Health literacy is a critical determinant of a patient’s comprehension of pre-operative instructions. This is essential for optimizing enhanced recovery after surgery (ERAS) pathways.

The 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, 2019, and January 31, 2020, were administered a 10-question survey providing personalized feedback. Those opting 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 nurses during their pre-operative visit.

A total of 101 patients were surveyed and 98% found pre-operative instructions easy to follow.

### RESULTS

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
<th># Patients</th>
<th>% Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1. Were the pre-op instructions for your surgery easy to follow?</td>
<td>No</td>
<td>99</td>
<td>98%</td>
</tr>
<tr>
<td>Q1B. If ‘no’ for Q1, did you feel you had adequate information?</td>
<td>Too much</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Q1B. If ‘no’ for Q1, did you feel you had adequate information?</td>
<td>Information?</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Q1B. If ‘no’ for Q1, did you feel you had adequate information?</td>
<td>Not enough information?</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Q2. Which clear liquids did you choose?</td>
<td>Coffee</td>
<td>22</td>
<td>22%</td>
</tr>
<tr>
<td>Q3. Did you drink the protein shake provided to you?</td>
<td>Yes</td>
<td>94</td>
<td>93%</td>
</tr>
<tr>
<td>Q4. Do you know why drinking the protein shakes were part of the instructions?</td>
<td>No</td>
<td>15</td>
<td>15%</td>
</tr>
<tr>
<td>Q5. Did you feel you received consistent information about surgical preparation from all of your care providers?</td>
<td>Yes</td>
<td>97</td>
<td>97%</td>
</tr>
<tr>
<td>Q6. How was your pain control after the procedure?</td>
<td>Above expectations</td>
<td>33</td>
<td>33%</td>
</tr>
<tr>
<td>Q7. Were you taking a blood thinner prior to surgery?</td>
<td>Yes</td>
<td>19</td>
<td>19%</td>
</tr>
<tr>
<td>Q8. If ‘yes’ to Q7, were you given instructions prior to surgery of when to stop and then restart that medication?</td>
<td>Yes</td>
<td>19</td>
<td>19%</td>
</tr>
<tr>
<td>Q9. Do you take medications for diabetes?</td>
<td>No</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Q10. Do you have a smart phone?</td>
<td>No</td>
<td>21</td>
<td>21%</td>
</tr>
</tbody>
</table>

### DISCUSSION

- Despite the increasing adoption of ERAS pathways in surgical care, there is a lack of data examining patient understanding of ERAS, particularly in areas with low literacy rates.
- The results of this study show 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, lower rates of complications, and improved patient satisfaction.
- Enhanced recovery after surgery (ERAS) pathways are evidence-based protocols aimed at improving outcomes for patients, reducing the stress response to surgery, optimizing pain control, and ultimately preventing complications.
- Health literacy refers to an individual’s ability to access, comprehend, and utilize fundamental health-related information. Deficiencies in patient health literacy have been shown to contribute to unfavorable outcomes and higher mortality. 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 line, elderly, from minority backgrounds, and who have not completed high school education are more likely to exhibit lower literacy rates.
- 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 (37%) have a literacy level significantly below the state average, with 9 counties (18%) meeting and only 2 counties (4%) above the state average.

Figure 1: Eastern Carolina Literacy Level (By County)

### MATERIALS & METHODS

- **ERAS pathways** consist of various elements in all phases of care. These include preoperative care, optimization of nutrition by providing education and immunomodulating nutritional intake to take 5 days prior to their surgery date, standardized anesthetic and anesthetic regimens, decreased narcotic and sedative medication use, and early post-operative mobilization, among others.
- All patients undergoing gynecologic oncologic and colorectal surgery enrolled in the institutional ERAS pathway from July 25, 2019, to January 31, 2020, were included in the study and subsequent analyses. Enrollment exclusions were not made.
- A survey comprising of 10 questions was used 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. These surveys were generated by a multidisciplinary team of health experts at our 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 understanding the digital divide in social determinants of health across patient populations.

### ACKNOWLEDGEMENTS

- This project was completed with the assistance of the associated authors. ECU Health Department of Gynecologic Oncology and ECU Health Department of Colorectal Surgery were integral to the project’s success.
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### REFERENCES


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

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