

The Impact of McMaster Model Family Intervention on Self-Efficacy, Psychological Well-Being, and Quality of Life in Patients with Advanced Liver Cancer

Zhu Liu*, Jie Tan, Yangyang Luo, Xiaoli Lin

Department of Hepatobiliary Surgery, The People's Hospital of Deyang City, Deyang, China

Email: *xiaodaoyaozhe@163.com

How to cite this paper: Liu, Z., Tan, J., Luo, Y.Y. and Lin, X.L. (2025) The Impact of McMaster Model Family Intervention on Self-Efficacy, Psychological Well-Being, and Quality of Life in Patients with Advanced Liver Cancer. *Journal of Biosciences and Medicines*, 13, 1-9.

<https://doi.org/10.4236/jbm.2025.1312001>

Received: October 29, 2025

Accepted: November 29, 2025

Published: December 2, 2025

Copyright © 2025 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Background: Little is known about the impact of family function on the quality of life of cancer patients. This knowledge can influence clinical practice. **Objective:** To assess the impact of McMaster model of family intervention on self-efficacy, emotional status, and quality of life in male patients with advanced liver cancer. **Methods:** A total of 300 participants were recruited from September 2019 to August 2021. Participants were randomly divided into two equal groups: routine and study group. The routine group received routine clinical intervention, and the study group received McMaster model of family intervention. The self-efficacy score, negative emotion score, quality of life score, and total nursing satisfaction of the two groups were assessed and compared. **Findings:** The self-efficacy, the quality of life, and the total satisfaction scores of the study group were significantly higher ($P < 0.05$). Depression and anxiety in the study group were significantly lower than those in the routine group ($P < 0.05$). The McMaster model of family intervention for male patients with advanced liver cancer was effective in enhancing self-efficacy, reducing negative emotions, and improving quality of life. The McMaster model of family intervention deserves more attention in research and popularization in modern clinical practice. **Conclusion:** The McMaster model of family intervention is effective in improving psychological well-being and care satisfaction among male patients with advanced liver cancer, and it should be considered for broader implementation in clinical practice.

Keywords

Liver Cancer, McMaster Model, Family Intervention, Self-Efficacy, Quality of Life

1. Introduction

Primary liver cancer ranks 4th among the most common malignancies and is the second leading cause of cancer-related deaths in China [1]. According to statistics, China accounts for more than half of the new cases and deaths of liver cancer in the world annually [2]. In terms of gender, the majority of liver cancer patients are male [3]. Patients diagnosed with liver cancer usually suffer a different degree of negative emotional or psychological consequences and male patients are especially at risk [3]. This not only seriously impairs their family functions but also is very detrimental to the physical rehabilitation and quality of life [4]. A psychological crisis is a state of mental imbalance caused by anxiety and depression when people are unable to deal with the difficulties they face [5]. Primary liver cancer is a disease that causes a high level of psychological burden, and patients tend to experience considerable psychological distress, which has been proven by different studies [3] [6] [7]. Therefore, supporting the mental health of male liver cancer patients holds immense clinical significance, aiming to alleviate negative emotions and enhance their quality of life.

McMaster Model of Family Functioning, originating in the 1950s, represents a family intervention approach [8]. According to this model, clinical staff play a crucial role as promoters and catalysts, collaborating closely with patients and their families to gain a comprehensive understanding of their situation, effectively resolving issues among family members. In this way, patients are encouraged to address the psychological crisis in their best psychosomatic states to eliminate their psychological problems, enhancing the sense of self-efficacy, and finally achieving the purpose of improving the quality of life. The aim of this study is to analyze the moderating effect of McMaster model of family intervention on self-efficacy, psychological well-being, and overall life status of patients diagnosed with advanced liver cancer.

2. Methods

2.1. Sample and Setting

At The Deyang People's Hospital, a grade A tertiary hospital in Sichuan, China, potential participants were recruited and randomly divided into the experiment group and the control group using a random table method. This study had been approved by the ethics committees of this hospital (VT2019SF). Each participant signed written informed consent. Three hundred male patients at mid-late stage liver cancer were recruited in total between September 2019 and August 2021. There were 150 cases in each group. The inclusion criteria of this study were: 1) initial diagnosis of primary liver cancer according to established norms; 2) understanding of the diagnosis and condition; 3) at least 18 years of age; 4) able to participate in the research process (good communication and no obvious cognitive impairment); 5) voluntary participation. Serious complications such as upper gastrointestinal hemorrhage, tumor nodule rupture and hemorrhage, and hepatic encephalopathy were the exclusion criteria set in this study. The eliminated criteria

of patients were as follows: 1) obvious inconsistencies in the questionnaire response; 2) incomplete questionnaires (more than 10% missing data); 3) questionnaire completion by a third party against the patient's will or in a manner not reflective of the patient's true situation.

2.2. Procedures

Patients in the routine group received usual care in the hepatobiliary surgery department, during which nurses provided oral explanations about daily precautions and emphasized the importance of family involvement in influencing disease outcomes. In addition, the routine clinical intervention included general nursing care such as health education, medication guidance, dietary counseling, and psychological support.

For the study group, the McMaster model family intervention followed a structured six-week program consisting of weekly 60-minute sessions conducted by nurses who were trained in family systems nursing. Each session focused on improving communication, facilitating emotional expression, clarifying family roles, and enhancing collaborative problem-solving among family members. Attendance and participation were recorded throughout the process to ensure adherence and intervention fidelity.

The McMaster model family intervention involved nurses engaging in comprehensive communication with patients and their families throughout the nursing intervention process. Nurses serve as attentive listeners, aiming to understand the patient and family's perspectives, confusion, and comprehension of the disease. They provide professional explanations about the disease's characteristics, clinical manifestations, treatment measures, and intervention essentials. Emphasis is placed on highlighting the importance of family care and support in improving patients' quality of life and self-efficacy. Nurses guide family members in understanding patient issues, utilizing tools like slides, videos, or illustrated manuals to impart a deeper understanding. They offer reasonable suggestions and opinions to family members from a professional standpoint. Throughout clinical treatment, family members are encouraged to participate actively, evaluating family functions collectively. Open discussions are facilitated to identify family goals and roles, fostering a harmonious environment for patients to receive treatment comfortably, ensuring a positive mental and physical experience. Nurses actively guide family members in facing and resolving problems together, fostering mutual support and growth. The intervention focuses on a compassionate and understanding approach, considering that patients and their families often experience anxiety and depression due to a limited understanding of the disease. Through close and empathetic communication, nurses aim to ease anxiety and promote acceptance.

2.3. Assessment

Self-efficacy: The General Self-Efficacy Scale (GSES) was used as the evaluation basis, with a total of 10 items and a full score of 10 - 40. The higher the score, the

stronger the self-efficacy.

Negative emotions: The assessment was based on Self-Rating Depression Scale (SDS) and Self-Rating Anxiety Scale (SAS). The critical value of the two scales was 50 points. In the overall score rankings, the higher the score, the more obvious the negative emotion.

Quality of life: Using the MOS 36-Item Short-Form Health Survey (SF-36) as the evaluation criterion, which contains 8 dimensions, including bodily pain, physical functioning, role physical, social function, the role of emotion, mental health, vitality, and general health. The full score of each dimension is 100. The higher the score, the better the quality of life of patients.

Overall satisfaction: Finally, the questionnaire designed by the nursing department of the hospital was used to calculate patients' satisfaction with clinical nursing services. 100 is the full mark. A score of 85 to 100 means very satisfied, 60 to 84 means generally satisfied, and 0 to 59 means not at all satisfied. The total satisfaction = 100% – dissatisfied.

Statistical software SPSS22.0 was employed to further examine and analyze the variables and attributes data obtained in this study, including self-efficacy score, SDS depression score, SAS anxiety score, quality of life score, described in the form of ($x \pm S$), inter-group T-test; Counting data included satisfaction, expressed in the form of % (rate), X² test between groups, and the results of data difference determination were described by P-value, with ($P < 0.05$) indicating statistical significance.

3. Results

After the intervention, the mean self-efficacy score increased significantly in the study group from 20.8 ± 6.1 to 34.2 ± 1.9 , compared with an increase from 20.9 ± 6.6 to 26.6 ± 1.8 in the control group ($P < 0.05$). The SDS depression and SAS anxiety scores declined markedly in the intervention group (38.9 ± 5.4 and 38.8 ± 5.6 , respectively) compared with the control group (46.7 ± 5.5 and 45.6 ± 5.3 ; $P < 0.05$). The SF-36 quality-of-life scores improved across all eight domains, with an average of 89 points in the study group versus 77 points in the control group ($P < 0.05$). Patient satisfaction was also significantly higher in the intervention group (96.67%) than in the control group (84.00%; $P < 0.05$).

The general characteristics of the two groups were comparable. The mean age of patients in the study group was 55.5 ± 13.2 years (range: 41 - 70 years), and 55.3 ± 12.8 years (range: 40 - 70 years) in the control group, with no statistically significant differences between groups ($P > 0.05$).

As shown in **Table 1**, self-efficacy scores were significantly higher in the study group than in the control group after the McMaster model intervention ($P < 0.05$).

According to **Table 2**, the SDS and SAS scores of the study group were significantly lower than those of the control group following the family intervention ($P < 0.05$), indicating that the intervention effectively alleviated depression and anxiety.

In **Table 3**, the post-intervention quality-of-life scores of the study group were significantly higher across all SF-36 domains compared with the control group ($P < 0.05$).

Finally, as presented in **Table 4**, overall patient satisfaction in the study group reached 96.67%, significantly higher than 84.00% in the control group ($P < 0.05$).

Table 1. Self-efficacy scores between the two groups ($x \pm s$, points).

Group	Cases	before	after	t	p
The study group	150	20.8 ± 6.1	34.2 ± 1.9	12.063	<0.05
The routine group	150	20.9 ± 6.6	26.6 ± 1.8	10.968	<0.05
t	-	0.112	7.154		
p	-	>0.05	<0.05		

Table 2. Negative emotional score between the two groups ($x \pm s$, points).

Group	Cases	SDS		SAS	
		before	after	before	after
The study group	150	62.4 ± 7.1	38.9 ± 5.4	60.3 ± 7.5	38.8 ± 5.6
The routine group	150	62.6 ± 7.7	46.7 ± 5.5	60.8 ± 7.8	45.6 ± 5.3
t	-	0.079	6.524	0.083	7.022
p	-	>0.05	<0.05	>0.05	<0.05

Table 3. Quality of life scores between the two groups ($x \pm s$, points).

Group	Time	Bodily pain	Role-physical	Physical functioning	Role of emotion	Social function	Vitality	Mental health	General health
The study group (150 cases)	before	60.3 ± 2.2	62.3 ± 3.8	62.6 ± 3.5	62.2 ± 3.4	62.8 ± 4.2	62.9 ± 5.1	61.3 ± 4.8	62.2 ± 5.5
	after	88.9 ± 7.2**	89.8 ± 7.5**	88.7 ± 7.6**	88.8 ± 5.7**	88.6 ± 5.5**	90.3 ± 4.5**	89.5 ± 5.1**	90.5 ± 4.4**
The routine group (150 cases)	before	60.6 ± 2.4	62.6 ± 4.1	62.8 ± 3.6	62.9 ± 3.3	62.7 ± 4.1	62.6 ± 5.5	61.6 ± 4.7	62.8 ± 5.7
	after	76.7 ± 3.4*	77.5 ± 3.3*	78.9 ± 2.7*	76.4 ± 3.5*	78.6 ± 2.5*	78.8 ± 2.4*	77.7 ± 3.1*	76.9 ± 3.5*

Note: Comparison of groups before intervention * $P < 0.05$; Comparison of the conventional group after intervention # $P < 0.05$.

Table 4. Overall satisfaction between the two groups.

Group	Cases	Very satisfied	Generally satisfied	Not at all satisfied	Total satisfaction
The study group	150	78	67	5	145 (96.67%)
The routine group	150	67	59	24	126 (84.00%)
X ²	-				8.714
p	-				<0.05

4. Discussion

This study demonstrated that the McMaster model of family intervention signifi-

cantly enhanced self-efficacy, reduced depression and anxiety, and improved quality of life among male patients with advanced liver cancer. These results are consistent with previous research showing that structured family-centered interventions can positively affect psychological well-being and overall life satisfaction in patients with cancer [9] [10].

Liver cancer remains a highly malignant disease with poor prognosis and a heavy psychosocial burden [1] [11]. Because early symptoms are often subtle, patients are usually diagnosed at an advanced stage and consequently experience considerable distress, hopelessness, and reduced self-efficacy [3] [6]. In such contexts, the family plays a vital role in providing emotional support and maintaining patients' motivation for treatment. Family dysfunction has been shown to exacerbate psychological problems and even suicidal ideation in patients with chronic illness [12] [13]. Therefore, strengthening family functioning is of great significance for improving the mental state and quality of life of cancer patients.

The McMaster model, grounded in family systems theory, emphasizes family communication, role clarification, emotional expression, and collaborative problem-solving [14]. Within this framework, nurses act as facilitators who help family members identify maladaptive patterns and work together toward mutual understanding and support. Through these processes, patients can regain confidence, improve emotional regulation, and enhance their sense of self-efficacy, which in turn improves quality of life [15] [16].

The current study focused exclusively on male patients because epidemiological data show that the incidence and mortality of liver cancer are substantially higher in men than in women [1]. Furthermore, men often bear greater social and economic responsibilities, which can amplify psychological pressure and feelings of inadequacy during illness [17]. Although this sampling improves homogeneity, it restricts the generalizability of our findings to female patients. Future studies should expand the sample to include women and other demographic groups to verify whether gender differences exist in response to family-based interventions.

The beneficial effects observed in this study may be mediated by improvements in family functioning. Although family function itself was not directly measured, the McMaster model aims to strengthen mutual understanding and empathy among family members, which may indirectly enhance patients' self-efficacy and emotional resilience [18]. Future studies should use validated scales of family function to explore this mediating mechanism in greater depth.

Finally, the higher patient satisfaction rate in the intervention group indicates that integrating family-centered nursing into clinical practice can strengthen the therapeutic alliance between nurses, patients, and their families, promoting a more supportive care environment [19] [20].

In summary, the McMaster model of family intervention provides a structured and effective approach to improving psychological well-being and quality of life among patients with advanced liver cancer. Encouraging family participation and emotional support, enhances patients' coping capacity and satisfaction with nurs-

ing care, offering valuable implications for incorporating family-based models into modern oncology nursing practice.

5. Limitations

This study has several limitations that should be acknowledged. First, the sample size was relatively small and limited to male patients with advanced liver cancer who were hospitalized in the Department of Hepatobiliary and Pancreatic Surgery of a tertiary (3A-level) hospital in Sichuan Province, China. This restricts the generalizability of the findings to other populations, including female patients and individuals from different medical institutions or regions.

Second, due to limitations in time and research personnel, only patients in the mid-to-late stages of liver cancer were included, and family function was not directly assessed as an outcome variable. Future multicenter studies with larger and more diverse samples are recommended to verify the current findings and to include validated measures of family functioning to better understand its mediating role in patient outcomes.

6. Implications for Nursing

The quality of life of patients with advanced liver cancer not only has a substantial impact on their personal well-being, but also threatens the functioning of the family system, affecting family stability and potentially leading to dysfunction. The application of the McMaster model of family intervention can help improve family functioning and thereby enhance patients' quality of life, and should be further promoted and integrated into routine clinical nursing practice.

7. Conclusions

The McMaster model of family intervention provides an effective framework for supporting patients with advanced liver cancer and their families. By promoting open communication, emotional expression, and active family participation, this model helps patients establish strong psychological support systems and enhances their ability to cope with illness-related stress. The intervention effectively alleviates negative emotions, strengthens self-efficacy, and improves overall quality of life, while simultaneously reducing caregiver burden.

Incorporating the McMaster model into oncology nursing practice offers a practical and evidence-based approach to holistic, family-centered care. Future clinical programs should consider integrating this model more widely to promote psychological well-being and optimize long-term outcomes for patients and their families.

Funding

This study was supported by the 2024 Incubation Project of Deyang People's Hospital (Project No. FHT202406).

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Zhou, J., Sun, H., Wang, Z., Cong, W., Wang, J., Zeng, M., et al. (2020) Guidelines for the Diagnosis and Treatment of Hepatocellular Carcinoma (2019 Edition). *Liver Cancer*, **9**, 682-720. <https://doi.org/10.1159/000509424>
- [2] Shakespeare-Finch, J., Martinek, E., Tedeschi, R.G. and Calhoun, L.G. (2013) A Qualitative Approach to Assessing the Validity of the Posttraumatic Growth Inventory. *Journal of Loss and Trauma*, **18**, 572-591. <https://doi.org/10.1080/15325024.2012.734207>
- [3] Graf, J. and Stengel, A. (2021) Psychological Burden and Psycho-Oncological Interventions for Patients with Hepatobiliary Cancers—A Systematic Review. *Frontiers in Psychology*, **12**, Article 662777. <https://doi.org/10.3389/fpsyg.2021.662777>
- [4] Norman, E.M.L., Weil, J. and Philip, J. (2022) Hepatocellular Carcinoma and Its Impact on Quality of Life: A Review of the Qualitative Literature. *European Journal of Cancer Care*, **31**, e13672. <https://doi.org/10.1111/ecc.13672>
- [5] Flannery, R.B. and Everly, G.S. (2000) Crisis Intervention: A Review. *International Journal of Emergency Mental Health*, **2**, 119-125.
- [6] Cheng, H.H., Kamarck, T.W., Gianaros, P.J., Roeklein, K.A., Vanegas, Y., Tsung, A., et al. (2019) Socioeconomic Disparities of Depressive Symptoms and Cytokines in Hepatocellular Carcinoma. *Psycho-Oncology*, **28**, 1624-1632. <https://doi.org/10.1002/pon.5127>
- [7] Jia, Y., Zhang, W., You, S., Li, M., Lei, L. and Chen, L. (2019) A Nomogram for Predicting Depression in Patients with Hepatocellular Carcinoma: An Observational Cross-Sectional Study. *International Journal of Psychiatry in Clinical Practice*, **23**, 273-280. <https://doi.org/10.1080/13651501.2019.1619777>
- [8] Epstein, N.B., Bishop, D.S. and Levin, S. (1978) The McMaster Model of Family Functioning. *Journal of Marital and Family Therapy*, **4**, 19-31. <https://doi.org/10.1111/j.1752-0606.1978.tb00537.x>
- [9] Peters, L. and Sellick, K. (2006) Quality of Life of Cancer Patients Receiving Inpatient and Home-Based Palliative Care. *Journal of Advanced Nursing*, **53**, 524-533. <https://doi.org/10.1111/j.1365-2648.2006.03754.x>
- [10] West, C.H., Bell, J.M., Woodgate, R.L. and Moules, N.J. (2015) Waiting to Return to Normal: An Exploration of Family Systems Intervention in Childhood Cancer. *Journal of Family Nursing*, **21**, 261-294. <https://doi.org/10.1177/1074840715576795>
- [11] Fu, J. and Wang, H. (2018) Precision Diagnosis and Treatment of Liver Cancer in China. *Cancer Letters*, **412**, 283-288. <https://doi.org/10.1016/j.canlet.2017.10.008>
- [12] Niu, L., Ma, Z., Jia, C. and Zhou, L. (2020) Gender-Specific Risk for Late-Life Suicide in Rural China: A Case-Control Psychological Autopsy Study. *Age and Ageing*, **49**, 683-687. <https://doi.org/10.1093/ageing/afaa036>
- [13] Sherman, D.W. and McMillan, S.C. (2015) The Physical Health of Patients with Advanced Pancreatic Cancer and the Psychological Health of Their Family Caregivers When Newly Enrolled in Hospice. *Journal of Hospice & Palliative Nursing*, **17**, 235-241. <https://doi.org/10.1097/njh.0000000000000154>
- [14] Miller, I.W., Ryan, C.E., Keitner, G.I., Bishop, D.S. and Epstein, N.B. (2000) The McMaster Approach to Families: Theory, Assessment, Treatment and Research. *Jour-*

- nal of Family Therapy*, **22**, 168-189. <https://doi.org/10.1111/1467-6427.00145>
- [15] Zeng, Y. (2021) Impact of Living with Hope Program on Hope Level and Quality of Life for Family Caregivers in Patients with Advanced Liver Cancer. Master's Thesis, Soochow University. <https://doi.org/10.27137/d.cnki.ghusu.2020.000090>
- [16] Zhong, D.M., Zhao, T., Chen, P. and Li, Y. (2016) Role of McMaster Model of Family Therapy in Improving Life Quality of Patients with Advanced Hepatocellular Carcinoma. *Nursing Journal of Chinese People's Liberation Army*, **33**, 30-33.
- [17] Hansen, L., Rosenkranz, S., Wherity, K. and Sasaki, A. (2017) Living with Hepatocellular Carcinoma near the End of Life: Family Caregivers' Perspectives. *Oncology Nursing Forum*, **44**, 562-570. <https://doi.org/10.1188/17.onf.562-570>
- [18] Chen, J., Zhang, Y., Lu, L., Chen, H., Shen, A. and Zhu, Y. (2019) Liver Cancer Screening in China: Practices and Its Extended Questions. *Hepatoma Research*, **5**, Article 12. <https://doi.org/10.20517/2394-5079.2019.03>
- [19] Luker, K., Cooke, M., Dunn, L., Lloyd-Williams, M., Pilling, M. and Todd, C. (2015) Development and Evaluation of an Intervention to Support Family Caregivers of People with Cancer to Provide Home-Based Care at the End of Life: A Feasibility Study. *European Journal of Oncology Nursing*, **19**, 154-161. <https://doi.org/10.1016/j.ejon.2014.09.006>
- [20] Yu, W., Chen, J., Sun, S., Liu, P., Ouyang, L. and Hu, J. (2021) The Reciprocal Associations between Caregiver Burden, and Mental Health in Primary Caregivers of Cancer Patients: A Longitudinal Study. *Psycho-Oncology*, **30**, 892-900. <https://doi.org/10.1002/pon.5667>