



# Factors Related to Health-Related Quality of Life among Postoperative Male Muscle Invasive Bladder Cancer Patients Receiving Chemotherapy in Wenzhou China\*

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## Abstract

**Purpose:** The study aimed to describe the health-related quality of life in postoperative male muscle invasive bladder cancer patients with chemotherapy, and to examine the relationships between age, symptoms, and social support with health-related quality of life among these patients.

**Design:** A descriptive correlation design.

**Methods:** Random sampling was used to recruit 106 postoperative male muscle invasive bladder cancer patients with chemotherapy from the First Affiliated Hospital of Wenzhou Medical University in China. Data were collected using 1) A demographic information questionnaire, 2) The M.D. Anderson Symptom Inventory Questionnaire, 3) The Multidimensional Scale of Perceived Social Support questionnaire, and 4) The Functional Assessment of Cancer Therapy in Bladder cancer Questionnaire. Data were analyzed using descriptive statistics and Pearson's correlation coefficient.

**Main findings:** The mean score of health-related quality of life was 79.27 out of 156 (SD = 22.58). There were significant negative relationships between age and symptom with health-related quality of life ( $r = -.30, p < .01$ ;  $r = -.77, p < .01$ , respectively), while social support had positive association with health-related quality of life ( $r = .62, p < .01$ ).

**Conclusion and recommendations:** According to the study findings, health-related quality of life was associated with age, symptoms, and social support. To enhance health-related quality of life among postoperative male MIBC receiving chemotherapy, nurses should consider patient age, reducing symptoms, and providing social support to this population.

**Keywords:** chemotherapy, health-related quality of life, muscle invasive bladder cancer, social support, symptom

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# ปัจจัยที่มีความสัมพันธ์กับคุณภาพชีวิตที่เกี่ยวกับภาวะสุขภาพ ของผู้ป่วยชายหลังผ่าตัดมะเร็งกระเพาะปัสสาวะที่รุกเข้า ชั้นกล้ามเนื้อและได้รับเคมีบำบัด ณ เหวินโจ ประเทศจีน\*

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## บทคัดย่อ

**วัตถุประสงค์:** การศึกษานี้มีวัตถุประสงค์เพื่อศึกษาคุณภาพชีวิตที่เกี่ยวกับภาวะสุขภาพ และปัจจัยที่มีความสัมพันธ์กับคุณภาพชีวิตที่เกี่ยวกับภาวะสุขภาพของผู้ป่วยชายหลังผ่าตัดมะเร็งกระเพาะปัสสาวะที่รุกเข้าชั้นกล้ามเนื้อและได้รับเคมีบำบัด ณ เหวินโจ ประเทศจีน

**รูปแบบการวิจัย:** การศึกษาเชิงพรรณนาเพื่อหาความสัมพันธ์

**วิธีดำเนินการวิจัย:** กลุ่มตัวอย่าง ได้แก่ ผู้ป่วยชายหลังผ่าตัดมะเร็งกระเพาะปัสสาวะที่รุกเข้าชั้นกล้ามเนื้อ และได้รับเคมีบำบัด จำนวน 106 ราย คัดเลือกกลุ่มตัวอย่างด้วยวิธีสุ่มอย่างง่ายจากหอผู้ป่วยนอก โรงพยาบาล The First Affiliated Hospital of Wenzhou Medical University ประเทศจีน เก็บข้อมูลโดยใช้แบบสอบถาม 1) ข้อมูลส่วนบุคคล 2) แบบสอบถามอาการของแอนเดอร์สัน 3) แบบสอบถามการสนับสนุนทางสังคม และ 4) แบบสอบถามการทำหน้าที่ของผู้ป่วยมะเร็งกระเพาะปัสสาวะที่ได้รับการรักษา วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา และสัมประสิทธิ์สหสัมพันธ์ของเพียร์สัน

**ผลการวิจัย:** ผลการวิจัยพบว่า กลุ่มตัวอย่างมีคะแนนเฉลี่ยคุณภาพชีวิตที่เกี่ยวกับภาวะสุขภาพเท่ากับ 79.27 จากคะแนนเต็ม 156 (SD = 22.58) ปัจจัยด้านอายุ และการรับรู้อาการมีความสัมพันธ์ทางลบอย่างมีนัยสำคัญทางสถิติกับคุณภาพชีวิตที่เกี่ยวกับภาวะสุขภาพ ( $r = -.30, p < .01$ ;  $r = -.77, p < .01$ , ตามลำดับ) และการสนับสนุนทางสังคมมีความสัมพันธ์ทางบวกอย่างมีนัยสำคัญทางสถิติกับคุณภาพชีวิตที่เกี่ยวกับภาวะสุขภาพ ( $r = .62, p < .01$ )

**สรุปและขอเสนอแนะ:** จากผลการศึกษา ปัจจัยด้านอายุ อาการ และการสนับสนุนทางสังคม มีความสัมพันธ์กับคุณภาพชีวิตที่เกี่ยวกับภาวะสุขภาพในผู้ป่วยชายหลังผ่าตัดมะเร็งกระเพาะปัสสาวะที่รุกเข้าชั้นกล้ามเนื้อและได้รับเคมีบำบัด ดังนั้น พยาบาลควรคำนึงถึงความแตกต่างด้านอายุ การบรรเทาอาการ และให้การสนับสนุนทางสังคม เพื่อส่งเสริมคุณภาพชีวิตที่เกี่ยวกับภาวะสุขภาพของผู้ป่วยกลุ่มนี้

**คำสำคัญ:** เคมีบำบัด คุณภาพชีวิตที่เกี่ยวกับภาวะสุขภาพ มะเร็งกระเพาะปัสสาวะที่รุกเข้าชั้นกล้ามเนื้อ การสนับสนุนทางสังคม อาการ

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## Background and Significance

Bladder cancer is the tenth most common cancer in the world, and its incidence is steadily increasing worldwide, especially in developed countries.<sup>1</sup> In 2018, about 550,000 people worldwide were diagnosed with bladder cancer, accounting for about 3% of all new cancer patients.<sup>1</sup> In China, bladder cancer ranks eighth in the incidence of malignant tumor.<sup>2</sup> Malignant tumor was the leading cause of death in Wenzhou, with a total of 13,120 fatalities.<sup>3</sup>

Muscle invasive bladder cancer (MIBC) accounts for 18-33% of all bladder cancers.<sup>4</sup> In China, the incidence of bladder cancer is increasing year by year, of which 25-30% is MIBC.<sup>5</sup> The treatment of patients with MIBC is a long-term process, which impacts on the physical, psychological, role function, and economic well-being of the patient, and that erodes the patient's health-related quality of life (HRQOL).<sup>6</sup>

HRQOL is defined as a person's perceived physical and mental health over time, which focus to the effects of health, illness, and treatment on quality of life.<sup>7</sup> In the study of Wu, et al.<sup>8</sup> patients who underwent any urethral bypass had lower HRQOL levels after radical cystectomy. According to the above research, it can be found that improving the HRQOL of bladder cancer patients, especially MIBC patients, is very important.

There are many factors affecting HRQOL in patients with MIBC. Age is one of the factor that is related to HRQOL. A previous study found that

age affected all areas of MIBC patients, such as physical and psycho-social health, which eventually led to a decline in HRQOL.<sup>9</sup> Symptoms refers to the subjective abnormal sensation or some objective pathological changes of patients affected by the disease itself or the side effects of treatment, including physical and psychological symptoms.<sup>7</sup> A previous study has shown that symptoms can significantly affect the HRQOL of MIBC patients.<sup>10</sup> Social support refers to the perceptions of patients with MIBC about receiving help from multiple sources, such as family, friends, medical professionals, and social health organizations.<sup>11</sup> Results from a previous study showed that strengthening the intervention of perceived social support might help to improve the quality of life of cancer patients.<sup>12</sup>

According to the literature review of quality of life in patients with MIBC, there are studies of MIBC in males and females. However, this study focused only on males because males are more likely to develop bladder cancer than females.<sup>5</sup> In China, the incidence of bladder cancer in males is 4.8 times higher than that in females, and has been on the rise since 2007.<sup>13</sup> The results of the present study may differ according to the peculiarities of Chinese culture, and there are fundamental gaps in studies on HRQOL of men treated with postoperative chemotherapy for MIBC urinary diversion in Wenzhou or even across the country.

In the present study, the revised version of

Wilson and Cleary's Model for HRQOL<sup>7</sup> was used as a theoretical framework of the study. The revised model displays the relationships among five dimensions (including biological function, symptoms, functional status, general health perceptions and overall quality of life) and the influences of characteristics of the individual and the environment on these five dimensions. In the present study, certain dimensions and characteristics (including age, symptoms, and social support) were hypothesized to have relationships with HRQOL among postoperative MIBC male patients. The study findings would help nurses and healthcare providers to understand factors related to HRQOL among this population and would also guide nurses how to improve HRQOL among postoperative male MIBC patients receiving chemotherapy through the modifiable factors.

### **Study objectives**

The objectives of this study were as follows:

1) To describe HRQOL in postoperative male MIBC patients with chemotherapy; and 2) To examine the relationship between age, symptoms, and social support with HRQOL in postoperative male MIBC patients with chemotherapy in Wenzhou, China.

### **Hypothesis**

Significant relationships existed between age, symptoms, and social support with HRQOL

in postoperative male MIBC patients receiving chemotherapy in Wenzhou, China.

## **Methodology**

### ***Study Design and Setting***

This study used a descriptive correlational design, and cases were recruited from the urinary cancer outpatient department (OPD) of the First Affiliated Hospital of Wenzhou Medical University. After postoperative male MIBC patients were discharged from the hospital, they regularly came to the OPD for re-examination and treatment follow-up, including chemotherapy. The attending physician was primarily responsible for adjusting the dose of the patients' medication. The nurse would provide health education to the patients about general self-care, medications taking, proper diet, and common side effects after chemotherapy and care. The patients would also be reminded of next appointment and the importance of adherence to medications prescribed.

### ***Population and Sampling***

The sample consists of male MIBC patients receiving chemotherapy from the cancer OPD of the First Affiliated Hospital of Wenzhou Medical University. The inclusion criteria were as follows: 1) Age  $\geq 18$  years old; 2) Able to read and write Chinese; 3) Good orientation to place and time and no history of mental illness; 4) No major physical disability (e.g., blindness, reduced physical mobility requiring assistance); and 5) Received at least one chemotherapy treatment prior to study entry.

The sample size was estimated by the G\*Power 3.1.9.7<sup>14</sup> program to identify the minimum number of participants required for statistical tests of significant associations. The small effect size of .25, the power of .80, and a .05 level of significance were used for computing the sample size. Based on the formula, at least 97 participants were needed. In this study, 10% of participants were added to compensate for incomplete responses. Ultimately, the final sample size was 106 participants used in the analysis.

Random sampling was used to recruit patients who came to the cancer OPD of the First Affiliated Hospital of Wenzhou Medical University in Wenzhou, China. First, the researchers selected patients who met the inclusion criteria. Then, the researchers randomly selected patients and invited them to participate in the study.

### **Research Instruments**

1. The Demographic Information Questionnaire - The questionnaire consisted of 18 items including age, marital status, occupation, education, income, smoking and drinking situation, the time of diagnosis, co-morbidities, type of surgical treatment, urinary diversion mode, complications of surgical treatment and complications after chemotherapy.

2. The M. D. Anderson Symptoms Inventory (ASI) - This tool was developed by Cleeland, et al.<sup>15</sup> and translated into Chinese by Wan, et al.<sup>16</sup> The ASI scale consists of two parts, including 13 core symptoms and 6 interference symptoms. The former mainly

evaluates the existence and severity of a patient's symptoms, while the latter evaluates the degree of interference of a patient's symptoms with function. The ASI rating is based on a, 11-point scale, with 0 being "non-existent symptoms," and 10 being "the worst symptoms you can imagine". The average score of the symptoms interference items is used to measure the overall symptoms severity. The higher the score, the higher the degree to which the patient is adversely affected by the symptoms. The Cronbach's  $\alpha$  (alpha) for ASI was .86.<sup>16</sup>

3. The Multidimensional Scale of Perceived Social Support (MPSSS) – This scale was developed by Zimet, et al.<sup>11</sup> to measure social support. For this study the Chinese version of the MPSSS was used, which was translated into Chinese by Huang, Jiang and Ren.<sup>17</sup> The MPSSS consists of 12 items, which can be divided into three parts: the first part is support from family, the second part is support from friends, and the last part is support from important people, such as leaders, colleagues, or medical professionals. The scale was evaluated with 7-point rating scale. The total score between 12 and 36 is mild support state, the total score between 37 and 60 is moderate support state, and the total score between 61 and 84 is high support state. The higher the score, the higher the degree of social support perceived by individuals. The Cronbach  $\alpha$  coefficient of the Chinese version of MPSSS is .84, showing good structure, good reliability and validity.<sup>2</sup>

4. The Functional Assessment of Cancer Therapy in Bladder cancer (FACT-BL) – This tool was developed by Cella, et al.<sup>18</sup> and translated into Chinese by Wang, et al.<sup>19</sup> The Chinese version was used to measure HRQOL in this study. The FACT-BL consists of 39 items including 27 items of FACT general (FACT-G) and 12 additional items specific to bladder cancer. The FACT-G has four subscales: physical well-being, social/ family well-being, emotional well-being, and functional well-being. The 12 additional items are specific to bladder cancer asking for problems of urinary, bowel, appetite and weight, sexual, and body image. The response task of FACT-BL scale is to rate from 0 - 4 (0 = none at all, 1 = a little, 2 = somewhat, 3 = quite a lot, and 4 = a lot). The final score was calculated by sum up scores from each subscale. The higher the score, the better the HRQOL of the patients. Cronbach's  $\alpha$  coefficient of the Chinese version of FACT-BL was .85.<sup>19</sup>

The original versions of the instruments used in the study were tested and verified by relevant experts in previous studies.<sup>16-17,19</sup> The Chinese version of the instruments used in the study were also translated by experts, which confirms the reliability and validity of the instruments, and ensured the suitability of use of the Chinese version. To ensure the reliability of the questionnaire, a pre-test was conducted with 30 participants whose eligibility was similar to the inclusion criteria for the study sample. The Cronbach's  $\alpha$  coefficients were .92 for ASI-C, .89 for the MPSSS, and .85 for the FACT-BL.

### ***Ethical Considerations***

This study protocol was approved by the Institutional Review Board (IRB) of Burapha University, Thailand (IRB number: MHESI 8137/1417) and the Research Ethical Board of the First Affiliated Hospital of Wenzhou Medical University (Approval Number: 2021-zz-080). In the process of data collection, all eligible participants were carefully informed of the purpose of the study and the process of data collection. Patients were told that they had the right to choose whether to participate in the study, and refusal to participate would not affect the quality of the treatment they received in the hospital. The written consent forms were obtained from the participants who agreed to participate in the study. Names of participants were anonymous. All documents related to data collection would be destroyed one year after the publication of the study.

### ***Data Collection***

Data were collected by the first researcher. Medical staff at the cancer OPD introduced the study to the eligible participants. Then, the researcher introduced the purpose, data collection procedures, and ethical considerations to the potential participants. When the eligible participants agreed to participate in the study, signed consent were obtained. Then participants were asked to complete the questionnaires, which took about 30 minutes. The researcher ensured that data collection took place before the patient received their treatment.

### **Data Analysis**

Data were analyzed by using SPSS program. The significance level was set at .05. Descriptive statistics (frequency, percentage, mean, standard deviation) were used to explain the demographic characteristics of the sample and the variables. Pearson's product moment correlation coefficients were used to examine relationships between age, symptoms, and social support with HRQOL. Assumptions for statistical use were checked before the analysis, including the level of measurement, linearity, normality, related pairs, and no outliers. All assumptions were met for the analysis of Pearson's product moment correlation coefficients.

### **Findings**

#### **1. Demographic Characteristics**

A total of 106 participants were recruited for this study. The mean age of the sample was 66.4 years old (SD = 9.66), and 80.5% of them were elderly. About four out of five participants completed junior high school education or less. Among all the participants, 62.3% had an income of 4,000-6,000 Chinese Yuan. Significantly, two-thirds of all participants were current or ever-smokers. Among the smokers, nearly all (96%) had smoked for more than 20 years. Fully 83% of the sample

were diagnosed of MIBC at least one year ago. Two-fifths of the sample had high blood pressure, while over half had radical cystectomy, and 45.3% had partial cystectomy. Skin ureterostomy was performed in 80.1% of patients undergoing urethral alteration. About half experienced pain after surgery. All patients had received or were undergoing chemotherapy, and 55.7% experienced nausea after chemotherapy.

#### **2. Description about the symptom**

As seen in Table 1, the mean score of all symptoms was 65.42 (SD = 27.95), the mean score of sub-symptoms was 40.04 (SD = 18.60), and the mean score of symptoms interference was 25.38 (SD = 10.97). Among the sub-symptoms, sleep disturbance had the highest severity ( $\bar{X} = 3.80$ , SD = 1.83), followed by fatigue ( $\bar{X} = 3.80$ , SD = 1.83), and distress ( $\bar{X} = 3.78$ , SD = 2.21). The symptom of remembering things was the least severe of all symptoms ( $\bar{X} = 1.81$ , SD = 1.84). In the subscale of symptoms interference, the item with the greatest influence was the enjoyment of life ( $\bar{X} = 4.80$ , SD = 2.32), followed by work ( $\bar{X} = 4.69$ , SD = 2.23), mood ( $\bar{X} = 4.37$ , SD = 2.20), and general activities ( $\bar{X} = 4.35$ , SD = 2.17). The symptom with the lowest influence was relationships with other people ( $\bar{X} = 3.30$ , SD = 1.96).

**Table 1** Range, mean, and standard deviation of symptoms (N = 106)

Variables	Range		$\bar{X}$	SD
	Possible	Actual		
<b>Symptom</b>	0-190	16-138	65.42	27.95
• <b>Sub-symptom</b>	0-130	7-87	40.04	18.60
Sleep disturbance	0-10	0-8	3.80	1.83
Fatigue	0-10	0-8	3.78	1.81
Distress	0-10	0-8	3.78	2.21
Drowsiness	0-10	0-8	3.75	2.40
Sadness	0-10	0-10	3.64	2.08
Pain	0-10	0-9	3.58	2.14
Lack appetite	0-10	1-8	3.49	1.87
Nausea	0-10	0-8	3.20	1.99
Vomiting	0-10	0-7	2.73	1.72
Numbness	0-10	0-10	2.22	1.67
Shortness breath	0-10	0-9	2.12	1.94
Dry mouse	0-10	0-8	2.02	1.86
Difficulty remembering	0-10	0-8	1.81	1.84
• <b>Symptom Interference</b>	0-60	5-52	25.38	10.97
Enjoyment of life	0-10	0-8	4.80	2.32
Work	0-10	1-10	4.69	2.23
Mood	0-10	0-10	4.37	2.20
General activity	0-10	0-10	4.35	2.17
Walking	0-10	0-10	3.84	2.16
Relations with other people	0-10	0-10	3.30	1.96

### 3. Description of social support

As seen in Table 2, overall, participants reported receiving social support at a moderate level ( $\bar{X} = 57.10$ ,  $SD = 14.15$ ), and the participants perceived that they were mostly supported by family ( $\bar{X} = 20.59$ ,  $SD = 4.55$ ), followed by significant others ( $\bar{X} = 19.67$ ,  $SD = 4.91$ ), and friends ( $\bar{X} = 16.83$ ,  $SD = 6.09$ ).

### 4. Description of health-related quality of life

As seen in Table 3, overall, participants perceived their HRQOL as not too low or not too high,

with mean score of 79.27 out of 156 ( $SD = 22.58$ ). Among subscales with the possible score of 28, the subscale with the highest impact on patient HRQOL was social-family well-being ( $\bar{X} = 15.54$ ,  $SD = 5.50$ ), followed by the physical well-being ( $\bar{X} = 14.31$ ,  $SD = 6.01$ ), and the functional well-being ( $\bar{X} = 13.33$ ,  $SD = 5.58$ ). The mean score of the emotional well-being was 13.24 out of 23 ( $SD = 5.45$ ). The mean score of the bladder cancer specific subscale was 22.84 out of a potential score of 48 ( $SD = 5.24$ ).

**Table 2** Range, mean, standard deviation, and level of social support (N = 106)

Variables	Range		$\bar{X}$	SD	Level
	Possible	Actual			
Social support	12-84	20-84	57.10	14.15	Moderate
Family	4-28	6-28	20.59	4.55	Moderate
Friends	4-28	4-28	16.83	6.09	Moderate
Significant people	4-28	6-28	19.67	4.91	Moderate

**Table 3** Range, mean, standard deviation of healthy-related quality of life (N = 106)

Variables	Range		$\bar{X}$	SD
	Possible	Actual		
HRQOL	0-156	18-139	79.27	22.58
Social/family well-being	0-28	2-27	15.54	5.50
Physical well-being	0-28	0-26	14.31	6.01
Functional well-being	0-28	2-27	13.33	5.58
Emotional well-being	0-24	0-23	13.24	5.45
Bladder cancer specific	0-48	8-40	22.84	5.24

### 5. Factors related to HRQOL in postoperative male MIBC patients receiving chemotherapy

As seen in Table 4, there was a small negative association between age and HRQOL ( $r = -.30, p < .01$ ).

Symptoms had a high negative association with HRQOL ( $r = -.77, p < .01$ ) while social support had a moderate positive association with HRQOL ( $r = .62, p < .01$ ).

**Table 4:** Correlations between age, symptoms, and social support and health-related quality of life in patients with MIBC (N = 106)

Variables	Pearson's correlation coefficients of HRQOL
Age	-.30**
Symptom	-.77**
Social support	.62**

\*\* $p < .01$

## Discussion

In this study, the mean HRQOL score of postoperative male MIBC patients receiving chemotherapy was 79.27 out of a potential score of 156 (SD = 22.58). The mean score of HRQOL of the participants tended to be in the lower-to-moderate level. This result is consistent with previous studies that bladder cancer affects participants' HRQOL.<sup>10,20</sup>

This result may be explained by the fact that the treatment of patients with bladder cancer may greatly affect HRQOL of patients. In this study, most patients underwent radical cystectomy (80.1%) and all patients had urinary diversions. Patients with radical bladder cancer require urinary bypass surgery, but urinary bypass surgery can also affect the patient's ability to perform daily living activities, thereby adversely affecting quality of life. This is consistent with the results of previous studies.<sup>21</sup> According to Ferrans, et al.<sup>7</sup> the appearance of these symptoms affects the functional status of the patients, and that can have a negative impact on the general health perception of the patients, and ultimately erode quality of life of the patients.

Moreover, among participants who received chemotherapy as a treatment adjuvant, 55.7% reported having nausea and suffering from the symptoms of treatment. These side effects also affected the physical, psychological, functional, and social aspects of patients, and ultimately impaired HRQOL.

When patients received multiple, concurrent treatments, HRQOL was adversely affected.<sup>22</sup> Side effects of treatment invariably have a negative impact on a patient's physical, mental, and social well-being.<sup>22</sup>

### Factors related to HRQOL

This study found a negative correlation between age and HRQOL in male patients with MIBC undergoing chemotherapy ( $r = -.30, p < .01$ ). This result is consistent with previous studies which found that age was an important indicator of impact on HRQOL. In addition, patients perceived a decrease in HRQOL as they aged.<sup>9,23</sup> According to the Wilson and Cleary model modified by Ferrans, et al.<sup>7</sup> individual characteristics, such as a demographic factors, are main predictor of HRQOL. Age is usually associated with perceived health status and overall quality of life.<sup>7</sup> Therefore, it can be expected that a patient's HRQOL decreases with advanced age.

This study found a high negative correlation between symptoms and HRQOL ( $r = -.77, p < .01$ ). That result is consistent with previous studies which found that, when patients with bladder cancer developed one or more symptoms, these symptoms could greatly affect the quality of life.<sup>20</sup> Postoperative male MIBC patients receiving chemotherapy suffered an array of symptoms, including adverse physical and psychological symptoms, due to the disease, the surgery, and/or the side effects of the chemotherapy.<sup>10</sup> In this study, the most common physical symptoms

were sleep disturbance, fatigue, and drowsiness, while the most common mental symptoms was distress and sadness. The emergence of these symptoms had a negative impact on a patient's perception of quality of life. In addition, the presence of one symptom may induce other symptoms, which can erode quality of life. According to the Wilson and Cleary model modified by Ferrans, et al.<sup>7</sup> the symptoms of the disease can affect the overall health of the patient and ultimately lead to a decrease in overall quality of life.

In this study, social support had a statistically-significant positive correlation with HRQOL ( $r = .67$ ,  $p < .01$ ). Studies have found that social support has a direct impact on the mental health and quality of life of cancer patients. Compared with others, people who feel a high level of social support will face problems in life with a more positive attitude.<sup>2 4</sup> This positive attitude is an important component of effective coping skills. Therefore, increasing social support can help patients maintain mental health, build confidence in being able to cope with disease, and strengthen the ability to deal with life challenges, thus improving quality of life.<sup>1 2 -2 4</sup> According to Ferrans, et al.<sup>7</sup> social support belongs to the domain of social characteristics of the environment. Social characteristics, including family, friends, and health service providers, are mainly interpersonal relationships and social effects on health outcomes.<sup>7</sup>

## Conclusion and Recommendations

This study used a descriptive correlation design to explore the relationships between age, symptoms, social support, and HRQOL in postoperative male MIBC patients receiving chemotherapy in Wenzhou, China. As expected, there was a negative correlation between age, symptoms, and HRQOL, while a moderate positive correlation was found between social support and HRQOL. Therefore, nurses and healthcare providers may be able to use the findings from this study to refine interventions for this group of patients by taking into account patient age, symptoms, and social support with the goal of improving or maintaining HRQOL.

There are some limitations of the study. Firstly, this study was conducted in one hospital, and limited to postoperative male MIBC patients who received chemotherapy only. Therefore, the results may not be applicable to other populations. Secondly, the majority of participants were elderly, and perceived HRQOL and its related factors may be different from the younger cohorts. Finally, this study is cross-sectional by design. Therefore, the results do not necessarily apply to other periods of time. Further studies should be conducted with a younger population and also those in a wider geographical area, with a larger sample size, different contexts, and over multiple periods of time so that the results can be more generalizable. Finally, this study does not represent a causal relationship among variables. Thus, future research should aim to determine the predictive factors on HRQOL of males with MIBC.

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