

## ORIGINAL RESEARCH

# Postoperative patient-centered multimedia education in head and neck cancer patients: A pilot study

Ameen Amanian MD  | Khanh Linh Tran BSc(C) | Edward Wang BAsC  |  
Himanshu Chotwani BSc(C) | Eitan Prisman MD, FRCSC 

Division of Otolaryngology – Head and Neck Surgery, University of British Columbia, Vancouver, British Columbia, Canada

**Correspondence**

Eitan Prisman, Division of Otolaryngology – Head and Neck Surgery, Department of Surgery, University of British Columbia, 4th floor, Gordon and Leslie Diamond Health Care Center, 2775 Laurel Street, Vancouver, BC, Canada V5Z1M9.

Email: [eitan.prisman@ubc.ca](mailto:eitan.prisman@ubc.ca)

**Abstract**

**Objective:** It is hypothesized that patients who are actively provided with more treatment-related education may report increased satisfaction and have improved overall outcomes. The aim of this study was to demonstrate the feasibility of an audiovisual education platform in patients undergoing head and neck surgery and to investigate whether patients using this module reported increased satisfaction.

**Methods:** This was a prospective pilot study of patients undergoing major head and neck reconstructive surgery who were randomized to either (1) control group or (2) intervention (i.e., in-patient audiovisual educational module). Both study groups then completed a discharge survey.

**Results:** Total 35 patients were recruited into the study ( $N = 16$  Intervention;  $N = 19$  Control). Patients in the intervention group reported an increased satisfaction with their overall outcome. Exactly 87.5% (14 of 16) found the intervention to be “Extremely useful,” “Quite useful,” or “Sometimes useful.” Exactly 68.8% (11 of 16) would recommend similar patients to receive the same educational intervention. However, there was no significant difference in patients’ perceived level of involvement amongst the two groups. For future improvements to the intervention, patients requested further information such as how to look after themselves, postoperative radiation, course in hospital, and nutrition.

**Conclusion:** This pilot study demonstrated the feasibility of an audiovisual education platform in the postoperative setting for patients undergoing major head and neck reconstructive surgery. Although most patients found the module useful, future steps will incorporate patient feedback to further improve the educational platform and confirm the current preliminary impressions in prospective studies.

**Level of Evidence:** 1b

**KEYWORDS**

education, free flap, head and neck cancer, multimedia, patient satisfaction

Preliminary results were presented as an oral presentation at the Canadian Society of Otolaryngology – Head & Neck Surgery Annual meeting, October 3, 2020 (Virtual).

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2022 The Authors. *Laryngoscope Investigative Otolaryngology* published by Wiley Periodicals LLC on behalf of The Triological Society.

## 1 | INTRODUCTION

Head and neck cancer (HNC) is the seventh most common cause of cancer globally and has a propensity for treatment-related morbidity including decreased communication, reduced nutritional status, and body-image dissatisfaction.<sup>1,2</sup> Patients with HNC commonly seek education across all phases of their cancer journey from pre-treatment to long-term follow-up.<sup>3,4</sup> Patients are most vulnerable in the initial postoperative period given the anxiety regarding treatment-related disfigurement and dysfunction.<sup>5</sup> This is further complicated by communication challenges, particularly if they have a tracheotomy or difficulty articulating due to extensive surgical resection.<sup>6</sup> Hence, patients need education by the health care team on recovery and planning for discharge.

Patient-centered education entails informing patients about their condition, surgical course, management of postoperative symptoms, and expected recovery both in hospital and following discharge.<sup>7</sup> However, as patients are seen by a multidisciplinary care team in the postoperative period, there may be variability in the information received from each member and consolidating the vast amount of information presented to them may be overwhelming. Delivery of education in multiple sittings and incorporating an audiovisual component with written material is associated with increased patient satisfaction, improved education (e.g., information retention and recall), and health outcomes.<sup>7,8</sup> Overall, we hypothesize that a platform that merges patient-centered information into a reliable resource and is always available to patients will result in improved patient outcomes. This study aims to assess whether use of an audiovisual teaching module delivered on a digital platform for HNC patients undergoing ablative and reconstructive procedures has an impact on patient satisfaction and perceived quality of medical care.

## 2 | MATERIALS AND METHODS

### 2.1 | Study design

Following institutional review board (H16-01039), a prospective randomized pilot study was conducted at a Quaternary Head and Neck Oncology Unit. All patients (age > 19) undergoing free flap reconstructive surgery for a confirmed primary head and neck malignancy diagnosis were identified and approached by a Research Assistant (RA) to be included in the study. Patients were excluded if they presented with recurrent or metastatic disease, were unable to use the electronic tablet due to cognitive limitations, could not read or speak English, or did not understand the conduct of the study.

Following informed consent, patients were randomly assigned to either the “control” or “intervention/patient-centered outcome (PCO)” group. At the preoperative visit, baseline demographic data (e.g., age, gender) were collected from the patient's medical record. Clinical data pertaining to tumor site, presence of tracheotomy, reconstructive option, and length of stay (LOS) in hospital were collected from the medical records following patient discharge.

The study workflow is presented in Figure 1. Briefly, only patients within the PCO group completed the educational module starting on postoperative day (POD) 1 and then once every other day. Throughout their admission, the surgical team was blinded as to which patients were receiving the intervention as only the RA administered the tablet to the PCO arm. Both groups then completed a discharge survey prior to discharge from hospital. All study patients were provided with the same standard of care regardless of the research arm that they were placed in.

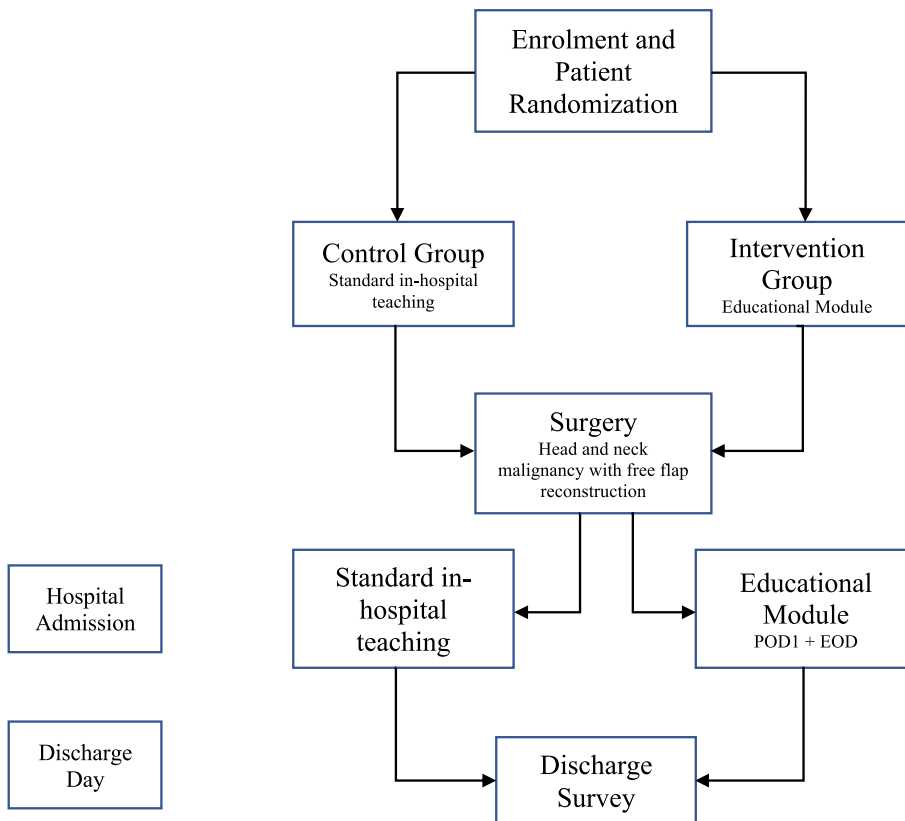
### 2.2 | Educational module

The audiovisual module was uploaded onto a survey tool (Qualtrics, Provo, UT) and displayed on an electronic tablet connected to a secure hospital internet server. This digital platform complies with the BC Freedom of Information and Protection of Privacy Act and stores and backs up the data in Canada. The educational module included 11 multiple-choice questions (Appendix 1) related to several previously identified critical domains within the physical, medical, and emotional domains as these have been deemed as the top three important domains for patients undergoing treatment following a new HNC diagnosis.<sup>3</sup> Questions pertained to topics of pain, oral care, mobility, presence of a foley or tracheotomy, current diet, and self-care.<sup>3</sup> Once each question was answered, the patient received carefully crafted educational feedback in an audiovisual format. The goal of the explanation was to provide information regarding the asked question (e.g., pain management) and reiterate key milestones that patients should meet during the postoperative stay prior to discharge. The content of the educational module was created in collaboration with the senior author, nurse clinician, residents, and RA. The content was then independently reviewed by two non-biased head and neck surgeons and an additional nurse clinician. The images and patient-care pathway were designed by a dedicated medical illustrator. An example of a question with its respective answer is shown in Figure 2A,B. Patients in the PCO group also had a patient-care pathway poster at the bedside highlighting the expected admission course following their surgery (Figure 3). The complete educational module can be viewed in Appendix 1.

### 2.3 | Discharge survey

On their discharge date, study participants in both groups completed the discharge survey which included 19–22 questions depending on group (Appendix 2). This questionnaire assessed for the (1) level of satisfaction with various levels of care they received in hospital and (2) perceived level of involvement by the patient, both assessed on a 5-point Likert-scale. For those within the PCO arm, they were also asked about the usefulness of the educational module and if they would recommend similar patients to utilize this intervention to serve as feedback for future improvement of the module. Completion of the discharge survey concluded their participation in the study.

**FIGURE 1** Study workflow from patient recruitment until end of study period. EOD, every other day; POD, postoperative day.



### 2.4 | Statistical analysis

Descriptive data were classified using “mean” for patient variables such as age. To assess a difference between POD1 and POD5 educational module scores within the PCO group, a paired *t*-test was performed. A Student’s *t*-test was used to assess for significance between the control and intervention group’s discharge questionnaire answers. A *p*-value of <.05 was considered to be significant. Given the pilot nature of the study, a sample size calculation was not conducted. All statistical analysis was performed via Python version 3.7 (Python Software Foundation).

## 3 | RESULTS

Overall, 35 patients were recruited into the study including 19 (54%) in the control group and 16 (46%) in the PCO group. The baseline and clinical characteristics of patients are shown in Table 1. There was no significant difference in age, sex, LOS, bony flap distribution, or proportion of patients undergoing a tracheotomy between the control and PCO group.

### 3.1 | Educational module

Only patients in the PCO group received the educational module (i.e., intervention). From 16 patients within the PCO group, one patient was unable to complete the modules due to difficulty using

the tablet and was thus only included in the discharge survey analysis component. All PCO patients reported an improvement in their ambulation and diet between the first and last day in the hospital (*p* < .05). Compared to the first day, patients could (1) sit in a chair and (2) walk around for significantly longer time periods on the last day. On the last day of hospital stay, patients were also able to (1) consume more solid food (*p* = .028) and (2) get closer to their preoperative diet (*p* = .003). Finally, patients felt more ready to be discharged on their last day in hospital (*p* = .002). Questions pertaining to urinary catheter and breathing tube were not included in the analysis as most patients had their catheter removed on POD1-2 and not all patients underwent a tracheotomy. Table 2 demonstrates the change in score for each survey question between POD1 and POD5.

### 3.2 | Discharge survey

The discharge survey was completed by both study groups and divided into three main categories: (a) patient satisfaction with care received, (b) perceived level of involvement, and (c) usefulness of PCO (if within the intervention group).

#### 3.2.1 | Patient satisfaction with care received

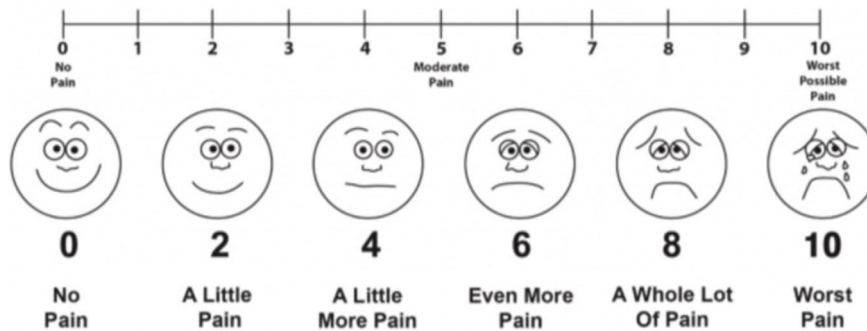
Patients in both groups were asked to rank their satisfaction with the (1) surgeon, (2) medical team, (3) office staff, and (4) overall outcome

1. How would you describe your pain? (Scale: 0-10)

No Pain Worst Possible Pain

0      1      2      3      4      5      6      7      8      9      10



**Pain after your operation is normal.**

**There are many pain medications available for you to use, and you should ask your nurse for more medication if you are in discomfort.**

**Reducing your pain and improving your comfort can increase your mood and make you more likely to get up, which speeds up your recovery.**



**FIGURE 2** (A) Sample question from the in-patient educational module.(B) Sample answer from the in-patient educational module

on a 5-point scale ranging from “Not satisfied” to “Satisfied.” Average patient satisfaction in each of the four categories was greater than 4. The PCO group reported slightly higher satisfaction with the surgeon, medical team, and office staff (Table 3). There was also a difference in patient’s perception of their “overall” outcome between the control (4.47) and PCO group (5.0) ( $p = .018$ ).

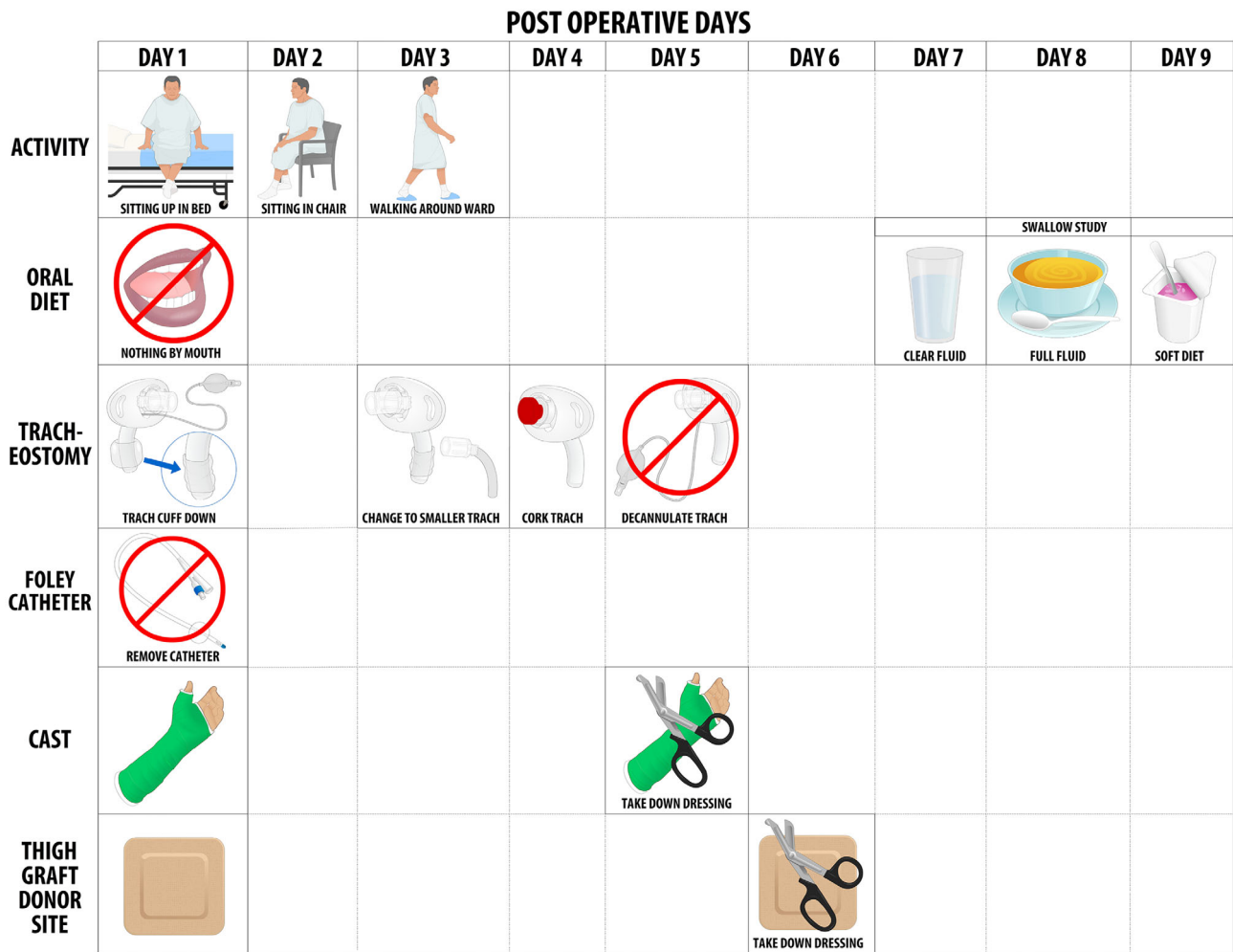
### 3.2.2 | Perceived level of involvement

Patients rated their perceived level of involvement (5-point scale) surrounding their pain, plans for functional recovery (e.g., breathing, swallowing, speech), active involvement in own care, and feeling

positive toward the future (Table 3 – Q5–16). The PCO group scored better in all domains related to their perceived level of involvement. Patients in the PCO group felt significantly more positive about the future. Finally, there was a positive trend within PCO group patients having improved perception related to their pain, breathing, and swallowing compared to the control group.

### 3.2.3 | Usefulness of in-hospital education

Although only the PCO group completed the educational module, the control group continued to receive routine education as part of the current standard of care. Amongst both groups, there was no



**FIGURE 3** Patient-care pathway poster for the intervention cohort

**TABLE 1** Summary of patient characteristics in the control and patient-centered outcome (PCO) group

	Control group N = 19	PCO group N = 16	p-Value
Age (years)	59.3 ± 15.8	66.2 ± 7.9	.12
<40	3 (15.8)	0 (0)	
40–50	1 (5.3)	0 (0)	
50–60	3 (15.8)	4 (25)	
>60	12 (63.2)	12 (75)	
Female (%)	36.8	50.0	.45
Charlson Comorbidity Index	3.7 ± 2	3.5 ± 2	.79
Length of hospital stay (days)	12.2	10.8	.65
Bony flap (%)	57.9	43.8	.42
Flap type			
Radial forearm (n/%)	7 (36.8)	5 (31.3)	
Fibula (n/%)	8 (42.1)	6 (37.5)	
Scapula (n/%)	3 (15.8)	1 (6.3)	
Anterolateral thigh (n/%)	1 (5.3)	4 (25)	
Tracheotomy (%)	35.3	31.3	.74

**TABLE 2** Inpatient survey questions for the patient-centered outcome group

Question	Day 1 post-Op	Day 5 post-Op	p-Value
1. Compared to your normal diet at home, how much are you eating?	1.53 ± 0.83	3.0 ± 1.56	.003
2. How long have you been sitting in a chair today?	2.13 ± 0.92	3.0 ± 0.65	.022
3. How much are you walking?	2.67 ± 1.59	4.0 ± 0.76	.012
4. How often does your mouth get cleaned by you or your nurse?	2.87 ± 1.25	3.47 ± 0.83	.057
5. I feel like I am actively being involved in my own care.	4.14 ± 1.29	4.53 ± 0.64	.139
6. I know what the plan is regarding my course in hospital.	4.0 ± 1.36	4.0 ± 1.07	.568
7. In how many days do you feel you will be ready to go home.	2.0 ± 1.04	3.47 ± 1.3	.009
8. What would you be able to eat or drink by mouth right now?	2.2 ± 1.01	3.13 ± 1.19	.048
9. How would you describe your pain? (Scale: 0–10)	3.75 ± 2.96	2.4 ± 2.5	.05

**TABLE 3** Discharge survey questions

Question	Control group	PCO Group	p-Value
Patient satisfaction with care received			
1. Rate your satisfaction with your <i>surgeon</i> .	4.83 ± 0.38	4.94 ± 0.25	.358
2. Rate your satisfaction with your <i>medical team</i> .	4.68 ± 0.67	4.88 ± 0.34	.311
3. Rate your satisfaction with your <i>office staff</i> .	4.58 ± 0.9	4.94 ± 0.25	.133
4. Rate your satisfaction with your <i>overall outcome</i> .	4.47 ± 0.84	5.0 ± 0.0	.018
Perceived level of involvement			
5. I feel my pain was adequately controlled when in hospital.	4.26 ± 1.05	4.81 ± 0.4	.056
6. I knew what the plan was regarding my breathing every day.	3.74 ± 1.48	4.56 ± 0.89	.06
7. I knew what the plan was regarding my swallowing every day.	3.89 ± 1.37	4.62 ± 0.89	.076
8. I knew what the plan was regarding my speech.	4.05 ± 1.35	4.56 ± 0.89	.207
9. I felt very supported when in hospital.	4.53 ± 0.84	4.69 ± 1.0	.611
10. I felt that I was actively involved in my own care.	4.11 ± 1.29	4.62 ± 0.81	.171
11. I feel positive about the future.	3.84 ± 1.42	4.62 ± 0.5	.045
12. How would you rate your quality of care received in hospital? (/10)	9.05 ± 1.68	9.38 ± 1.09	.515
13. How would you rate your physical health? (/10)	8.16 ± 2.36	8.62 ± 1.2	.48
14. How would you rate your confidence level? (/10)	8.53 ± 2.04	8.94 ± 1.24	.486
15. How would you rate your stress level? (/10)	7.95 ± 2.2	4.94 ± 3.09	.002
16. How would you rate your satisfaction with life? (/10)	8.39 ± 2.38	9.0 ± 1.1	.352
In-hospital education			
17. How did you feel about the education you received in hospital?	3.68 ± 1.53	4.19 ± 0.83	.248

Abbreviation: PCO, patient-centered outcome.

significant difference in how patients felt about the education they received in hospital (Table 3 – Q17). However, PCO patients found their education useful to a larger degree compared to the control group. Exactly 87.5% (14 of 16) of the PCO patients found the intervention to be “Extremely useful,” “Quite useful,” or “Sometimes useful” and 68.8% (11 of 16) would recommend (“Strongly agree” or “Agree”) other similar patients to receive the same educational intervention. Patients were also given the opportunity to provide feedback pertaining to their education. Intervention patients appreciated the repetitive nature of the module and the incorporation of audio with the written segments. One patient stated that it taught them “how to look after” themselves. Nonetheless, patients also wanted further

information about postoperative radiation, course in hospital, surgical side effects, and nutrition. Within the control arm, patients wanted more brochures and additional health care members providing teaching to the patients.

## 4 | DISCUSSION

This prospective pilot study aimed to study the feasibility of administering an audiovisual education module in the postoperative setting for patients undergoing major head and neck reconstructive surgery. Overall, PCO patients reported a high level of satisfaction with their

care, found the educational content useful, and would recommend it to others undergoing similar procedures. Although prior studies highlight the importance of addressing postoperative symptoms, there is still an unmet informational need identified by head and neck surgery patients.<sup>3,9-11</sup> Therefore, this module serves as the foundational platform which with further improvement, can be integrated into the surgical workflow for HNC patients.

#### 4.1 | Patient satisfaction

Patients in the PCO group reported significantly higher satisfaction with the “overall” outcome of their surgery (Table 3, Q4). They also reported slightly higher satisfaction with the surgeon, medical team, and office staff compared to the control group, which although multifactorial, may be partly due to the intervention. The educational platform also aimed to encourage self-involvement and communication; factors which have been linked with post-visit satisfaction.<sup>12</sup> Compared to the control group, PCO patients reported knowing their hospital recovery plan better and feeling more actively involved in their care as time elapsed in the postoperative period. Therefore, the results of this pilot study may serve as the motivation for future studies to further incorporate multimodality education into the postoperative care pathway.

#### 4.2 | Physical domains

Pain management is the second most desired information for HNC patients recently diagnosed with cancer or undergoing treatment.<sup>3</sup> Effective pain management is crucial in a patient's recovery as it is associated with reduced length of hospital stay, faster recovery, improved quality of life, and decreased morbidity.<sup>13-15</sup> PCO patients were encouraged to discuss options available for pain management with their care team. The PCO group felt their pain was better managed during their hospital stay compared to the control group, which may have been due to the additional education through the educational module. Therefore, employing multimodal analgesia and incorporating education can improve patient satisfaction following major reconstructive surgery.<sup>16</sup>

Our module emphasized the benefits of early ambulation in accelerating patient recovery from surgery and reducing rates of blood clots, postoperative complications, and length of hospital stay.<sup>13</sup> PCO patients progressed as expected with regards to their ambulation and were able to sit in a chair and walk for significantly longer periods by discharge day. Approximately half of the PCO group was able to walk at least short distances on the first POD. Although the module may have served as a motivator and reminder for ambulation, it is rather difficult to decipher an effect size from this early finding. Nevertheless, while various surgical and patient factors affect a patient's ambulatory status, we believe providing information on a recurring basis can accelerate a patient's recovery and motivate patients to be key drivers in their own recovery.<sup>17</sup>

Changes in eating patterns following head and neck surgery may have a negative impact on patients' physical, emotional, and social functioning.<sup>18</sup> As patients are typically unsure of their diet progression, we felt it is important to address this theme continuously throughout their treatment by highlighting reasons for placement of a feeding tube and how their diet would be advanced. PCO patients also felt they knew their swallowing plan better than their counterparts. As swallowing is one of the unmet needs of head and neck surgical patients, the module aimed to fill in that knowledge gap especially in the early postoperative period and will continue to be refined with further patient input.<sup>3</sup>

#### 4.3 | Emotional domains

Within the immediate postoperative period, patients undergoing head and neck surgical procedures experience anxiety regarding treatment-related disfigurement and dysfunction.<sup>5</sup> Therefore, the discharge survey included several emotional-domain related questions to assess the utility of the educational module in this regard. Patients in the intervention group felt significantly more positive about the future and reported lower stress levels. Optimism has been associated with a higher quality of life in the treatment of patients with cancers of the upper aerodigestive tract and thyroid cancer.<sup>19,20</sup> Additionally, HNC surgical patients who engage in self-care activities have shown to have decreased anxiety levels.<sup>5</sup> High anxiety levels in the pre and perioperative periods have also been associated with lower quality of life postsurgery.<sup>21,22</sup> Thus, interventions aimed at lowering patient's stress could have an impact on their recovery. Although the results of the study are preliminary, the observed optimism and decreased stress levels in the PCO cohort could be attributed to the enhanced education they received. Furthermore, we deliberately highlighted aspects of a patient's quality of life that would improve with time to provide hope to patients after discharge.

With regards to other questions within the emotional domain, there were minimal differences in patients' perception of physical health, confidence level, and satisfaction with life by discharge day. Although the intervention group did score higher compared to the control group, there was not a statistically significant difference which may have been attributed to the small sample size of the study. Overall, the emotional domain results reflect short-term changes in the immediate postoperative period and the intervention's long-term impact should be further explored in future studies.

#### 4.4 | Usefulness of educational material

HNC patients recently diagnosed or undergoing treatment prefer more medical information related to their disease, treatment, and posttreatment sequelae.<sup>3</sup> However, they prefer to have most of the information at the outset of treatment as opposed to an incremental format.<sup>23</sup> Similarly, we provided PCO patients with all the information at once but with repetitions during their postoperative recovery

period. Our intervention incorporated audiovisual formats with routine standard of care for several reasons: (1) Patients can be confused in the days immediately following surgery and benefit from guidance. (2) Patients can be overwhelmed by the wealth of information presented only one time. (3) Repetition can consolidate the information. (4) Providing information in multiple formats can help with information recall.<sup>24</sup>

Given that one-on-one teaching can be particularly challenging simply from a logistics and resource utilization perspective, we felt that an audiovisual education module would be a practical alternative especially as patients have indicated this modality as an effective method for postoperative education. In fact, patient-centered educational modules have been associated with increased patient satisfaction, reduced nursing care needs, and increased confidence in self-care.<sup>3,25-28</sup> In this study, PCO patients better perceived the education they received in hospital. Over two-thirds of patients in this arm would recommend similar patients to undergo the educational module while in hospital as part of their postoperative recovery journey. Our intervention allowed us to deliver reliable adjunct education using a digital device in a recurring format for which the patient can consolidate knowledge over time. The digital platform is an ideal modality as it is user-friendly, can be revised with patient feedback, and incorporates audiovisual media.

There are several limitations to the study. First, this is a pilot study and as such we did not perform a sample size calculation. As a result, the small number of participants may limit the reliability of the presented results to a larger population. Second, we did not collect information on the educational status of patients, but this may have confounded the impact of the preferred education modality.<sup>3</sup> Third, we did not stratify patient assignment based on patient variables such as comorbidities or disease stage primarily due to the pilot nature of the study. However, no significant differences existed amongst these variables between the two groups. Most of the educational module focused on the physical, medical, and emotional domain as that has been deemed to be most important in the treatment phase for HNC patients.<sup>3</sup> Additionally, patients were only informally involved in the inception and initiation of this educational module. Indeed, the next iteration of this module is being improved upon to include additional information (e.g., adjuvant treatment, lifestyle modifications) based on patient involvement, feedback, and integrating the practical, social, and spiritual domains. Future prospective studies will also collect time series data pertaining to foley removal, ambulation progression, tracheostomy decannulation, and diet initiation and advancement to assess whether the audiovisual intervention helps patients better follow the projected recovery timeline.

Overall, the results of this study demonstrate the feasibility of this intervention in the postoperative setting and potential benefit that adjunct audiovisual education materials provide to HNC surgical patients. The module served as a complementary resource to reinforce the information that patients are provided by the physician, nursing, and multidisciplinary care team. The intervention in this study was well received and easy to use by the study patients. The results of this study will set the foundations for performing a large

prospective randomized trial to confirm the current preliminary impressions. Finally, we will aim to assess the long-term impact of our digital education platform on patient satisfaction, and quality of life in patients undergoing surgical treatment for HNC.

## 5 | CONCLUSION

This pilot study assessed the feasibility of a novel audiovisual education module for patients undergoing major head and neck reconstructive surgery. The intervention was easy to implement, and most patients found it to be useful and would recommend it for use in patients undergoing similar procedures. Future studies are needed to assess the long-term impact of this intervention following discharge from hospital with further expansion to other subsites of the head and neck.

## CONFLICT OF INTEREST

The authors have no conflicts of interest to disclose.

## ORCID

Ameen Amanian  <https://orcid.org/0000-0002-4418-8215>

Edward Wang  <https://orcid.org/0000-0002-8570-3105>

Eitan Prisman  <https://orcid.org/0000-0001-7201-6181>

## REFERENCES

1. Chow LQM. Head and neck cancer. *N Engl J Med*. 2020;382(1):60-72. doi:10.1056/NEJMra1715715
2. Gupta B, Johnson NW, Kumar N. Global epidemiology of head and neck cancers: a continuing challenge. *Oncology*. 2016;91(1):13-23. doi:10.1159/000446117
3. Papadakos J, McQuestion M, Gokhale A, et al. Informational needs of head and neck cancer patients. *J Cancer Educ Off J Am Assoc Cancer Educ*. 2018;33(4):847-856. doi:10.1007/s13187-017-1176-9
4. Fang CY, Heckman CJ. Informational and support needs of patients with head and neck cancer: current status and emerging issues. *Cancers Head Neck*. 2016;1:15. doi:10.1186/s41199-016-0017-6
5. Dropkin MJ. Anxiety, coping strategies, and coping behaviors in patients undergoing head and neck cancer surgery. *Cancer Nurs*. 2001;24(2):143-148. doi:10.1097/00002820-200104000-00010
6. Chen SC, Yu PJ, Hong MY, et al. Communication dysfunction, body image, and symptom severity in postoperative head and neck cancer patients: factors associated with the amount of speaking after treatment. *Support Care Cancer Off J Multinatl Assoc Support Care Cancer*. 2015;23(8):2375-2382. doi:10.1007/s00520-014-2587-3
7. Fredericks S, Guruge S, Sidani S, Wan T. Postoperative patient education: a systematic review. *Clin Nurs Res*. 2010;19(2):144-164. doi:10.1177/1054773810365994
8. Snyder-Ramos SA, Seintsch H, Böttiger BW, Motsch J, Martin E, Bauer M. Patient satisfaction and information gain after the preanesthetic visit: a comparison of face-to-face interview, brochure, and video. *Anesth Analg*. 2005;100(6):1753-1758. doi:10.1213/01.ANE.0000153010.49776.E5
9. Giuliani M, McQuestion M, Jones J, et al. Prevalence and nature of survivorship needs in patients with head and neck cancer. *Head Neck*. 2016;38(7):1097-1103. doi:10.1002/hed.24411
10. Fang CY, Longacre ML, Manne SL, Ridge JA, Lango MN, Burtness BA. Informational needs of head and neck cancer patients. *Health Technol*. 2012;2(1):57-62. doi:10.1007/s12553-012-0020-9



11. Wells M, Cunningham M, Lang H, et al. Distress, concerns and unmet needs in survivors of head and neck cancer: a cross-sectional survey. *Eur J Cancer Care (Engl)*. 2015;24(5):748-760. doi:10.1111/ecc.12370
12. Venetis MK, Robinson JD, Turkiewicz KL, Allen M. An evidence base for patient-centered cancer care: a meta-analysis of studies of observed communication between cancer specialists and their patients. *Patient Educ Couns*. 2009;77(3):379-383. doi:10.1016/j.pec.2009.09.015
13. Dort JC, Farwell DG, Findlay M, et al. Optimal perioperative care in major head and neck cancer surgery with free flap reconstruction: a consensus review and recommendations from the enhanced recovery after surgery society. *JAMA Otolaryngol - Head Neck Surg*. 2017;143(3):292-303. doi:10.1001/jamaoto.2016.2981
14. Wick EC, Grant MC, Wu CL. Postoperative multimodal analgesia pain management with nonopioid analgesics and techniques: a review. *JAMA Surg*. 2017;152(7):691-697. doi:10.1001/jamasurg.2017.0898
15. Gan TJ. Poorly controlled postoperative pain: prevalence, consequences, and prevention. *J Pain Res*. 2017;10:2287-2298. doi:10.2147/JPR.S144066
16. Clark BS, Swanson M, Widjaja W, et al. ERAS for head and neck tissue transfer reduces opioid usage, peak pain scores, and blood utilization. *The Laryngoscope*. 2021;131(3):E792-E799. doi:10.1002/lary.28768
17. Wainwright TW, Burgess L. Early ambulation and physiotherapy after surgery. In: Ljungqvist O, Francis NK, Urman RD, eds. *Enhanced recovery after surgery: A complete guide to optimizing outcomes*. Springer International Publishing; 2020:211-218. doi:10.1007/978-3-030-33443-7\_23
18. Ganzer H, Touger-Decker R, Byham-Gray L, Murphy BA, Epstein JB. The eating experience after treatment for head and neck cancer: a review of the literature. *Oral Oncol*. 2015;51(7):634-642. doi:10.1016/j.oraloncology.2015.04.014
19. Kung S, Rummans TA, Colligan RC, et al. Association of optimism-pessimism with quality of life in patients with head and neck and thyroid cancers. *Mayo Clin Proc*. 2006;81(12):1545-1552. doi:10.4065/81.12.1545
20. Allison PJ, Guichard C, Gilain L. A prospective investigation of dispositional optimism as a predictor of health-related quality of life in head and neck cancer patients. *Qual Life Res Int J Qual Life Asp Treat Care Rehabil*. 2000;9(8):951-960. doi:10.1023/a:1008931906253
21. Sharma A, Sharp DM, Walker LG, Monson JRT. Predictors of early postoperative quality of life after elective resection for colorectal cancer. *Ann Surg Oncol*. 2007;14(12):3435-3442. doi:10.1245/s10434-007-9554-x
22. Schelling G, Richter M, Rozenendaal B, et al. Exposure to high stress in the intensive care unit may have negative effects on health-related quality-of-life outcomes after cardiac surgery. *Crit Care Med*. 2003;31(7):1971-1980. doi:10.1097/01.CCM.0000069512.10544.40
23. Ziegler L, Newell R, Stafford N, Lewin R. A literature review of head and neck cancer patients information needs, experiences and views regarding decision-making. *Eur J Cancer Care (Engl)*. 2004;13(2):119-126. doi:10.1111/j.1365-2354.2004.00449.x
24. Chan Y, Irish JC, Wood SJ, et al. Patient education and informed consent in head and neck surgery. *Arch Otolaryngol Head Neck Surg*. 2002;128(11):1269-1274. doi:10.1001/archotol.128.11.1269
25. Zan S, Agboola S, Moore SA, Parks KA, Kvedar JC, Jethwani K. Patient engagement with a mobile web-based telemonitoring system for heart failure self-management: a pilot study. *JMIR MHealth UHealth*. 2015;3(2):e33. doi:10.2196/mhealth.3789
26. van Eck CF, Toor A, Banffy MB, Gambardella RA. Web-based education prior to outpatient orthopaedic surgery enhances early patient satisfaction scores: a prospective randomized controlled study. *Orthop J Sports Med*. 2018;6(1):2325967117751418. doi:10.1177/2325967117751418
27. Pecorelli N, Fiore JF, Kaneva P, et al. An app for patient education and self-audit within an enhanced recovery program for bowel surgery: a pilot study assessing validity and usability. *Surg Endosc*. 2018;32(5):2263-2273. doi:10.1007/s00464-017-5920-3
28. Wang TF, Huang RC, Yang SC, Chou C, Chen LC. Evaluating the effects of a mobile health app on reducing patient care needs and improving quality of life after oral cancer surgery: Quasiexperimental study. *JMIR MHealth UHealth*. 2020;8(7):e18132. doi:10.2196/18132

## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

**How to cite this article:** Amanian A, Tran KL, Wang E, Chotwani H, Prisman E. Postoperative patient-centered multimedia education in head and neck cancer patients: A pilot study. *Laryngoscope Investigative Otolaryngology*. 2022;7(6):1857-1865. doi:10.1002/lio2.960