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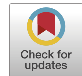
Demand and Influencing factors for community health services during chemotherapy of patients with advanced cancer☆



Qianqian Li[a,b], Xunrui Chen[a], Wenying Zhang[a], Haihua Yuan[a], Yanjie Zhang[a], Bin Jiang[a], Feng Liu[a,*]

[a] Department of Oncology, Shanghai Ninth People's Hospital, Shanghai Jiaotong University School of Medicine, China
[b] General Medicine Department, Shanghai Xuhui Lingyun Community Health Service Center, China

A R T I C L E I N F O

Keywords:
Neoplasms
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Root cause analysis

A B S T R A C T

Background: Implementing effective, rational support and comprehensive services for patients with advanced cancer undergoing chemotherapy is a significant challenge in community health services. According to recent data, the mortality rate from malignant tumors in Shanghai residents now ranks second only to cardiovascular and cerebrovascular diseases. Attention toward patients with advanced cancer undergoing chemotherapy is gradually increasing. This study aims to understand the primary care demands of such patients and the factors influencing these demands.
Objective: To investigate the demand and influencing factors for community health services during chemotherapy for patients with advanced cancer in Shanghai and to develop community interventions and services tailored to these patients' demands.
Methods: Patients with advanced cancer undergoing chemotherapy who regularly visited or were hospitalized at Shanghai Ninth People's Hospital, Wusong Hospital and Shanghai Baoshan Hospital of Integrated Traditional Chinese and Western Medicine from December 2021 to March 2022 were selected as the study subjects. Based on government specifications, previous research findings from surveys on questionnaires and interviews, the final version of the "Community Health Services Demand Questionnaire for Patients with Advanced Cancer in Shanghai" was developed. It includes three demand dimensions (psychological, medical care, social support) and 38 demand items. The contents cover general information such as demographic and sociological information(educational level, marital status, source of medical expenses, disposable monthly household income, patient group participation), and tumor diagnosis(type and time of diagnosis, pain score, comorbidities), along with items on psychological demand (6 items), medical care demand (24 items), and social support demand (8 items). A 3-point scale was employed: 1 for unnecessary, 2 for necessary, and 3 for very necessary. Demand levels were ranked according to the average score of each item. Logistic regression analyses were used to identify the influencing factors of community health service demand among these patients.
Results: The demand dimensions, ranked from highest to lowest, were psychological demand (2.31 points), medical care demand (2.27 points), and social support demand (2.18 points). The top five demands were "preparation for pathological tests such as routine blood, liver and kidney functions before chemotherapy" (2.48 points), "education on chemotherapy knowledge" (2.48 points), "care for peripherally inserted central catheter(PICC) catheterization during chemotherapy" (2.45 points), "management of myelosuppression after chemotherapy" (2.43 points) and "providing updated information on treatment, examination and rehabilitation" (2.42 points), primarily focusing on the medical care demand dimension. Logistic regression analysis showed that educational level and disposable monthly household income significantly influenced psychological demand, while age and source of medical expenses influenced medical care demand, and age and patient group participation affected social support demand ($P < 0.05$).

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* Correspondence author at: Liu Feng, Associate chief physician, Department of Oncology, Shanghai Ninth People's Hospital, Shanghai Jiaotong University School of Medicine, China.
E-mail address: nuanliu@126.com (F. Liu).

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Conclusion: Patients with advanced cancer undergoing chemotherapy have specific demands for community health services across psychological, medical care, and social support dimensions, influenced by factors such as age, educational level, and household income. This study offers recommendations for community health centers to develop relevant medical services. Future initiatives could introduce new service items in high demand and monitor the effectiveness of community interventions, such as psychological and medical care support for these patients, to improve their quality of life.

Introduction

The global incidence and death rates from cancer continue to rise, posing a significant threat to human life and health. The 2020 Global Burden of Disease shows that China has the highest rates of cancer incidence and mortality.[1] For patients with advanced cancer, either not eligible for surgery or post-surgery, chemotherapy remains a prevalent clinical strategy to extend survival. Typically, these patients need monthly visits to a general hospital for their treatment. During the chemotherapy, they often confront various side effects, along with significant psychological and financial challenges. Besides routine hospital visits for treatment, pre-chemotherapy medical assessments, post-chemotherapy nursing care, and other supportive services during the treatment phase are crucial. Recent developments in healthcare have enabled community health centers to expand their services, now featuring advanced medical technology and staffed with more professionally skilled personnel. These facilities can provide certain chemotherapy-related services, such as routine blood tests, liver and kidney function tests, administration of oncology drugs prescribed by specialized hospitals, and referral services. However, they fall short in meeting all patient needs, such as CT scan for tumor monitoring, distribution of specific cancer medications, and post-chemotherapy PICC catheterization care. As primary care facilities, community health centers could offer more accessible services to chemotherapy patients, reducing the need for these patients to seek care from specialized hospitals and alleviating the operational load on these institutions. Understanding patient demands for community health services can aid in enhancing or modifying the services provided by these centers.

According to the Shanghai Statistical Yearbook 2022, the resident population of the city was 24,894,300 by the end of 2021.[2] Focusing on Pudong New District as a case study, the resident population reached 5681,500 by 2020, and the cumulative number of reported malignant tumor deaths from 2010 to 2020 was 76,779, with a crude mortality rate of 240.03 per 100,000, and a standardized mortality rate of 1501 per 100,000. Malignant tumor deaths rank as the second leading cause of death among Shanghai residents, following cardiovascular and cerebrovascular diseases,[3] highlighting the growing concern for patients with malignant tumors. A survey conducted in four community health centers in Changning District, Shanghai, regarding the health service demands of breast cancer patients indicated that the primary need was understanding health insurance matters related to the disease.[4] Preliminary studies, including surveys in Changning District and broader analyses by Gu et al.,[5] emphasized an urgent need for a clearer understanding of medical insurance, along with increased family support, psychological counseling, pain management, and nutritional guidance. Our research team's previous survey on the health service needs of oncology patients and their families in Shanghai revealed significant demands for family support, psychological advice from medical staff regarding post-death scenarios, evaluation and management of cancer-related pain and constipation, and guidance on improving appetite.[6] Regarding chemotherapy patients, Tang et al.'s[7] study on the demands of postoperative breast cancer chemotherapy patients found that patients' demand scores ranged from medium to high. Huang et al.[8]'s survey on the supportive care needs of chemotherapy patients with breast cancer showed high scores in the dimensions of service and health system information needs. Providing effective and appropriate support for advanced tumor patients undergoing chemotherapy and addressing their primary needs can enhance their quality of life and strengthen their confidence in the treatment, which is beneficial for the prognosis of tumor patients.

This is a cross-sectional study involving patients with advanced cancer who were diagnosed or hospitalized in Shanghai general hospitals and are currently receiving regular chemotherapy treatment. Questionnaires were employed to collect basic patient characteristics and various demand scores. The goal was to understand the fundamental conditions of patients with advanced cancer undergoing chemotherapy in the Shanghai community, identify the primary demands for community health services, and the factors influencing these demands, with the aim of providing guidance for community health services tailored to patients with advanced tumor chemotherapy in Shanghai.

Methods

Study subjects

This study targeted individuals receiving regular chemotherapy for advanced-stage cancer, recruited from three major medical institutions in Shanghai between December 2021 and March 2022. These institutions were Shanghai Jiao Tong University School of Medicine Affiliated Ninth People's Hospital, Wusong Hospital, and Baoshan District Integrated Traditional Chinese and Western Medicine Hospital.

The inclusion criteria were as follows: (1)aged 18 years or older, clinically diagnosed with advanced tumors, and currently undergoing regular chemotherapy; (2)diagnoses covering a variety of advanced-stage cancers, as defined by national guidelines or expert consensus, including: Stage III-IV lung,[9] gastric,[10] Stage IV colorectal,[11] oral,[12] Stage II-IV liver,[13] Stage IV kidney,[14] advanced bladder[15] and prostate cancers,[16] and Stage IV breast cancer;[17]; (3)capability to fully understand and complete the survey; (4)residency in Shanghai for at least six months prior to the study. Excluded from the analysis were individuals unable to comprehend or complete the survey, those with visual impairments, or mental health conditions that hinder self-care. The study received ethical approval from the Ethics Committee of the Shanghai Jiao Tong University School of Medicine Affiliated Ninth People's Hospital (SH9H-2021-T480–1). All participants provided informed consent.

Questionnaire design

Based on the "Shanghai Cancer Patients and Family Members Community Care Willingness Survey Questionnaire"[18] which was developed by the researchers from Second Military Medical University, the team revised and re-developed a new questionnaire against our research aims. The questionnaire was developed carefully, involved a comprehensive process including pilot research, site visits, validation, preliminary surveys, and extensive testing. This is the first draft of questionnaire "Survey Questionnaire on Community Service Needs of Late-stage Chemotherapy Patients in Shanghai." Considering that our research subjects were the late-stage cancer patients who were the primary recipients of palliative care,[19] the essential demands from government guidelines, such as "Shanghai Community Health Service Center Palliative Care Department Setting Standards," the basic operational standards for the Shanghai Community Health Centers[20-21] were also included in the questionnaire.

To refine the study framework, an interview guide was developed and in-depth consultations were conducted with a diverse panel of ex-

perts including oncologists from various disciplines, experienced community health service workers, data analysis experts, and directly impacted late-stage chemotherapy patients. The "Survey Questionnaire on Community Service Needs of Late-stage Chemotherapy Patients in Shanghai" then finalized, including 3 dimensions and 38 items. It covers sociodemographic details (such as gender, age, religious beliefs, educational level, marital status, source of medical expenses, household income, and patient group participation), detailed cancer diagnosis information (type, time of diagnosis, pain score, comorbidities), and provides comprehensive insights into psychological well-being (6 items), medical care demands (24 items), and social support demands(8 items). A three-level scoring system was implemented (1 for 'not needed,' 2 for 'needed,' and 3 for 'very needed') to quantitatively evaluate each requirement, offering a detailed view of the patients' needs.

Data collection

The survey was conducted from December 2021 to March 2022 and was administered by trained researchers to ensure consistent understanding and adherence to the study protocol. The training covered understanding the survey's goals, as well as the precautions and requirements for its completion. The questionnaire survey was conducted using two methods: self-completion by the patients and completion by researchers on behalf of the patients. Before patients filled out the questionnaire themselves, researchers were required to obtain their informed consent and ensure they fully understood the content of the questionnaire. For patients who required assistance in completing the survey, support was provided to accurately capture their responses, ensuring the reliability of the data collected. The study targeted a sample size based on Kendall's criterion,[22] with an allowance for a 30 % attrition rate, leading to the distribution of 500 questionnaires and the retrieval of 380 valid responses, constituting a response rate of 76 %. This sample size exceeded the minimum requirement, reinforcing the credibility of the study's findings.

Statistical methods

Data entry was performed by two independent researchers employing Microsoft Excel 2019, with accuracy subsequently verified by a third researcher. Statistical analyses were performed using SPSS software 25.0(IBM, Armonk, NY). Count data were expressed as relative number, and the χ^2 test was applied for group comparisons. Demand prioritization was ranked according to the mean score of each item. Groups were categorized based on these average scores, followed by univariate analyses of clinical data across the groups. Statistically significant variables from the univariate analyses were then assessed through logistic regression to identify factors influencing the demand for community health services among late-stage chemotherapy patients in Shanghai. Statistical significance was established at a P-value of less than 0.05.

Results

Service demands scores of patients undergoing chemotherapy for advanced cancer

Among the three dimensions, psychological and mental health demands scored highest (2.31), followed by medical care demands (2.27), and social support demands (2.18). Among all dimensions, the five primary demands based on average scores were identified: pathological tests on blood, liver and kidney functions prior to chemotherapy; basic knowledge chemotherapy procedures; care for PICC during chemotherapy; management of myelosuppression after chemotherapy; and the provision of updated information on treatment, examinations and rehabilitation, highlighting a significant focus on medical care demands.

In the psychological and mental health dimension, regular professional consultations with disease and psychological issues in community settings; effective guidance for understanding disease and chemotherapy correctly; family understanding, support, and encouragement; leveraging belief and mental strength; and improved communication among patients, families, and medical staff.

Within the social support dimension, the prioritized demands are: logistical assistance in obtaining medications; information on local rehabilitation and community activities; preparation for family caregiving as the patient nears the end of life; a directory of available caregivers and volunteers; and access to resources for acquiring or renting care equipment. Detailed scores for each demand are provided in Table 1.

Analysis of factors influencing the demands for community health services among patients undergoing chemotherapy for advanced cancer

Participants were divided into three sub-groups based on their average scores across three dimensions: psychological and mental health demands, medical care demands, and social support demands. For psychological and mental health, individuals were further divided into two groups: scores of ≤ 2.31 (n = 90) and > 2.31 (n = 290). For medical care demands, the groups were ≤ 2.27 (n = 120) and > 2.27 (n = 260); and for social support demands, ≤ 2.18 (n = 140) and >2.18 (n = 240). Univariate analysis exploring the community health service demands among patients with advanced tumors undergoing chemotherapy revealed significant differences. The educational level and monthly disposable family income were significantly different between the groups with scores ≤ 2.31 and > 2.31 in the psychological and mental health dimension ($P < 0.01$ for both). In the medical care dimension, significant differences were observed in age, source of medical expenses, and comorbidities between the ≤ 2.27 and > 2.27 groups ($P < 0.01$ for age and source of medical expenses; $P = 0.01$ for comorbidities). In terms of social support demands, there were significant differences in age ($P = 0.02$), educational level ($P = 0.04$), patient groups participation($P = 0.01$), and comorbidities ($P = 0.03$) between the ≤ 2.18 and > 2.18 groups, as detailed in Table 2.

Logistic regression was employed to assess the impact of various factors on the three demands dimensions: psychological and mental health, medical care, and social support. The thresholds for these needs were defined as follows: psychological and mental health demands (≤ 2.31 as 0, > 2.31 as 1), medical care demands (≤ 2.27 as 0, > 2.27 as 1), and social support demands (≤ 2.18 as 0, > 2.18 as 1). This analysis included variables that were statistically significant in the univariate analysis, encompassing: age (< 60 years = 0, ≥ 60 years = 1), educational level (up to high school = 0, beyond high school = 1), medical expense coverage (out-of-pocket = 0, alternative sources = 1), monthly disposable household income (≤5000 yuan = 0, > 5000 yuan = 1), patient group participation (no = 0, yes = 1), and comorbidities (no = 0, yes = 1). The results showed that educational level and monthly disposable household income significantly influenced psychological and mental health demands, with P-values < 0.01 and =0.01, respectively. Age and the source of medical expenses were significant predictors for medical care demands, with P-values < 0.05 and =0.01. Additionally, age and patient group participation significantly affected social support demands, as indicated by P-values of 0.04 and 0.01, respectively, as detailed in Table 3.

Discussion

Notable shifts in the epidemiological patterns of malignant tumors have been witnessed in recent years, characterized by increasing incidences across various regions and tumor types, as evidenced by population surveys.[23] Furthermore, the rising incidence and mortality rates of malignant tumors highlight the essential role of disease management within community health services, emphasizing the importance of initiatives like widespread tumor screening and prevention efforts in community health centers.[24-25] The results reveal that the patients

Table 1
Item scores and ranking of psychological, medical care and social support demand of patients with advanced cancer during chemotherapy.

Demand dimension	Ranking	Demand items	Not needed [cases (%)]	Needed [cases (%)]	Highly needed [cases (%)]	Average score of demand items (score)
Psychological and Mental Health	1	Regular community consultations with experts in disease and psychological fields	55(14.5)	132(34.7)	193(50.8)	2.36
	2	Active guidance to understand and cope with illness and chemotherapy correctly	61(16.1)	130(34.2)	189(49.7)	2.34
	3	Understanding, support, and encouragement from families	54(14.2)	143(37.6)	183(48.2)	2.34
	4	Guidance to harness the strengh of beliefs	72(18.9)	126(33.2)	182(47.9)	2.29
	5	Effective communication guidance between you, your family, and healthcare providers	77(20.3)	144(37.9)	159(41.8)	2.22
	6	Encouragement and support from friends, supervisors, colleagues, and classmates	65(17.1)	140(36.8)	175(46.1)	2.20
Medical Care	1	Preparation for pathological tests such as blood routine, liver and kidney function before chemotherapy	38(10.0)	123(32.4)	219(57.6)	2.48
	2	Public education on chemotherapy knowledge	48(12.6)	105(27.6)	227(59.8)	2.47
	3	Nursing care for PICC catheterization during chemotherapy	32(8.4)	146(38.4)	202(53.2)	2.45
	4	Management of myelosuppression after chemotherapy	49(12.9)	119(31.3)	212(55.8)	2.43
	5	Providing of updated information on treatment, examination and rehabilitation	39(10.3)	143(37.6)	198(52.1)	2.42
	6	Guidance on oral medication for other diseases	31(8.2)	162(42.6)	187(49.2)	2.41
	7	Knowledge of disease nutrition and dietary adjustments	51(13.4)	127(33.4)	202(53.2)	2.40
	8	Methods to improve appetite after chemotherapy	45(11.8)	141(37.1)	194(51.1)	2.39
	9	Guidance on correctly assessing and expressing your pain	45(11.8)	142(37.4)	193(50.8)	2.39
	10	Treatment guidance for oral mucosal ulcers during chemotherapy	63(16.6)	119(31.3)	198(52.1)	2.36
	11	Management of discomfort such as nausea and vomiting after chemotherapy	50(13.2)	142(37.4)	188(49.4)	2.36
	12	Treatment guidance for fever during chemotherapy	57(15.0)	138(36.3)	185(48.7)	2.34
	13	Scientific exercise methods and precautions	44(11.6)	165(43.4)	171(45.0)	2.33
	14	Management of discomforts such as abdominal distension, abdominal pain, and constipation after chemotherapy	57(15.0)	158(41.6)	165(43.4)	2.28
	15	Timely referral based on your condition	70(18.4)	141(37.1)	169(44.5)	2.27
	16	Guidance on the use of ice packs and hot water bags	75(19.7)	133(35.0)	172(45.3)	2.26
	17	Referral to other physicians based on your condition	59(15.5)	163(42.9)	158(41.6)	2.26
	18	Management of skin allergies and reactions after chemotherapy	63(16.6)	161(42.4)	156(41.0)	2.24
	19	Treatment guidance for coughing and assistance in expectorating sputum during chemotherapy	92(24.2)	143(37.6)	145(38.2)	2.14
	20	Encouragement to adhere to scheduled blood routine and follow-up visits for changes after chemotherapy	93(24.5)	156(41.1)	131(34.4)	2.10
	21	Guidance and rescue measures for acute discomforts (such as shortness of breath, heavy bleeding)	96(25.3)	159(41.8)	125(32.9)	2.08
	22	Prevention guidance for infections during chemotherapy	129(34.0)	143(37.6)	108(28.4)	1.94
	23	Guidance and treatment for relieving and improving shortness of breath during chemotherapy	151(39.7)	121(31.9)	108(28.4)	1.89
	24	Guidance and treatment for pain relief	161(42.4)	130(34.2)	89(23.4)	1.81
Social Support	1	Assistance in delivering medications to stations or homes when inconvenient	63(16.6)	128(33.7)		2.33
	2	Provision of relevant information for joining local rehabilitation clubs	51(13.4)	164(43.2)		2.30
	3	Ensuring someone will care for family members in case of your demise	73(19.2)	125(32.9)		2.29
	4	Providing contact information for caregivers, nurses, and volunteers	73(19.2)	149(39.2)		2.22
	5	Providing information on purchasing and renting care facilities	62(16.3)	176(46.3)		2.21
	6	Suggestions for body image modification during chemotherapy (e.g., wigs)	88(23.2)	144(37.9)		2.16
	7	Provision of easily digestible information on human understanding of death	84(22.1)	158(41.6)		2.14
	8	Hospital bed availability in community health centers	152(40.0)	142(37.4)		1.83

Note: PICC = Peripherally Inserted Central Catheter.

of advanced cancer have specific demands in psychological and mental health, medical care, and social support, each with a varied level. Importantly these demands are influenced by various demographic and socio-economic factors, such as age, educational level, and household income.

Furthermore, a significant number of cancer patients return to their community and family settings after receiving chemotherapy in general hospitals. These individuals confront multifaceted challenges, including psychological burden of disease management, medical responsibilities such as preparatory and follow-up care, and the adaptation to changed social roles. Surveying the community health service requirements of these patients is important, offering evidences to adjust the strategic orientation of community health services to better support chemotherapy patients.

Demographic analysis of study participants showed a majority were under 60 years of age, predominantly covered by medical insurance, with a monthly household income over 5000 yuan, married, non-religious, with an educational level below a bachelor's degree, and engaged in patient groups. These findings reflect the younger onset age of cancer,[26] comprehensive medical insurance coverage,[27] the more accessible educational distribution of the 1980s, and the significant impact of the digital revolution, especially the spread of the internet in China. They also align with China's policy of religious freedom, with only estimated number of nearly 200 million people iden-

Table 2
Univariate analysis of influencing factors for community health services of patients with advanced cancer during chemotherapy.

Item	Psychological and mental health demand dimension				Medical care demand dimension				Social support demand dimension			
	≤ 2.31 Group (n=90)	> 2.31 Group (n=290)	$\chi2$ Value	*P* Value	≤ 2.27 Group (n=120)	> 2.27 Group (n=260)	$\chi2$ Value	*P* Value	≤ 2.18 Group (n=140)	> 2.18 Group (n=240)	$\chi2$ Value	*P* Value
Gender			1.66	0.20			0.03	0.86			0.01	0.93
Male	38(42.22)	145(50.00)			57(47.50)	126(48.46)			67(47.86)	116(48.33)		
Female	52(57.78)	145(50.00)			63(52.50)	134(51.54)			73(52.14)	124(51.67)		
Age (years)			1.35	0.25			12.56	<0.01			5.66	0.02
<60	55(61.11)	157(54.14)			51(42.50)	161(61.92)			67(47.86)	145(60.42)		
≥60	35(38.89)	133(45.86)			69(57.50)	99(38.08)			73(52.14)	95(39.58)		
Religious belief			0.01	0.95			3.17	0.08			2.80	0.09
No	67(74.44)	215(74.14)			82(68.33)	200(76.92)			97(69.29)	185(77.08)		
Yes	23(25.56)	75(25.86)			38(31.67)	60(23.08)			43(30.71)	55(22.92)		
Educational level			68.10	<0.01			0.57	0.45			4.39	0.04
High school and below	12(13.33)	183(63.10)			65(54.17)	130(50.00)			62(44.29)	133(55.42)		
High school above	78(86.67)	107(36.90)			55(45.83)	130(50.00)			78(55.71)	107(44.58)		
Marital status			1.90	0.60			6.26	0.10			5.15	0.16
Single	7(7.78)	13(4.48)			4(3.33)	16(6.15)			3(2.14)	17(7.08)		
Married	67(74.44)	222(76.55)			86(71.67)	203(78.08)			107(76.43)	182(75.83)		
Divorced	9(10.00)	26(8.97)			13(10.83)	22(8.46)			14(10.00)	21(8.75)		
Widowed	7(7.78)	29(10.00)			17(14.17)	19(7.31)			16(11.43)	20(8.34)		
Source of medical expenses			1.07	0.30			12.93	<0.01			3.26	0.07
At own expense	15(16.67)	36(12.41)			5(4.17)	46(17.69)			13(9.29)	38(15.83)		
Not at own expense	75(83.33)	254(87.59)			115(95.83)	214(82.31)			127(90.71)	202(84.17)		
Monthly disposable household income(RMB)			12.93	<0.01			0.33	0.56			1.78	0.18
≤5000	19(21.11)	122(42.07)			42(35.00)	99(38.08)			58(41.43)	83(34.58)		
>5000	71(78.89)	168(57.93)			78(65.00)	161(61.92)			82(58.57)	157(65.42)		
Diagnosis time			3.23	0.66			1.88	0.87			2.84	0.73
2021	27(30.00)	102(35.17)			43(35.83)	86(33.08)			52(37.14)	77(32.08)		
2020	26(28.89)	86(29.66)			33(27.5)	79(30.38)			42(30.00)	70(29.17)		
2019	21(23.33)	48(16.55)			24(20.00)	45(17.31)			21(15.00)	48(20.00)		
2018	5(5.56)	22(7.59)			6(5.00)	21(8.08)			10(7.14)	17(7.08)		
2017	5(5.56)	11(3.79)			5(4.17)	11(4.23)			7(5.00)	9(3.75)		
2016 and before	6(6.66)	21(7.24)			9(7.50)	18(6.92)			8(5.72)	19(7.92)		
Diagnosed disease			5.62	0.47			6.91	0.33			11.87	0.07
Lung cancer	37(41.11)	90(31.03)			36(30.00)	91(35.00)			35(25.00)	92(38.33)		
Gastric cancer	15(16.67)	70(24.14)			21(17.50)	64(24.62)			29(20.71)	56(23.33)		
Colorectal cancer	15(16.67)	51(17.59)			24(20.00)	42(16.15)			31(22.14)	35(14.58)		
Oral cancer	14(15.56)	42(14.48)			19(15.83)	37(14.23)			25(17.86)	31(12.92)		
Liver cancer	4(4.44)	10(3.45)			7(5.83)	7(2.69)			7(5.00)	7(2.92)		
Urinary system Tumors	1(1.11)	10(3.45)			5(4.17)	6(2.31)			3(2.14)	8(3.33)		
Breast cancer	4(4.44)	17(5.86)			8(6.67)	13(5.00)			10(7.15)	11(4.59)		
Pain score (points)			1.54	0.22			0.03	0.87			3.36	0.07
0–5	48(53.33)	176(60.69)			70(58.33)	154(59.23)			91(65.00)	133(55.42)		
6–10	42(46.67)	114(39.31)			50(41.67)	106(40.77)			49(35.00)	107(44.58)		
Participation in group			0.40	0.53			0.05	0.82			6.02	0.01
No	29(32.22)	104(35.86)			41(34.17)	92(35.38)			60(42.86)	73(30.42)		
Yes	61(67.78)	186(64.14)			79(65.83)	168(64.62)			80(57.14)	167(69.58)		
Comorbidities			6.15	0.06			6.04	0.01			4.64	0.03
No	32(35.56)	66(22.76)			21(17.50)	77(29.62)			27(19.29)	71(29.58)		
Yes	58(64.44)	224(77.24)			99(82.5)	183(70.38)			113(80.71)	169(70.42)		

Note: Among non-out-of-pocket patients, 244 cases (74.16 %) are covered by social medical insurance, 59 cases (17.93 %) are covered by the New Rural Cooperative Medical Scheme, and 26 cases (7.91 %) are covered by public funds; Among patients with comorbidities, 176 cases (62.41 %) have diabetes, 169 cases (59.93 %) have hypertension, 81 cases (28.72 %) have arthritis, 85 cases (30.14 %) have cerebrovascular disease, 42 cases (14.89 %) have chronic obstructive pulmonary disease, and 38 cases (13.48 %) have heart disease (since one patient in this study may have multiple diseases, the percentages do not add up to 100.00 %).

tify with a religion, it corresponds with the trend observed in this study's participants.[28] Lung cancer was the most common diagnosis among participants, aligning with national epidemiology trends.[1] Many patients also had comorbidities such as diabetes and hypertension and reported a range of pain scores, indicating various disease progression stages. The survey highlighted a significant demand for psychological and mental health support among patients undergoing chemotherapy for advanced cancer, pointing to an unmet need in this area.

The reasons behind this gap are multifaceted. Patients experience considerable psychological stress due to the life-altering nature of cancer, impacting social roles and family dynamics, potentially leading to anxiety, depression, and variations in determination.[29] Medical professionals, overwhelmed by their duties in general hospitals, may neglect the psychological aspects of patient care. Additionally, community health service teams often lack the necessary resources, including specialized psychologists, to conduct comprehensive psychological assessments and provide adequate support.[30] Families dealing with can-

Table 3
Logistic regression analysis of influencing factors for community health services of patients with advanced cancer during chemotherapy.

Demand dimension	Variables	*B*	*SE*	Wald χ^2 Value	*P* Value	*OR* (95 % *CI*)
Psychological and Mental Health	Education level	-2.35	0.34	48.94	<0.01	0.10(0.05, 0.18)
	Monthly disposable household income	-0.82	0.31	7.16	0.01	0.44(0.24, 0.80)
Medical care	Age	-0.69	0.23	9.13	<0.01	0.50(0.32, 0.78)
	Medical expense	-1.38	0.50	7.76	0.01	0.25(0.10, 0.66)
	Comorbidities	-0.41	0.29	1.98	0.16	0.67(0.38, 1.17)
Social support	Age	-0.44	0.22	3.92	0.04	0.65(0.42, 1.00)
	Education	-0.41	0.22	3.41	0.07	0.67(0.43, 1.01)
	Participation in patient group	0.57	0.27	6.33	0.01	1.77(1.13, 2.75)
	Comorbidities	-0.50	0.26	3.61	0.06	0.61(0.36, 1.02)

cer may avoid discussing its progression to prevent additional stress to the patient, inadvertently leaving them uninformed about their condition.[31] This silence can lead to increased curiosity and anxiety, highlighting the lack of effective strategies to meet the psychological demands of these patients. It is critical to prioritize addressing these demands within community health services. One approach could involve community health centers recruiting psychology professionals to provide regular psychological consultations or therapy sessions for patients undergoing chemotherapy, offering targeted counseling and support tailored to their specific mental health issues. The survey results emphasize the importance of psychological and mental health among patients, despite the highest demands were primarily identified in the medical care dimensions. This discrepancy likely stems from the medical care dimension's wider range of 24 items, with lower-scoring items reducing the overall average, making it slightly less than the psychological and mental domain in total scores. Highlighted medical care demands include vital areas such as pre-chemotherapy pathological tests, care for PICC catheterization during chemotherapy, management of myelosuppression after chemotherapy, and providing updated information on treatment, examination and rehabilitation. Notably, patients with advanced tumors undergoing chemotherapy often necessitate prolonged use of PICC catheterization, underscoring need for skilled PICC catheterization maintenance between chemotherapy treatments. Studies, such as the one by Wang et al.[32] on community-based PICC catheterization outpatient services, showed a high demand among tumor patients for local PICC catheterization services to lessen financial burdens. Considering these insights, the emerging hospital-community-home care model has become more popular, showing that an integrated PICC maintenance approach can significantly enhance patients' self-management capabilities and mitigate the risks of PICC-related complications.[33] Moving forward, it is imperative for community health service providers to focus on educational efforts and broad information dissemination on rehabilitation practices and managing side effects. Developing oncology outpatient services that align with community medical facility capabilities is crucial. These efforts aim to reduce the financial impact on patients, reduce the time and effort involved in accessing medical services, and ultimately enhance patients' comprehension of their condition and overall quality of life. While the demand for social support among patients with advanced cancer was observed to be less significant than other dimensions, the reasons behind this trend warrant further exploration. The ability of these patients to effectively manage their social roles and to feel connected and supported by their community is essential for maintaining engagement with society, even during illness. The presence of robust social support has been shown to significantly improve patient health outcomes by reducing negative emotional states like anxiety and depression and providing patients with better strategies to tackle challenges and resolve problems.[34] This study highlights a clear need for social support within this patient group. In response to this identified demand, it is crucial for community health centers to expand their support frameworks. Enhancements could include services like community volunteers delivering medications to patients residing at home, promoting the active involvement of family members in patient care, and gradually introducing of end-of-life education for both patients and their families. These efforts are designed to cultivate a comprehensive understanding of end-of-life matters, addressing both the practical and emotional demands of patients and their families.

This study established a clear correlation between patients' disposable monthly income, educational level, and the demand for psychological and mental health services, showing that individuals with higher incomes and educational levels exhibit greater needs for support in these dimensions. Conversely, older patients and those not covering their medical expenses themselves tend to focus more on medical care demands. Additionally, this group, along with those not participating in patient group, shows a higher demand for social support services. This suggests that financial security enables patients to broaden their focus beyond immediate medical concerns to include psychological wellbeing. In contrast, older individuals, potentially dealing with the combined effects of aging and illness, tend to prioritize medical and social support demands, the latter likely exacerbated by reduced mobility and fewer opportunities for social engagement. The lack of involvement in support groups further highlights a deficit in social interaction and support, indicating a gap in their social health management. Given these findings, it is crucial for community health service providers to tailor their services to align with the varied needs of their patient base. The Chinese Anti-Cancer Association maintains that addressing the needs of cancer patients should form the basis of national cancer prevention and treatment strategies.[34] Reflecting on the findings of this study, to improve the quality of primary care for patients undergoing chemotherapy for advanced cancer in Shanghai, future initiatives should aim to develop a customized community support system for this demographic. The main goal of this strategy should be to enhance the psychological and mental health support for chemotherapy patients.

This could include regularly scheduled educational workshops about cancer and chemotherapy, providing psychological counseling services, consistent monitoring of patients' mental health, refining patient follow-up protocols, and establishing integrated care clinics in collaboration with mental health centers to bridge the current gaps in psychological support within community health services. Moreover, equipping community health professionals with skills in psychological counseling will empower them to support a broader spectrum of patients, thereby enhancing overall mental health outcomes. Concurrently, addressing the medical care needs of patients remains a crucial objective. This involves expanding outpatient services, diagnostic tests, and rehabilitation care specifically tailored for cancer chemotherapy patients within community health centers, thus raising the overall standard of medical services provided at community hospitals. The formation of communication networks or regularly organizing meetings for cancer chemotherapy patients within the community could create greater opportunities for mutual support and involvement, facilitating their reintegration into community life. Furthermore, enhancing the medical social security system to provide increased support for financially challenged patients is recommended, aiming to alleviating the economic burdens faced by individuals with limited household incomes.

This research introduces several innovative components. Notably, the questionnaire design, developed through consultations with experts and patients, is scientifically robust. Furthermore, by focusing on patients undergoing routine chemotherapy as participants, the study critically assesses their demands and expectations from community health services. This is crucial for identifying gaps in service provision by these entities and assists in developing or refining targeted services for patients in advanced stages of chemotherapy treatment. This aligns with the strategic initiative to establish specialized departments within Shanghai's community health service centers. However, the study has certain limitations. The use of closed-ended questions limits participants' ability to fully express their views, potentially neglecting unmet patient needs. Additionally, as a cross-sectional analysis, it lacks the capability to predict the fulfillment of patient needs or ascertain improvements in their quality of life.

Conclusion

The findings from this study provide practical evidence for community health service centers to introducing the customized medical services. Moving forward, it would be advisable to initiate pilot services in high demand, focusing on targeted community interventions in psychological and mental health care, medical support, and related domains for patients undergoing chemotherapy for advanced-stage tumors. Additionally, evaluating the impact of these interventions on patients' quality of life through systematic follow-ups is crucial.

Declarations

Not applicable.

Authors' contributions

Overall design of the paper, L.Q. and C.R.; Methodology, L.Q. and C.R.; Data collection, L.Q. and Z.W.; data analysis, L.Q.; Project administration, Z.W.; Supervision, Z.Y. and J.B.; Validation, L.Q.; First draft, L.Q. and L.F.; Draft review and editing, L.Q. and L.F. All authors have read and agreed to the published version of the manuscript.

Ethics approval and consent to participate

The study received approval from Shanghai Jiao Tong University School of Medicine Affiliated Ninth People's Hospital Ethics Review Committee (SH9H-2021-T480–1).

Consent for publication

Not applicable.

Availability of data and materials

Not applicable.

Authors' other information

Not applicable.

Declaration of competing interest

The authors declare that they have no competing interests.

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