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A Study on the Extent of Delays in Seeking Medical Care Among Gastric Cancer Patients and Its Associated Factors

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Abstract: ***Objective:*** *To investigate the extent of delayed medical care among gastric cancer patients and analyze the associated factors, thereby providing a basis for the early identification of high-risk populations, the implementation of stratified interventions, and the optimization of care pathways.* ***Methods:*** *Using convenience sampling, 427 gastric cancer patients were selected from the Shaanxi Provincial Cancer Hospital and the Shaanxi Provincial Early Diagnosis and Treatment Program for Upper Gastrointestinal Tract Cancers between January and April 2026. Data were collected using a demographic questionnaire, the abbreviated version of the Disease Perception Questionnaire, the Cancer Patient-Reported Outcomes Economic Toxicity Scale, and the Social Support Rating Scale. Delay in seeking medical care was categorized as mild (2-4 weeks), moderate (5-11 weeks), or severe (≥12 weeks) based on the time interval from the onset of symptoms to the first medical visit. Ordinal multinomial logistic regression analysis was used to identify factors associated with the degree of delay.* ***Results:*** *Among the 427 patients, 162 (37.9%) experienced mild delay, 145 (34.0%) experienced moderate delay, and 120 (28.1%) experienced severe delay. Ordered multinomial logistic regression analysis revealed a significant socioeconomic gradient in the degree of delay: increasing age (OR=1.042), higher total disease perception scores (OR =1.070), an education level of elementary school or below (OR = 5.680) or junior high school (OR=5.339), lower per capita monthly household income, participation in public cancer screening programs, and attributing the delay to "mistaking it for gastritis" or "concerns about costs" were associated with more severe delays (P < 0.05); Higher total social support scores (OR = 0.922), lower financial toxicity (higher COST scores, OR = 0.916), residence in the central urban area (OR=0.318), and a history of regular health checkups were associated with milder delays (P < 0.05).* ***Conclusion:*** *Delays in seeking medical care among gastric cancer patients are generally significant and exhibit a socioeconomic gradient characterized by advanced age, low educational attainment, low income, and residence in rural districts or counties. These delays result from the combined effects of symptom attribution, financial burden, social support, and access to services. Nursing care should focus on implementing stratified, targeted interventions for the aforementioned high-risk populations, strengthen the identification of symptom attribution and support for healthcare decision-making, promote financial relief, social support, and improved access to services, and refine the closed-loop system for post-screening referral and follow-up to facilitate early diagnosis and treatment.*

Keywords: Gastric cancer, Delayed seeking of medical care, Influencing factors, Nursing.

1. Introduction

Gastric cancer is a highly prevalent malignant tumor in China, with 358,700 new cases and 260,400 deaths annually; it ranks fifth in incidence and third in mortality among all malignant tumors [1]. The 5-year survival rate for early-stage gastric cancer can exceed 90% following standardized treatment, whereas for advanced-stage gastric cancer, it remains below 30% even after surgery [2–4]. Shortening the patient interval—the time from symptom onset to the first medical visit—is a critical factor in improving prognosis.

Delayed presentation generally refers to cases where the interval between symptom onset and medical consultation exceeds a predetermined threshold; however, current definitions range from 2 weeks to 3 months, and the rate of delay varies depending on the standard used [5–9]. In China, the incidence of delayed presentation among cancer patients ranges from 25.93% to 62.50%, reaching as high as 67.1% for gastric cancer [10–11]; delayed presentation is associated with advanced disease staging and poor survival outcomes [11–12]. Previous studies have mostly dichotomized outcomes as "delayed/not delayed," overlooking the differences in clinical urgency and intervention needs between presentations at 2, 4, and 12 weeks, making it difficult to identify the subgroups most in need of priority intervention [8–9].

Delays in seeking medical care are influenced by a variety of factors, including sociodemographic characteristics, disease awareness, financial burden, social support, and access to health services [13–16]; however, there remains a limited body of research on the relationship between financial toxicity and participation in public cancer screening programs [17–19]. A 2026 systematic review published in *Gastric Cancer* noted that only three studies had examined the interval of delay among gastric cancer patients, with sample sizes ranging from 31 to 187 cases, and that the definitions of delay and grouping criteria varied [9]. Therefore, this study adopted the classification proposed by Bao Heling et al. [6], categorizing the degree of delay into mild, moderate, and severe levels based on the patient's interval, and analyzed its influencing factors to provide a basis for stratified interventions and the optimization of early diagnosis and treatment pathways.

2. Subjects and Methods

2.1 Study Population

Using convenience sampling, 427 gastric cancer patients from the Shaanxi Provincial Cancer Hospital and the Shaanxi Provincial Early Diagnosis and Treatment Program for Upper Gastrointestinal Tract Cancers were selected as study subjects between January and April 2026. Inclusion criteria: 1)

Diagnosed with gastric cancer based on cytological or histopathological examination, aged ≥18 years; 2) Able to communicate effectively and understand the questionnaire; 3) Aware of their own condition and diagnosis, and voluntarily participating in this study; 4) Permanent residents of Shaanxi Province who have lived there for at least six months; 5) The time interval between the first onset of symptoms—such as upper abdominal distension, discomfort, or dull pain; loss of appetite; melena; anemia; or fatigue [4]—and the first medical visit was ≥2 weeks. Exclusion Criteria: 1) Participants whose specific onset date is unclear; 2) Participants with current or past cognitive impairment or psychiatric disorders; 3) Participants with concurrent severe organ failure, other serious illnesses, or malignant tumors.

Delay in seeking medical care was defined as the time interval from the onset of symptoms to the first medical visit. Following the classification by Bao Heling et al. [6], the degree of delay was categorized as mild (2–4 weeks), moderate (5–11 weeks), and severe (≥12 weeks). The "first medical visit" refers to the patient's first visit to a medical institution at any level for treatment of the relevant symptoms.

Based on the sample size estimation formula for cross-sectional surveys, $N = 4(U\alpha S/\delta)^2$, with $\alpha=0.05$, $U\alpha=1.96$, and a margin of error δ set at 0.2 times the standard deviation; and in conjunction with previous similar studies [11], with $S = 16.5$ and $\delta = 3.3$, the calculated sample size is $N \approx 384$. Taking into account a 10% rate of invalid questionnaires, the planned sample size was set at 427 cases. This study was approved by the Ethics Committee of Shaanxi Provincial Cancer Hospital (Medical Ethics Review [2025] No. 107), and all patients provided informed consent.

2.2 Research Tools

2.2.1 General Information Questionnaire

This questionnaire was developed independently by the research team based on relevant literature. It includes questions on age, religious beliefs, place of residence, educational level, comorbid chronic diseases, method of medical payment, history of physical examinations, participation in public cancer screening programs, clinical stage, and family history of gastric cancer. The questionnaire on patients' healthcare-seeking behavior was modeled after the questionnaire for breast cancer patients developed by Wang Guorong [20]. Residence was categorized as either the central urban area or district/county; participation in public cancer screening programs referred to whether patients participated in state-supported screening and early diagnosis/ treatment programs for common and high-incidence cancers, such as the "China Residents' Cancer Prevention and Control Initiative" [19].

2.2.2 Brief Illness Perception Questionnaire

The Brief Illness Perception Questionnaire (BIPQ) [21–22] was used. This scale consists of 9 items; the first 8 items assess disease consequences, disease course, personal control, treatment control, symptom recognition, disease worry, disease understanding, and emotional response, respectively, all scored on a 0–10 scale; Item 9 is an open-ended question regarding the cause of the illness. The total score ranges from 0 to 80, with a higher score indicating a stronger negative perception of the illness on the part of the patient. The Cronbach's α coefficient for the original scale is 0.840 [22].

2.2.3 Patient-Reported Outcome Measure for Financial Toxicity in Cancer Patients

The Comprehensive Score for Financial Toxicity based on the Patient-Reported Outcome Measure (COST-PROM) [17–18] was used. Developed by de Souza et al. [17] and subsequently localized into Chinese by Yu Huihui et al. [18], this scale comprises three dimensions—financial expenditure, financial resources, and psychosocial response—with a total of 11 items. Each item is rated on a 5-point Likert scale, with a total score ranging from 0 to 44; a lower score indicates more severe financial toxicity, while a higher score indicates milder financial toxicity.

2.2.4 Social Support Rating Scale

The Social Support Rating Scale developed by Xiao Shuiyuan [23] was used. This scale consists of 10 items across three dimensions: objective support, subjective support, and utilization of support. A higher total score indicates a higher level of social support. The original scale and its domestic applications have demonstrated good reliability and validity [23–24].

2.3 Data Collection and Quality Control

Data were collected in person by two investigators who had undergone standardized training. The investigators explained the purpose and significance of the study; after obtaining informed consent from the patients, they distributed the questionnaires on-site and provided standardized instructions for completion. The questionnaires were collected and verified on the spot, and any missing or incomplete items were supplemented immediately. For patients unable to complete the questionnaire independently, the investigators assisted them through interviews. All data were entered into Excel after being cross-checked by two investigators to ensure accuracy and completeness.

2.4 Statistical Methods

Statistical analysis was performed using SPSS 26.0 software. Categorical data are presented as counts (%). Comparisons between groups were performed using the chi-square (χ^2) test. For continuous data, the Shapiro-Wilk normality test was first conducted; data conforming to a normal distribution were expressed as $\bar{x} \pm s$ and analyzed using one-way analysis of variance (ANOVA), while data not conforming to a normal distribution were expressed as M (P25, P75) and analyzed using the Kruskal-Wallis H test. Using the degree of delay in seeking medical care (mild = 1, moderate=2, severe=3) as the dependent variable, variables with $P < 0.05$ in the univariate analysis were included in an ordered multinomial logistic regression. Prior to regression, the proportional hazards assumption was verified using the parallel lines test, and variance inflation factor (VIF) and tolerance were used to diagnose multicollinearity. Categorical variables were included as dummy variables.

3. Results

3.1 Demographic and Clinical Characteristics of Gastric Cancer Patients

A total of 445 questionnaires were distributed in this study. After excluding 18 invalid questionnaires (10 due to severe data missing, 3 due to excessively short response times, and 5 due to repetitive responses), 427 valid questionnaires were ultimately included, resulting in a valid response rate of 95.96%. Among the 427 patients, 162 (37.9%) experienced mild delay, 145 (34.0%) experienced moderate delay, and 120 (28.1%) experienced severe delay. The most common reason for delay was "mistaking it for gastritis and not taking it seriously" (148 cases, 34.7%), followed by "concerns about medical expenses" (104 cases, 24.4%), "being too busy with work to seek medical care" (98 cases, 23.0%), and "no obvious symptoms of discomfort" (77 cases, 18.0%). See Table 1 for additional data.

Table 1: Demographic and Clinical Characteristics of Patients with Gastric Cancer (N=427)

Variable	Category	Number of cases (n)	Constituent ratio (%)
Gender	Male	298	69.8
	Female	129	30.2
Age (years)	18–49	57	13.3
	50–59	109	25.5
	60–69	144	33.7
	≥70	117	27.4
Residence	Urban main district	169	39.6
	County/district	258	60.4
Household registration type	Agricultural household	237	55.5
	Non-agricultural household	190	44.5
Educational level	Primary school and below	135	31.6
	Junior high school	139	32.6
	High school / Technical secondary school	94	22.0
	College and above	59	13.8
Medical insurance	Urban Employee Basic Medical Insurance	83	19.4
	Urban–Rural Resident Basic Medical Insurance	287	67.2
	Self-pay / Others	57	13.3
Marital status	Married	343	80.3
	Divorced	24	5.6
	Widowed	53	12.4
	Unmarried	7	1.6
Occupation	Farmer	159	37.2
	Worker	72	16.9
	Retired personnel	96	22.5
	Public institution staff	40	9.4
	Others	60	14.1
Monthly household per-capita income (CNY)	<1000	93	21.8
	1000–4000	140	32.8
	4000–7000	124	29.0
	7000–10000	50	11.7
	≥10000	20	4.7
Regular physical examination	Annual examination	35	8.2
	Examination every 3 years	46	10.8
	Examination every 5 years or longer	60	14.1
	Never receive physical examination	286	67.0
Disease stage	Stage I	67	15.7
	Stage II	81	19.0
	Stage III	129	30.2
	Stage IV	150	35.1
Presence of metastasis	Yes	153	35.8
	No	274	64.2
Family history of gastric cancer	Yes	48	11.2
	No	379	88.8
Route of initial diagnosis	Active medical consultation after the onset of severe symptoms	169	39.6
	Further examination due to abnormal findings on routine physical examination	45	10.5
	Incidental detection during treatment for other diseases	49	11.5
	Detected through cancer screening	50	11.7
	Other routes	114	26.7
Initial symptoms	Epigastric fullness or dull pain (aggravated after meals)	163	38.2
	Anorexia, belching, acid reflux, nausea, vomiting, melena, etc.	124	29.0
	Weight loss, anemia, fatigue	98	23.0
	No obvious symptoms	42	9.8
Awareness of early gastric cancer symptoms	Aware	94	22.0
	Unaware	333	78.0
Awareness of gastric cancer risk factors	Aware	83	19.4
	Unaware	344	80.6
Participation in public-welfare cancer screening	Participated	74	17.3
	Did not participate	353	82.7

3.2 Univariate Analysis of Gastric Cancer Patients Across Different Delay Severity Groups

The results of the univariate analysis showed that there were statistically significant differences ($P < 0.05$) among the three groups in terms of educational level, occupation, per capita monthly household income, place of residence, participation in public cancer screening programs, regular health checkups, reasons for delay, as well as age, total disease perception score, total economic toxicity score, and total social support score. Specifically, 74.2% of patients in the severe delay group resided in districts or counties, which was higher than the 45.1% in the mild delay group; 30.0% of patients in the severe delay group had a per capita monthly household income of <1,000 yuan, compared to 11.1% in the mild delay group. There were no statistically significant differences among the three groups in terms of gender, marital status, household registration type, type of health insurance, disease stage, presence of metastasis, family history of gastric cancer, initial symptoms, awareness of early symptoms of gastric cancer, or awareness of gastric cancer risk factors ($P > 0.05$). See Table 2 for details.

Table 2: Univariate Analysis of Gastric Cancer Patients by Degree of Delay in Seeking Medical Care (n=427)

Variable	Category	Mild-delay group (n=162)	Moderate-delay group (n=145)	Severe-delay group (n=120)	χ^2/F value	P value
Gender	Male	116 (71.6)	95 (65.5)	87 (72.5)	1.927	0.382
	Female	46 (28.4)	50 (34.5)	33 (27.5)		
Age (years)	Mean ± SD	60.74 ± 11.06	62.31 ± 10.34	64.33 ± 11.33	3.747	0.024
Age group	18–49 years	23 (14.2)	20 (13.8)	14 (11.7)	7.458	0.281
	50–59 years	51 (31.5)	34 (23.4)	24 (20.0)		
	60–69 years	51 (31.5)	51 (35.2)	42 (35.0)		
	≥70 years	37 (22.8)	40 (27.6)	40 (33.3)		
Marital status	Married	125 (77.2)	117 (80.7)	101 (84.2)	7.469	0.280
	Divorced	12 (7.4)	7 (4.8)	5 (4.2)		
	Widowed	20 (12.3)	21 (14.5)	12 (10.0)		
	Unmarried	5 (3.1)	0 (0.0)	2 (1.7)		
Educational level	Primary school and below	41 (25.3)	48 (33.1)	46 (38.3)	26.052	<0.001
	Junior high school	45 (27.8)	43 (29.7)	51 (42.5)		
	High school / Technical secondary school	44 (27.2)	32 (22.1)	18 (15.0)		
	College and above	32 (19.8)	22 (15.2)	5 (4.2)		
Household registration type	Agricultural household	88 (54.3)	81 (55.9)	68 (56.7)	0.165	0.921
	Non-agricultural household	74 (45.7)	64 (44.1)	52 (43.3)		
Occupation	Farmer	63 (38.9)	62 (42.8)	34 (28.3)	15.881	0.044
	Worker	35 (21.6)	14 (9.7)	23 (19.2)		
	Public institution staff	11 (6.8)	13 (9.0)	16 (13.3)		
	Retired personnel	35 (21.6)	34 (23.4)	27 (22.5)		
	Others	18 (11.1)	22 (15.2)	20 (16.7)		
Monthly household per-capita income	<1000 CNY	18 (11.1)	39 (26.9)	36 (30.0)	37.098	<0.001
	1000–4000 CNY	50 (30.9)	46 (31.7)	44 (36.7)		
	4000–7000 CNY	52 (32.1)	37 (25.5)	35 (29.2)		
	7000–10000 CNY	28 (17.3)	18 (12.4)	4 (3.3)		
	≥10000 CNY	14 (8.6)	5 (3.4)	1 (0.8)		
Medical insurance	Urban Employee Basic Medical Insurance	23 (14.2)	32 (22.1)	28 (23.3)	6.034	0.197
	Urban–Rural Resident Basic Medical Insurance	113 (69.8)	98 (67.6)	76 (63.3)		
	Self-pay / Others	26 (16.0)	15 (10.3)	16 (13.3)		
Residence	Urban main district	89 (54.9)	49 (33.8)	31 (25.8)	27.492	<0.001
	County/district	73 (45.1)	96 (66.2)	89 (74.2)		
Disease stage	Stage I	27 (16.7)	18 (12.4)	22 (18.3)	4.379	0.626
	Stage II	28 (17.3)	31 (21.4)	22 (18.3)		
	Stage III	53 (32.7)	46 (31.7)	30 (25.0)		
	Stage IV	54 (33.3)	50 (34.5)	46 (38.3)		
Presence of metastasis	Yes	50 (30.9)	58 (40.0)	45 (37.5)	2.980	0.225
	No	112 (69.1)	87 (60.0)	75 (62.5)		
Family history of gastric cancer	Yes	13 (8.0)	16 (11.0)	19 (15.8)	4.222	0.121
	No	149 (92.0)	129 (89.0)	101 (84.2)		
Initial symptoms	Epigastric fullness or dull pain	59 (36.4)	49 (33.8)	55 (45.8)	6.306	0.390
	Anorexia, belching, acid reflux, etc.	50 (30.9)	40 (27.6)	34 (28.3)		
	Weight loss, anemia, fatigue	37 (22.8)	39 (26.9)	22 (18.3)		
	No obvious symptoms	16 (9.9)	17 (11.7)	9 (7.5)		
Awareness of early gastric cancer symptoms	Aware	44 (27.2)	29 (20.0)	21 (17.5)	4.266	0.118
	Unaware	118 (72.8)	116 (80.0)	99 (82.5)		
Awareness of gastric cancer risk factors	Aware	34 (21.0)	23 (15.9)	26 (21.7)	1.813	0.404
	Unaware	128 (79.0)	122 (84.1)	94 (78.3)		
Participation in public-welfare cancer screening	Participated	23 (14.2)	20 (13.8)	31 (25.8)	8.432	0.015
	Did not participate	139 (85.8)	125 (86.2)	89 (74.2)		
Regular physical examination	Annual examination	16 (9.9)	13 (9.0)	6 (5.0)	16.613	0.011
	Examination every 3 years	19 (11.7)	19 (13.1)	8 (6.7)		
	Examination every 5 years or longer	31 (19.1)	20 (13.8)	9 (7.5)		

Variable	Category	Mild-delay group (n=162)	Moderate-delay group (n=145)	Severe-delay group (n=120)	χ^2/F value	P value
Causes of delay	Never receive physical examination	96 (59.3)	93 (64.1)	97 (80.8)	29.955	<0.001
	Misdiagnosed as gastritis and neglected	41 (25.3)	61 (42.1)	46 (38.3)		
	Too busy with work to seek medical care	42 (25.9)	33 (22.8)	23 (19.2)		
	Reluctant to seek care due to financial concerns	37 (22.8)	25 (17.2)	42 (35.0)		
	No obvious discomfort	42 (25.9)	26 (17.9)	9 (7.5)		
Scale scores	Total Illness Perception score	36.08 ± 11.76	43.34 ± 11.71	49.92 ± 12.69	46.372	<0.001
	Total Financial Toxicity score	24.77 ± 7.26	20.64 ± 6.72	17.70 ± 7.19	35.701	<0.001
	Total Social Support score	39.44 ± 7.24	36.81 ± 6.12	33.34 ± 6.16	29.687	<0.001

Note: Categorical data are expressed as examples (%) and analyzed using the chi-square test; continuous data are expressed as $\bar{x} \pm s$ and analyzed using one-way analysis of variance. Age is presented both as a grouped variable and a continuous variable; for multivariate analysis, it is treated as a continuous variable. Delay severity groups: mild (2–4 weeks), moderate (5–11 weeks), and severe (≥12 weeks). A higher total economic toxicity score indicates milder economic toxicity.

3.3 Ordered Multiclass Logistic Regression Analysis of Factors Influencing the Degree of Delay in Seeking Medical Care Among Gastric Cancer Patients

With the degree of delay in seeking medical care (mild = 1, moderate = 2, severe = 3) as the dependent variable, variables with $P < 0.05$ in the univariate analysis were included in an ordered multinomial logistic regression. The parallel lines test yielded $\chi^2 = 31.157$, $P = 0.119$, confirming the assumption of proportional odds; the VIF values for each independent variable ranged from 1.018 to 1.218, with tolerance values ranging from 0.821 to 0.982, indicating no significant multicollinearity.

After adjusting for other factors, for every 1-year increase in age and every 1-point increase in the total perceived illness score, the ORs for entering a higher delay category were 1.042 (95% CI 1.020–1.063) and 1.070 (95% CI 1.050–1.091), respectively (both $P < 0.001$). Compared with those with a college degree or higher, the ORs for those with a primary school education or lower and those with a junior high school education were 5.680 (95% CI 2.697–11.977) and 5.339 (95% CI 2.527–11.291), respectively; Monthly per capita household income showed a clear gradient: the OR for the <1,000 yuan group was 31.031 (95% CI 8.390–114.778), and for the 1,000–4,000 yuan group, it was 19.727 (95% CI 5.529–70.316); The OR for participants in public cancer screening programs was 5.447 (95% CI 2.904–10.217); this association runs counter to expectations and requires interpretation in light of the timing and indications for screening; The ORs for those attributing the delay to "mistaking it for gastritis" or "concerns about costs" were 2.810 (95% CI 1.471–5.366) and 2.460 (95% CI 1.218–4.968), respectively (both $P < 0.05$).

Conversely, for every 1-point increase in the total social support score and every 1-point increase in the total economic toxicity score (i.e., a reduction in the economic burden), the ORs were 0.922 (95% CI 0.891–0.954) and 0.916 (95% CI 0.887–0.946), respectively; The OR for those residing in the central urban area was 0.318 (95% CI 0.200–0.505); compared with those who never underwent health checkups, the ORs for those who underwent checkups annually, every 3 years, and every 5 years or more were 0.279, 0.220, and 0.210, respectively (all $P < 0.05$). There was no significant association between educational attainment (high school/vocational school, various vocational levels) and the reason for delay ("busy with work") and the degree of delay ($P > 0.05$). Complete estimates and 95% CIs are shown in Table 3.

It should be noted that the cause of the delay was based on retrospective self-assessment, and the temporal relationship with the delayed outcome is difficult to determine; therefore, the OR is provided for descriptive purposes only. A higher total economic toxicity score indicates milder economic toxicity; an OR > 1 indicates a greater tendency toward a higher (more severe) delay grade, while an OR < 1 indicates a milder grade. The reference group with income ≥10,000 yuan consisted of only 20 cases; the 95% CI for the OR in the <1,000 yuan group is wide, so the point estimate should not be overinterpreted. Occupation was associated in univariate analysis but was not statistically significant after multivariate adjustment, possibly reflecting covariation with income, educational level, and health insurance coverage.

Table 3: Ordered Multiclass Logistic Regression Analysis of Factors Influencing the Degree of Delay in Seeking Medical Care Among Gastric Cancer Patients (n=427)

Variable	β	SE	Wald χ^2	P value	OR	95% CI for OR
Age at diagnosis	0.041	0.010	15.235	<0.001	1.042	1.020–1.063
Total Illness Perception score	0.068	0.010	50.467	<0.001	1.070	1.050–1.091
Total Financial Toxicity score	-0.088	0.017	28.130	<0.001	0.916	0.887–0.946
Total Social Support score	-0.081	0.018	20.975	<0.001	0.922	0.891–0.954
Residence (urban main district)	-1.146	0.236	23.645	<0.001	0.318	0.200–0.505
Educational level (primary school and below)	1.737	0.380	20.877	<0.001	5.680	2.697–11.977
Educational level (junior high school)	1.675	0.382	19.244	<0.001	5.339	2.527–11.291
Educational level (high school / technical secondary school)	0.361	0.399	0.818	0.366	1.435	0.656–3.133
Occupation (farmer)	-0.318	0.351	0.820	0.365	0.728	0.366–1.448
Occupation (worker)	-0.729	0.406	3.223	0.073	0.482	0.218–1.069
Occupation (public institution staff)	0.536	0.470	1.301	0.254	1.709	0.681–4.293
Occupation (retired personnel)	-0.230	0.376	0.373	0.541	0.795	0.381–1.660
Monthly household per-capita income (<1000 CNY)	3.435	0.667	26.487	<0.001	31.031	8.390–114.778
Monthly household per-capita income (1000–4000 CNY)	2.982	0.649	21.127	<0.001	19.727	5.529–70.316
Monthly household per-capita income (4000–7000 CNY)	2.421	0.646	14.034	<0.001	11.257	3.174–39.965
Monthly household per-capita income (7000–10000 CNY)	1.812	0.693	6.828	0.009	6.123	1.573–23.831
Regular physical examination (annual)	-1.275	0.405	9.897	0.002	0.279	0.126–0.618
Regular physical examination (every 3 years)	-1.513	0.368	16.878	<0.001	0.220	0.107–0.453
Regular physical examination (every 5 years or longer)	-1.563	0.342	20.912	<0.001	0.210	0.107–0.409
Public-welfare cancer screening (participated)	1.695	0.321	27.883	<0.001	5.447	2.904–10.217
Causes of delay (misdiagnosed as gastritis)	1.033	0.330	9.802	0.002	2.810	1.471–5.366

Variable	β	SE	Wald χ^2	P value	OR	95% CI for OR
Causes of delay (too busy with work)	0.599	0.362	2.746	0.098	1.820	0.896–3.699
Causes of delay (financial concerns)	0.900	0.359	6.296	0.012	2.460	1.218–4.968
Threshold 1	7.159	1.408	25.859	<0.001	—	—
Threshold 2	9.763	1.456	44.956	<0.001	—	—

Note: The dependent variable is the degree of delay in seeking medical care (mild = 1, 2–4 weeks; moderate = 2, 5–11 weeks; severe = 3, ≥12 weeks). Age, total disease perception score, total economic toxicity score, and total social support score were included as continuous variables. Reference categories: Place of residence = district/county; Educational level = college or higher; Occupation = other; Per capita monthly household income = ≥10,000 yuan; Regular physical examinations = never undergo physical examinations; Public cancer screening = did not participate; Reason for delay = no obvious symptoms of discomfort. An OR > 1 indicates a greater tendency toward a higher (more severe) delay level, while an OR < 1 indicates a lower level. A higher total economic toxicity score indicates milder economic toxicity.

4. Discussion

4.1 Severe Delay; Symptom Attribution and Financial Concerns Are Prominent

All 427 patients in this study sought medical care ≥2 weeks after the onset of symptoms. Among the patients with delayed presentation, 162 (37.9%) had mild delay, 145 (34.0%) had moderate delay, and 120 (28.1%) had severe delay; severe delay accounted for more than one-quarter of the cases. The incidence of presentation delay among cancer patients in China ranges from 25.93% to 62.50% [10], reaching as high as 67.1% for gastric cancer [11]; however, previous studies have mostly used a binary classification, making it difficult to directly compare the distribution of delay severity. This study employs an ordered scale as an outcome measure and includes a large sample size, which aids in identifying high-risk populations across different levels of delay [9–11].

The main reasons for delayed presentation were "mistaking the symptoms for gastritis and not taking them seriously" (34.7%) and "concerns about medical costs" (24.4%). A mixed-methods study by Karnchanachari et al. [25] found that patients with upper gastrointestinal tract tumors often normalized or misattributed their symptoms, seeking medical care only after symptoms persisted or worsened; competing priorities and access to care also influenced decisions to seek medical care. This is consistent with the perspective of the symptom assessment–health-seeking decision pathway model [15–16]. The findings of this study echo these observations. Although the reasons for delay were based on retrospective self-reports and cannot be interpreted causally, symptom attribution, cost concerns, and convenience of care remain valuable entry points for intervention. The fact that 18.0% of patients reported no obvious symptoms of discomfort suggests that education focused solely on symptom awareness is insufficient; it must be combined with risk stratification of high-risk populations and screening reminders at the primary care level.

4.2 Perception of Illness is Associated with the Degree of Delay, but the Temporal Relationship Remains to be Verified

For every 1-point increase in the total disease perception score, the odds ratio (OR) for entering a higher delay category was 1.070 (95% CI 1.050–1.091), and the scores across the three groups increased in a stepwise manner (36.08→43.34→49.92); however, there was no difference among the three groups regarding "awareness of early symptoms of gastric cancer" (χ^2 = 4.266, P = 0.118). This suggests that a lack of knowledge alone cannot fully explain the delay; patients' interpretation of symptoms and assessment of the threat they pose may be more critical factors [15–16].

Ristvedt et al. [26] found that patients' assessments of their symptoms were influenced by factors such as trait anxiety and tumor location; the results reported by Tanrıkulu et al. [27] in patients with colorectal cancer were not entirely consistent with those of this study, and the differences may stem from the type of cancer, symptom characteristics, sample, and measurement tools. Since the BIPQ was administered after diagnosis, disease perception could be either a cause of delay or a consequence of disease progression or the diagnostic experience; therefore, this study considers it only as a related factor. Interventions should focus on identifying warning symptoms, correcting the attribution of symptoms to "gastritis," and reducing fear and hesitation regarding seeking medical care.

4.3 The Extent of Delays Follows a Socioeconomic Gradient; attention Should be Paid to Health Equity.

The degree of delay showed a clear socioeconomic gradient: compared with households with a per capita monthly income of ≥10,000 yuan, the OR for the <1,000 yuan group was 31.031 (95% CI 8.390–114.778), and it gradually increased as income decreased; the ORs for those with an elementary school education or lower and a junior high school education were 5.680 and 5.339, respectively; the OR for those residing in the central urban area was 0.318 (95% CI 0.200–0.505). Patients from districts and counties accounted for 74.2% of the severe delay group, higher than the 45.1% in the mild delay group. However, there were only 20 cases in the reference group with an income of ≥10,000 yuan, and the confidence interval for the <1,000 yuan group is relatively wide; therefore, interpretations should be based on the interval rather than the point estimate alone.

Hansen et al. [13] and Bao Heling et al. [6] both indicated that low socioeconomic status and residence in rural areas or counties are associated with delayed cancer diagnosis; Zhang et al. [28] and Alemayehu et al. [29] reported, respectively, that insufficient medical and social support, rural residence, and financial barriers are associated with delayed diagnosis among patients with lung and gastric cancer. These findings, together with those of the present study, point to a dual disadvantage in terms of economic conditions and geographic accessibility. In this study, there was no statistically significant association between disease stage and the degree of delay (χ^2 = 4.379, P = 0.626). This may be related to the cross-sectional design, the retrospective nature of the analysis following diagnosis, and survival bias in the staging data; however, this does not mean that the delay has no clinical consequences. Efforts should be made to extend high-quality medical resources to underserved areas, improve health insurance reimbursement, and enhance guidance and referral

support for low-income populations seeking medical care.

4.4 Economic Toxicity is an Economic Psychological Factor that can be Addressed

For every 1-point increase in the total economic toxicity score (i.e., a reduction in the economic burden), the odds ratio (OR) for entering a higher delay category was 0.916 (95% CI 0.887–0.946), indicating that the likelihood of increased delay decreased by approximately 8.4%; the OR for "concern about costs" was 2.460 (95% CI 1.218–4.968), which is consistent with the scale results.

Economic toxicity includes direct medical expenses, indirect costs such as transportation, caregiving, and lost wages, as well as psychosocial reactions such as financial anxiety [17–18]. Alemayehu et al. [29] also reported an association between financial barriers and treatment delays among gastric cancer patients. Since financial toxicity is measured after diagnosis, it may partially reflect treatment costs and loss of income, suggesting a potential reverse causality; therefore, it should be considered an intervenable risk factor. Clinically, screening for financial toxicity can be incorporated into nursing assessments to facilitate communication about costs, explain health insurance coverage, provide medical assistance, and facilitate referrals to social workers.

4.5 Social Support and Health Screenings Are Key Areas for Nursing Interventions

For every 1-point increase in the total social support score, the odds ratio (OR) for entering a higher delay category was 0.922 (95% CI 0.891–0.954); scores in the three groups showed a decreasing trend (39.44→36.81→33.34), suggesting that individuals with greater social support were more likely to receive medical advice, companionship, and practical assistance. Zhang et al. [28] also found that medical social support was associated with delay in seeking care among rural lung cancer patients. This is consistent with the view that decisions regarding seeking medical care are influenced by family and social networks [15–16].

Compared with those who never underwent health checkups, the odds ratios (ORs) for those who underwent checkups annually, every 3 years, and every 5 years or more were 0.279, 0.220, and 0.210, respectively. All were associated with milder delays; however, there was no significant dose-response relationship between groups. Furthermore, since each checkup group consisted of only 35 to 60 cases, these findings should not be overinterpreted. Health checkups may simultaneously reflect health literacy, economic status, and access to medical care, and a "health adherer effect" may be present. From a nursing perspective, patients and their families should be educated on symptom recognition and decision-making regarding medical care; community follow-up, telephone reminders, and referral assistance should be established; and access to primary-care health checkups and gastric cancer screening should be improved.

4.6 Public Screening Programs are Associated with More Severe Delays; Follow-up Management Needs to be Improved.

Participation in public cancer screening was associated with more severe delays (OR = 5.447, 95% CI 2.904–10.217); however, this should not be directly interpreted as indicating that screening is harmful. Possible reasons include: some patients may have participated in screening after symptoms appeared, suggesting reverse causality; the chronological sequence between screening and symptom onset was unclear; screening participation was assessed as a single self-reported item, without distinguishing between screening type, timing, and results; normal screening results may have led to a "false sense of security," thereby delaying the patient's response to subsequent symptoms; furthermore, this association may also be influenced by unmeasured confounding factors.

Cao et al. [19] pointed out that cancer screening in China still faces challenges in terms of coverage, quality, and follow-up; the referral and follow-up of individuals with positive results are key to maximizing the effectiveness of screening. Systems should be established for registering positive results, creating a fast-track referral process, and providing follow-up reminders. Future research should clarify the chronological sequence between screening and the onset of symptoms and utilize screening registries and medical records to reduce self-reporting bias.

4.7 Limitations of This Study

This study has the following limitations: First, convenience sampling was used, and the sample was drawn solely from a single Grade A Level 3 specialized cancer hospital in Shaanxi Province and a regional early diagnosis and treatment program, resulting in limited representativeness; the inclusion criterion of ≥2 weeks precludes estimation of the overall delay rate among gastric cancer patients. Second, due to the cross-sectional design, the BIPQ, COST, and social support measures were all assessed after diagnosis, making it difficult to determine temporal sequences and causal relationships. Third, the duration and reasons for delay relied on patient recall and self-assessment, which may introduce recall bias and misclassification bias; although the three-tier threshold was based on the classification by Bao Heling et al. [6], sensitivity analyses still need to be conducted across different populations.

In the future, multicenter, prospective cohort studies could be conducted to objectively measure the time to diagnosis using medical records and screening registries; to assess disease perception and financial concerns after the onset of symptoms but before diagnosis; and to use mixed-methods approaches to gain a deeper understanding of patients' interpretations of their symptoms and their decision-making processes regarding seeking medical care.

5. Conclusion

This study shows that among the 427 gastric cancer patients who met the definition of delayed medical care, 162 (37.9%) experienced mild delay, 145 (34.0%) experienced moderate delay, and 120 (28.1%) experienced severe delay, indicating that the overall degree of delay was relatively severe. Advanced age, low educational attainment, low income, residence in rural districts or counties, a higher total disease

perception score, greater economic toxicity (lower COST score), insufficient social support, and participation in public cancer screening programs were associated with more severe delays; a history of regular health checkups was associated with milder delays. The most prominent reasons for delay were “mistaking the condition for gastritis and not taking it seriously” and “concerns about costs.”

The above findings suggest that stratified interventions should be implemented for patients who are elderly, have low educational attainment, are low-income, or reside in rural districts and counties: health education should focus on symptom attribution and timely decision-making regarding medical care; financial barriers should be reduced through cost communication, health insurance reimbursement, and medical assistance; social support should be strengthened through families and communities; access to primary-care physical examinations and screenings should be improved; and the closed-loop system for referral and follow-up of individuals with positive results from public cancer screening programs should be refined. Given the cross-sectional design of this study and the timing of variable measurements, the causal relationships among disease perception, financial toxicity, and the extent of screening participation and delay still require further validation through longitudinal studies.

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