

An Audit of Patient Satisfaction of Flexible Nasoendoscopy in the SARS-CoV-2 Era

Khalid Munir^{1,2}, Emma Keane²

¹Department of Otorhinolaryngology, Royal College of Surgeons, Dublin, Ireland

²Department of Otorhinolaryngology, Sligo University Hospital, Sligo, Ireland

Corresponding Author: Khalid Munir

Email: [khalidmunir\[at\]rcsi.ie](mailto:khalidmunir[at]rcsi.ie)

Phone: +353 87 716 0864

ORCID Number: 0000-0002-6270-8042

Higher Specialty Training Programme in Otolaryngology/Head & Neck Surgery, Royal College of Surgeons, Ireland.

Abstract: ***Background:** Flexible nasoendoscopy is critical to a comprehensive head and neck examination. It is commonly performed in an outpatient setting and used as an examination tool and to monitor head and neck cancer patients. This procedure can be uncomfortable for patients and has the potential to generate aerosols and droplets, leading to a risk of transmission of respiratory tract illnesses such as SARS-CoV-2. **Aims:** This audit aimed to identify patients' experiences of undergoing flexible nasoendoscopy and ascertain whether they had concerns about this procedure during the SARS-CoV-2 pandemic. **Methods:** An observational study was conducted using a 15-item written questionnaire on patient-reported satisfaction with FNE in the SARS-CoV-2 era. Over three months, this questionnaire was disseminated to patients in outpatient clinics in a northwestern regional hospital in the Republic of Ireland. **Results:** 61 questionnaires were returned, and 53 were included in the data analysis. 52.83% (n=28) were female, and the mean age was 53. The mean patient discomfort score was 3.22. This was inversely correlated with a thorough understanding of the procedure. 87% (n=46) had no concerns about undergoing similar procedures during the pandemic. 94.3% (n=50) of participants were fully vaccinated against SARS-Cov-2. **Conclusions:** Flexible nasoendoscopy can be uncomfortable, but a thorough understanding of the procedure can enhance the patient experience. Few concerns were expressed about hospital attendance and undergoing procedures during the SARS-CoV-2 pandemic.*

Keywords: Flexible nasoendoscopy; fiberoptic nasoendoscopy; SARS-CoV-2; COVID-19; otolaryngology.

1. Introduction

The otolaryngologist diagnoses and treats various diseases involving the upper aerodigestive tract [1]. Timely and appropriate visualisation of the anatomy of the nasal cavity, nasopharynx, oropharynx, hypopharynx, and larynx is required [1-4]. Flexible nasoendoscopy (FNE) is a critical component of a comprehensive examination of the upper aerodigestive tract and is excellent at visualising these key areas [5, 6]. It forms part of the routine ENT clinical examination and is performed freely in the outpatient setting [5, 6]. The utility of FNE is most relevant in diagnosing and surveilling head and neck cancers [4, 6]. The United Kingdom National Multidisciplinary Guidelines state that an adequate clinical examination should include FNE [7].

Acknowledging that this procedure can be uncomfortable for patients is essential [2]. As a result, various methods have been proposed to alleviate discomfort [2]. We must recognize and understand patient satisfaction and tolerance of this examination, as this will increase the likelihood of patients permitting repeat FNE in the future [2].

While consideration of the effects of this procedure on patients is essential, the SARS-CoV-2 pandemic raised questions about the safety of FNE for the endoscopist [8]. In the past, FNE was performed frequently in the outpatient setting with little to no personal protective equipment [4]. FNE has the potential to generate aerosols and droplets associated with the patient coughing, sneezing, and talking,

all of which are likely to occur during this procedure [8]. As awareness increased, guidelines were formed, and changes were made [8]. However, this did not consider patients' perception of the safety of undergoing this procedure during a global pandemic.

The purpose of this study was two-fold: to identify whether patients found FNE uncomfortable and any relevant factors that reduced discomfort and whether patients were concerned about undergoing this procedure during the SARS-CoV-2 pandemic.

2. Methods

An observational study was conducted using a 15-item written questionnaire about patient-reported satisfaction with FNE in the SARS-CoV-2 era. Over three months, this questionnaire was disseminated to patients in outpatient clinics in a northwestern regional hospital in the Republic of Ireland.

Inclusion Criteria

Patients undergoing FNE were invited to participate voluntarily by completing the questionnaire. Only patients over the age of 18 were invited to participate.

Exclusion Criteria

Only complete questionnaires were included in the study.

Questionnaire

The questionnaire (Supplementary File 1) was designed within the ENT department by a specialist registrar (SpR) and a consultant otolaryngologist. The SpR initially developed the Questionnaire and reviewed it with the consultant, reducing the initial number of questions from 21 to 15. The questionnaire was piloted on three patients in the outpatient clinic, who reported that it was easy to comprehend and required only a short time to answer. Responses were fully anonymised and apparent only by a code number.

The questionnaire was divided into three sections:

- Demographic information of study subjects: age, sex, presenting complaint, previous FNE.
- Questions related to an understanding of the procedure and subjective discomfort.
- The final section addressed concerns about the SARS-CoV-2 pandemic, vaccination status and whether this alleviated concerns.

Ethical Considerations

Patients gave informed consent before participating. The study was explained to them, and only if they agreed to participate were questionnaires provided. Data collection, storage, and analysis were fully anonymised, and no patient-related data was identifiable.

Data Extraction & Analysis

All data was extracted into an Excel file and stored securely on a single password-protected file on a hospital computer. This file was then imported into the Stata 17 program for analysis.

3. Results

A total of 61 questionnaires were returned to the primary author. Eight incomplete questionnaires were discounted from the final analysis, leaving 53 questionnaires suitable for data analysis.

Demographics & Characteristics

The mean age of participants was 53, with 52.83% (n=28) female.60.4% (n=32) were return patients and 56.6% (n=30) had previously undergone FNE. Only 18.87% (n=10) were active smokers. A blocked nose was the most frequent primary concern (n=12). A summary of these characteristics can be seen in Tables 1-3 below.

Table 1: Basic characteristics of participants

Characteristics	n=	%
Age Range		
24-33	8	15.12
34-43	10	18.9
44-53	8	15.12
54-63	7	13.2
64-73	12	22.7
74-83	7	13.2
84-93	1	1.89
Total	53	100
Sex		
Male	25	47.17
Female	28	52.83

New Patient		
No	32	60.4
Yes	21	39.6
Smoker		
Yes	10	18.87
No	43	81.13

Table 2: Previous FNE and time since last FNE

Characteristics	n=	%
Previous FNE		
Yes	30	56.6
No	23	43.4
Time Since Last FNE		
0-6 months	6	20
6-12 months	9	30
1-3 years	9	30
3-5 years	3	10
>5 years	3	10
Total	30	100

Table 3: Presenting complaints

Characteristics	n=
Main Concern	
Blocked Nose	12
Voice/Hoarse	8
Swallowing	7
Cancer Surveillance	4
Blocked/Sore Ear	3
Sore Throat	3
Neck Swelling	3
Hearing Loss	2
Recurrent Tonsillitis	2
Tongue Lesion	1
Dry Nose	1
Breathing Issues	1
Postnasal Drip	1
T-Tube Cleaning	1
Buccal Lesion	1
Post-Op Review	1
Nasal Polyps	1
Reflux	1
Total	53

Doctor-Patient Visit

Only three patients reported that their general practitioner (GP) had mentioned the possibility of undergoing FNE.92.45% (n=49) agreed or strongly agreed that the physician encountered had adequately explained the procedure.92.45% (n=49) agreed or strongly agreed that they appropriately understood the procedure. Most patients (n=45) preferred not to receive a patient information leaflet.

Discomfort Score

The discomfort score was graded from 1-10, with 1 representing minimal discomfort and 10 representing maximum discomfort.64.15% (n=34) of respondents reported a discomfort score of 3 or less, with a mean discomfort score of 3.22. Figure 1 below demonstrates a graphical representation of the discomfort scores. The reported discomfort score was inversely correlated with the patient's understanding of the procedure, $r = -0.3162$ ($p=0.02$). There was a positive correlation between smoking and discomfort score, $r = 0.0308$, but this was not statistically significant ($p=0.83$).

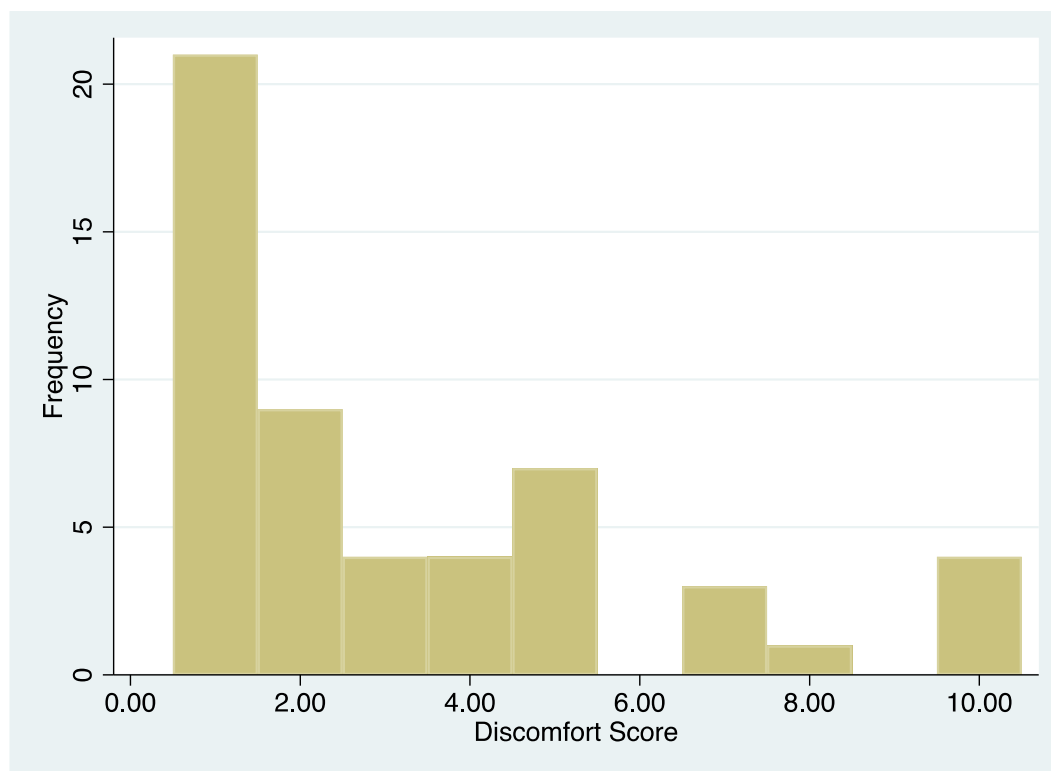


Figure 1: Histogram of patient-reported discomfort score

Concerns Related to the SARS-CoV-2 Pandemic

79.2% (n=42) reported no concerns about attending the hospital during the pandemic. 87% (n=46) also had no worries about undergoing procedures such as FNE during the pandemic. 94.3% (n=50) of respondents had been fully vaccinated against SARS-CoV-2. 31 people felt that any potential concerns about attending the hospital and undergoing procedures during the pandemic were alleviated following vaccination. 96% (n=51) of respondents thought the clinician took appropriate measures to protect themselves and the patient during the procedure.

4. Discussion

This observational study assessed the impact of SARS-CoV-2 on patient-reported satisfaction of having procedures such as FNE performed and whether their vaccination status impacted their concerns. To our knowledge, this is the first Irish study discussing patient-reported satisfaction of FNE during the SARS-CoV-2 era.

Paul et al. noted that the likelihood of patient-perceived discomfort with outpatient FNE was low for most patients, and they reported an average discomfort rating of 3.71 out of 10 [9]. Young et al. previously reported an average of 37 out of 100 on a discomfort scale, with 0 representing no discomfort and 100 representing maximal discomfort [10]. This was consistent with our study, where 64.15% of respondents reported pain scores less than or equal to 3, with a mean pain score of 3.22.

The senior author previously performed an audit demonstrating that written information leaflets before FNE could improve the patient-reported experience of FNE. Scott Brown's seminal textbook notes that an appropriate

explanation of the procedure is crucial to allowing the patient to relax and alleviating the risk of discomfort [11]. This is important as our study reported that 92.59% (n=50) of patients agreed or strongly agreed that the doctor explained the procedure. 92.59% (n=50) felt that they understood what the procedure entailed. This may have contributed to the lower pain scores reported in our study. A statistically significant inverse correlation between discomfort scores and the patient's understanding of the procedure was identified in our study.

As noted, the pandemic resulted in FNE being identified as a potential aerosol-generating procedure (AGP) with the potential to pose a risk to the healthcare provider when performing this examination in patients potentially carrying the SARS-CoV-2 virus [12]. It is also possible that nosocomial transmission to patients could occur with this procedure [12]. Scott Brown's book reports that the examiner should always use universal precautions, such as gloves and masks when dealing with potential contact with secretions and blood [11]. Our study demonstrated an awareness of this, with 96% of patients noting that doctors took apparent measures to protect them and the patient when performing FNE. The literature supports this importance, with Kavanagh et al. reporting that in asymptomatic patients where appropriate PPE was worn, the risk of transmission of COVID-19 from FNE was no more than 1% [4].

In Ireland and other countries, non-urgent elective care was curtailed mainly during the early phases of the pandemic. Return to everyday practice was phased gradually with the increased use of PPE and more informed guidelines about safe practice [4]. Interestingly, little literature was reported about patients' perceptions of attending the hospital during the pandemic. Our study demonstrates that 79.2% (n=41)

patients had no concerns about hospital attendance, and 87% (n=46) had no concerns about procedures such as FNE during the pandemic. This may have been related to the success of the national vaccination program in Ireland, with 94.3% of respondents (n=50) having been fully vaccinated. This was higher than the national average, which reports that 82.5% of the entire population is fully vaccinated [13].

5. Conclusion

In conclusion, FNE can be an uncomfortable procedure, but appropriate explanation and understanding can enhance the patient experience. Patients expressed few concerns about attending the hospital and undergoing FNE during the pandemic. Some of those concerns that were raised were alleviated by vaccination against SARS-CoV-2.

Statements and Declarations

Funding

The authors declare that no funding was received in support of this project.

Conflicts of Interest

The authors declare that there is no conflict of interest and no external funding was obtained for this project.

Acknowledgements

The authors would like to thank the participants for taking the time to fill out our questionnaire.

Ethical Approval

Not required

Consent to Participate

The authors declare that informed consent was obtained from the patients for participation in this patient satisfaction study.

Consent for Publication

The authors declare that informed consent was obtained from the patients for participation in this patient satisfaction study with the understanding that the results would be published.

Availability of data and material

All relevant data is stored in a secure Excel sheet on a secure hard drive and can be made available on request.

Code availability

Not applicable

Authors contributions

Khalid Munir performed the literature review, data collection, data analysis, and manuscript writing and review. Emma Keane was the senior author and provided continuous support and input into the data collection and analysis and reviewed the manuscript before submission,

References

- [1] Aremu SK (2019) Flexible nasopharyngolaryngoscopy: Evaluation and appraisal of its effectiveness and diagnostic yield, The Nigerian experience. *J Family Med Prim Care* 8: 3399-3403. https://doi.org/10.4103/jfmpc.jfmpc_489_19
- [2] Clark BS, Gao WZ, Bertelsen C, Choi JS, Shoffel - Havakuk H, Reder LS, Hapner ER, Johns MM, O'Dell K (2020) Flexible versus rigid laryngoscopy: A randomized crossover study comparing patient experience. *The Laryngoscope* 130: 2663-2666. <https://doi.org/10.1002/lary.28491>
- [3] Demirci S, Tuzuner A, Callioglu EE, Akkoca O, Aktar G, Arslan N (2015) Rigid or flexible laryngoscope: The preference of children. *Int J Pediatr Otorhinolaryngol* 79: 1330-1332. <https://doi.org/10.1016/j.ijporl.2015.06.004>
- [4] Kavanagh FG, Connolly C, Farrell E, Callanan D, Brinkman D, Affendi A, Lang E, Sheahan P (2021) Risk of disease transmission from flexible nasoendoscopy during the coronavirus disease 2019 pandemic. *J Laryngol Otol* 135: 246-249. <https://doi.org/10.1017/S002221512100061X>
- [5] Seccia V, Dallan I, Massimetti G, Segnini G, Navari E, Fortunato S, Bajraktari A, Lenzi R, Muscatello L, Sellari-Franceschini S (2014) Patient-related and ENT-related predictive factors based on the pain experienced during flexible nasendoscopy. *Laryngoscope* 124: 1648-1652. <https://doi.org/10.1002/lary.24535>
- [6] Digonnet A, Hamoir M, Andry G, Haigentz M, Takes RP, Silver CE, Hartl DM, Strojjan P, Rinaldo A, de Bree R, Dietz A, Grégoire V, Paleri V, Langendijk JA, Vander Poorten V, Hinni ML, Rodrigo JP, Suárez C, Mendenhall WM, Werner JA, Genden EM, Ferlito A (2013) Post-therapeutic surveillance strategies in head and neck squamous cell carcinoma. *European Archives of Oto-Rhino-Laryngology* 270: 1569-1580. <https://doi.org/10.1007/s00405-012-2172-7>
- [7] Simo R, Homer J, Clarke P, Mackenzie K, Paleri V, Pracy P, Roland N (2016) Follow-up after treatment for head and neck cancer: United Kingdom National Multidisciplinary Guidelines. *The Journal of Laryngology & Otology* 130: S208-S211. <https://doi.org/10.1017/s0022215116000645>
- [8] Curran J, Calder N, Yaneza M, Iyer A (2020) Reducing potential aerosol generation in flexible nasolaryngoscopy: a novel method. *J Laryngol Otol* 134: 744-746. <https://doi.org/10.1017/S0022215120001413>
- [9] Paul B, Rafii B, Achlatis A, Amin M, Branski R (2012) Morbidity and Patient Perception of Flexible Laryngoscopy. *Annals of Otolaryngology & Laryngology* 121: 708-713. <https://doi.org/10.1177/000348941212101102>
- [10] Young VN, Smith LJ, Sulica L, Krishna P, Rosen CA (2012) Patient tolerance of awake, in-office laryngeal procedures: A Multi-Institutional Perspective. *The Laryngoscope* 122: 315-321. <https://doi.org/10.1002/lary.22185>
- [11] Gleeson M, Browning GG, Burton MJ, Clarke R, John H, Jones NS, Lund VJ, Luxon LM, Watkinson JC (2008) *Scott-Brown's Otorhinolaryngology, Head and Neck Surgery*. 7th Edition edn. Hodder Arnold, London
- [12] Loizidou A, Tatla TS, Harvey I, Aibibula M, Roe J, Sethi N, Schilder AGM (2022) COVID-VU – ENT-

UK national survey of flexible nasendoscopy in the upper aerodigestive tract amidst the COVID-19 pandemic. BMC Health Services Research 22. <https://doi.org/10.1186/s12913-021-07416-x>

- [13] Mathieu E RH, Rodes-Guirao L, Appel C, Giattino C, Hasell J, Macdonald B, Dattani S, Beltekian D, Ortiz-Ospina E, Roser M (2020) Coronavirus Pandemic (COVID-19). <https://ourworldindata.org/coronavirus>. Accessed 24th February 2023