ORIGINAL ARTICLE

ASSESSMENT OF QUALITY OF LIFE IN PATIENTS WITH GASTRIC CANCER IN UKRAINE

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ABSTRACT

The aim: To identify the main problems in the quality of life of patients with gastric cancer to optimize health care for them.

Materials and methods: The sociological study was performed by surveying 404 patients with gastric cancer usage questionnaires EORTC QLQ-C30 and QLQ-STO22. Calculations were performed according to the EORTC QLQ-C30 Scoring Manual and QLQ-STO22. The analysis of three main indicators was performed: functional scale, symptom scale and quality of life scale.

Results: The quality of life of gastric cancer patients amounted to 51.80±11.35 on a 100-point scale. According to the QLQ-C30 functional scale, the psycho-emotional sphere (59.62±12.91), social functioning (66.42±13.48) are the most impressive in patients. According to the results obtained in the QLQ-C30 symptoms scale, gastric cancer patients were most concerned about financial difficulties (57.18±12.45) and fatigue with a score of 50.12±10.86 on a 100-point scale. According to the QLQ-STO22 symptom scale in the study of patients, anxiety (59.07±12.46) and hair loss (56.97±11.78) amounted to the highest scores.

Conclusions: Given the low quality of life of gastric cancer patients, they need psychological support, which is aimed at adapting to the manifestations of the disease and should be a mandatory component in the development of models or strategies for providing medical care to cancer patients. Standardized psychological care should be organized at all stages of diagnosis, treatment and rehabilitation in all institutions that provide treatment to gastric cancer patients. It is also important to develop and implement a comprehensive program to support gastric cancer patients in interaction with society, family and work.

KEY WORDS: gastric cancer, quality of life, psychological support

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INTRODUCTION

Gastric cancer (GC) is one of the most common forms of tumors for individuals of all ages in Ukraine. According to the latest published data from the Center of Public Health (CPH) of the Ministry of Health (MOH) of Ukraine, the GC ranks third in the structure of cancer among men and women [1]. Among all human tumors, GC accounts for 15%, and among tumors of the gastrointestinal tract, it accounts for 50%. Men get affected more often, almost twice more often. More than 85% of GC patients are in the age group of 40 and older [2].

Despite the fact that the death rate from GC has been declining for several decades, its incidence is still high worldwide. Efforts to improve survival in previous years include pre- and postoperative chemotherapy and chemoradiation therapy [3-5]. However, improved survival with multimodal treatment may also be associated with increased toxic side effects. Therefore, a full assessment of new treatments for GC should also include indicators of outcomes reported by patients, i.e. the quality of life.

THE AIM

The aim of the study was to identify the main problems in the quality of life of patients with GC (C16) to optimize health care for them.

MATERIALS AND METHODS

The sociological study was performed by surveying 404 patients according to a unified study protocol, which included the use of a comprehensive questionnaire consisting of a questionnaire to determine the quality of life in oncology, EORTC QLQ-C30, and a questionnaire to determine the quality of life of patients with GC, QLQ-STO22. Permission to use the data from "EORTC Quality of Life Group" questionnaires was obtained in November 2021.

EORTC QLQ-C30 is a questionnaire of the European Organization for Research and Treatment of Cancer, developed by the EORTC Quality of Life Study Group, which is currently one of the most widely used tools for determining the quality of life in oncology [6-8]. The

current version consists of 30 questions and includes 5 functional scales:

- physical functioning (PF2),
- role functioning (RF2),
- emotional functioning (EF),
- cognitive functioning (CF),
- social functioning (SF);

QLQ-C30 scale includes the following symptoms:

- fatigue (FA)
- nausea (NV)
- sleep disturbances (SL)
- appetite loss (AP)
- diarrhea (DI)
- dyspnea (DY)
- pain (PA)
- constipation (CO)
- financial difficulties (FI)

The required number of participants was calculated according to Glen's method, and was 398 people. Taking into account the possibility of elimination (10%), we sent 440 questionnaires proportionally to different regions of Ukraine (North, South, West, East, Central), from which we received 404 questionnaires. Primary data were collected from November 2021 to February 2022. All participants gave written consent to participate in the study.

The inclusion criteria were patients who were hospitalized with a histologically confirmed diagnosis «gastric cancer» and received inpatient treatment. Exclusion criteria were lack of written consent to participate in the study.

A randomized study was conducted with further control for distribution of patients by the gender and stage of the disease. Thus, 60.6 % of patients were men and 39.4 % – women. The distribution of patients by the stage of the disease is as follows: I stage – 8.0%, II stage – 15.9%, III stage – 22.3%, IV stage – 44.8%, the stage is not determined in 9.0% of patients. The distribution data are identical to the average data in Ukraine.

Secondary data [1, 2, 4, 9] was used in writing this article also.

Calculations were performed according to the EORTC QLQ-C30 Scoring Manual [8] and QLQ-STO22 [9]. The analysis of three main indicators was performed: functional scale (FS), symptom scale (SS) and quality of life scale (QoL). First of all, an average score (Raw Score – RS) was assessed for each indicator, which is presented as M±SD.

Since the structure of the questionnaire enables the questions to have a 4 or 7-point scale, the developers proposed a unified approach by using a 100-point scale for each of the parameters. Thus, the value of the functional scale (FS) per 100 points was calculated by the following formula:

$$\mathrm{FS} = \left(1 - \frac{RS-1}{range}\right) * 100$$

Where RS is average score of the scale, range is the range of the scale, which is determined by the difference between the possible maximum and minimum values of the scale.

Meanwhile, the symptom scale (SS) and quality of life (QoL) per 100 points were calculated according to the following formula:

SS = ((RS-1)/range)*100

Where RS is the average score of the scale, range is the scale range determined by the difference between the possible maximum and minimum scale values.

Interpretation of the obtained results was performed according to the traditional approach: a high level of functional scale (FS) indicated a high (healthy) level of functioning regarding this indicator. Similarly, a high quality of life scale (QoL) indicated a high quality of life, but a high level of symptom scale (SS) indicated a high level of existence of this problem or symptom.

For scales consisting of 2 or more questions, Cronbach's alpha was calculated as an indicator of scale consistency.

The statistical calculations were performed by using software RStudio v. 1.1.442 and R Commander v.2.4-4.

RESULTS

According to the results, the quality of life of GLOBAL HEALTH STATUS / QoL in patients with GC amounted to 51.80±11.35 points on a 100-point scale. It should be noted that the answers of the respondents were of the same type, as indicated by sufficient consistency determined by the method of & Cronbach and is 0.78.

According to the questionnaire, within the QLQ-C30 functional scale, among other subscales, the worst indicators belong to the subscale of "Emotional functioning", which amounted to 59.62±12.91 points on a 100-point scale (Table I), and the average score is 2.21±0.87 (Fig.1).

The score on the "Social functioning" subscale is only 66.42±13.48 out of 100, thus habitual communication with people, communication in the family creates certain challenges, discomfort, and generally suffers due to the patient's physical condition or treatment.

"Role functioning" has a score of 68.86±13.74 on a 100-point scale, which indicates that there were some difficulties for the patient in performing their work, daily activities, there were restrictions on hobbies or leisure activities. In general, this indicator is often associated

Table I. The results of the survey with the QLQ-C30 functional scale in GC patients

Scale items	Directory code	Score on a 100-point scale	& Cronbach
Emotional functioning	EF	59.62	0.86
Social functioning	SF	66.42	0.74
Role functioning	RF2	68.86	0.81
Physical functioning	PF2	70.42	0.82
Cognitive functioning	CF	76.65	0.31

Table II. Results of the QLQ-C30 symptom scale questionnaire in GC patients

Scale items	Directory code	Score on a 100-point scale	& Cronbach
Financial difficulties	FI	57.18	-
Fatigue	FA	50.12	0.77
Pain	PA	44.10	0.64
Sleep disturbances	SL	40.69	-
Appetite loss	AP	37.62	-
Diarrhea	DI	35.64	-
Constipation	CO	34.99	-
Dyspnea	DY	31.76	-
Nausea and vomiting	NV	27.97	0.85

Table III. Scores the QLQ-STO22 symptom scale in GC patients

Scale items	Directory code	Score on a 100-point scale	& Cronbach
Anxiety	ANX	59.07	0.67
Hair loss	HAIR	56.97	-
Body perception	BI	39.78	-
Dry mouth	DM	37.14	-
Chest and abdominal pain	PAIN	36.14	0.84
Reflux	RFX	35.45	0.68
Eating restrictions	EAT	28.93	0.60
Taste problems	TA	23.68	-
Dysphagia	DYS	19.71	0.68

with patient support, particularly inside the family.

Compared to the previous items, "Physical functioning" suffers less, its score on the 100-point scale amounts to 70.42±14.27, and, according to the questionnaire, GC patients find it harder to perform strenuous physical work or carry a certain load.

"Cognitive functioning" has the highest indicators in the QLQ-C30 functional scale, its score on the 100-point scale amounted to 76.65±14.72. This indicates that most patients did not have difficulty remembering, concentrating, for example, while reading a newspaper or watching a TV show.

Overall, the Cronbach's alpha on the QLQ-C30 functional scale ranged from 0.74 to 0.86, indicating sufficient and high consistency in patient responses. Only in the subscale "Cognitive functions" it was equal to 0.31, which corresponds to the low consistency of patient responses.

The QLQ-C30 symptom scale survey of CG patients evaluated the following symptoms: fatigue (FA), nausea and vomiting (NV), pain (PA), sleep disturbances (SL), dyspnea (DY), appetite loss (AP), constipation (CO), diarrhea (DI), financial difficulties (FI).

As shown in Table II, CG patients were most concerned about financial difficulties, which amounted to 57.18±12.45 points on a 100-point scale, the average score was 2.72±0.87 (Fig. 2).

Patients are slightly less worried about fatigue, which was expressed in 50.12±10.86 points on a 100-point scale. This is one of the symptoms most often complained of by patients with malignant neoplasms. The presence of fatigue significantly affects the quality of life, as it is a kind of "mirror" of the psychological and physical condition of the patient.

Another symptom that significantly affects the quality of life of a cancer patient is pain. It is often among the

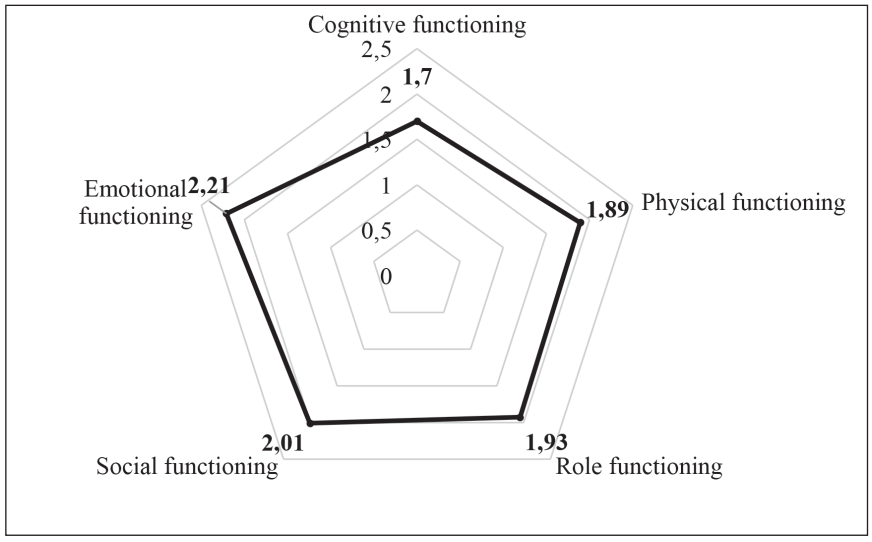

Fig. 1. The average score of the QLQ-C30 functional scale in GC patients (points)

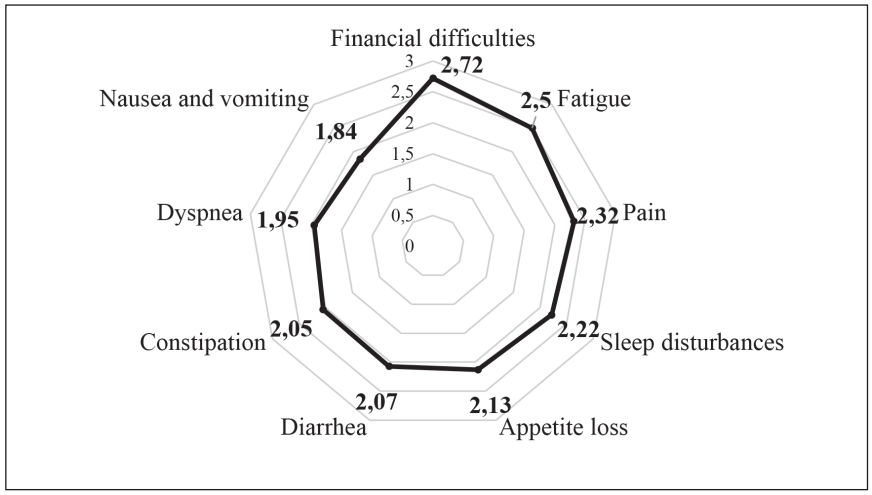

Fig. 2. The average score on the QLQ-C30 symptom scale in GC patients (points)

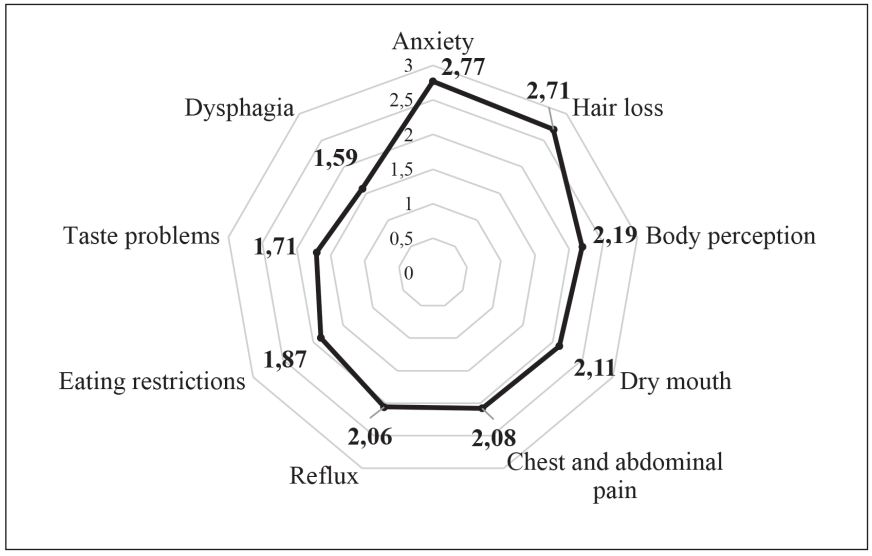

Fig. 3. Average score on the QLQ-STO22 symptom scale in GC patients (points)

"leading" symptoms that disturb, cause difficulties in the daily life of the patient, often together with fatigue, because it is exhausting, and it is also associated with the fear of losing independence and freedom of movement, restriction of movement. In this questionnaire, pain accounted for 44.1±10.17 points out of 100.

The "Sleep disturbances" subscale is slightly lower. It scored 40.69±9.82 points on a 100-point scale. This complaint is a component of the conditional complex "Fatigue-Pain-Sleep Disturbances", these are symptoms that often trigger each other and are a consequence of each other.

The lowest scores according to the QLQ-C30 symptom scale questionnaire belong to gastrointestinal problems. Gastric surgery, chemotherapy can cause a corresponding potential deterioration in the patient's quality of life. They have a huge impact on the anatomy and physiology of the patient, as they change the functions of digestion and often affect the patient's attitude to food. In the QLQ-C30 symptom scale questionnaire, "Appetite loss" amounted to 37.62±8.91 points. Slightly fewer patients were concerned about diarrhea, this item amounted to 35.64±7.83 points out of 100. "Constipation" indicator was almost consistent with the previous subscale item, as it amounted to 34.99±7.26 points on a 100-point scale. Also, patients were less worried about "Dyspnea". It scored 31.76±6.46 points on a 100-point scale. The lowest result in the QLQ-C30 symptom scale questionnaire, and in particular among gastrointestinal disorders was found in the item "Nausea and vomiting", which amounted to 27.97±5.84 points out of 100.

The Cronbach's alpha indicator of the QLQ-C30 symptom scale ranged from 0.77 to 0.85, indicating sufficient and high consistency of patient responses. The indicators of consistency on the subscale "Pain" were low, Cronbach's alpha was 0.63 (doubtful consistency), and the correlation was significant moderate ($R=0.47$; $p<0.001$).

The EORTC QLQ-STO22 questionnaire takes into account 22 additional indicators related to GC, including five scales: dysphagia (DYS), chest and abdominal pain (PAIN), reflux (RFX), eating restrictions (EAT), anxiety (ANX), as well as four separate items that reflect the symptoms of the disease, side effects of treatment and emotional problems: dry mouth (DM), body perception (BI), taste problems (TA), hair loss (HAIR) [7, 10, 11].

I n general, the patients' quality of life is affected by several factors, including the stage of the disease and the treatment associated with it [12]. Age, comorbidities and current (at the time of analysis) oncological medical treatments can have profound and negative effects on patients' responses. In the QLQ-STO22 symptom scale the highest indicator was that of "Anxiety", which amounted to 59.07±12.46 points on a 100-point scale (Table III), the average score was 2.77±1.00 (Fig. 3). This subscale includes questions about worrying about future health, worrying about being underweight, and the patient's thoughts about the disease.

Hair loss is one of the symptoms that GC patients often complain of, with a subscale amounting to 56.97±11.78 on a 100-point scale. The patient's assessment of their body also suffers, and a certain cohort of respondents stated that they felt less physically attractive due to the disease or its treatment. The item "Body perception" amounts to 39.78±9.47 points out of 100.

The lowest scores on the QLQ-STO22 symptom scale belong to dry mouth, chest and abdominal pain, reflux, eating restrictions, taste problems, and dysphagia. According to the questionnaire, the item "Dry mouth" equals 37.14±8.62 points on a 100-point scale, which is slightly higher than 36.14±8.33 points out of 100, which the subscale "Chest and abdominal pain" amounts to. Patients describe this symptom by asking questions about unpleasant sensations while eating, pain in the upper abdomen, bloating.

To a lesser extent, GC patients were concerned about reflux. This subscale amounts to 35.45±7.52 points on a 100-point scale. This item includes questions about the discomfort caused by bile and/or acid, belching, heartburn.

The item "Eating restrictions" amounts to 28.93±6.33 points on a 100-point scale. This subscale contains questions about the feeling of fullness of the stomach too soon after eating, discomfort to eat in the presence of other people, satisfaction from food.

The QLQ-STO22 symptom scale "Taste problems" item scores 23.68±5.73 on a 100-point scale. Patients were asked if they tasted food and drink differently than usual.

According to our data, dysphagia causes the least discomfort for GC patients with cancer. Its score on a 100-point scale is equal to 19.71±5.11. The questions on this subscale relate to difficulties in eating hard/or grated/or soft foods, as well as beverages, and general discomfort during eating.

According to the QLQ-STO22 questionnaire, only the "Chest and abdominal pain" scale was characterized by good values of internal consistency indicators – Cronbach's alpha was 0.84, which corresponds to high consistency. Other QLQ-STO22 questionnaire scales were characterized by Cronbach's alpha values at the level of questionable internal consistency in the range of 0.60–0.68.

DISCUSSION

Quality of life is a wide concept that covers a person's physical and psychological health, level of independence, social aspects and relationship with the environment [13-15]. Quality of life is defined by the World Health Organization (WHO) as people's perception of their position in life in the cultural context and value system in which they live, as well as in relation to their goals, expectations, standards and concerns.

According to the results, the quality of life of GLOBAL HEALTH STATUS / QoL in GC patients amounted to 51.80 points on a 100-point scale, which is 8 points lower than the value described by Chinese authors Zhou Yangyang

and Xi Shuhua (60.1) [16] and 6 points above the value described by Iranian authors (45.7) [3].

According to our data, among other sub-scales, the worst indicators within the functional scale QLQ-C30 fell belong to the "Emotional functioning" subscale, which amounted to 59.62 points on a 100-point scale. Authors Zhou Yangyang, Xi Shuhua in their studies show a higher score of 79.4 points, and generally the item "Emotional functioning" was among the highest indicators of the QLQ-C30 functional scale, while "Cognitive functioning", which disturbed our respondents the least (76.65 points on a 100-point scale), received the lowest points in the aforementioned study and amounted to 71.0 points [16].

The results of our survey according to the QLQ-C30 symptom scale show the highest score among the complaints of financial difficulties (57.18), which is quite high compared to the studies by other authors (32.8) [16], but the score of 32.8 leads list of QLQ-C30 symptoms scale of other researchers and is second only to fatigue (33.9). In our survey, fatigue bothered GC patients up to 50.12 points on a 100-point scale and took second place after the "Financial difficulties" subscale. In general, fatigue is one of the most common symptoms in patients with malignancies. Fatigue is often associated with sleep problems, depression, pain. This indicator is significantly influenced by the current physical and psychological state.

According to our QLQ-C30 symptom scale studies, patients were least concerned about nausea and vomiting with a score of 27.97, while the Chinese authors give a score of 17.6 in their studies, but it is also the penultimate place in this scale and this symptom is less disturbing for GC patients [16].

According to our QLQ-STO22 symptom scale data, most patients complained of anxiety, which amounted to 59.07 points on a 100-point scale, consistent with Iranian authors (56.0) [3], and significantly higher than Chinese authors (26.6) [16]. Respondents with GC were also concerned about hair loss, this subscale accounted for 56.97 points out of 100. Iranian authors describe this point of the QLQ-STO22 symptom scale with significantly lower scores of 17.3 [3], while Chinese authors indicated 25.1 points on this subscale [16].

There is an interesting approach of comparing the results of various reconstructive surgeries from the quality of life viewpoint for the subscale "Reflux", Stefano Rausei, Alberto Mangano, Federica Galli and co-authors analyzed a subgroup of patients who underwent SG with Roux-en-Y or Billroth II reconstructions. Billroth procedures (I and II) are more commonly performed in Eastern countries due to the simplicity of surgical techniques compared to Roux-en-Y [12]. Theoretically, they tend to cause reflux of the duodenum and stomach [17], which causes many symptoms that adversely affect quality of life [18]. On the contrary, Roux-en-Y reconstruction, although a more risky and complicated procedure because two anastomoses need to be performed, is less likely to cause reflux symptoms. For this reason, this surgical reconstruction is used more often, especially in obese patients who are more prone to duodenal gastric reflux [10]. In a meta-analysis, Liang Zong and Ping Chen compared Billroth I, Billroth II, and Roux-en-Y from 15 studies involving 2,169 patients, finding that Roux-en-Y reconstruction was more effective in preventing duodenal reflux and esophagus-stomach with the corresponding best indicator of quality of life [19]. According to our data, "Reflux" accounts for 35.45 on a 100-point scale, which exceeds the data of Iranian and Chinese authors 19.4–20.3 [3,16].

According to our results, patients were least concerned about dysphagia. The scores on this point amounted to 19.71 out of 100, which exceeds 6.5–15.6 in studies by Iranian and Chinese authors [3, 16], but all authors were unanimous about the symptom of dysphagia, which in all studies had the lowest scores.

In general, the authors noted that the overall quality of life of GC patients returned to normal 3 years after surgery, but in some respects, especially symptoms associated with the upper gastrointestinal tract (e.g., nausea and vomiting, reflux, limitation of food) there is a gap in the results with healthy people, indicating that the effect of surgery on patients lasts for at least 3 years, so there must be targeted measures (including symptomatic treatment and psychotherapy) for treatment and care to improve postoperative GC patients' quality of life [16]. Tumor and treatment factors affect the quality of life after gastric cancer surgery. To improve the quality of life of patients, Stefano Rausei, Alberto Mangano, Federica Galli et al. believe that after gastrectomy for cancer, subtotal resection with Roux-en-Y reconstruction should be preferred when it is oncologically acceptable. The authors also noted that all possible factors should be taken into account for a proper analysis of the real consequences of gastric surgery for the well-being of patients [12].

CONCLUSIONS

1. It is advisable to determine the quality of life of GC patients, one of the tools for this can be the questionnaires developed by European Organisation for Research and Treatment of Cancer (EORTC).
2. In Ukraine, as of the pre-war period (November 2021 – February 2022), the quality of life of GC patients amounted to 51.80±11.35 on a 100-point

scale. Psycho-emotional sphere (59.62±12.91), social functioning (66.42±13.48) are the most impressive in Ukrainian patients according to the QLQ-C30 functional scale. According to the results of the QLQ-C30 symptoms scale, GC patients were most concerned about financial difficulties with indicators of 57.18±12.45, and fatigue with results of 50.12±10.86. According to the QLQ-STO22 symptom scale in the study of Ukrainian patients, the highest rates were for anxiety (59.07±12.46) and hair loss (56.97±11.78).

3. Psychological support, which is aimed at adapting to the manifestations of the disease and prospects, should be a mandatory component in the development of models or strategies for the provision of medical care to cancer patients. Standardized psychological care should be organized at all stages of diagnosis, treatment and rehabilitation in all institutions that provide treatment to GC patients. It is also important to develop and implement a comprehensive program to support GC patients in interaction with society, family and work.

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Conflict of interest:
The Authors declare no conflict of interest.

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A – Work concept and design, **B** – Data collection and analysis, **C** – Responsibility for statistical analysis, **D** – Writing the article, **E** – Critical review, **F** – Final approval of the article