



# Patient Understanding of Enhanced Recovery After Surgery in an At-Risk Population

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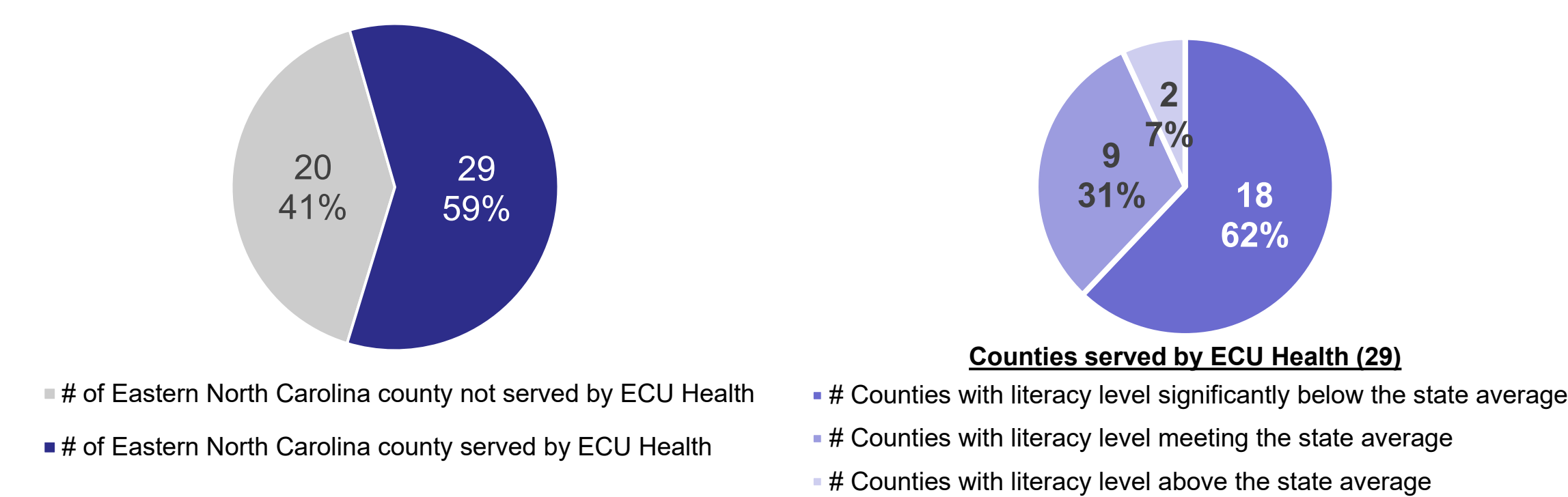
## ABSTRACT

- Health literacy is a critical determinant of a patients' comprehension of pre-operative instructions. This is essential for optimizing enhanced recovery after surgery (ERAS) pathways.
- This study aimed to assess surgical patients' experience and understanding of an ERAS pathway in a region that provides care for a rural population with low literacy and high poverty rates.
- A single institution, cross-sectional study was conducted including patients enrolled in the institutional ERAS program. Patients undergoing gynecologic oncologic and colorectal surgery between July 25, 2022 and January 31, 2023 were administered a 10-question survey post-operatively to assess understanding of the pathway, their experiences with the surgical process, and adherence to pre-operative instructions. All patients received verbal instructions regarding the ERAS pathway by physicians and nutritionists during their pre-operative visit.
- A total of 101 patients were surveyed and 98% found pre-operative instructions easy to follow while 94% reported satisfactory pain control. The majority (96%) felt they received consistent information about surgical preparation from all care providers.
- Of interest, a subset of patients (21%) did not own a smartphone, thus highlighting the digital divide in social determinants of health across patient populations.

## INTRODUCTION

- Enhanced recovery after surgery (ERAS) pathways are evidence-based protocols aimed at improving outcomes for patients, reduce the stress response to surgery, optimize pain control, and ultimately prevent complications.<sup>1</sup>
- Health literacy refers to an individual's ability to access, comprehend, and utilize fundamental health-related information.<sup>2</sup> Deficiencies in patient health literacy have been shown to contribute to unfavorable outcomes and higher mortality.<sup>3</sup> Despite the known correlation between a patient's understanding of and adherence to instructions, there is a paucity of data evaluating the patient's perspective and understanding of ERAS.
- Studies have shown that individuals who are living below the poverty level, elderly, from minority backgrounds, and who have not completed high school education are more likely to exhibit lower health literacy rates.<sup>4</sup>
- Eastern North Carolina faces numerous challenges that likely contribute to low healthcare literacy and understanding. ECU Health services 29 of the 49 counties in eastern North Carolina, of which 18 counties (62%) have a literacy level significantly below the state average, with 9 counties (31%) meeting and only 2 counties (7%) above the state average.<sup>5</sup>

Figure 1: Eastern Carolina Literacy Level (by County)



- In terms of education, the area has lower high school graduation rates and college education attainment rates compared to the national average.<sup>6</sup> Poverty rates in this region are also higher with median household income being lower than the state and national levels.<sup>7</sup> The employment landscape is marked by a lower labor force participation rate and a higher concentration of low-wage occupations and industries compared to the rest of the state.<sup>8</sup> These factors combined create a complex environment where patients face multiple barriers to accessing and understanding important health information.

## MATERIALS & METHODS

- ERAS pathways consist of various elements in all phases of care. These include preoperative counseling, optimization of nutrition by providing education and immunomodulating nutritional drink to take 5 days prior to their surgery date, standardized analgesic and anesthetic regimens, decreased narcotic pain medication use, and early post-operative mobilization, among others.
- All patients undergoing gynecologic oncologic and colorectal surgery and enrolled in the institutional ERAS pathway from July 2022 to January 2023 were included in the study and subsequent analysis. Enrollment exclusions were not made.
- A survey consisting of 10 questions to assess patient understanding of the ERAS pathway, as well as an open-ended space to provide feedback was administered to the patients at their first post-operative visit. Questions were generated by a multidisciplinary team of health experts at a lower education level to maintain accessibility regardless of patient educational status and associated health literacy. The questions were intentionally binary, brief, and administered by a medical assistant.
- Data and responses to the survey were analyzed to determine the level of patient understanding of the ERAS pathway, their experiences with the surgical process, their adherence to pre-operative instructions, and better understand the digital divide in a predominantly rural, low income and literacy population.

## RESULTS

Question	Response	# Patients	% Patients
Q1. Were the pre-op instructions for your diet easy to follow?	Yes	99	98%
	No	2	2%
Q1B. If "no" for Q1, did you feel you had:	Too much information?	0	0%
	Not enough information?	1	50%
Q2. Which clear liquids did you choose?	Coffee	22	22%
	Juice	35	35%
	Water	93	92%
	None	3	3%
	Other	25	25%
Q3. Did you drink the protein shake provided to you?	Yes	94	93%
	No	5	5%
	N/A	2	2%
Q4. Do you know why drinking the protein shakes were part of the instructions?	Yes	89	88%
	No	10	10%
	N/A	2	2%
Q5. Did you feel you received consistent information about surgical preparation from all of your care providers?	Yes	97	96%
	No	4	4%
Q6. How was your pain control after the procedure?	Above expectations	33	33%
	At expectations	62	61%
	Below expectations	6	6%
Q7. Were you taking a blood thinner prior to surgery?	Yes	19	19%
	No	82	81%
Q8. If "yes" to Q7, were you given instructions prior to surgery of when to stop and then restart that medication?	Yes	19	100%
	No	0	0%
Q9. Do you take medications for diabetes?	Yes	27	27%
	No	74	72%
Q10. Do you have a smart phone?	Yes	80	79%
	No	21	21%

Table 1: Results of patient surveys conducted by the ECU Health Department of Surgical Gynecologic Oncology and ECU Health Department of Colorectal Surgery on ERAS pathways. The surveys were completed by 101 patients following their surgery.

## DISCUSSION

- Despite the increasing adoption of ERAS pathways in surgical care, there is a lack of data examining patients' understanding of ERAS, particularly in areas with low literacy rates.
- The results of this study showed a high level of patient understanding (98%) of pre-operative instructions provided to them on the ERAS pathway. Additionally, we found that the majority (94%) of surveyed patients felt that their pain control met or exceeded their expectations after the procedure.
- Our results align with studies that have demonstrated improved outcomes for patients undergoing surgery using Enhanced Recovery After Surgery (ERAS) pathways. These pathways have been found to lead to faster recovery times,<sup>9</sup> lower rates of complications,<sup>10</sup> and improved patient satisfaction.<sup>11</sup> By following the ERAS protocol, patients receive evidence-based care and are better able to understand expectations for their recovery.
- One of the key components of our ERAS program was ensuring that patients had their questions answered and that open communication was maintained. This was particularly important given the low literacy and education level in our patient population. By providing clear, consistent information to our patients, we were able to mitigate some of the barriers that may have otherwise impacted their understanding of the surgical process and their recovery.
- In relation to open communication, it is important to note that 21% of our patients reported not owning a smartphone. This highlights the ongoing issue of digital connectivity in Eastern North Carolina. According to the North Carolina Department of Information Technology, though approximately 98% of North Carolinians have access to high-speed internet, Eastern North Carolina has significantly lower connectivity rates with 26 of the 29 counties reporting connectivity rates lower than 70%.<sup>12</sup> This data helps to form future strategies for improving patient education and communication, including exploring alternative methods of communication and support for those patients who do not have access to smartphones or the internet.

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