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Available online at: http://www.iajps.com ***Research Article***

A DESCRIPTIVE CROSS-SECTIONAL RESEARCH TO ASSESS THE PREOPERATIVE AND POSTOPERATIVE OUTCOMES OF COBLATION TURBINATE REDUCTION AND DEVIATED NASAL SEPTOPLASTY THROUGH RHINOMANOMETRIC EVALUATION

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Abstract:

Introduction: *Turbinate, valves and vestibules are three components of nasal airflow. The composition of the nasal valves is from the nasal septum part. From the turbinate (mostly inferior turbinate) is covered by the surface of mucous along with expanded capacity which is capable to reduce or increase the overall volume which comprises of nasal resistance. Therefore, inferior turbinate hypertrophy and nasal septum increases nasal resistance and also affect nasal patency among nasal congestion patients. We conducted this research in order to study rhinomanometric nasal airflow among deviated nasal septum patients who belong to inferior turbinate hypertrophy. We also aimed to compare and contrast nasal septoplasty rhinomanometric improvements after surgical intervention and the coblation of the reduced inferior turbinate.*

Methods: *The design of our research was descriptive cross-sectional which was conducted at Services Hospital, Lahore in the timeframe starting from February to October 2017. Our research included a total of forty-two patients who underwent coblation inferior turbinate reduction and nasal septoplasty. We interviewed every patient and observed their SNOT-22 through a questionnaire. We also performed nasal airflow postoperative and preoperative assessment with the help of rhinomanometry.*

Results: *The male to female distribution was such as that our research sample included 11 females and 31 males with a mean age of (33.56 ± 11.59) years. Preoperative SNOT-22 average score was (6.38 ± 3.10); whereas, values of nasal airflow and nasal airflow resistance was respectively (461.17 ± 110.84) cm^3/s and (0.35± 0.07) $Pa/cm^3/s$. The postoperative outcomes reflected that SNOT-22, nasal airflow and airflow resistance was respectively (1.78 ± 1.66), (977.26 ± 155.84) cm^3/s and (0.16 ± 0.03) $Pa/cm^3/s$. The improvement of nasal resistance and nasal airflow was respectively 2.18 times and 2.12 times.*

Conclusion: *Rhinomanometry is useful, reliable and objective way to assess the postoperative and preoperative nasal obstruction in the patients. It is suggested that this method is to be made a regular routine assessment for the shortlisted patients experiencing surgical intervention.*

Keywords: *Assessment, Rhinomanometric, Deviated Nasal Septoplasty, Nasal Airflow and Coblation Turbinate Reduction.*

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INTRODUCTION:

There may be a bone deviation in the nasal septum or cartilage or the presence of the both. Due to the imbalanced progression of the bones and nasal septal cartilages nasal septum and palatine crest do not merge with one another. Presence of trauma is also possible in the newborn children with deformity of the nose structure as it is the most prominent part of the face [1, 2]. Among other reasons of deformity of the nose, we include accidents, falling, inferior turbinate hypertrophy, mucous membrane and bone hypertrophy. Local reasons include chemicals, contacting polluted air, nasal septum deviation and wet cold weather. Systemic reasons include endocrine disruption and allergy. Turbinate, valves and vestibules are three components of nasal airflow [3, 4, 5]. The composition of the nasal valves is from the nasal septum part. From the turbinate (mostly inferior turbinate) is covered by the surface of mucous along with expanded capacity which is capable to reduce or increase the overall volume which comprises of nasal resistance. Therefore, inferior turbinate hypertrophy and nasal septum increases nasal resistance and also affect nasal patency among nasal congestion patients [6, 7].

Rhinomanometry may be carried out as a passive or active method. In the technique of active Rhinomanometry, the air pressure and airflow are measured in the course of spontaneous breathing; whereas, in the technique of passive Rhinomanometry, air is blown in a fixed amount through single or both nostrils through the route of external nozzle and the patients hold their breath so that the pressure measurement is carried out [8]. The practice of using passive Rhinomanometry is very rare as it results in the form of nasal mucous membrane hypertrophy. We may also perform an Active Rhinomanometry with posterior/anterior approaches which depend on the sensor position [9].

We conducted this research in order to study rhinomanometric nasal airflow among deviated nasal septum patients who belong to inferior turbinate hypertrophy. We also aimed to compare and contrast nasal septoplasty rhinomanometric improvements after surgical intervention and the coblation of the reduced inferior turbinate.

METHODOLOGY:

We conducted this research in order to study rhinomanometric nasal airflow among deviated nasal septum patients who belong to inferior turbinate hypertrophy. We also aimed to compare and contrast nasal septoplasty rhinomanometric improvements after surgical intervention and the coblation of the reduced inferior turbinate. The design of our research was descriptive cross-sectional which was conducted at Services Hospital, Lahore in the timeframe starting from February to October 2017. Our research included a total of forty-two patients who underwent coblation inferior turbinate reduction and nasal septoplasty. We interviewed every patient and observed their SNOT-22 through a questionnaire. We also performed nasal airflow postoperative and preoperative assessment with the help of rhinomanometry.

The population of this research was in the age bracket of above sixteen years who were further treated with surgical interventions in the prescribed timeframe of this research.

Sample Size: $n = 1.96^2 \times \frac{0.87\times(1-0.87)}{0.1^2} \approx 43$

The sample size is in accordance with the Buckland J.R sample collection procedure for coblation turbinate reduction and nasal septoplasty. The research includes all the patients who were non-respondents to the treatment, inferior turbinate hypertrophy and nasal septal deviation. There are no other involved lesions causing the nasal obstruction as reported in this particular research. We did not include any patient comorbid lesions, chronic rhinosinusitis, acute rhinosinusitis, nasal tumours, nasal polyposis and nasal valve diseases.

The sources of data collection included patient's information database, a patient's record and analysis of data was done through SPSS software. The outcomes were presented in the form of a percentage, frequency and average (Mean ± SD) for both quantitative and qualitative variables).

The researcher also took one-month prior history for symptoms and also evaluated different types of inferior turbinate hypertrophy and nasal deviation. The overall success was dependent on the comfort of the patients. The Rhinomanometry one month before and after surgical intervention was treated with locally available decongestant Naphazoline (0.05%) for five minutes. Patients sat comfortably in the office chars with a straight back and sealed nostrils through pressure tube connected through nasal Olive connecting and the tube was also connected to the machine. Do not touch the nose as it may deform the nose. The deformation can possibly be eliminated through a fitting size such as Olive.

RESULTS:

Detailed outcomes are presented in the given tabular and graphical data as under.

Table – I: Inspiration and Expiration Presentation

Presentation	Inspiration			Expiration			Unit
	75	150	300	75	150	300	Pa
FI. L	398	570	774	400	576	800	ml/s
FI. R	400	564	771	405	573	792	ml/s
FI. L+R	798	1134	1545	805	1149	1592	ml/s
FI. L/R	1	1.01	1	0.99	1.01	1.01	ml/s
FI. L-R	-2	6	3	-5	3	8	ml/s
FI. Inc L	43	-	36	44	-	39	Percentage
FI. Inc R	41	-	37	41	-	38	Percentage
FI. L/(R+L)	50	50	50	50	50	50	Percentage
FI. R/(R+L)	50	50	50	50	50	50	Percentage
Res I.	0.64	0.89	1.31	0.63	0.88	1.26	Percentage
Res R.	0.63	0.9	1.31	0.62	0.88	1.28	Percentage

Table – II: Time of Nasal Cognition (Months and Years)

Nasal Cognition Time	Number	Percentage
< 6 Months	3	7.14
6 Months to < 1 Year	11	26.19
1 Years to < 5 Years	26	61.9
Above 5 Years	2	4.76

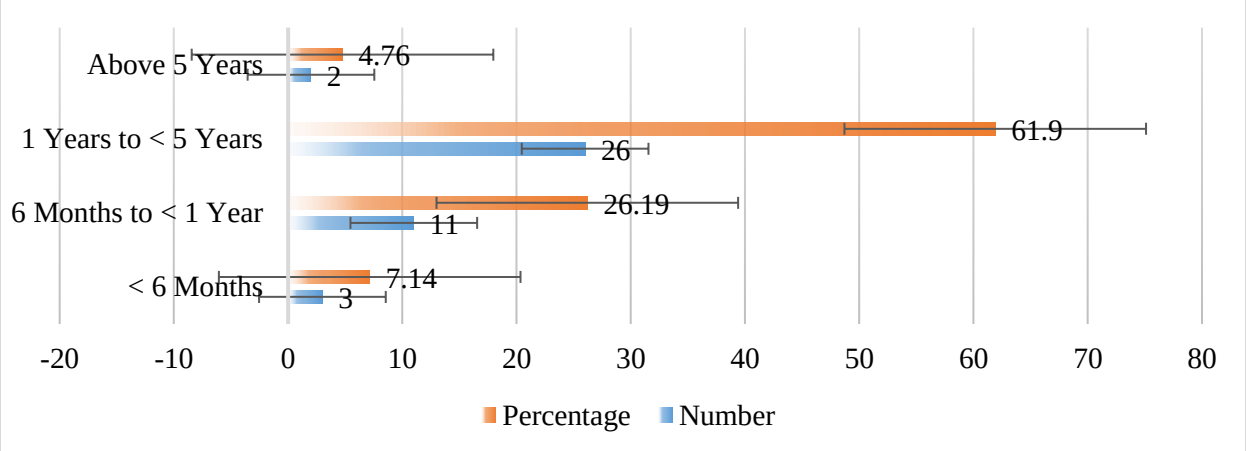

Table – III: Nasal Cognition with respect to time of day

Nasal Cognition Time of Day	Number	Percentage
Morning	9	21.4
Evening	8	19
Cold Days	6	14.3
All Day	13	31

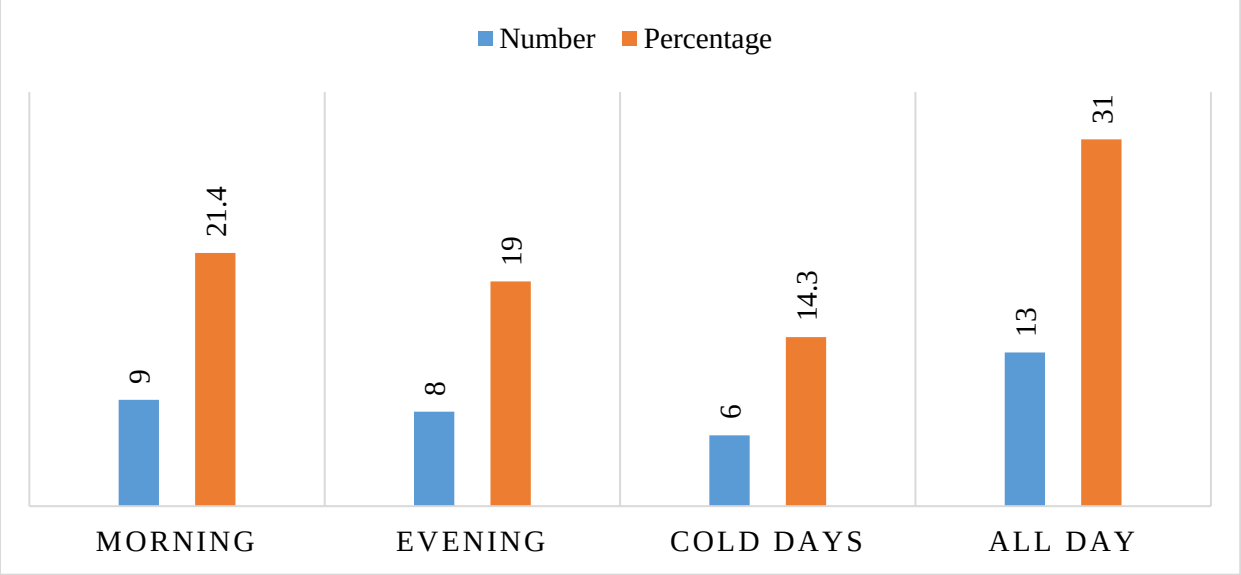

Table – IV: SNOT-22 Score

SNOT 22 Score	Number	Percentage
Under 5	14	33.33
5 to Under 10	24	57.14
Above 10	4	9.53

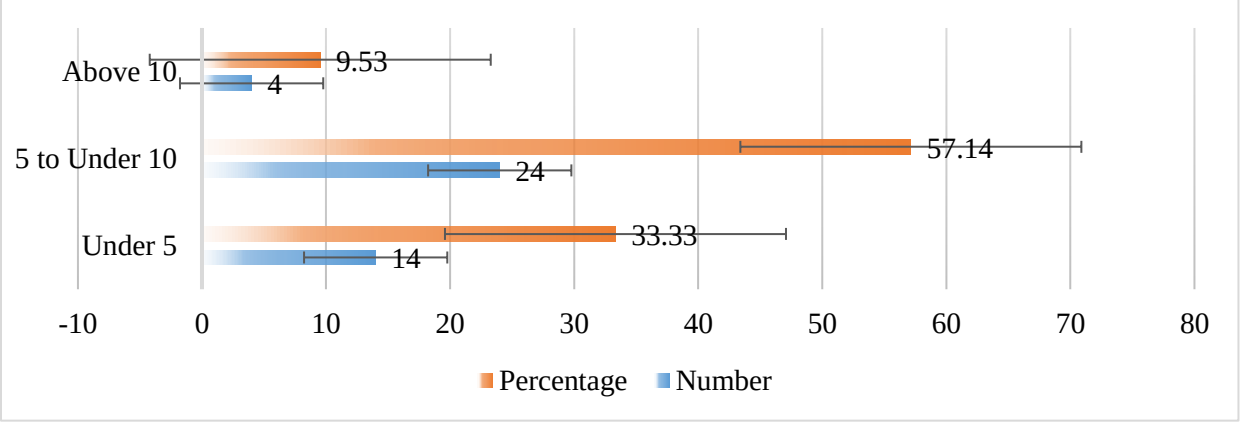

Table – V: Various Symptoms with their Proportion

Symptoms	Percentage
Nasal Discharge	26.19
Mucous Discharge	0
Purulent Discharge	0
Posterior Nasal Discharge	4.76
Nasal Obstruction	95.24
Hyposmia	0
Headache/Facial Pain	53.38
Sneeze	16.67
Cough	9.52
Tinnitus	0
Earache	0
Dizziness	0
Trouble Sleeping	53.38
Night Awakening	0
Not Well Sleep	7.14
Tired When Awake	0
Fatigue	28.57
Reduce Productivity	2.38
Reduce Concentration	2.38
Arousal	0
Sadness	0
Anxious	9.52

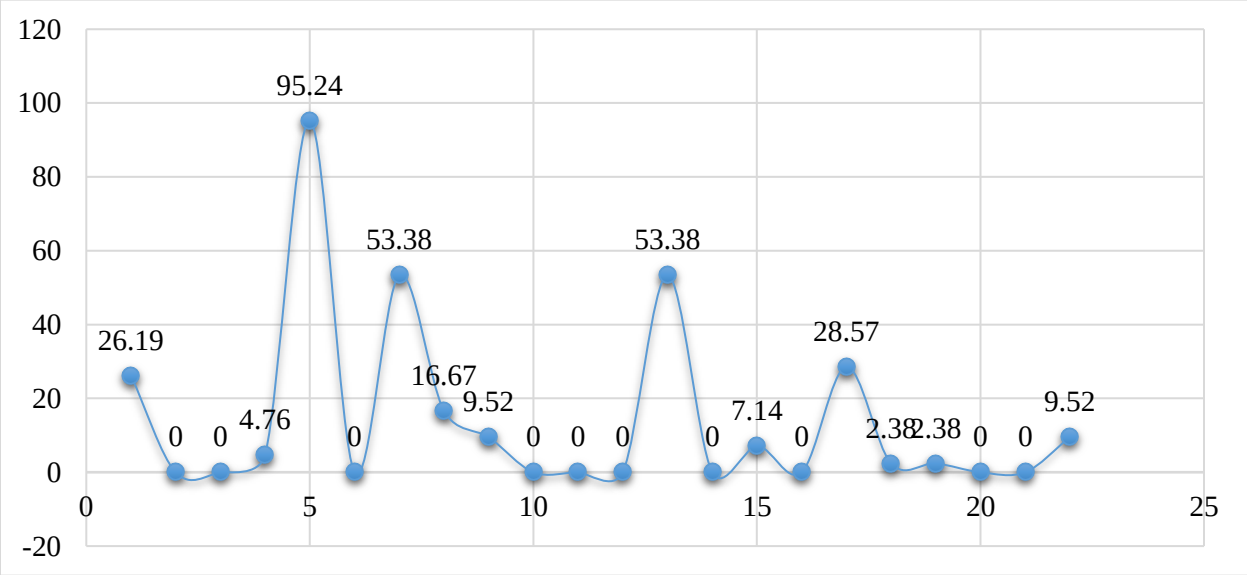

Table – VI: Comparison with Different Research Studies

Study/Symptoms	Nasal obstruction	Headache/ Facial pain	Nasal discharge
J.R. Buckland (2003)	72.5	7.5	20.0
K.K. Pannu (2009)	80	12.5	32.5
N.N Ha (2017)	88.1	30.95	35.71
Our Study	95.24	53.38	26.19

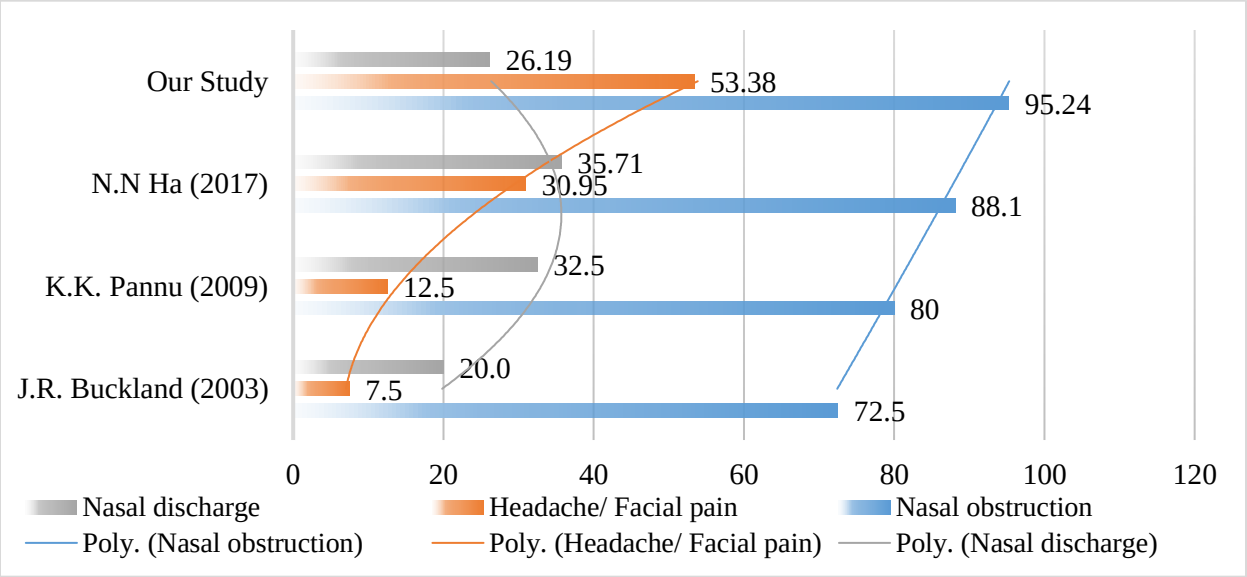

Table – VII: Nasal Septum Deviation

Nasal Septum Deviation	Right	Left
C Shape	7	18
	28	72
S Shape	1	1
	50	50
Spur	2	0
	100	0
Crest	6	7
	46.2	53.8
Total (42)	16	26
	38.1	61.9

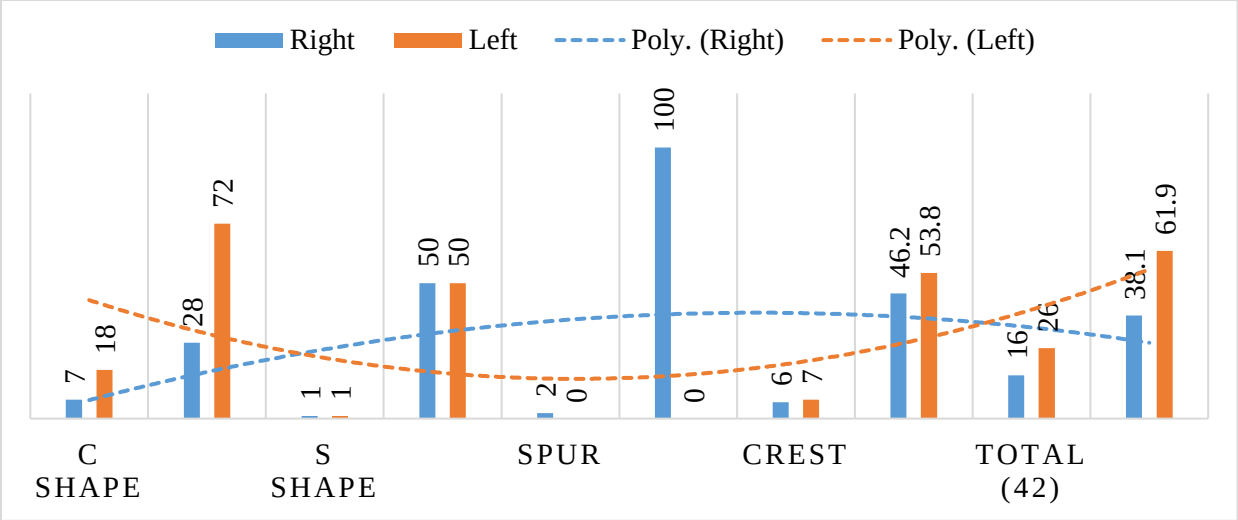

Table – VIII: Preoperative Outcomes

Postoperative Assessment	Number	Percentage
Under 1	23	54.76
2 to 3	13	30.95
Above 4	6	14.28

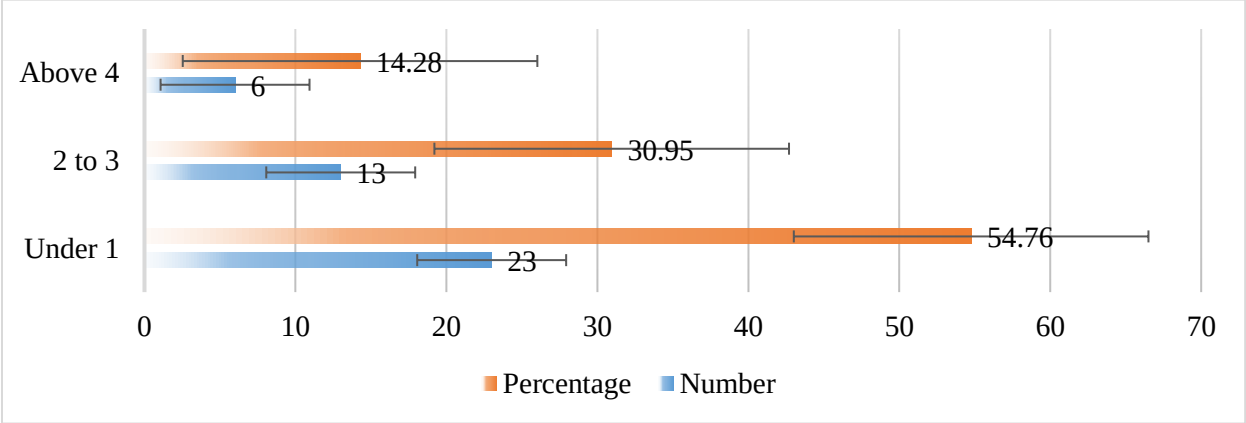

Table – IX: Preoperative and Postoperative Outcomes Analysis

Research Study	Number	Preoperative	Postoperative
J.R. Buckland (2003)	40	3.9	1.2
K.K. Pannu (2009)	60	3.42	1.3
H.S. Statish (2013)	70	3.3	1.1
Our Study	42	3.25	1.25

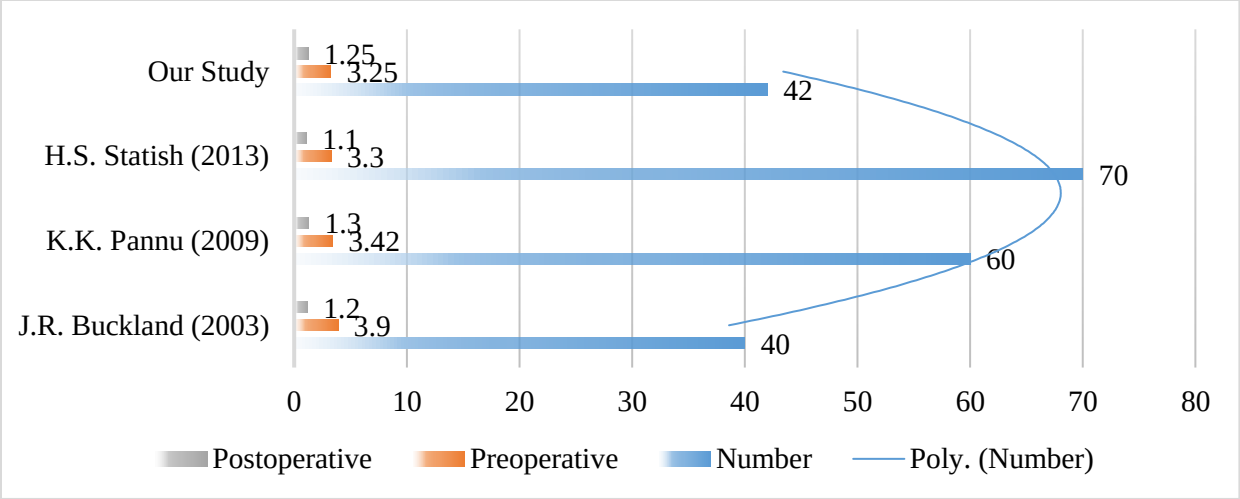

Table – X: Preoperative and Postoperative Average Values

Average Values	Preoperative		Postoperative		P-Value	Improvement (%)
	Mean	±SD	Mean	±SD		
FL.150 L	221.9	40.62	482.7	76.67	< 0.001	54.00
FL.150 R	240.1	43.3	494.6	82.45	< 0.001	51.47
Total FL.150	461.2	110.8	977.3	155.8	< 0.05	52.81
RES.150 L	0.7	0.14	0.32	0.06	< 0.001	54.26
RES.150 F	0.69	0.15	0.31	0.06	< 0.001	55.07
Total RES.150	0.35	0.07	0.16	0.03	< 0.001	54.29

CONCLUSION:

The improvement of nasal resistance and nasal airflow was respectively 2.18 times and 2.12 times. Preoperative SNOT-22 average score was (6.38 ± 3.10); whereas, values of nasal airflow and nasal airflow resistance was respectively (461.17 ± 110.84) cm^3/s and (0.35± 0.07) $Pa/cm^3/s$. The postoperative outcomes reflected that SNOT-22, nasal airflow and airflow resistance was respectively (1.78 ± 1.66), (977.26 ± 155.84) cm^3/s and (0.16 ± 0.03) $Pa/cm^3/s$. The male to female distribution was such as that our research sample included 11 females and 31 males with a mean age of (33.56 ± 11.59) years. Detailed outcomes are presented in the given tabular and graphical data as shown in the results and discussions. Rhinomanometry is useful, reliable and objective way to assess the postoperative and preoperative nasal obstruction in the patients. It is suggested that this method is to be made a regular routine assessment for the shortlisted patients experiencing surgical intervention.

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