1	0	1	3	2	3	2	2	3	3	2	4	4	54	
								POSTOP	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	5
45	ARUNA	32	F	ARAKONAM	NIL	NO	YES	PRE OP	4	3	4	2	4	4	4	4	3	2	1	3	3	3	3	5	5	2	2	4	1	3	69
								POSTOP	1	1	0	1	0	2	1	0	0	1	0	0	3	0	0	0	1	1	1	2	1	0	13
46	ALAMELU	50	F	TVMALAI	NIL	NO	NO	PRE OP	4	3	0	0	3	1	3	0	0	0	4	1	2	2	0	2	2	3	2	5	4	44	
								POSTOP	0	1	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	1	1	7		
47	ROSELIN ESABELLA	45	F	CHENNAI	NIL	NO	NO	PRE OP	2	1	2	2	2	2	1	1	1	2	2	2	3	3	3	3	3	3	2	2	4	49	
								POSTOP	1	0	0	0	1	1	0	1	0	0	1	0	0	0	1	1	0	0	0	1	1	10	
48	MAHALAKSHMI	30	F	CHENNAI	NIL	NO	NO	PRE OP	4	3	3	2	4	3	3	0	1	0	3	3	3	3	3	3	2	2	3	3	4	57	
								POSTOP	1	1	0	0	1	1	1	0	0	1	1	0	0	0	0	0	1	0	0	0	1	10	
49	VIJAYA	35	F	VELLORE	NIL	NO	YES	PREOP	5	1	5	0	4	4	1	1	0	1	5	5	5	1	4	5	4	5	4	5	4	66	
								POSTOP	1	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	9	
50	RADHIKA	28	F	CHENNAI	NIL	NO	NO	PREOP	4	1	1	1	1	3	1	4	1	2	2	0	3	1	1	1	2	2	2	5	5	45	
								POSTOP	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	1	6
51	PRASANDH	37	M	VILLUPURAM	NIL	YES	NO	PRE OP	4	4	1	3	5	5	0	5	0	0	3	0	3	1	1	1	1	5	4	5	1	57	
								POSTOP	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	5	
52	KARTHIK	28	M	VELLORE	NIL	NO	NO	PRE OP	4	1	1	1	1	3	1	4	1	2	2	0	3	1	1	1	2	2	2	5	5	45	
								POSTOP	1	1	1	1	0	1	0	0	0	1	0	0	0	0	0	1	1	0	1	1	1	11	
53	MAHADEVAN	25	M	CHENNAI	NIL	NO	NO	PRE OP	4	3	4	3	3	1	0	1	0	1	3	2	3	2	2	3	3	3	2	3	3	52	
								POSTOP	0	1	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	5
54	HARIPRASAD	30	M	KANCHIPURAM	NIL	NO	YES	PRE OP	4	1	1	1	1	3	1	4	1	2	2	0	3	1	1	1	2	2	2	5	5	45	
								POSTOP	1	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	1	6	
55	KUMARASAN	48	M	KANCHIPURAM	NIL	YES	NO	PRE OP	2	3	2	1	3	2	2	2	0	0	2	3	2	3	3	3	2	3	3	4	48		
								POSTOP	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	5	
56	VASANDHI	40	F	TV MALAI	DM	NO	NO	PRE OP	4	3	4	2	4	4	3	4	3	2	1	3	4	4	3	5	2	2	3	1	3	70	
								POSTOP	1	1	0	1	0	2	1	0	0	1	0	1	0	0	0	0	0	1	1	2	1	0	13
57	MEHARUNISA	53	F	REDDITHOPPU	NIL	NO	YES	PRE OP	4	4	3	0	2	1	0	0	1	2	3	4	2	3	4	4	3	4	3	4	58		
								POSTOP	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	4	
58	NARASIMMAN	48	M	PALLUPATTU	NIL	NO	YES	PRE OP	4	3	4	2	4	4	4	4	3	2	1	3	3	3	3	4	5	2	2	4	1	3	68
								POSTOP	1	1	0	1	0	2	1	0	0	1	0	0	1	0	0	0	1	1	2	1	2	15	
59	RAJIV GANDHI	33	M	ARIYALUR	NIL	YES	YES	PRE OP	4	1	4	2	2	2	1	1	1	2	2	2	3	3	3	3	4	3	3	3	4	56	
								POSTOP	1	0	0	0	2	1	0	1	0	1	0	0	0	1	0	1	2	0	1	0	1	11	
60	NARESH KUMAR	23	M	CHENNAI	NIL	NO	NO	PRE OP	2	3	3	3	3	1	3	1	1	1	4	2	2	0	0	1	1	3	0	1	5	4	44
								POSTOP	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	6
61	HEMIMA	18	F	CHENNAI	NIL	NO	NO	PRE OP	4	1	1	1	1	3	1	4	1	2	2	0	3	1	1	1	2	2	2	5	5	45	
								POSTOP	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	11	
62	JAGADHA	50	F	CHENNAI	DM	NO	YES	PRE OP	3	3	3	1	2	3	3	0	3	0	3	3	3	3	3	2	2	3	2	3	4	55	
								POSTOP	0	1	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	5
63	NASEEMA BEEVI	46	F	THIRUVALLUR	NIL	NO	YES	PRE OP	4	3	4	3	3	4	0	3	0	3	3	2	3	2	2	3	3	3	3	2	4	4	61
								POSTOP	0	1	0	1	0	2	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	7
64	VIVEKANANDAN	24	M	CHENNAI	NIL	NO	NO	PRE OP	2	1	2	2	2	2	1	1	1	2	2	3	3	3	3	3	3	2	2	4	4	49	
								POSTOP	1	0	0	0	1	1	0	1	0	1	0	0	1	0	0	1	1	1	0	1	1	10	
65	PRAVEEN KUMAR	25	M	CHENNAI	NIL	YES	YES	PRE OP	4	4	1	3	5	5	0	5	3	3	3	2	3	1	1	1	5	4	5	1	5	65	
								POSTOP	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	5
66	KAVIN WILSON	22	M	CHENNAI	NIL	NO	YES	PREOP	4	1	1	1	1	3	1	4	1	2	2	0	3	1	1	1	2	2	2	5	5	45	
								POSTOP	1	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1	1	6	
67	KALAIARASI	55	F	CHENNAI	DM	NO	YES	PREOP	5	4	5	0	4	4	1	1	0	1	5	5	5	1	4	0	4	4	3	4	5	4	69
								POSTOP	1	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	9	
68	RENUKA	30	F	OOTHUKKOTAI	NIL	NO	YES	PREOP	4	1	1	1	1	3	1	4	1	2	2	0	3	1	1	1	2	2	2	5	5	45	
								POSTOP	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	6	
69	AMUDHA	44	F	KODUNGAIYUR	DM	NO	YES	PREOP	5	1	5	0	4	4	1	1	0	1	5	5	5	1	4	0	4	3	4	5	4	66	

72	JODHI	42	F	KANCHIPURAM	NIL	NO	NO	PRE OP	4	3	4	3	3	1	0	1	0	1	3	2	3	2	2	3	3	2	3	3	52		
								POSTOP	1	1	0	1	0	1	0	0	1	0	0	1	0	1	0	0	0	1	1	1	8		
73	SARAVANAN	41	M	CHENNAI	NIL	YES	YES	PRE OP	5	4	4	3	3	2	3	1	1	3	3	3	3	3	3	2	4	3	2	4	65		
								POSTOP	1	0	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	0	0	1	6		
74	SEKAR	60	M	THIRUVALLUR	HTN.	YES	YES	PRE OP	2	3	2	1	3	2	2	2	0	0	2	3	3	3	3	3	2	2	3	4	48		
								POSTOP	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	5		
75	PRABHAKARAN	57	M	CHENNAI	DM	YES	YES	PRE OP	4	1	1	1	1	3	1	4	1	2	2	0	3	3	3	4	2	2	2	5	52		
								POSTOP	1	1	1	1	0	1	0	0	0	0	0	0	3	3	3	4	1	1	1	1	11		
76	KANIPANDIYAN	23	M	CHENNAI	NIL	NO	NO	PRE OP	5	1	5	0	4	4	1	1	0	3	5	5	5	3	4	4	4	3	4	5	73		
								POSTOP	1	0	1	0	1	1	1	0	0	0	0	1	0	0	0	0	0	1	1	1	9		
77	SELVAM	60	M	KANCHIPURAM	NIL	YES	YES	PRE OP	4	3	4	3	3	1	0	1	0	3	3	2	3	2	2	3	3	3	3	3	54		
								POSTOP	0	1	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	5		
78	KALYANI	41	F	CHENNAI	NIL	NO	YES	PRE OP	5	4	5	0	4	4	1	1	0	3	5	5	5	4	4	3	4	5	4	77			
								POSTOP	1	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0	1	9		
79	ASWINI	25	F	CHENNAI	NIL	NO	YES	PRE OP	4	3	4	3	3	2	0	3	0	4	3	2	3	2	3	2	3	3	2	3	58		
								POSTOP	0	1	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	5		
80	PAVIDRA	21	F	CHENNAI	NIL	NO	NO	PRE OP	2	1	2	2	2	2	3	3	3	2	2	2	1	3	3	3	2	3	2	4	55		
								POSTOP	1	0	0	0	1	1	0	1	0	0	1	0	0	0	1	1	1	0	0	0	1	10	
81	MYDHILI	35	F	KANCHIPURAM	NIL	NO	YES	PRE OP	2	3	3	3	3	1	3	1	1	1	4	2	2	3	3	3	4	4	4	6	63		
								POSTOP	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	6		
82	VIJAYA	40	F	CHENNAI	NIL	NO	YES	PRE OP	4	3	3	2	3	3	2	4	2	2	2	0	3	1	1	1	2	2	2	5	54		
								POSTOP	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	1	1	6		
83	VASANDHA	45	F	CHENNAI	DM	NO	YES	PRE OP	5	4	5	0	4	4	3	3	0	1	5	5	5	1	4	4	4	3	4	5	73		
								POSTOP	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	
84	RAJA	29	M	CHENNAI	NIL	YES	NO	PRE OP	3	3	3	1	2	3	3	0	3	0	3	3	3	3	3	3	2	2	3	4	55		
								POSTOP	0	1	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	5	
85	ARUN	25	M	CHENNAI	NIL	NO	NO	PRE OP	3	4	3	0	3	3	0	0	0	0	2	2	2	3	3	3	3	2	2	5	48		
								POSTOP	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5		
86	LALAN KUMAR	18	M	BIHAR	NIL	NO	YES	PRE OP	4	3	4	2	4	4	3	4	3	2	4	4	4	4	4	4	2	2	3	1	3	68	
								POSTOP	1	1	0	1	0	2	1	0	1	0	1	0	0	0	0	0	1	1	2	1	0	13	
87	MOHAN RAJ	24	M	CHENNAI	NIL	YES	NO	PRE OP	2	3	2	1	3	2	2	2	3	3	2	3	3	3	3	2	2	3	3	4	57		
								POSTOP	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	5
88	AJAY	18	M	CHENNAI	NIL	NO	YES	PRE OP	5	1	5	0	4	4	1	1	0	3	4	4	4	3	4	4	4	4	5	4	70		
								POSTOP	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	1	1	9		
89	KUMARI	56	F	THIRUVALLUR	DM	NO	YES	PRE OP	4	3	4	3	3	3	3	2	2	3	3	2	3	2	2	3	3	3	3	3	63		
								POSTOP	1	1	0	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	1	8	
90	REKHA	22	F	PERAMBALUR	NIL	NO	NO	PRE OP	4	3	3	2	2	2	3	3	3	2	2	2	1	3	3	3	3	2	3	4	60		
								POSTOP	1	0	0	0	1	1	0	1	0	1	0	0	0	0	0	1	1	0	0	0	1	10	
91	SABANA	21	F	CHENNAI	NIL	NO	NO	PRE OP	4	3	4	3	3	2	0	3	0	4	3	2	3	2	2	3	3	3	3	3	58		
								POSTOP	0	1	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	5	
92	MAHALAKSHMI	16	F	THIRUVALLUR	NIL	NO	YES	PRE OP	5	1	5	0	4	4	1	1	0	3	5	5	5	3	4	4	4	5	4	73			
								POSTOP	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	9		
93	SHANDHI	45	F	CHENNAI	NIL	NO	YES	PRE OP	3	4	3	0	3	3	0	0	0	0	2	2	2	2	3	3	3	2	2	5	48		
								POSTOP	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	5	
94	SURESH	46	M	CHENNAI	NIL	YES	YES	PRE OP	2	1	2	2	2	2	3	3	3	2	2	2	3	3	3	3	3	2	2	4	55		
								POSTOP	1	0	0	0	1	1	0	1	0	0	1	0	0	0	0	1	1	0	0	0	1	10	
95	FEROZ KHAN	27	M	VELLORE	NIL	NO	NO	PRE OP	5	4	5	0	4	4	1	1	0	3	5	5	5	4	4	4	4	3	4	5	4	77	
								POSTOP	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	9	
96	LOKESH BASKAR	26	M	CHENNAI	NIL	NO	NO	PRE OP	5	4	4	3	3	3	3	1	1	1	3	3	3	3	3	3	2	4	3	2	4	65	
								POSTOP	1	1	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	1	1	7	
97	THYAGARAJAN	55	M	CHENNAI	DM	YES	NO	PRE OP	3	4	3	3	3	1	3	2	2	2	4	2	2	3	3	3	4	4	4	5	4	68	
								POSTOP	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	1	6	
98	ABDUL RAHMAN	37	M	CHENNAI	NIL	YES	YES	PRE OP	3	4	2	3	3	4	3	2	2	2	4	2	2	3	3	3	4	4	4	5	4	70	
								POSTOP	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	1	7
99	SUNIL KUMAR	22	M	CHENNAI	NIL	NO	NO	PRE OP	4	3	4	3	3	2	0	3	0	4	3	2	3	2	2	3	3	3	3	2	4	60	
								POSTOP	0	1	0	1	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	
100	AROKKIYASAMY	45	M	CHENNAI	NIL	YES	YES	PRE OP	3	4	3	2	3	3	2	2	2	2	2	2	2	2	3	3	3	2	2	5	60		
								POSTOP	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	2	2	7	
101	JAYANTHI	33	F	CHENNAI	NIL	NO	NO	PRE OP	4	3	4	3	3	4	0	3	0	3	3	3	3	2	3	3	3	3	2	4	63		
								POSTOP	0	1	0	1	0	2	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	7	
102	SARASWADHY	28	F	CHENNAI	NIL	NO	YES	PRE OP	2	1	2	2	2	2	3	3	3	2	2	3	3	3	3	3	2	2	3	4	55		
								POSTOP	1	0	0	0	1	1	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	1	9
103	MANJULA	40	F	CHENNAI	NIL	NO	YES	PRE OP	3	3	3	2	2	3	3	0	3	0	3	3	3	3	3	3	4	3	3	3	4	60	
								POSTOP	0	1	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	5	
104	SUSEELA	29	F	CHENNAI	NIL	NO	YES	PRE OP	4	3	4	2	4	4	3	4	3	2	1	3	4	4	4	4	4	2	2	3	1	3	68
								POSTOP	1	1	0	1	0	2	1	0	0	1	0	0	1	1	0	0							

							POSTOP	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	
182	DEENA	20	M	CHENNAI	NIL	NO	NO	PRE OP	3	4	2	2	2	1	3	3	4	3	4	2	2	3	3	3	4	4	20	
								POSTOP	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	6	
183	VINDOKUMAR	30	M	CHENNAI	NIL	NO	YES	PRE OP	3	3	4	2	3	2	2	2	3	3	3	2	3	3	3	3	2	2	61	
								POSTOP	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
184	KANNAN	44	M	CHENNAI	NIL	NO	YES	PRE OP	4	4	5	3	4	4	2	2	0	1	5	5	5	1	4	0	4	4	73	
								POSTOP	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	8	
185	VANIDHA	30	F	CHENNAI	NIL	NO	NO	PRE OP	3	3	3	1	2	3	3	0	3	0	3	3	3	3	3	2	2	4	55	
								POSTOP	0	1	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	5	
186	BOOPALAN	29	M	CHENNAI	NIL	NO	NO	PRE OP	4	4	2	2	2	2	3	3	3	2	2	3	3	3	3	3	3	4	62	
								POSTOP	1	0	0	0	1	1	0	1	0	0	1	0	0	0	0	1	1	0	9	
187	RAMKI	21	M	ARIYALUR	NIL	NO	YES	PRE OP	2	1	3	1	4	4	2	1	1	1	5	5	5	4	4	4	4	5	73	
								POSTOP	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0	10	
188	RAJI	29	F	CHENNAI	NIL	NO	NO	PRE OP	4	3	4	3	3	4	2	3	0	3	3	3	3	2	3	3	3	4	65	
								POSTOP	2	1	0	1	0	2	0	0	0	1	0	0	0	2	0	0	0	0	10	
189	RAJAGURU	18	M	CHENNAI	NIL	NO	NO	PRE OP	3	4	3	2	3	3	2	2	2	2	2	2	2	2	3	3	3	2	60	
								POSTOP	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	2	7	
190	SARAVANAN	29	M	CHENNAI	NIL	NO	YES	PRE OP	2	3	3	1	1	3	3	0	1	0	3	3	3	3	3	3	2	4	51	
								POSTOP	0	0	1	0	1	1	1	0	0	0	0	1	1	0	0	1	0	0	9	
191	PACHAIYAPPAN	60	M	CHENNAI	DM	YES	YES	PRE OP	4	4	4	0	4	3	1	1	0	4	3	3	3	1	4	0	4	4	63	
								POSTOP	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	5	
192	SARAVANAN	29	M	CHENNAI	NIL	NO	NO	PRE OP	5	4	5	3	4	4	2	2	0	1	5	5	5	1	4	0	4	4	74	
								POSTOP	1	0	1	0	1	1	1	0	0	0	0	0	0	0	0	1	1	0	9	
193	KANNAN	32	M	CHENNAI	NIL	YES	NO	PRE OP	2	1	2	2	2	2	3	3	3	2	2	3	3	3	3	3	2	4	55	
								POSTOP	1	0	0	0	1	1	0	1	0	0	1	0	0	0	1	1	0	1	10	
194	VINAYAGA MOORTHY	43	M	KANCHIPURAM	NIL	NO	NO	PRE OP	3	2	0	0	2	1	3	0	0	0	4	1	2	0	0	1	1	3	34	
								POSTOP	0	1	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	5	
195	MAHESH	35	M	CHENNAI	NIL	YES	YES	PRE OP	4	3	4	3	3	4	0	3	0	3	3	2	3	2	2	3	3	4	61	
								POSTOP	0	1	0	1	0	2	0	0	0	1	0	0	2	0	0	0	0	0	7	
196	PADMAVADHY	37	F	CHENNAI	NIL	NO	YES	PRE OP	3	3	3	1	2	3	3	0	3	0	3	3	3	3	3	3	2	4	55	
								POSTOP	0	1	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	5	
197	VIIAYA	40	F	VELLORE	NIL	NO	NO	PRE OP	3	4	3	2	3	3	2	2	2	2	2	2	2	2	3	3	3	4	62	
								POSTOP	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	7	
198	NAUZIN BANU	26	F	CHENNAI	NIL	NO	YES	PRE OP	3	3	3	1	2	3	3	0	3	0	3	3	3	3	3	3	3	4	60	
								POSTOP	0	1	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	5	
199	SASIKALA	38	F	CHENNAI	NIL	NO	YES	PRE OP	2	1	2	2	2	2	3	3	3	2	2	3	3	3	3	3	2	2	55	
								POSTOP	1	0	0	0	1	1	0	1	0	0	1	0	0	1	1	1	0	1	10	
200	ASRIYA	19	F	CHENNAI	NIL	NO	YES	PRE OP	3	3	2	1	4	3	3	0	1	0	3	3	3	3	3	2	2	3	54	
								POSTOP	0	0	1	0	1	1	1	0	0	0	0	0	0	1	1	0	0	0	1	9