

The Relationship among a Palliative Care Service, Patient's Factors, and Quality of Life of Post Treatment Cervical Cancer Patients: a Causal Model Approach

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ABSTRACT

Objective: To test a causal pathway of palliative care (PC) service delivery system on quality of life (QOL) of patients with post-treatment stage II-III cervical cancer (PT2-3CC-PTs).

Methods: The cross-sectional design with two-staged sampling was implemented to recruit 447 PT2-3CC-PTs and 16 healthcare providers from 12 cancer center hospitals. Standardized tools and procedures were used, followed by the structural equation model (SEM) analysis to measure variables of interest.

Results: The average age was 54.07 (SD 11.72) years, most of the patients (90.2%) received radiotherapy and chemotherapy, and more than two-thirds (68.7%) had comorbidities. The results showed that the patients had problems with the physical, role, emotional, and social functioning due to urinary and vaginal symptoms which made them anxious about sexual health. SEM analysis also revealed that the PC service delivery system did not improve the patients' QOL significantly. Finally, it was found that healthcare providers had low competencies in PC, and their caring did not respond to the patients' needs concerning a woman's specific role and responsibility.

Conclusion: The PC service delivery system in Thailand mainly provides physical care without encouraging family to collaborate in care of the patients. PC training to increase competency of providers to care for PT2-3CC-PTs should take the patients' age, severity of comorbidities, treatment differences, and a woman's role, especially sexual health into account. Thus, to enhance QOL (general and sexual health) in PT2-3CC-PTs, healthcare providers should focus on patients' self-management and provider support.

Keywords: Quality of life; post-treatment cervical cancer; palliative care delivery service; sexual health; self-management; social support (Siriraj Med J 2019; 71: 268-277)

INTRODUCTION

Quality of life (QOL) is one of the measurements used to evaluate outcome of the patients' cervical cancer (CC) care, self-management (SM), and CC health-related

palliative care (PC). Patient care is found to be associated with patients' QOL¹ and impacted by functioning problems including physical functioning², role functioning³, social functioning^{4,5}, emotional functioning⁶, cognitive functioning⁷,

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sexual functioning⁷, and symptoms experience affecting daily lives.⁸⁻¹¹ Patients with CC need PC for symptom and psychosocial management so as to maintain all dimensional functioning. Healthcare providers are responsible for providing information and practical care so they should acknowledge patients' competency knowledge on disease and treatment, and they should possess effective communication skills and understanding of women with CC.^{9,11,12} Previous studies have reported that QOL was lower in ACC-PT post-treatment compared to that of other women.^{2-4,13} PC is one of health delivery services that support symptom management, symptom control, and QOL of post-treatment cervical cancer patients (PTCC-PT).¹⁴⁻¹⁶ PC could be applied early on in the course of illness or in conjunction with other therapies intended to prolong life.¹⁷ However, several studies of PC have been undertaken only with the advance stage cervical cancer patients (ACC-PT) or stage 4. There was a few studies on PC during post-treatment stages 2-3 cervical cancer patients (PT2-3CC-PTs).^{2,11,13,24} In fact, the study of PC among PT2-3CC-PTs is needed due to the highest prevalence of this disease among the female population. It was anticipated that the results of the present study could be utilized to provide knowledge of PC for PT2-3CC-PTs.

This study aimed to promote QOL for the PTCC-PT depending on multidimensional factors, including patients' dimensional factors and PC dimensional factors that enhance patients' self-management behaviors to reduce physical, mental, and social health problems. Patients' dimensional factors investigated in this study included demographic factors (age of the patients^{9,18}, social support^{4,5,19}, and patients' self-management)^{7,12,15,20}, as well as medical factors (the stage of disease¹³, radiation therapy/combination of radiation therapy and chemotherapy (RT/CCRT)^{9,21}, and comorbidities³). PC dimensional factors included model of care^{22,23}, provider competence⁷, and provider support.^{7,24} In addition, the relationship between the patients' dimensional factors and the PC dimensional factors and QOL of PT2-3CC-PTs^{14,15} has rarely been studied in the country. Therefore, this study also examined the association of the patients' dimensional factors and the PC dimensional factors on QOL of PT2-3CC-PTs.

Research Questions

1. What factors in the patients' dimensional factors (age, stage of disease, RT/CCRT, comorbidity, social support, self-management, and symptom experience) have a direct effect on QOL of Thai PT2-3CC-PTs?

2. What factors in the PC dimensional factors (model of care, provider competence, and provider support) have an effect on QOL of Thai PT2-3CC-PTs?

3. What factors between the patients' dimensional factors (age, stage of disease, RT/CCRT, comorbidity, social support, self-management, and symptom experience) and the PC dimensional factors (model of care, provider competence, and provider support) have an effect on QOL of Thai PT2-3CC-PTs in tertiary care cancer centers in four regional service areas in Thailand?

MATERIALS AND METHODS

Design

A cross-sectional study design was conducted from May 2016 to April 2017. The data were presented focusing on the results regarding the relationships between patients' dimensional factors and PC dimensional factors on QOL of Thai PT2-3CC-PTs.

Sample and Recruitment Methods

The two-stage sampling was used to select service areas and recruit participants of this study. Field data collection comprised four regional service areas in Thailand categorized by health service networks from the guideline of the Ministry of Public Health. Finally, the four areas were selected including the fourth, fifth, sixth, and 13th service areas. These four areas had the highest registry number, 61.1% of 3,771 new CC patients in the year 2013 (1,844 of whom were PT2-3CC-PTs).

The research was implemented in 16 follow-up clinics including five obstetric-gynecological clinics and 11 radiological clinics of 12 tertiary HC centers. The power analysis was implemented to calculate the sample size for SEM, the sample size required in this study was 480.²⁵ Then, the distribution of patient participants in each hospital setting was calculated based on the probability proportional to size sampling²⁶ that was appropriate for an unequal number of CC population in each clinic. There were 16 provider participants (one provider participant per clinic) in the study.

The participants of this study were divided into two groups including patients and HC providers. The first group was patients with 2-3CC-PT who underwent RT/CRT for three to 12 months as prescribed by the physician to ensure completeness of response for cancer treatment. Then, the patients received care provided at the onco-gynecological clinic, radiotherapy clinic, and obstetric-gynecological clinic in the out-patient department of cancer centers. Next, the patients age was 18 years and over, and they understood or could read or

write in Thai. Patients who had recurrence or metastasis, had been diagnosed with cognitive impairment, or were unable to communicate were excluded from this study.

The second group was HC providers including physicians, radio-oncologists, gynecological-oncologists, and registered nurses (oncology nurse specialists and registered nurses in the radiotherapy clinic, oncogynecological clinic, or obstetric-gynecological clinic in the out-patient department of the cancer centers). The HC providers were selected based on the settings where the patients received care. Temporary HC providers in the clinics were excluded.

Ethics

Ethical approval for the study was obtained from the Ethics Committee of the Faculty of Medicine, Siriraj Hospital, Mahidol University (Si 281/2016) and Human Research Ethics Committee of each 11 cancer center hospitals.

Measures

The participants' self-reported questionnaires were used to collect data including dimensional factors, PC dimensional factors, and QOL.

Patient's dimensional factors were measured using the Patients Demographic and Medical Information Questionnaire (PDMIQ) to collect the demographic data and medical information of the PT2-3CC-PTs. Next, the Cervical Cancer Patient Self-management Questionnaire (CCSMQ) was used to assess the patients' ability to use available resources, information, decision making, and SM skill by sharing decision making and utilizing coping strategies. The reliability of the tool was determined using internal consistency, with Cronbach's alpha equal to 0.92. Then, the Medical Outcome Study-Social Support Survey (MOS-SSS) was employed to measure perceptions of the availability of support or the support from partners, family, and peers including its adequacy.²⁷ As for reliability of the instrument, internal consistency was calculated and Cronbach's alpha was 0.90. Lastly, data regarding comorbidity, which was defined as one or more additional diseases or disorders co-occurring with a primary disease or disorder that the patients had before cancer diagnosis, were retrieved from the patients' health record based on the Charlson Comorbidity Index (CCI).²⁸ Each comorbidity was reassigned into the number weighting by the severity of diseases.

Furthermore, data regarding PC dimensional factors were collected by means of the Structure of Palliative Care Delivery Service Questionnaire (SPCDQ) and the Palliative Care Delivery Service Questionnaire (PCDQ)

which were developed by the researchers. Firstly, the SPCDQ consisted of the palliative care delivery structure questionnaire (PCDSQ) and the provider information questionnaire (PIQ). The PCDSQ questionnaire was used to collect data regarding the type of care, number of providers in the clinic, and number of patients who received care per day, etc. The provider information questionnaire (PIQ) was used to gather provider information including gender, age, educational background, work experience, duration of work experience, specialist certification, and role in the clinic. Secondly, the PCDQ consisted of the provider competence questionnaire (PCQ) and the provider support questionnaire (PSQ). The PCQ assessed HC provider competence. The competency included symptom monitoring and management, use of simple language with the patients, capability to enhance good relationships with patients and other providers, being an effective advocate for the patient, and referral to the specialist. The reliability of the tool was determined in terms of internal consistency, with Cronbach's alpha equal to 0.95. Also, the provider support questionnaire (PSQ) was used to measure four behaviors of care provided for patients including coaching, training, goal setting, and performance feedback. The reliability of the tool was determined using internal consistency, and Cronbach's alpha was 0.97.

The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire C30 (EORTC QOQ-C30) was a 30-item core cancer specific questionnaire measuring QOL in cancer patients. The instrument was provided by the EORTC Quality of Life Group.²⁹ The reliability of the tool using internal consistency by means of Cronbach's alpha was 0.78. Finally, the EORTC QOQ CX 24 was a 24-item questionnaire to assess patients' perception of symptoms related to CC.³⁰ The reliability of the tool was determined using internal consistency, with Cronbach's alpha equal to 0.78.

Data Collection Procedures

The study protocol was submitted to and approved by Human Research Protection Unit, Faculty of Medicine Siriraj Hospital, Mahidol University, and Human Research Ethics Committee of each 11 cancer center hospitals. In addition, formal permission from the cancer center administrators was sought after. Then, the researchers approached prospective participants who met the inclusion criteria and agreed to participate in the study. After the participants signed the informed consent form to indicate their willingness to take part in the study, data collection commenced. The researchers collected data from the PT2-3CC-PTs and retrieved the patients' medical

history and CCI from existing medical records. The EORTC QOQ-C30 and the EORTC QOQ-CX24 were administered to explore patients' QOL. Then, the PDMIQ, CCSMQ, and MOS-SSS were administered to collect data regarding patient dimensional factors. The time required to complete all questionnaires was approximately 30-45 minutes. If the participants had visual problems, their caregiver or the researchers helped them complete the questionnaires by giving them verbal assistance.

The researcher collected data from HC providers who were key informants and agreed to participate in the study after the informed consent form was signed. The SPCDQ and the PCDQ were administered. The time to complete the questionnaires was approximately 30-45 minutes. All providers completed the questionnaires by themselves.

Data analysis

SEM statistics were conducted to identify the causal pathway of the PC dimensional factors and the patient dimensional factors that affected QOL of PT2-3CC-PTs.

RESULTS

The study sample comprised 450 patients, three of whom subsequently dropped out. One had a severe pain problem, another went back to work and were unable to participate in the study, and the last one was too tired to join due to her old age. Finally, the total number of participants was 447 PT2-3CC-PTs and 16 HC providers.

Patient Dimensional Factors on QOL

The mean age of PT2-3CC-PTs was 54.07 years old (SD 11.72). More than a half (51.1%) were classified as stage 2, and almost all (90.2%) received radiotherapy with chemotherapy. Moreover, more than a half (60%) had mild severity of comorbidity before cancer diagnosis (Table 1). The patients received less SS and performed good self-management. For instance, the results showed that most of the patients did not receive overall dimension of SS as they needed. Furthermore, the patients had low ability to use HC resources and HC provider information to perform SM and collaborate in decision making with the HC provider (Table 2).

PC Dimensional Factors on QOL

The results regarding PC delivery structure in this study are shown in Table 3. There were a limited number of PC nurses. As regards provider characteristics, nurses were found to be the professionals providing overall PC for CC-PTs. The age of nurses was older than 45 years, and a few of the providers had experience in PC.

The PC delivery service was composed of two essential structures, including provider competence and provider support, as shown in Table 3. In this study, it was found that the providers had less competence in disease and treatment knowledge. Providers also had a variety of forms of symptom and complications which impacted patient communication. In multidisciplinary care, the providers had the highest competence in PC. Providers used simple language, had effective symptom and complication impact communication, had effective patient support, and referred the patients to the specialist when needed. Comparing with providers in the multidisciplinary team, the providers in the specialist care team had the lowest competence in PC. The majority of the providers in this study provided training, goal setting, and performance feedback; however, they had limited ability to perform coaching. Such results indicated that providers in the PC delivery service system perceived themselves as having low competence in PC, resulting in the ineffectiveness of PC services provided to patients.

Relationship between Patient Dimensional Factors and PC Dimensional Factors and QOL

Structural equation model was performed to examine the effects of the PC dimensional factors and the patient dimensional factors on QOL of PT2-3CC-PTs by using the program AMOS version 23. Table 5 presents the hypothesized model (theoretical model) which did not fit the empirical data due to high inter-correlation, the poor goodness of fit coefficient, and misspecification parameters. Thus, the hypothesized model (Fig 1) was modified to achieve a better fit. In this step, the modifications were maintained until acceptable fit indices were achieved. Error covariance of self-management, provider support, model of care, and quality of life were set free. One variable, stage of disease, one path from the model of care to QOL, and eight covariances were deleted. On the contrary, two paths, one from CCI score to model of care and one from the model of care to patient self-management, were added. In the end, the modification model improved the model of fit better than the hypothesized model (Table 5).

The results regarding SEM of QOL in PT2-3CC-PTs showed that the theoretical model explained less than the modified model (Table 5). The modified model (Fig 2) shows the factors that directly affected differences in QOL of PT2-3CC-PTs like age difference ($\beta = -0.161$, $p < 0.001$), patients' SM difference ($\beta = -0.265$, $p < 0.001$), and palliative care delivery service difference ($\beta = 0.114$, $p < 0.01$), as well as factors that indirectly affected QOL through patients' SM like treatment difference ($\beta = -0.031$, $p < 0.01$), severity of comorbidity prior to cancer

TABLE 1. Demographic and Medical Characteristics of PT2-3CC-PTs (N = 447).

Characteristics	Number	Percent
Age (years) Mean = 54.07, SD = 11.72, Range = 24 - 86		
≤ 45	107	23.9
> 45	340	76.1
Marital status		
Single	21	4.7
Marriage	282	63.1
Widowed	87	19.5
Separated	57	12.8
Education		
No formal education	36	8.1
Primary school	251	56.2
Lower than Bachelor's degree	114	25.5
Undergraduate and graduate degree	46	10.3
Living with		
Other family/ No one	21	4.7
Couple	109	24.4
2-generation family	136	30.4
≥ 3 generation (extended) family	181	40.5
Monthly Income (Baht)		
no income	201	45.0
1-5,000	70	15.7
5,001-10,000	88	19.7
10,001 baht or more	88	19.7
Medical Payment Method		
Universal healthcare coverage	265	59.3
Social insurance scheme	111	24.8
Government reimbursement	64	14.3
Others (self-payment, insurance, company benefit, Private Education Commission: OPEC)	7	1.6
Stage (FIGO)		
2A	51	11.4
2B	222	49.7
3A	14	3.1
3B	160	35.8
Treatment		
Radiotherapy	44	9.8
Radiotherapy & chemotherapy	403	90.2
Number of comorbidities		
No comorbidity	140	31.3
1 comorbidity	185	41.4
2 comorbidities	88	19.7
≥ 3 comorbidities	34	7.6
CCI severity scores		
0	140	31.30
1-2 (mild severity)	196	43.80
3-4 (moderate severity)	76	17.00
≥ 5 (high severity)	35	7.80

TABLE 2. Social Support and Self-management of PT2-3CC-PTs (N = 447).

Variables	Possible range	Actual range	Median	Mean	SD
Social Support	16-75	26-83	68.00	65.92	11.01
Number of close friends		0-30	2.00	3.89	14.63
Number of close cousins		0-40	4.00	4.72	5.09
Material support	5-20	5-20	18.00	16.92	3.36
Emotional/informational support	6-30	6-30	23.00	22.75	5.18
Social relation support	3-15	3-15	12.00	11.79	2.61
Affective support	2-10	3-10	10.00	9.00	1.39
Self-management	19-76	26-76	56.00	56.69	9.01
Healthcare resources used	4-16	4-16	11.00	10.82	2.95
Ability caused by healthcare information	4-16	4-16	12.00	11.51	2.41
Collaborative care with healthcare providers	5-20	7-20	15.00	15.55	2.50
Shared decision making	3-12	3-12	9.00	8.84	1.77
Behavioral changes	3-12	4-12	10.00	9.97	1.55

TABLE 3. Characteristics of palliative care delivery service system.

Characteristics	Total score	Median	IQR (Q1,Q3)
Palliative care delivery structure			
Number of physicians		4.0	6.0 (4.0,10.0)
Number of onco-gynecologists		0.9	2.8 (0,2.8)
Number of onco-radiologists		4.1	2.3 (3.2,5.5)
Number of gynecologists		0.7	4.4 (0,4.4)
Number of registered nurses		5.9	5.9 (3.7,8.6)
Number of onco-nurses		1.8	2.8 (0.8,3.6)
Number of PC nurses		0.4	1.8 (0,1.8)
Work experience in clinic (yrs.)		9.8	9.2 (5.4,14.6)
Work experience in profession (yrs.)		22	16.1 (12.7,28.8)
Work experience in onco-specialization (yrs.)		2.4	14.7 (0.2,14.9)
Work experience in palliative care (yrs.)		1.8	7.3 (0,7.3)
Total service time/ one patient(min/patient)	132.8		111.5 (57.1,168.6)
Nurse service time/one patient(min/patient)		79.5	56.9 (29.8,86.7)
Screening time		3.8	3.4 (2.6,6.0)
Need/symptom assessment time		9.5	9.6 (4.5,14.1)
Need/symptom management time		13.4	15.6 (3.3,18.9)
SM resource information time		9.4	11.7 (4.5,16.2)
SM consultancy/coaching/skill training time		19.4	22.0 (6.9,28.9)
Referral to unit/service appropriate for patient need time		9.1	7.5 (5.4,12.9)
Physician service time/one patient (min/patient) (Monitor recurrence time)		54.2	56.3 (21.0,77.3)
Palliative care delivery service			
Provider competence	100	88	15 (81-96)
Knowledge of disease	32	18	4 (15,19)
Use of simple language	12	12	3 (9,12)
Effective symptom and complication management			
Effective communication	24	21	5 (18,23)
Patient relation building	12	11	3 (9,12)
Effective patient support	12	10	3 (9,12)
Referral to specialists	20	15	4 (15,19)
Provider support	80	71	12(60-72)
Coaching	40	36	8 (30,38)
Training	20	17	3 (15,18)
Goal setting	12	9	2 (9,11)
Performance feedback	8	7	1 (6,7)

TABLE 4. Quality of life scale scores* in PT2-3CC-PTs (N = 447).

Quality of life	Possible range	Actual range	Median	Mean	SD
EORTC QLQ C30 scale score					
General quality of life	2-14	2-14	11.00	11.20	2.06
Physical functioning	5-20	5-20	7.00	7.29	2.73
Role functioning	2-8	2-8	2.00	2.46	0.99
Emotional functioning	4-16	4-16	6.00	6.11	2.24
Cognitive functioning	2-8	2-8	3.00	2.90	0.90
Social functioning	2-8	2-8	2.00	2.55	1.01
EORCT C 30 symptoms					
Fatigue	3-12	3-12	5.00	5.49	1.77
Nausea and vomiting	2-8	2-6	2.00	2.35	0.76
Pain	2-8	2-8	3.00	3.30	1.34
Dyspnea/Shortness of breath	1-4	1-4	1.00	1.38	0.58
Sleep disturbance	1-4	1-4	2.00	1.72	0.82
Lack of appetite	1-4	1-4	1.00	1.59	0.77
Constipation	1-4	1-4	1.00	1.52	0.68
Diarrhea	1-4	1-4	1.00	1.33	0.55
Financial problems	1-4	1-4	1.00	1.73	0.90
EORCT CX 24 symptoms					
Sexual vaginal functioning** (n = 293)	4-16	4-16	5.00	4.73	4.12
Symptom experience	11-44	11-34	14.00	15.28	3.29
Body image	3-12	3-12	4.00	4.65	1.90
Neuropathy	1-4	1-4	2.00	1.76	0.79
Menopausal symptom	1-4	1-4	1.00	1.51	0.72
Sexual pleasure** (n = 293)	1-4	1-4	4.00	3.70	0.70
Sexual functioning**	1-4	1-4	4.00	3.73	0.61
Sexual anxiety	1-4	1-4	1.00	1.27	0.61
Lymphedema	1-4	1-4	1.00	1.17	0.45

* higher score = more symptoms/problems, ** higher score = less symptoms/problems

TABLE 5. Statistical fitted index values of hypothesized model and modified model (N = 447).

Fitted Index	χ^2	χ^2/df	GFI	CFI	RMSEA	Largest Standardized Residual
Hypothesized model	37.362 (df = 18,	2.076 p= 0.005)	0.984	0.986	0.049	3.469
Modification model	20.220 (df=24,	0.843 p = 0.684)	0.990	1.000	0.000	1.804

Abbreviations: df = degree of freedom GFI = Goodness of fit index (≥ 0.95), CFI = Comparative fit index = $[d(\text{Null model}) - d(\text{purposed model})] / d(\text{Null model})$ (≥ 0.95), RMSEA = Root mean square error of approximation = $\sqrt{(\chi^2 - df) / [df(N - 1)]}$ (≤ 0.05) Standardized residual (≤ 2.58)

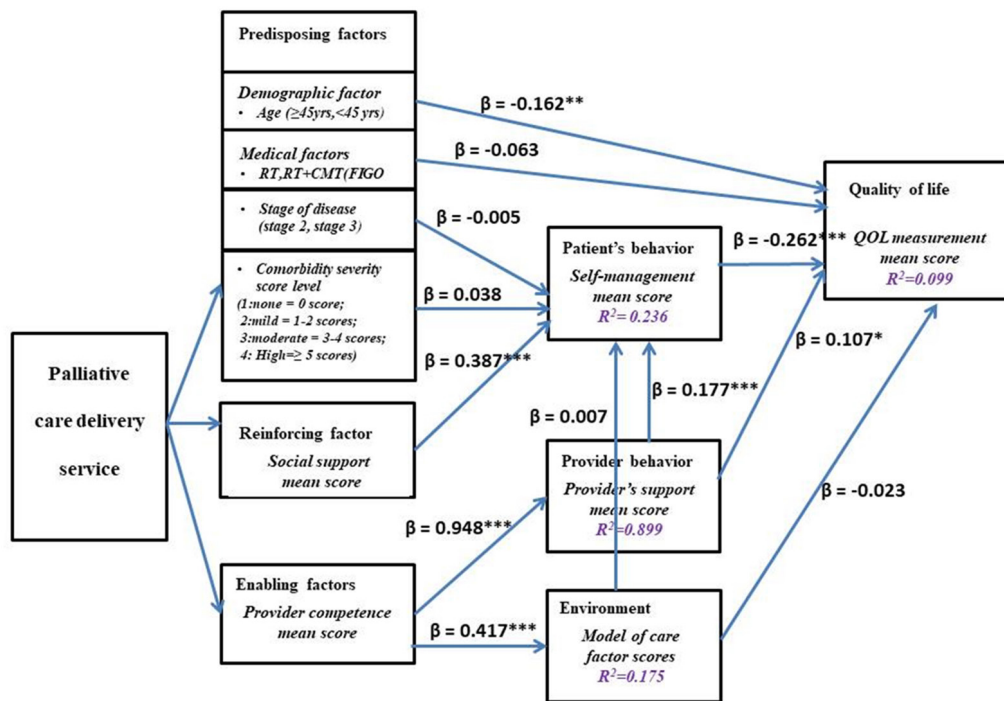


Fig 1. Relationships between patient dimensional factors, palliative care dimensional factors, and QOL of PT2-3CC-PTs of the hypothesized model

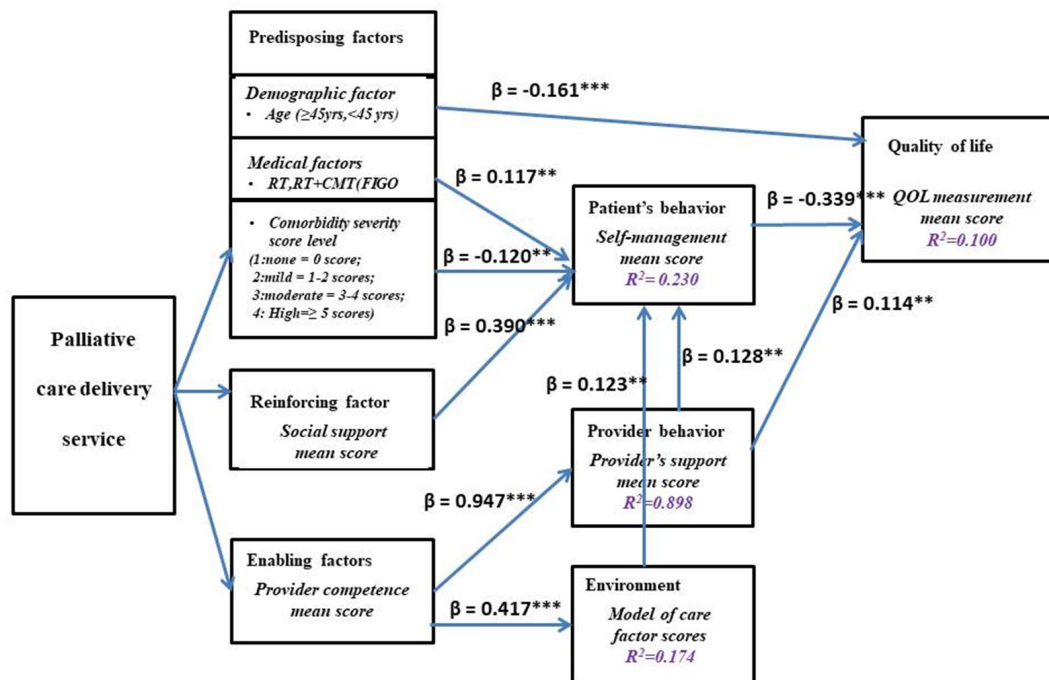


Fig 2. Relationships between patient dimensional factors, palliative care dimensional factors, and QOL of PT2-3CC-PTs of the modified model

diagnosis difference ($\beta = 0.032$, $p < 0.01$), and social support difference ($\beta = -0.103$, $p < 0.001$). The difference of provider competence had a minimal indirect effect on QOL difference through the model of care, provider support, and patients' SM ($\beta = 0.095$, $p < 0.001$). Model of care difference had no direct effect on patients' QOL but had the minimal indirect effect on the difference of QOL through patients' SM ($\beta = -0.033$, $p < 0.01$).

DISCUSSION

The results showed that PT2-3CC-PTs who completed response to cancer treatment had poor QOL due to unsupportive health system. In particular, the health system was not sensitive to sexual health needs, resulting in a lack of engagement of patients, family, and healthcare providers. For instance, the findings revealed no relationships between patients and family

and providers who provided SM support in response to the patients' health problems. Hence, cooperation among patients, family, and healthcare provider is an important strategy to improve QOL of the patients as shown in Fig 2.

This study also found that patients could not live well because of functioning problems, general symptom problems, sexual health problems, and economic problems, as shown in Table 4. The results were correlated with previous studies that PT2-3CC-PTs who had functioning problems, general symptom problems, and sexual health problems would have poor QOL.^{3,7,9,19,22,31}

The results in this study indicated that PC in Thailand was mainly developed by considering mainly physical functioning of the patients. As such, the system overlooked patients' age, sexual health related to CC treatment, and severity of comorbidity prior to CC diagnosis. These factors were associated with patients' SM, resulting in poor QOL of the majority of the patients. For example, the presents study found no relationship between patients and family and providers who provided SM support in response to the patients' health problems. Hence, supportive health system is an important strategy to improve QOL of the patients, as shown in Fig 2.

Support from family is the strength of Thai society.³² The strategy to encourage patients' family to collaborate in PT2-3CC-PTs' HC is significant for improvement of QOL for the patients.⁷ Recently, the strategy to provide PC as early as possible by integrating PC services into cancer treatment services is promoted to enhance patients' QOL.¹⁷ In this study, the results showed that the patients could not live well because of their health problems, especially sexual health problems, which, in turn, impacted their emotional, role, and social functioning, as shown in Table 4. The difference of PC dimensional factors associated with poor QOL in the patients in this study is shown in Fig 2. Poor QOL of the patients implied that although the patients had accessed to HC delivery service (follow-up care), they did not receive the PC service as needed. Moreover, PC delivery system in Thailand was not effective enough to encourage patients' family collaboration in PT2-3CC-PTs' HC; thus, the patients had poor QOL (Fig 2). The findings were consistent with previous studies which found that CC patients undergoing complete care for cancer treatment could not live well because HC providers mostly alleviated only physical health problems⁹ without considering the differences in age^{18,22}, comorbidity severity prior to cancer diagnosis³, and sexual health problems of the

patients.^{33,34} As a result, the current service could not enhance patients' self-management, causing the patients to continue suffering from the disease and decreased QOL.

CONCLUSION

In Thailand, family is a key component of PC. SS by family members who collaborate with HC delivery service is a promising strategy to develop PC dimensional factors. Another important strategy is to increase the number of providers who understand sexual health care and PC to support both women in the reproductive age and aging women. PT2-3CC-PTs are women with different sexual health problems who still have several roles to play in daily life such as a wife, a mother, and a woman who have their roles for themselves, family, and society. Enabling PT2-3CC-PTs to manage care for themselves requires the support system that directly serves their needs. In addition, they also require the support from family and HC providers who understand their HC needs, especially sexual health problems that can differ in accordance with their age, severity of comorbidity prior to cancer diagnosis, and types of cancer treatment. Therefore, HC providers have an important role to support the patients' ability to SM by improving their ability to manage their health problems, while simultaneously encouraging the patients' family to promote their SM. In addition, competency of nurses who provide care for the patients is an essential component of HC delivery service systems that should be developed urgently. The persons in charge of organizing HC delivery service systems should consider nurses as an important bridge to link, transfer knowledge, and develop skills in sexual health care to the patients. Besides this, policy makers should be careful when devising a policy on PC delivery services for PT2-3CC-PTs. It is suggested that a longitudinal study should be conducted to shed more light on the continuity of relationships between PC dimensional factors and patient dimensional factors. Moreover, further studies should be carried out to confirm that the factors identified as being related to QOL of PT2-3CC-PTs in this study including patient dimensional factors such as age and SM and PC dimensional factors such as provider support actually have an influence on QOL of PT2-3CC-PTs.

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REFERENCES

1. Damodar G, Gopinath S, Vijayakumar S, Rao AY. Reasons for Low Quality of Life in South Indian Cancer Patient Population: A Prospective Observational Study. *Indian J Pharm Sci* 2014;76:2-9.
2. Korfage IJ, Essink-Bot M-L, Mols F, van de Poll-Franse L, Kruitwagen R, van Ballegooijen M. Health-Related Quality of Life in Cervical Cancer Survivors: A Population-Based Survey. *J Radiat Oncol Biol Phys* 2009;73:1501-9.
3. Osann K, Hsieh S, Nelson EL, Monk BJ, Chase D, Cella D, et al. Factors associated with poor quality of life among cervical cancer survivors: implications for clinical care and clinical trials. *Gynecol Oncol* 2014;135:266-72.
4. Ashing-Giwa KT, Tejero JS, Kim J, Padilla GV, Kagawa-Singer M, Tucker MB, et al. Cervical cancer survivorship in a population based sample. *Gynecol Oncol* 2009;112:358-64.
5. Lim JW, Zebrack B. Different pathways in social support and quality of life between Korean American and Korean breast and gynecological cancer survivors. *Qual Life Res* 2008;17:679-89.
6. Mantegna G, Petrillo M, Fuoco G, Venditti L, Terzano S, Anchora LP, et al. Long-term prospective longitudinal evaluation of emotional distress and quality of life in cervical cancer patients who remained disease-free 2-years from diagnosis. *BMC Cancer* 2013;13:127.
7. Jarroenwech C, Sindhu S, Ratinthorn A. The effect of empowerment program using PEACE process on quality of life among cervical cancer patients with sexual dysfunction after treatment. Bangkok: Mahidol University; 2015.
8. Beesley V, Janda M, Eakin E, Obermair A, Battistutta D. Lymphedema after gynecological cancer treatment. *Cancer* 2007;109:2607-14.
9. Foster C, Fenlon D. Recovery and self-management support following primary cancer treatment. *Br J Cancer* 2011;105 (Suppl 1):S21-S8.
10. Herzog TJ, Wright JD. The impact of cervical cancer on quality of life—The components and means for management. *Gynecol Oncol* 2007;107:572-7.
11. Lammerink EAG, de Bock GH, Pras E, Reyners AKL, Mourits MJE. Sexual functioning of cervical cancer survivors: A review with a female perspective. *Maturitas* 2012;72:296-304.
12. Oskay ÜY, Beji NK, Bal MD, Yılmaz SD. Evaluation of sexual function in patients with gynecologic cancer and evidence-based nursing interventions. *Sex Disabil* 2011;29:33-41.
13. Azmawati MN, Najibah E, Hatta MD, Norfazilah A. Quality of life by stage of cervical cancer among Malaysian patients. *Asian Pac J Cancer Prev* 2014;15:5283-6.
14. Hui D, De La Cruz M, Mori M, Parsons HA, Kwon JH, Torres-Vigil I, et al. Concepts and definitions for supportive care, best supportive care, palliative care, and hospice care in the published literature, dictionaries, and textbooks. *Support Care Cancer* 2013;21:659-85.
15. Johnston B, Rogerson L, Macijauskienė J, Blaževičienė A, Cholewka P. An exploration of self-management support in the context of palliative nursing: a modified concept analysis. *BMC Nursing* 2014;13:1-10.
16. Yennurajalingam S, Kang JH, Hui D, Kang DH, Kim SH, Bruera E. Clinical response to an outpatient palliative care consultation in patients with advanced cancer and cancer pain. *J Pain Symptom Manag* 2012;44:340-50.
17. WHO. Cervical cancer screening in developing countries. Report of a WHO consultation, 2002.
18. Lai BPY, Tang CS-k, Chung TKH. Age-specific correlates of quality of life in Chinese women with cervical cancer. *Support Care Cancer* 2009;17:271-8.
19. Ashing-Giwa KT, Lim J-W. Health-related quality of life outcomes among cervical cancer survivors: Examining ethnic and linguistic differences. *Cancer Epidemiol* 2011;35:194-201.
20. Bulsara C, Styles I, Ward AM, Bulsara M. The psychometrics of developing the patient empowerment scale. *J Psychosoc Oncol* 2006;24:1-16.
21. Barnas E, Skret-Magierlo J, Skret A, Bidzinski M. The quality of life of women treated for cervical cancer. *Eur J Oncol Nurs* 2012;16:59-63.
22. Nord C, Mykletun A, Thorsen L, Bjørø T, Fosså SD. Self-reported health and use of health care services in long-term cancer survivors. *Int J Cancer* 2005;114:307-16.
23. Stjernsward J, Foley KM, Ferris FD. Integrating palliative care into national policies. *J Pain Symptom Manag* 2007;33:514-20.
24. Sumdaengrit B, Hanucharurnkul S, Dodd M, Wilailak S, Vorapongsathorn T, Pongthavornkamol K. Symptom Experience and Self-care among Thai Women with Cervical Cancer. *Pac Rim Int J Nurs Res Thail* 2013;14:203-18.
25. Hair JF, Black WC, Babin BJ, and Anderson RE. *Multivariate Data Analysis (7th Edition)*. Pearson, New York, 2010.
26. Bierrenbach. Steps in applying Probability Proportional to Size (PPS) and calculating Basic Probability Weights. 2008.p.1-5.
27. Rungruangsiripan M, Sitthimongkol Y, Maneesriwongul W, Talley S, Vorapongsathorn T. Mediating Role of Illness Representation Among Social Support, Therapeutic Alliance, Experience of Medication Side Effects, and Medication Adherence in Persons With Schizophrenia. *Arch Psychiatr Nurs* 2011;25:269-83.
28. Charlson ME, Charlson RE, Peterson JC, Marinopoulos SS, Briggs WM, Hollenberg JP. The Charlson comorbidity index is adapted to predict costs of chronic disease in primary care patients. *J Clin Epidemiol* 2008;61:1234-40.
29. Fayers P, Aaronson N, Bjordal K, Groenvold M, Curran D, A B. *EORTC QLQ-C30 Scoring Manual*. Brussels, : EORTC Publications; 2001.
30. Greimel E, Kuljanic Vlasic K, Waldenstrom A, Duric V, Jensen P, Singer S, et al. The European Organization for Research and Treatment of Cancer (EORTC) Quality-of-Life questionnaire cervical cancer module: EORTC QLQ-CX24. *Cancer* 2006;107:1812-22.
31. Pastrana T, Wenk R, De Lima L. Consensus-Based Palliative Care Competencies for Undergraduate Nurses and Physicians: A Demonstrative Process with Colombian Universities. *J Palliat Med* 2016;19:76-82.
32. J. K. B. T. Family Support for Older Persons in Thailand: Challenges and Opportunities. Population Studies Center, University of Michigan; 2017 March 2017. Contract No.: Report 17-879.
33. Juraskova I, Butow P, Robertson R, Sharpe L, McLeod C, Hacker N. Post-treatment sexual adjustment following cervical and endometrial cancer: a qualitative insight. *Psycho-oncology* 2003;12:267-79.
34. Khalil J, Bellefqih S, Sahli N, Afif M, Elkacemi H, Elmajjaoui S, et al. Impact of cervical cancer on quality of life: beyond the short term (Results from a single institution): Quality of life in long-term cervical cancer survivors: results from a single institution. *Gynecol Oncol Res Pract* 2015;2:7.