

Original Article



Patients' Preferences for Gastric Cancer Treatment: A Cross-Sectional Study on Decision-Making in Multidisciplinary Treatment Strategies

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ABSTRACT

Purpose: Decisions regarding gastric cancer treatment affect patient outcomes and quality of life (QOL); nonetheless, factors influencing patient preferences remain unclear. This study investigated the preferences for the extent of gastrectomy, minimally invasive surgery, and adjuvant therapy while identifying the key determinants.

Materials and Methods: A cross-sectional survey of 240 respondents, including patients with gastric cancer and the general population, assessed their preferences for the extent of gastrectomy, surgical modality, adjuvant therapy, palliative systemic therapy, and endoscopic therapy. Correlations between demographic variables and treatment choices were statistically analyzed.

Results: Patients prioritized expert recommendations for determining the extent of gastrectomy for proximal gastric cancer and selecting the surgical modality, with recurrence risk and surgical complications being the primary considerations. In terms of adjuvant therapy, a 12-month oral regimen was preferred over a 6-month oral plus injection regimen, with survival benefit being the most valued factor. Conversely, QOL was a primary concern in palliative therapy. With respect to incomplete endoscopic submucosal dissection, electrocauterization was the preferred approach, followed by surgical resection; local recurrence risk was assigned with the highest priority, followed by concerns regarding lymph node metastasis. Men and individuals living alone had a lower risk of recurrence and lymph node metastasis. Patients undergoing gastric cancer treatment preferred shorter procedures, whereas medical personnel emphasized surgical safety and efficiency.

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Conflict of Interest

No potential conflict of interest relevant to this article was reported.

Author Contributions

Conceptualization: K.T.H.; Data curation: K.S.J., S.G.J., J.M.R.; Formal analysis: K.T.H.; Funding acquisition: K.S.H.; Investigation: K.S.J., S.G.J., J.M.R.; Supervision: H.H.S., N.S.Y.; Writing - original draft: K.T.H., K.I.H.; Writing - review & editing: H.H.S., N.S.Y., K.S.H.

Conclusions: Demographic and clinical factors significantly influence patient preferences. Understanding these preferences is essential for shared decision-making and personalized oncological care.

Keywords: Stomach neoplasm; Patient preference

INTRODUCTION

Gastric cancer remains a significant global health concern and was ranked as one of the leading causes of cancer-related mortality worldwide in 2020 [1]. Management of gastric cancer involves multiple therapeutic approaches, including gastrectomy, minimally invasive surgical techniques, adjuvant therapy, and palliative care [2-4]. Treatment decisions are influenced by numerous clinical and demographic factors, as well as patient preferences, which play crucial roles in shared decision-making and personalized oncological care [5,6].

To improve the quality of care, the Korean Gastric Cancer Association has published evidence-based clinical practice guidelines for gastric cancer treatment that were developed based on the principles of evidence-based medicine, aiming to standardize and optimize clinical decision-making for gastric cancer treatment [4,7,8]. The Appraisal of Guidelines for Research and Evaluation (AGREE) was developed to provide a standardized framework for evaluating methodological rigor and transparency [9]. Improve the quality and consistency of clinical guidelines. Its updated version, AGREE II, further highlights the need to incorporate patient values, preferences, and public input into guideline development [10].

In line with the current trends, the integration of patient-centered values and societal perspectives is increasingly recommended for the development of comprehensive clinical guidelines. This study aimed to investigate patient preferences across key aspects of gastric cancer management, such as surgical extent, minimally invasive techniques, adjuvant therapy, and palliative care, while also identifying the demographic and clinical factors that influence treatment decisions. These findings are expected to inform strategies that promote shared decision-making and support the creation of more credible and patient-centered treatment guidelines for gastric cancer.

MATERIALS AND METHODS

Study design and population

The Development Working Group for the Korean Practice Guideline for Gastric Cancer Task Force Team initiated a study to investigate patient preferences on July 2023.

This study was designed as a cross-sectional multi-institutional survey conducted across 8 tertiary hospitals geographically distributed throughout South Korea between July and August 2023. The study was initiated after obtaining approval from the Institutional Review Boards of all participating institutions. This study aimed to evaluate patient preferences regarding various aspects of gastric cancer treatment, including surgical extent, modality, adjuvant treatment, palliative treatment, and endoscopic treatment. The survey instrument consisted of structured scenario-based questions with rank-based responses, developed through expert consensus among gastric surgeons, oncologists, and gastroenterologists.

Statistical analysis

The required sample size was estimated using a repeated-measures analysis of variance framework to detect within-subject differences across the 8 treatment decision factors presented in the survey. Assuming a medium effect size (Cohen's $f=0.25$), a significance level (α) of 0.05, and a statistical power of 0.80.

All statistical analyses were performed using SPSS version 28, with the significance level set at $P<0.05$. Descriptive statistics were used to summarize the demographic characteristics and survey responses, with means and standard deviations (SDs) calculated for continuous variables, and frequencies and percentages reported for categorical variables. The mean rank and SD of each factor were computed to determine their relative importance. Friedman's test was conducted to assess whether significant differences existed in the rankings of decision-making factors. Effect sizes of surveys were calculated to assess the strength differences, with eta-squared (η^2). The Wilcoxon signed-rank test with Bonferroni correction was used for post-hoc pairwise comparisons between factors, with the results presented as Z -values and adjusted P -values.

Ordinal logistic regression was conducted to identify the associations between patient characteristics and ranked treatment preferences with independent variables. The dependent variables were ranked according to preferences for each treatment decision factor. The results were reported as odds ratios (ORs) with 95% confidence intervals (CIs). All results are presented using summary tables and forest plots, providing a clear visualization of ranking preferences and subgroup differences.

Participant recruitment and data collection

The participants were recruited using a standardized protocol across all participating institutions to ensure consistency and representativeness. The eligibility criteria were as follows: 1) adults aged ≥ 20 years; 2) ability to understand the survey content and provide informed consent; and 3) willingness to express personal treatment preferences. Individuals who were 1) pregnant; 2) had significant cognitive impairment or difficulty in autonomous decision-making were excluded, and all surveys were performed after obtaining informed consent. Pregnant women were excluded based on ethical considerations to protect potentially vulnerable individuals from undue discomfort during survey completion.

Recruitment was conducted pragmatically based on eligibility and availability among individuals who visited each participating institution. These included outpatients, accompanying caregivers, and individuals attending unrelated healthcare services, such as routine check-ups. Medical personnel, including registered nurses, physicians, and surgeons, were included to evaluate how healthcare environments influenced treatment preferences. Given the possibility that these individuals may have clinical knowledge or experience related to gastric cancer care, subgroup analyses were conducted to assess the potential differences in preferences between medical and non-medical respondents.

The survey was self-administered, with the research staff available to support respondents when needed. The centers were encouraged to ensure diversity in the respondents' backgrounds to improve the generalizability of the findings. Data on the following demographic and clinical characteristics were collected from all participants: sex, age, status of medical personnel, residential location, educational attainment, and living arrangements. Clinical history included prior diagnosis of cancer other than gastric cancer and current or past treatment status for gastric cancer (active treatment or periodic follow-up).

To include a balanced representation across key demographic and clinical characteristics, subgroup population was guided by prior sample size estimation and structured to ensure subgroup comparability (assuming a medium effect size, $\alpha=0.05$, power=0.80, $n=67$). Therefore, we targeted the allocation of key demographic and clinical factors, such as medical personnel and patients with a cancer history, to comprise the population displayed above.

Development and rationale of questionnaire

The questionnaire was developed through expert consensus by a multidisciplinary task force comprising gastric surgeons, gastroenterologists, oncologists, and medical research methodologists in alignment with real-world clinical decision points encountered in gastric cancer care (**Supplementary Data 1**). This study examined the preferences of diverse patient groups in various clinical scenarios. The original questionnaire was written in Korean and underwent a forward-backward translation process to ensure accuracy and conceptual equivalence with the English text. Discrepancies were resolved through discussion and a final review by the study investigators. The content covers the following domains:

- Extent of gastrectomy: Questions compared total versus proximal gastrectomy to evaluate how patients prioritized oncologic safety over functional preservation.
- Surgical modality: Items addressed laparoscopic versus robotic gastrectomy to compare factors such as complication risk, mechanical reliability, and cost burden.
- Adjuvant systemic therapy: Scenarios involving oral versus combination regimens assessed patient preferences related to treatment burden, side effects, survival benefit, and hospital visits.
- Palliative systemic therapy: Questions evaluated the thresholds for initiating or withholding chemotherapy in elderly patients, highlighting values such as quality of life (QOL) versus life prolongation.
- Post-endoscopic resection management: Scenarios presented treatment options (e.g., resection, observation, and coagulation) after incomplete endoscopic submucosal dissection (ESD) to explore the risk tolerance for recurrence and lymph node metastasis.

RESULTS

Demographics and background of respondents

The survey was completed in August 2023 and included responses from 240 participants. Among them, 96 (40.0%) were male and 15 (6.3%) were aged 70 years or older. Regarding medical background, 74 participants (30.8%) were medical personnel, 86 (35.8%) reported urban residency, and 154 (64.2%) lived in rural areas. Most participants (75.4%) had a college education and 57 (23.8%) lived alone. Among the respondents, 50 (20.8%) had a history of cancers other than gastric cancer, 46 (19.2%) were patients with gastric cancer who were under follow-up and not under active treatment, and 41 (17.1%) were currently being treated for gastric cancer (**Table 1**).

Preferences regarding gastrectomy extent

When asked about their preferred extent of gastrectomy for upper gastric cancer, 92 (38.3%) respondents favored proximal gastrectomy, whereas 31 (12.9%) preferred total gastrectomy. A significant proportion (48.8%) stated that they followed the expert recommendations (**Table 2**).

Table 1. Responders' background and demographic characteristics (n=240)

Variables	Values
Sex	
Male	96 (40.0)
Female	144 (60.0)
Age ≥70 yr	
Yes	15 (6.3)
No	225 (93.8)
Medical personnel	
Yes	74 (30.8)
No	166 (69.2)
Urban residency	
Yes	86 (35.8)
No	154 (64.2)
College graduate	
Yes	181 (75.4)
No	59 (24.6)
Living alone	
Yes	57 (23.8)
No	183 (76.3)
History of cancer other than gastric cancer	
Yes	50 (20.8)
No	190 (79.2)
Patients with gastric cancer who are periodically followed up and not receiving active treatment	
Yes	46 (19.2)
No	194 (80.8)
Patients with gastric cancer who are under treatment	
Yes	41 (17.1)
No	199 (82.9)

Data shown are number (%) not otherwise specified.

The most influential factor in the choice between total and proximal gastrectomies was the risk of cancer recurrence in the remaining stomach (mean rank: 2.163). Other significant considerations included the risk of complications (short- and long-term) (mean rank: 2.388), expert recommendations (mean rank: 2.688), concerns about nutritional deterioration (mean rank: 3.267), and the burden of lifelong vitamin B12 supplementation (mean rank: 4.446). Statistical analyses confirmed significant differences in priority rankings among these factors ($P<0.001$, $\eta^2=0.335$) (**Table 3**).

While, responders associated with malignancy other than gastric cancer showed a higher “Concern for nutritional deterioration” (OR, 2.11; 95% CI, 0.64–7.03), patients currently undergoing gastric cancer treatment appear to prioritize significantly less (OR, 0.21; 95% CI, 0.05–0.84), indicating a preference for more radical treatment options (**Fig. 1A**). Medical personnel showed less priority for the “Risk of vitamin B12 deficiency” (OR, 2.05; 95% CI, 1.04–4.04). The other preference values were not significantly associated with patient factors in the regression analysis.

Preferences for surgical modality

Regarding surgical modality, 55 respondents (22.9%) chose robotic surgery, whereas 83 (34.6%) preferred laparoscopic surgery. However, 42.5% of the respondents stated that they deferred their decision to expert recommendations (**Table 2**).

The risk of complications (mean rank: 2.02) was the most critical factor influencing the choice between robotic and laparoscopic surgery, followed by expert recommendations (mean rank: 2.43), concerns about mechanical failure (mean rank: 3.75), economic burden

Table 2. Patients' responses regarding gastric cancer treatment

Question	Response (%)
Q1. Which surgery would you prefer if diagnosed with upper gastric cancer?	
① Proximal gastrectomy	92 (38.3)
② Total gastrectomy	31 (12.9)
③ Follow expert recommendations (unsure)	117 (48.8)
Q3. If you needed surgery for gastric cancer, which would you prefer?	
① Robotic surgery	55 (22.9)
② Laparoscopic surgery	83 (34.6)
③ Follow expert recommendations (unsure)	102 (42.5)
Q6. After reviewing the summary table above, if the effectiveness of both regimens (A and B) is similar, which regimen would you choose?	
① 12-month oral therapy	172 (71.7)
② 6-month oral + injection therapy	68 (28.3)
Q8. Based on your opinion, at what age do you believe systemic therapy is no longer appropriate for stage 4 gastric cancer? (Please select the most appropriate age based on your perspective)	
① 60 years	5 (2.1)
② 65 years	5 (2.1)
③ 70 years	27 (11.3)
④ 75 years	34 (14.2)
⑤ Over 80 years	169 (70.4)
Q9. If the risk of lymph node metastasis in early-stage gastric cancer falls within the following ranges, how much risk would you be willing to accept while still choosing endoscopic resection?	
① <0.2% (fewer than 2 cases per 1,000 people)	89 (37.1)
② 0.2%–0.5% (2–5 cases per 1,000 people)	46 (19.2)
③ 0.6%–0.9% (6–9 cases per 1,000 people)	42 (17.5)
④ 1%–2% (1–2 cases per 100 people)	41 (17.1)
⑤ 2%–5% (2–5 cases per 100 people)	22 (9.2)
Q10. If you were diagnosed with incomplete horizontal resection after an endoscopic procedure, which treatment would you choose?	
Choose one of the following treatment options:	
① No additional treatment (follow-up monitoring, treat only if recurrence occurs)	12 (5)
② Electrocoagulation (burn the remaining lesion with electrical energy)	92 (38.3)
③ Repeat endoscopic resection	56 (23.3)
④ Surgical resection	80 (33.3)

(mean rank: 3.95), surgical duration (mean rank: 4.06), and surgeon convenience (mean rank: 4.79) ($P < 0.001$, $\eta^2 = 0.319$) (**Table 3**).

Patients currently undergoing gastric cancer treatment considered “Long operative time” a higher concern (OR, 4.73; 95% CI, 1.27–17.56), suggesting that they favor shorter procedures (**Fig. 1B**). Patients living alone expressed less concern for “Fear of mechanical error” (OR, 1.77; 95% CI, 1.03–3.04).

While medical personnels were concerned about “Surgical complications” (OR, 0.47; 95% CI, 0.26–0.84), the responders with malignancy other than gastric cancer were less concerned (OR, 2.83; 95% CI, 1.04–7.68) and were associated with higher reliance on “Expert recommendations” (OR, 0.27; 95% CI, 0.09–0.82) when choosing surgical modality.

No significant predictors were observed for prioritizing surgeons' physical convenience and hospital costs.

Preferences in adjuvant systemic therapy

Regarding adjuvant systemic therapy, the majority (71.7%) preferred a 12-month oral therapy regimen, whereas 28.3% preferred a 6-month oral or injection combination therapy (**Table 2**). In terms of palliative systemic therapy for stage 4 gastric cancer, 70.3% of the respondents considered treatment inappropriate beyond the age of 80 years, whereas

Patient Preferences in Gastric Cancer Treatment

Table 3. Responses regarding patient value of gastric cancer treatment

Rank	Factor	Mean rank	Standard deviation	Rank comparison* (post-hoc)	Z-value	P-value
Q2. Value for choosing resection extent; total gastrectomy vs. proximal gastrectomy, Friedman's test ($\chi^2=321.8$, $P<0.001$, $\eta^2=0.335$)						
1	Risk of cancer recurrence in the remaining stomach	2.163	1.1401	vs. 2	-2.387	0.017
				vs. 3	-3.637	<0.001
				vs. 4	-8.04	<0.001
				vs. 5	-12.199	<0.001
2	Risk of complications (short-term and long-term)	2.388	0.9999	vs. 3	-2.233	0.026
				vs. 4	-7.65	<0.001
				vs. 5	-11.99	<0.001
3	Expert recommendations	2.688	1.5246	vs. 4	-4.141	<0.001
				vs. 5	-10.043	<0.001
4	Concern about nutritional deterioration	3.267	1.0803	vs. 5	-11.333	<0.001
5	Burden of lifelong vitamin B12 injections or daily oral supplements	4.446	0.9535			
Q4. Value for choosing surgical modality; robotic vs. laparoscopic gastrectomy, Friedman's test ($\chi^2=382.8$, $P<0.001$, $\eta^2=0.319$)						
1	Risk of complications	2.02	1.157	vs. 2	-2.634	0.008
				vs. 3	-10.016	<0.001
				vs. 4	-10.451	<0.001
				vs. 5	-11.336	<0.001
				vs. 6	-12.541	<0.001
2	Expert recommendations	2.43	1.6141	vs. 3	-6.899	<0.001
				vs. 4	-7.89	<0.001
				vs. 5	-8.592	<0.001
				vs. 6	-11.724	<0.001
3	Concern about mechanical failure	3.75	1.5923	vs. 4	-1.682	0.093
				vs. 5	-2.194	0.028
				vs. 6	-5.982	<0.001
4	Economic burden	3.95	1.4189	vs. 5	-0.879	0.380
				vs. 6	-5.593	<0.001
5	Surgery duration	4.06	1.3293	vs. 6	-5.182	<0.001
6	Surgeon convenience	4.79	1.3205			
Q5. Value for adjuvant systemic therapy, Friedman's test ($\chi^2=574$, $P<0.001$, $\eta^2=0.597$)						
1	Increased survival	1.633	0.905	vs. 2	-4.937	<0.001
				vs. 3	-9.294	<0.001
				vs. 4	-12.679	<0.001
				vs. 5	-13.033	<0.001
2	Reduced recurrence	2.071	0.9143	vs. 3	-6.597	<0.001
				vs. 4	-11.898	<0.001
				vs. 5	-12.794	<0.001
3	Impact of side effects on quality of life	2.771	0.8878	vs. 4	-10.636	<0.001
				vs. 5	-12.036	<0.001
4	Economic burden	4.104	0.9338	vs. 5	-3.546	<0.001
5	Frequency of hospital visits	4.408	0.863			
Q7. Value in palliative systemic therapy, Friedman's test ($\chi^2=500.6$, $P<0.001$, $\eta^2=0.521$)						
1	Improving the quality of life	1.883	0.9868	vs. 2	-2.723	0.006
				vs. 3	-6.662	<0.001
				vs. 4	-12.453	<0.001
				vs. 5	-12.567	<0.001
2	Extending survival time	2.183	1.234	vs. 3	-2.97	0.003
				vs. 4	-11.429	<0.001
				vs. 5	-11.326	<0.001
3	Minimizing side effects of systemic therapy	2.5	0.8434	vs. 4	-12.141	<0.001
				vs. 5	-12	<0.001
4	Financial burden	4.133	0.8377	vs. 5	-2.5	0.012
5	Reducing the frequency of hospital visits	4.333	0.9838			

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Table 3. (Continued) Responses regarding patient value of gastric cancer treatment

Rank	Factor	Mean rank	Standard deviation	Rank comparison* (post-hoc)	Z-value	P-value
Q11. Values considered in incomplete horizontal resection after ESD, Friedman's test ($\chi^2=444.7$, $P<0.001$, $\eta^2=0.370$)						
1	Recurrence in the stomach	2.075	1.2386	vs. 2	-8.943	<0.001
				vs. 3	-8.069	<0.001
				vs. 4	-7.921	<0.001
				vs. 5	-8.78	<0.001
				vs. 6	-12.689	<0.001
2	Risk of lymph node metastasis	3.096	1.3078	vs. 3	-1.334	0.182
				vs. 4	-1.626	0.104
				vs. 5	-2.99	0.003
				vs. 6	-11.969	<0.001
3	Procedure-related complications	3.296	1.2543	vs. 4	-0.53	0.596
				vs. 5	-2.131	0.033
				vs. 6	-12.442	<0.001
4	Need for stomach resection	3.346	1.5256	vs. 5	-1.615	0.106
				vs. 6	-11.52	<0.001
5	Mortality risk associated with treatment	3.596	1.613	vs. 6	-10.498	<0.001
6	Fear of general anesthesia	5.558	1.1374			

ESD = endoscopic submucosal dissection.

*Post-hoc pairwise comparisons were performed using the Wilcoxon signed-rank test with Bonferroni correction. P-values indicate the significance of differences between each pair of ranks. Negative Z-values reflect the direction of the rank difference.

smaller proportions selected 75 years (14.2%), 70 years (11.3%), 65 years (2.1%), and 60 years (2.1%) as the cutoffs (**Table 2**).

The most important factors in selecting adjuvant systemic therapy were increased survival (mean rank: 1.633), reduced recurrence risk (mean rank: 2.071), impact of side effects on QOL (mean rank: 2.771), economic burden (mean rank: 4.104), and hospital visit frequency (mean rank: 4.408) ($P<0.001$, $\eta^2=0.597$) (**Table 3**).

Male responders showed a significantly lower concern for "Decreased QOL" (OR, 2.14; 95% CI, 1.20–3.82) (**Fig. 1C**). Medical personnel placed a lower priority on "Financial burden" (OR, 2.07; 95% CI, 1.14–3.74). Regarding priority in "Discomfort from frequent hospital visits," medical personnel (OR, 0.51; 95% CI, 0.28–0.95) and responders currently undergoing gastric cancer treatment groups (OR, 0.19; 95% CI, 0.04–0.95) showed higher priority

There were no significant predictors associated to "Expectation for survival" and "Expectation for less recurrence."

Preferences in palliative systemic therapy

For palliative therapy, the most critical value was improving QOL (mean rank: 1.883), followed by extending survival time (mean rank: 2.183), minimizing the side effects of therapy (mean rank: 2.5), reducing financial burden (mean rank: 4.133), and reducing hospital visits (mean rank: 4.333) ($P<0.001$, $\eta^2=0.521$) (**Table 3**).

Medical personnel prioritized "Expect for better QOL" (OR, 0.49; 95% CI, 0.27–0.88) (**Fig. 1D**). Urban residents showed lower priority in "Expect less side effects" (OR, 2.96; 95% CI, 1.15–3.34). Male sex showed higher priority for "Financial burden" (OR, 0.48; 95% CI, 0.28–0.83) and college-educated patients had a significantly lower priority on reducing hospital visits (OR, 2.00; 95% CI, 1.01–3.93).

There were no significant factors related to “Expectation for survival” and “Expect for better QOL,” in palliative therapy.

A

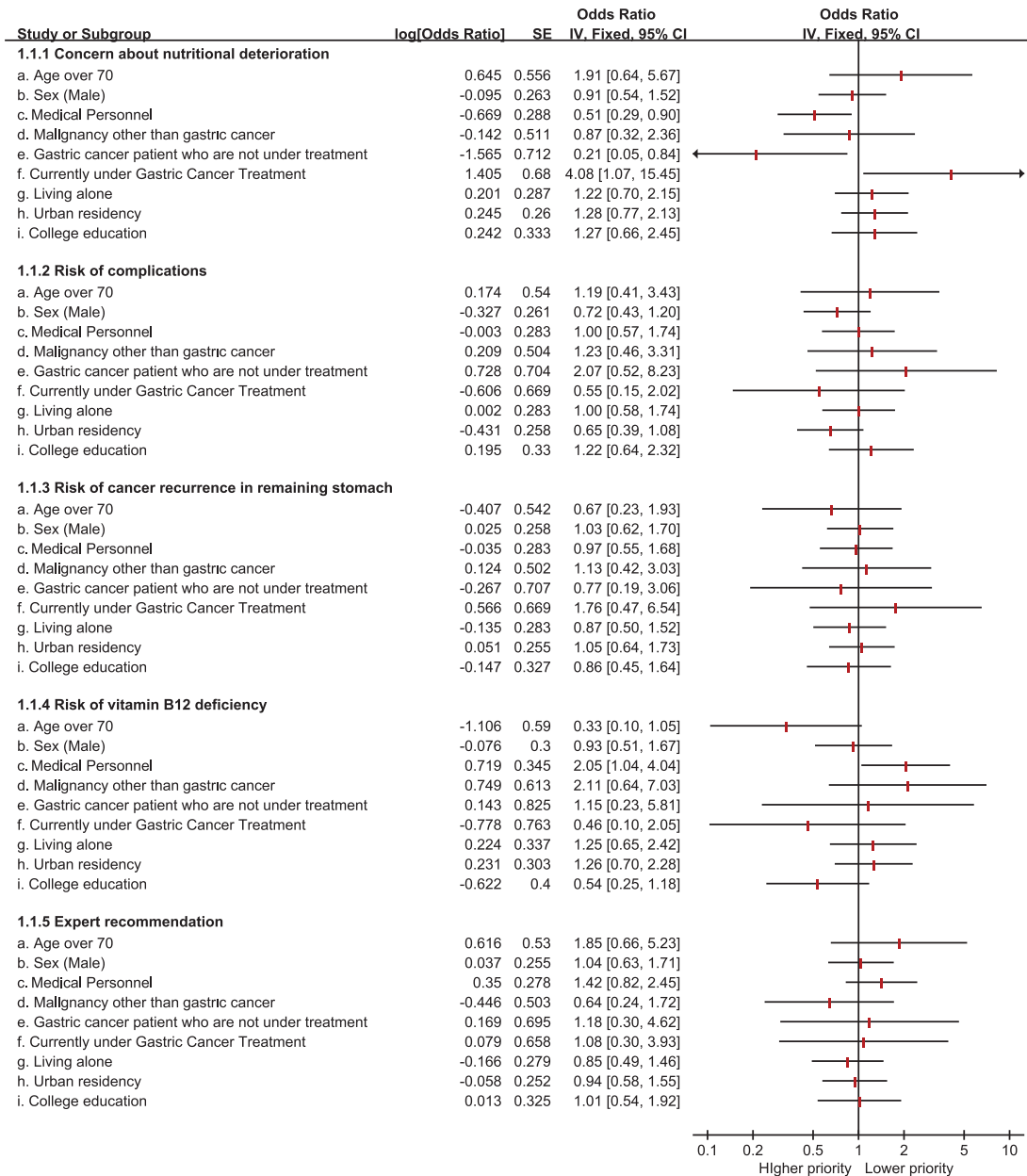


Fig. 1. Patient preference in determining treatment decisions from ordinal logistic regression. This forest plot presents subgroup analyses of factors influencing patient priorities in surgical decision-making for gastric cancer. ORs and 95% CIs indicate the relative likelihood of each subgroup assigning higher or lower importance to key considerations. OR >1 reflects lower prioritization by the subgroup, whereas OR <1 indicates higher prioritization. Subgroups whose CIs do not cross the center line (OR=1) demonstrate statistically significant differences in preferences ($P<0.05$). (A) Decision factor for determining the extent of gastrectomy. (B) Decision factor for robot gastrectomy versus laparoscopic gastrectomy. (C) Decision factor for adjuvant therapy. (D) Decision factor for incomplete ESD.

OR = odds ratio; CI = confidence interval; ESD = endoscopic submucosal dissection; SE = standard error; IV = inverse variance.

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B

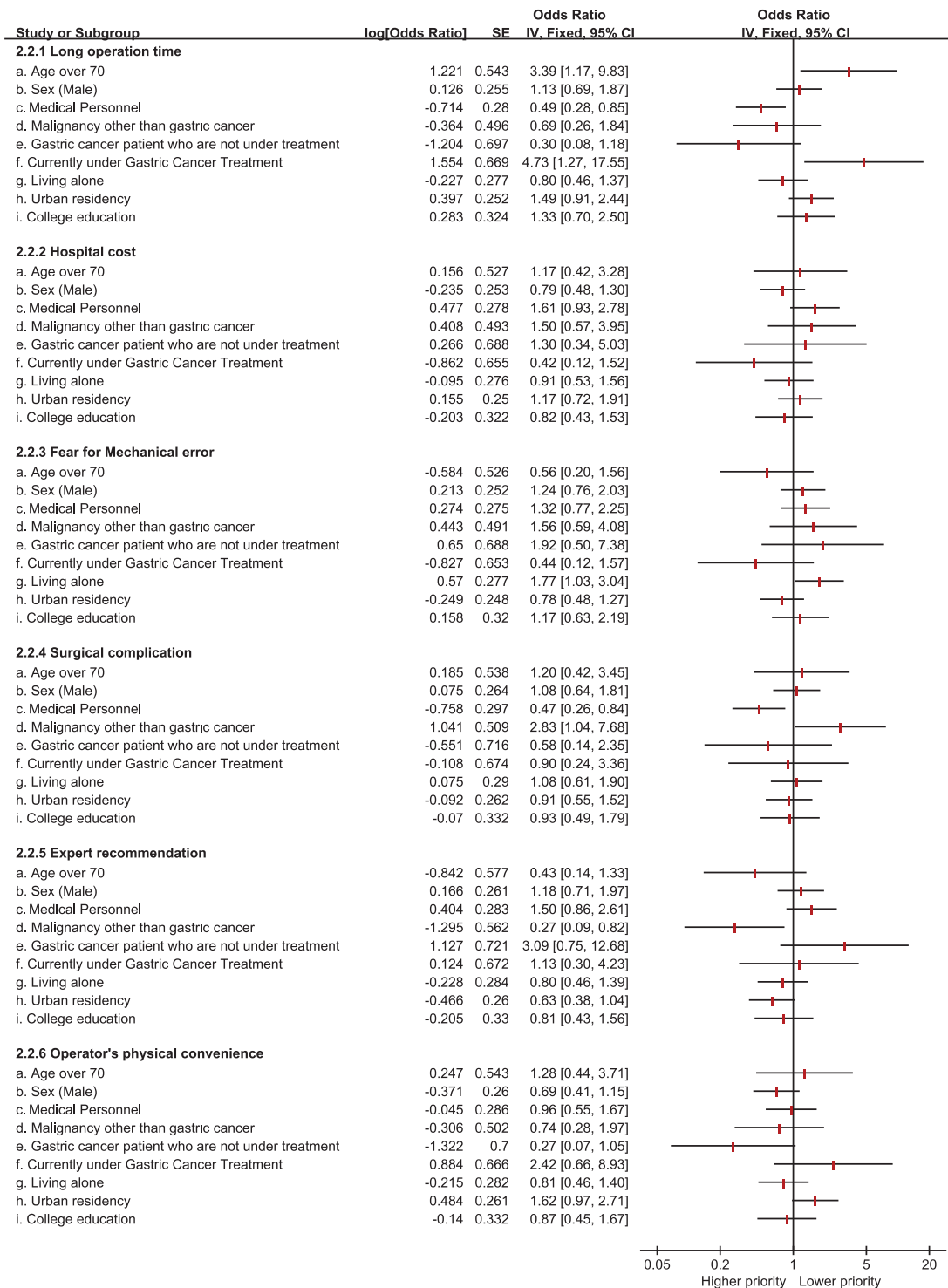


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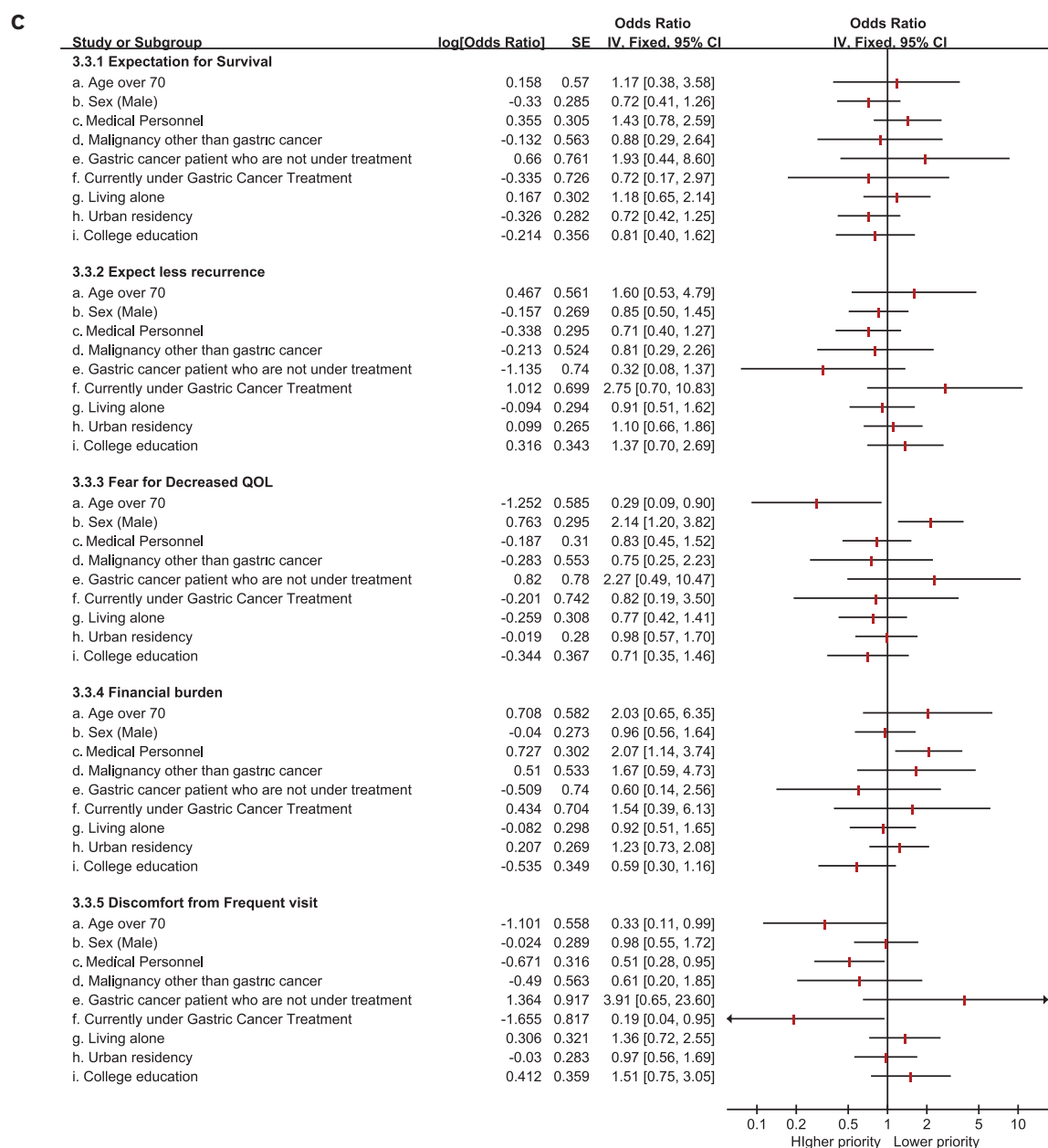


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D

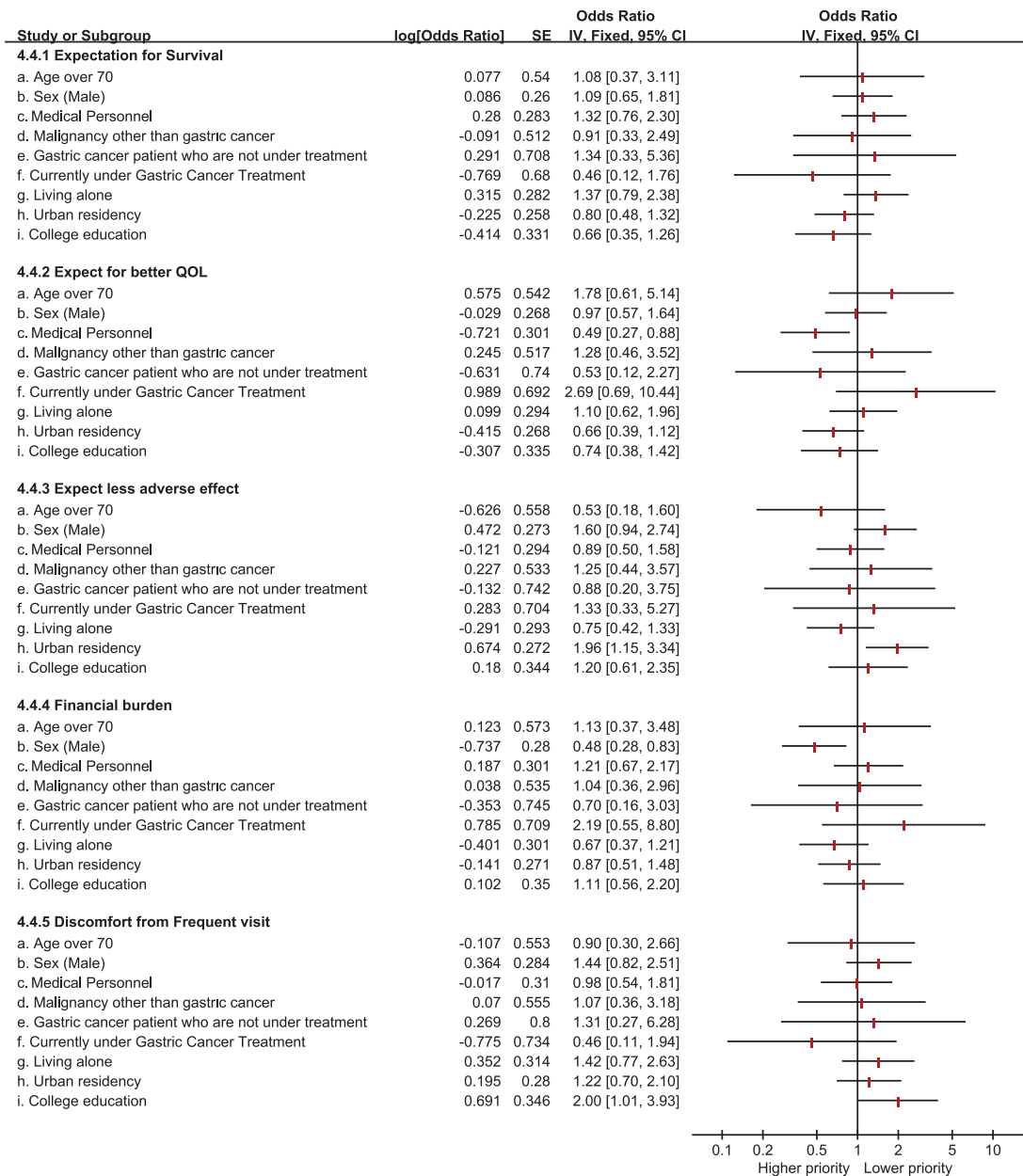


Fig. 1. (Continued) Patient preference in determining treatment decisions from ordinal logistic regression. This forest plot presents subgroup analyses of factors influencing patient priorities in surgical decision-making for gastric cancer. ORs and 95% CIs indicate the relative likelihood of each subgroup assigning higher or lower importance to key considerations. OR >1 reflects lower prioritization by the subgroup, whereas OR <1 indicates higher prioritization. Subgroups whose CIs do not cross the center line (OR=1) demonstrate statistically significant differences in preferences (P<0.05). (A) Decision factor for determining the extent of gastrectomy. (B) Decision factor for robot gastrectomy versus laparoscopic gastrectomy. (C) Decision factor for adjuvant therapy. (D) Decision factor for palliative therapy. (E) Decision factor for incomplete ESD. OR = odds ratio; CI = confidence interval; ESD = endoscopic submucosal dissection; SE = standard error; IV = inverse variance. (continued to the next page)

Patient Preferences in Gastric Cancer Treatment

E

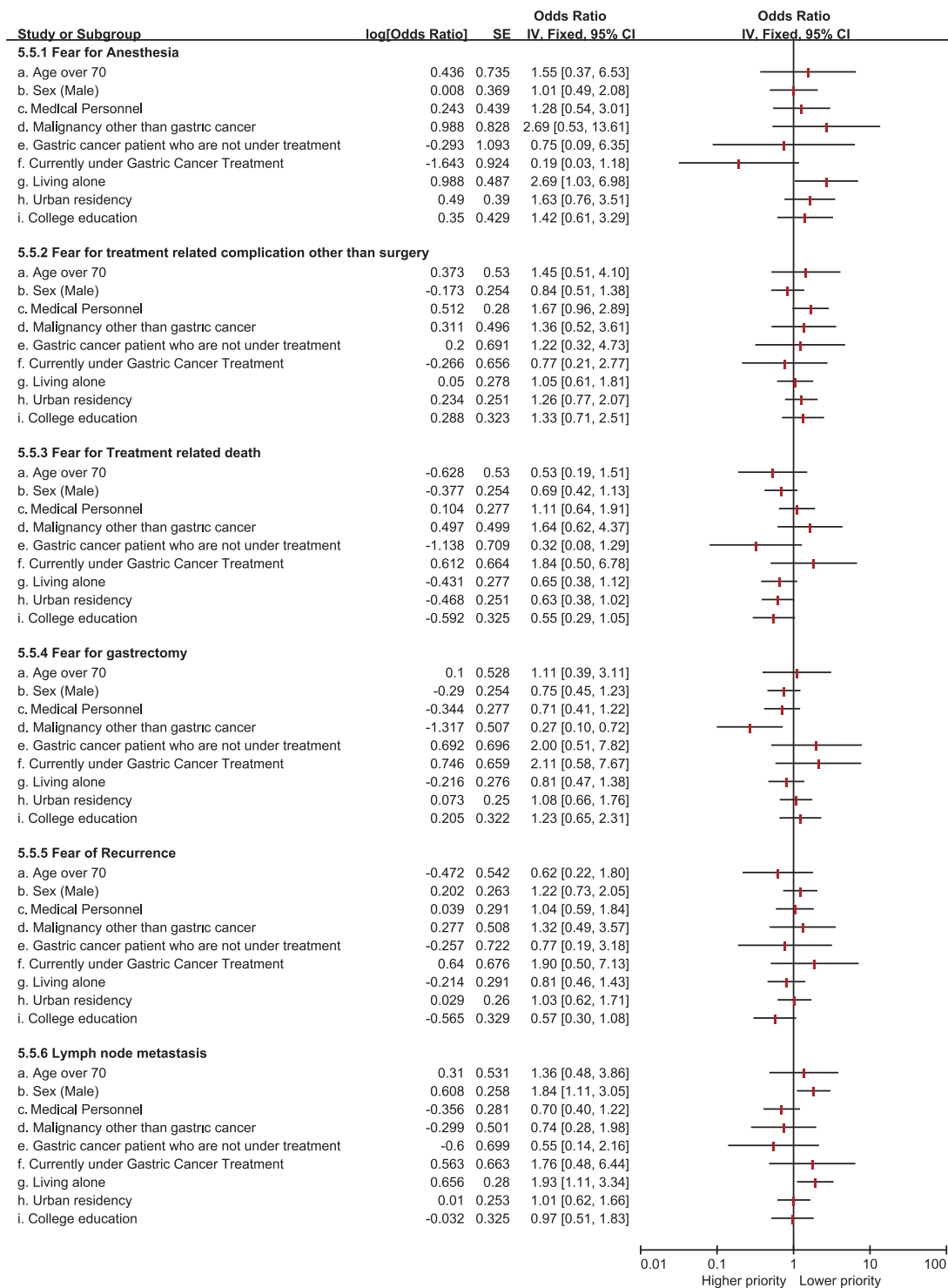


Fig. 1. (Continued) Patient preference in determining treatment decisions from ordinal logistic regression. This forest plot presents subgroup analyses of factors influencing patient priorities in surgical decision-making for gastric cancer. ORs and 95% CIs indicate the relative likelihood of each subgroup assigning higher or lower importance to key considerations. OR >1 reflects lower prioritization by the subgroup, whereas OR <1 indicates higher prioritization. Subgroups whose CIs do not cross the center line (OR=1) demonstrate statistically significant differences in preferences ($P<0.05$). (A) Decision factor for determining the extent of gastrectomy. (B) Decision factor for robot gastrectomy versus laparoscopic gastrectomy. (C) Decision factor for adjuvant therapy. (D) Decision factor for palliative therapy. (E) Decision factor for incomplete ESD.

OR = odds ratio; CI = confidence interval; ESD = endoscopic submucosal dissection; SE = standard error; IV = inverse variance.

Preferences after incomplete endoscopic resection

The participants were asked about the maximum acceptable risk of lymph node metastasis in early-stage gastric cancer while still opting for endoscopic resection. The most common acceptable risk threshold was below 0.2% (37.1%), followed by 0.2%–0.5% (19.2%), 0.6%–0.9% (17.5%), 1%–2% (17.1%), and 2%–5% (9.2%) (**Table 2**).

When faced with incomplete horizontal resection after ESD, participants' preferences were electrocoagulation (burning the remaining lesion with electrical energy) (38.3%), surgical resection (33.3%), repeated endoscopic resection (23.3%), and no additional treatment (5%) (**Table 2**). Among the preferred values, the risk of cancer recurrence in the stomach (mean rank: 2.075) was the primary concern, followed by the risk of lymph node metastasis (mean rank: 3.096), procedure-related complications (mean rank: 3.296), necessity of further stomach resection (mean rank: 3.346), mortality risk associated with treatment (mean rank: 3.596), and fear of general anesthesia (mean rank: 5.558) ($P < 0.001$, $\eta^2 = 0.370$) (**Table 3**).

In the regression analysis, responders who were living alone showed less priority in “Fear of anesthesia” (OR, 2.69; 95% CI, 1.03–6.98), patients with a history of malignancies other than gastric cancer expressed a higher “Fear for gastrectomy (OR, 0.27; 95% CI, 0.10–0.72) (**Fig. 1E**). Male responders (OR, 1.84; 95% CI, 1.11–3.05) and living alone responders (OR, 1.93; 95% CI, 1.11–3.34) showed less “Fear for lymph node metastasis.” There were no significant factors related to “Fear of Treatment-Related Complications other than surgery,” “Fear of Treatment-Related Death,” or fear of recurrence.”

Comparison between medical and non-medical respondents

Regarding the extent of gastrectomy, medical personnel were more likely than non-medical participants to prefer proximal gastrectomy (45.9% vs. 34.9%) and total gastrectomy (21.6% vs. 9.0%). By contrast, non-medical respondents indicated that they would follow expert recommendations more frequently (56.0% vs. 32.4%) ($P = 0.001$).

In terms of surgical modality, medical personnel showed a greater preference for laparoscopic surgery (59.5% vs. 23.5%), whereas non-medical participants deferred expert recommendations more frequently (52.4% vs. 20.3%) ($P = 0.001$). The preferences for robotic surgery were similar between groups.

All participants ultimately chose a standard oral and intravenous combination for adjuvant systemic therapy. However, a trend toward oral monotherapy was more common among non-medical participants (31.9% vs. 20.3%), although this difference was not statistically significant ($P = 0.087$).

When asked to indicate the age at which palliative chemotherapy would no longer be appropriate, the average threshold age was slightly higher among medical personnel (81.3 ± 6.3 years) compared to non-medical participants (79.6 ± 7.4 years), but this difference was not statistically significant ($P = 0.221$).

DISCUSSION

To the best of our knowledge, this is one of the earliest studies to investigate patient preferences in the context of multidisciplinary gastric cancer treatment in South Korea.

This study provided a comprehensive analysis of treatment preferences among patients with gastric cancer, highlighting the multifaceted decision-making process influenced by clinical, demographic, and personal factors. Our findings demonstrate that individualized preferences based on survival expectations, treatment-related morbidity, and QOL considerations play a crucial role in patient decisions.

Several previous studies support the notion that patients with gastric cancer not only prioritize survival benefits but also weigh treatment-related risks and QOL implications [11-13]. A German study using a choice-based conjoint analysis reported that patients ranked low treatment toxicity as the most important factor (relative importance: 44.6%), followed by the ability to maintain self-care (32.3%), with additional survival benefits as a secondary consideration [13]. These preferences indicate that while survival remains a key consideration, patients place substantial value on treatment convenience, functional independence, and side-effect management.

In deciding the extent of gastrectomy for proximal gastric cancer, the choice between proximal and total gastrectomy primarily comes from balancing the potential benefit of reducing vitamin B12 deficiency against the risk of cancer recurrence in the remnant stomach as there are no clear differences in nutritional, clinical, or QOL outcomes between the 2 approaches [14,15]. Although proximal gastrectomy was advocated more often than total gastrectomy, most patients replied that they followed the expert recommendations. Responders with malignancies other than gastric cancer exhibited a higher concern for “nutritional deterioration” in deciding the extent of gastrectomy while, patients currently undergoing gastric cancer treatment placed significantly less priority on this topic, suggesting a preference for more radical resection. This finding implies that patients in active treatment may prioritize curative interventions over potential nutritional risks.

Regarding the preference for robotic gastrectomy, complication risk was the most important factor, whereas surgeon convenience was the least important. Medical personnel demonstrated a high priority for long operative times and fewer surgical complications, whereas patients with gastric cancer receiving treatment responded that a long operative time was of lower priority. This suggests that medical personnel understands that operative efficiency leads to minimal surgical risks [16,17]. Their emphasis on reducing surgical complications and shortening the operative time reflects a clinical perspective focusing on optimizing perioperative outcomes.

While most participants responded that systemic therapy could be considered appropriate at age over 80 years, it was notable that participants in the older age group responded that fear of decreased QOL and discomfort for frequent visits were of higher priority compared to increased survival. In previous studies, older patients (≥ 70 years) were more likely to prioritize maintaining cognitive function and minimizing treatment burden over aggressive life-prolonging interventions [18] and A systematic review of oncology treatment preferences among older patients found that QOL was the most frequently prioritized outcome (79%), followed by overall survival (67%) [19]. These results emphasize the necessity of incorporating geriatric-specific considerations into gastric cancer treatment planning to ensure that therapies align with the values and functional status of older individuals.

Regarding systemic therapy, our study showed that the most important value for adjuvant therapy was increased survival and reduced recurrence, whereas the most prioritized value for

palliative therapy was improved QOL. This distinction reflects the fundamental difference in treatment goals between the adjuvant and palliative settings. In an adjuvant setting, where the intent is curative, patients and clinicians emphasize long-term oncological outcomes and prioritize therapies that maximize survival benefits and minimize the risk of recurrence. This aligns with previous studies indicating that patients undergoing adjuvant chemotherapy are willing to tolerate substantial treatment-related toxicities in exchange for an increased survival probabilities [20]. Conversely, in the palliative setting, where curative intent is not feasible, the focus shifts toward optimizing the QOL by alleviating symptoms and minimizing treatment-related burdens. Patients in this setting often have reduced toxicity, convenience, and the ability to maintain daily activities over marginal survival benefits [20].

The participants preferred local endoscopic therapy or surgical resection without additional treatment after incomplete ESD. This is well displayed in the values where the patient feared local recurrence followed by lymph node metastasis, while general anesthesia was the least considered. This preference underscores the strong oncological concerns among patients, prioritizing tumor eradication and recurrence prevention over procedural risks or perioperative discomfort. However, male and respondents living alone showed lower priority. This trend aligns with previous studies, indicating that sex and social circumstances significantly influence treatment preferences [21]. Patients living alone often experience higher levels of social isolation, which can lead to distinct decision-making patterns, including a reduced emphasis on aggressive interventions or recurrence risk management [22].

Similarly, a study on decisions regarding treatment for early gastric cancer found that patients initially exhibited more autonomy when preferring endoscopic treatment but shifted to a passive role after physician consultation influenced by expert recommendations [23]. These findings highlight the importance of tailoring post-ESD treatment discussions based on individual social and demographic factors to ensure that both oncological outcomes and patient-specific values are appropriately balanced in shared decision-making processes, particularly in patients who have the potential for social isolation and may need comprehensive support.

This study highlights the important differences in treatment preferences between medically informed individuals and the general population. Medically experienced participants demonstrated a more system-aware and risk-managed approach to decision-making, whereas non-medical participants tended to prioritize personal burden, safety, and cost. This divergence underscores the need for flexible decision-support tools that can accommodate both clinically informed and lay perspectives.

Approximately 30% of respondents were healthcare professionals. Although not all were oncology specialists, their familiarity with medical systems and terminology might have influenced their responses. While their inclusion was intended to reflect semi-lay viewpoints with potential clinical insights, subgroup analyses were conducted to differentiate their preferences from those of non-medical participants. This distinction is critical when interpreting findings and considering their applicability to broader patient-centered decision-making frameworks.

Social and geographic factors also influence treatment preferences. Patients living alone preferred treatment options requiring fewer hospital visits, likely because of logistical challenges and limited caregiver support. This finding is consistent with a German study

on palliative treatment preferences, which found that self-care ability ranked higher than survival benefits [13]. Similarly, rural residents emphasized financial burden and healthcare accessibility, favoring treatments that minimized travel and hospitalization. Studies on centralized cancer services have suggested that while specialized care is valued, logistical barriers often limit treatment choices [24]. Addressing these disparities through decentralized treatment strategies, telemedicine, and financial assistance programs can improve equitable access to care.

These findings offer insights that can be translated into practical tools for enhancing patient care. Specifically, the distinct preference patterns identified in this study may serve as a foundation for developing patient-centered decision-making aids tailored to various demographic and clinical subgroups. By integrating these preferences into the consultation processes, clinicians can better support shared decision-making that aligns with each patient's values and expectations. This approach may improve treatment compliance and outcomes in patients with gastric cancer.

An additional strength of this study is that the questionnaire was designed to include basic contextual information such as explanations of treatment options and associated risks, which likely helped bridge baseline knowledge gaps among respondents. By providing this background, the survey ensured that the participants, including those without direct clinical experience, would make informed and meaningful choices. This design feature enhances the interpretability and validity of the preference data by minimizing the influence of information asymmetry between patients, caregivers, and medical personnel.

Despite the findings of this study, its limitations remain unclear. First, the cross-sectional survey design captures patient preferences at a single time point, which may not fully account for evolving perspectives, such as disease progression or treatment experience changes. Longitudinal studies are required to assess changes in treatment preferences over time. Second, although our sample included a diverse population, cultural and healthcare system differences may have limited the generalizability of our findings to other regions. Further multicenter international studies are required to validate and extend our results. Finally, although efforts have been made to understand the broad spectrum of decision-making factors, additional qualitative research could provide deeper insights into the psychological and emotional considerations that influence treatment decisions. One potential limitation is that some caregivers included in the study may not have had direct experience in caring for patients with gastric cancer. Thus, their responses may reflect general attitudes rather than first-hand knowledge, which should be considered when interpreting data. Therefore, these participants were classified as part of the general population rather than a medical personnel group, as their lack of clinical involvement aligned more closely with lay perspectives.

Understanding patient preferences is essential for optimizing gastric cancer treatment strategies. Our study reinforces the need for personalized oncologic care that incorporates not only clinical efficacy, but also patient-specific values and concerns. By integrating patient preferences with clinical expertise, oncology care can move towards a more tailored and effective decision-making model that prioritizes both survival outcomes and QOL. Future research should explore how treatment preferences evolve over time, particularly in the context of disease progression and changing health status.

SUPPLEMENTARY MATERIAL

Supplementary Data 1

Survey on preferences for gastric cancer treatment

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