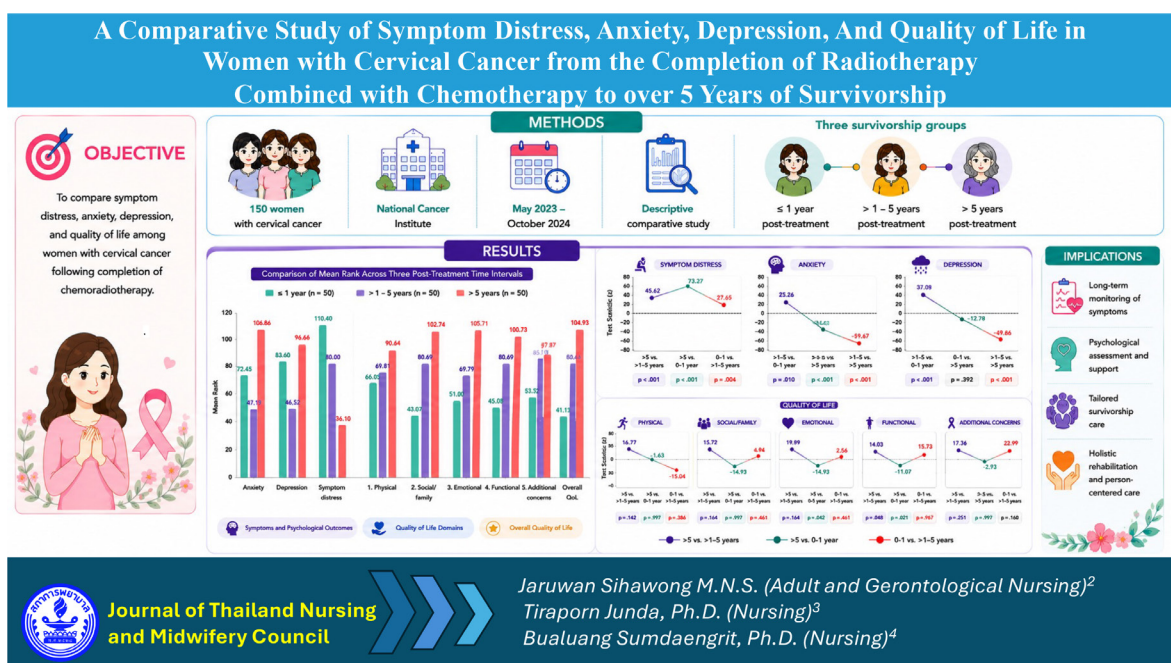


# A Comparative Study of Symptom Distress, Anxiety, Depression, And Quality of Life in Women with Cervical Cancer from the Completion of Radiotherapy Combined with Chemotherapy to over 5 Years of Survivorship<sup>1</sup>

Jaruwan Sihawong M.N.S. (Adult and Gerontological Nursing)<sup>2</sup>

Tiraporn Junda, Ph.D. (Nursing)<sup>3</sup>

Bualuang Sumdaengrit, Ph.D. (Nursing)<sup>4</sup>



## Extended Abstract

**Introduction** Cervical cancer remains one of the most prevalent malignancies among Thai women. Although treatment has significantly improved survival rates, many patients continue to endure both acute and long-term side effects. These include distressing conditions such as vaginal stenosis and dryness, as well as alterations in urinary and bowel function resulting from radiation-induced tissue damage. Such complications not only compromise physiological functioning but also exert profound psychological consequences, leading to anxiety and depression associated with changes in body image and the loss of sexual function. These sequelae directly impair long-term quality of life. Accordingly, systematic follow-up and investigation of post-treatment effects across different phases of survivorship are essential for holistic rehabilitation.

<sup>1</sup> Thesis, Master of Nursing Science Program in Adult and Gerontological Nursing, Ramathibodi School of Nursing, Faculty of Medicine Ramathibodi Hospital, Mahidol University

<sup>2</sup> Candidate for the Master of Nursing Science Degree, Master of Nursing Science Program in Adult and Gerontological Nursing, Ramathibodi School of Nursing, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Thailand

<sup>3</sup> Corresponding author, Assistant Professor, Ramathibodi School of Nursing, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Thailand; E-mail: tiraporn.jun@mahidol.ac.th

<sup>4</sup> Associate Professor, Ramathibodi School of Nursing, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Thailand

A deeper understanding the trajectory and nature of symptoms at each stage enables nurses to provide patient-centered care strategies that effectively support recovery. Ultimately, such approaches promote well-being and empower cervical cancer survivors to resume their lives with greater happiness and sustained quality of life.

**Objective** The objective of this study was to compare symptom distress, anxiety, depression, and quality of life among women with cervical cancer following completion of concurrent chemoradiotherapy, across three distinct post-treatment groups: (1) within 0–1 year post-treatment, (2) more than 1 to 5 years post-treatment, and (3) beyond 5 years post-treatment.

**Design** This study employed a descriptive comparative design, guided by a quality-of-life framework derived from a review of the literature, integrating with the Functional assessment of cancer therapy–cervix (FACT-Cx). Quality of life is conceptualized as an individual's perception of well-being despite illness or treatment, including five domains: physical, social/family, emotional, functional, and cervical cancer-specific aspects. Patients undergoing concurrent chemoradiotherapy frequently experience side effects and complications, which tend to intensify with prolonged treatment. Moreover, patients differ in their perceptions and responses to these symptoms. Assessing quality of life across all five domains provides health professionals with essential information for nursing care and symptom management. The impact of disease and treatment extends across physical, social, emotional, and functional dimensions, thereby influencing overall well-being. Systematic monitoring of quality of life offers a critical foundation for holistic rehabilitation, enabling healthcare teams to design patient-centered strategies that promote recovery and support cervical cancer survivors in regaining normalcy and sustaining a good quality of life.

**Methodology** The sample comprised 150 women diagnosed with cervical cancer who had completed concurrent chemoradiotherapy according to the prescribed treatment plan and were attending scheduled follow-up visits at the National Cancer Institute. Participants were selected purposively based on inclusion criteria and stratified into three groups of 50 individuals each, according to survivorship duration: Group 1, patients within one year post-treatment; group 2, patients between more than one year and up to five years post-treatment; and Group 3, patients beyond five years post-treatment. Sample size determination was conducted using the G\*Power program, with an effect size of 0.19, a significance level ( $\alpha$ ) of .05, and a desired statistical power of .80. To account for potential dropout, the sample size was increased by 5%, resulting in 50 participants per group, for a total of 150. Data collection instruments included: (1) a personal information questionnaire, (2) a symptom assessment form related to disease and treatment, (3) anxiety and depression questionnaires, and (4) the FACT-Cx quality-of-life instrument. Data were collected between May 2023 and October 2024 in the outpatient clinic following medical examinations. Data analysis was performed using descriptive statistics and the Kruskal–Wallis test.

**Results** The participants had a mean age of 54.5 years ( $SD = 10.75$ ). The majority were married (64.7%), utilized the Universal Health Coverage scheme (64.0%), and were diagnosed primarily with stage II and III cervical cancer equally (41.3%). Significant differences were observed across groups in symptom distress, anxiety, depression, and overall quality of life ( $\chi^2 = 75.932, p < .001$ ;  $\chi^2 = 48.558, p < .001$ ;  $\chi^2 = 37.546, p < .001$ ;  $\chi^2 = 75.932, p < .001$ , respectively). Pairwise comparisons revealed statistically significant differences among all groups in symptom distress, anxiety, depression, and overall quality of life, except for depression between group 1 ( $\leq 1$  year post-treatment) and group 3 ( $> 5$  years post-treatment), where no significant difference was found.

**Recommendation** The findings of this study can be applied to the development of nursing strategies aimed at managing symptoms, alleviating distress, reducing anxiety and depression, and ultimately enhancing the quality of life of cervical cancer patients following treatment. Nurses should conduct regular assessments of symptom burden, symptom perception, anxiety, and depression across different survivorship phases. Such systematic evaluation enables timely, individualized, and patient-centered interventions that effectively respond to patients' evolving needs, thereby supporting holistic recovery and promoting sustained well-being.

**Keywords** symptom distress/ anxiety/ depression/ quality of life/ cervical cancer survivors

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# การศึกษาเปรียบเทียบความทุกข์ทรมานจากอาการ ความวิตกกังวล ภาวะซึมเศร้า และคุณภาพชีวิตของสตรีที่เป็นมะเร็งปากมดลูกตั้งแต่หลังสิ้นสุดการรักษา ด้วยรังสีรักษาร่วมกับยาเคมีบำบัดจนถึงระยะเวลารอดชีวิตมากกว่า 5 ปี<sup>1</sup>

จาวรรรณ สีหะวงษ์ พย.ม. (การพยาบาลผู้ใหญ่และผู้สูงอายุ)<sup>2</sup>

อิราภรณ์ จันทร์ตา, Ph.D. (Nursing)<sup>3</sup>

บัวหลวง สำแดงฤทธิ์, ประ.ด. (การพยาบาล)<sup>4</sup>

## บทคัดย่อขยาย

**บทนำ** มะเร็งปากมดลูกเป็นหนึ่งในโรคมะเร็งที่พบบ่อยในสตรีไทย แม้การรักษาจะช่วยเพิ่มอัตราการรอดชีวิต แต่ผู้ป่วยจำนวนไม่น้อยยังคงเผชิญกับผลข้างเคียงทั้งในระยะเฉียบพลันและระยะยาว โดยเผชิญกับความทุกข์ทรมานจากอาการ เช่น ภาวะช่องคลอดตีบแคบและแห้ง การเปลี่ยนแปลงของระบบขับถ่ายปัสสาวะและอุจจาระอันเนื่องมาจากเนื้อเยื่อถูกทำลายด้วยรังสี ซึ่งคุกคามสรีรวิทยาของร่างกาย และยังส่งผลกระทบต่อเนื่องทางจิตใจ ก่อให้เกิดความวิตกกังวล และภาวะซึมเศร้า จากภาพลักษณ์ที่เปลี่ยนไป และการสูญเสียหน้าที่ทางเพศ ส่งผลกระทบต่อตรงต่อคุณภาพชีวิตในระยะยาว การติดตามและศึกษาผลกระทบหลังสิ้นสุดกระบวนการรักษาในระยะเวลาที่แตกต่างกัน จึงเป็นสิ่งสำคัญต่อการฟื้นฟูแบบองค์รวม เพื่อให้พยาบาลเข้าใจวิธีการเปลี่ยนแปลงและธรรมชาติของอาการในแต่ละระยะรอดชีวิต และนำไปสู่การกำหนดกลยุทธ์การฟื้นฟูที่เน้นผู้ป่วยเป็นศูนย์กลางได้อย่างมีประสิทธิภาพและส่งเสริมให้สตรีผู้รอดชีวิตจากมะเร็งปากมดลูกสามารถดำเนินชีวิตต่อไปได้อย่างมีความสุขและมีคุณภาพชีวิตที่ดีต่อไป

**วัตถุประสงค์การวิจัย** การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อเปรียบเทียบความทุกข์ทรมานจากอาการ ความวิตกกังวล ภาวะซึมเศร้า และคุณภาพชีวิตของสตรีที่เป็นมะเร็งปากมดลูกภายหลังสิ้นสุดการรักษา ด้วยรังสีรักษาร่วมกับยาเคมีบำบัด ในช่วงระยะเวลาหลังการรักษาที่แตกต่างกัน 3 ช่วง (ภายหลังสิ้นสุดการรักษาด้วยรังสีรักษาร่วมกับยาเคมีบำบัด 0 ถึง 1 ปี หลังสิ้นสุดการรักษามากกว่า 1 ถึง 5 ปี และหลังสิ้นสุดการรักษามากกว่า 5 ปีขึ้นไป)

**การออกแบบการวิจัย** การศึกษาครั้งนี้เป็นการศึกษาแบบบรรยายเชิงเปรียบเทียบ ใช้กรอบแนวคิดคุณภาพชีวิตจากการทบทวนวรรณกรรม ร่วมกับแบบวัดคุณภาพชีวิตเฉพาะผู้ป่วยมะเร็งปากมดลูก (Functional assessment of cancer therapy-cervix: FACT-Cx) โดยคุณภาพชีวิตหมายถึงการรับรู้ของบุคคลต่อความทุกข์ที่ไม่ถูกกระทบจากโรคหรือการรักษา ครอบคลุม 5 ด้าน ได้แก่ ร่างกาย ครอบครัวยุติธรรม สังคม อารมณ์ การปฏิบัติกิจกรรม และด้านเฉพาะมะเร็งปากมดลูก ผู้ป่วยที่ได้รับเคมีบำบัดร่วมกับรังสีรักษามักมีอาการข้างเคียงและภาวะแทรกซ้อน ซึ่งรุนแรงขึ้นเมื่อการรักษายาวนาน และผู้ป่วย

<sup>1</sup>วิทยานิพนธ์ หลักสูตรพยาบาลศาสตรมหาบัณฑิต สาขาวิชาการพยาบาลผู้ใหญ่และผู้สูงอายุ โรงเรียนพยาบาลรามธิบดี คณะแพทยศาสตร์โรงเรียนพยาบาลรามธิบดี มหาวิทยาลัยมหิดล

<sup>2</sup>นักศึกษาหลักสูตรหลักสูตรพยาบาลศาสตรมหาบัณฑิต สาขาวิชาการพยาบาลผู้ใหญ่และผู้สูงอายุ โรงเรียนพยาบาลรามธิบดี คณะแพทยศาสตร์โรงเรียนพยาบาลรามธิบดี มหาวิทยาลัยมหิดล

<sup>3</sup>ผู้ประพันธ์บรรณกิจ ผู้ช่วยศาสตราจารย์ โรงเรียนพยาบาลรามธิบดี คณะแพทยศาสตร์โรงเรียนพยาบาลรามธิบดี มหาวิทยาลัยมหิดล  
E-mail: tiraporn.jun@mahidol.ac.th

<sup>4</sup>รองศาสตราจารย์ โรงเรียนพยาบาลรามธิบดี คณะแพทยศาสตร์โรงเรียนพยาบาลรามธิบดี มหาวิทยาลัยมหิดล

แต่ละรายมีการรับรู้และตอบสนองต่ออาการแตกต่างกัน การประเมินคุณภาพชีวิตทั้ง 5 ด้านจะช่วยให้ทีมสุขภาพมีข้อมูลสำหรับการพยาบาลและการจัดการอาการ โดยผลกระทบจากโรคและการรักษาสามารถส่งผลต่อความผาสุกทั้งด้านร่างกาย สังคม อารมณ์ และการดำเนินชีวิต การติดตามคุณภาพชีวิตจะเป็นข้อมูลพื้นฐานในการส่งเสริมให้ผู้ป่วยมะเร็งปากมดลูกมีคุณภาพชีวิตที่ดีและสามารถกลับไปใช้ชีวิตตามปกติได้

**วิธีดำเนินการวิจัย** กลุ่มตัวอย่าง คือสตรีที่ได้รับการวินิจฉัยว่าเป็นมะเร็งปากมดลูกที่ได้รับการรักษาด้วยรังสีรักษาร่วมกับยาเคมีบำบัดครบตามแผนการรักษาแล้ว และเข้ารับการติดตามอาการตามนัดหมายทางการแพทย์ ณ สถาบันมะเร็งแห่งชาติ จำนวน 150 คน เลือกแบบเฉพาะเจาะจง ตามเกณฑ์คัดเข้าแบ่งกลุ่มตัวอย่างออกเป็น 3 กลุ่ม ตามระยะเวลาของการรอดชีวิต กลุ่มละ 50 คน ประกอบด้วย กลุ่มที่ 1 ผู้ป่วยที่สิ้นสุดกระบวนการรักษาภายในระยะเวลาไม่เกิน 1 ปี กลุ่มที่ 2 ผู้ป่วยที่สิ้นสุดกระบวนการรักษา มากกว่า 1 ปี ถึง 5 ปี และ กลุ่มที่ 3 ผู้ป่วยที่สิ้นสุดกระบวนการรักษา มากกว่า 5 ปีขึ้นไป การกำหนดขนาดตัวอย่างใช้โปรแกรม G\*Power โดยกำหนดขนาดอิทธิพลเท่ากับ 0.19 ระดับนัยสำคัญ ( $\alpha$ ) เท่ากับ .05 และอำนาจในการทดสอบ (power) เท่ากับ .80 เพื่อรองรับการสูญหายของกลุ่มตัวอย่าง (dropout) ผู้วิจัยได้เพิ่มจำนวนกลุ่มตัวอย่างขึ้นอีกร้อยละ 5 ได้ขนาดตัวอย่างเท่ากับ 50 คนต่อกลุ่ม รวม 150 คน เครื่องมือที่ใช้ในการเก็บข้อมูล ได้แก่ แบบสอบถามข้อมูลส่วนบุคคล แบบประเมินอาการจากโรคและการรักษา แบบสอบถามอาการวิตกกังวลและภาวะซึมเศร้า และแบบวัดคุณภาพชีวิตเฉพาะผู้ป่วยมะเร็งปากมดลูก เก็บรวบรวมข้อมูลในระหว่างเดือนพฤษภาคม พ.ศ. 2566 ถึง เดือนตุลาคม พ.ศ. 2567 ที่หน่วยตรวจผู้ป่วยนอกภายหลังผู้ป่วยได้รับการตรวจจากแพทย์ วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา และการทดสอบ Kruskal-Wallis

**ผลการศึกษา** กลุ่มตัวอย่างมีอายุเฉลี่ย 54.5 ปี (SD 10.75) ส่วนใหญ่มีสถานภาพสมรสคู่ (ร้อยละ 64.7) ใช้สิทธิประกันสุขภาพถ้วนหน้า (ร้อยละ 64.0) เป็นมะเร็งมดลูกระยะที่ 2 และ 3 ร้อยละ 41.3 เท่ากัน กลุ่มตัวอย่างมีความทุกข์ทรมานจากอาการ ความวิตกกังวล ภาวะซึมเศร้า คุณภาพชีวิตโดยรวมแตกต่างกันอย่างมีนัยสำคัญทางสถิติ ( $\chi^2 = 75.932, p < .001$ ;  $\chi^2 = 48.558, p < .001$ ;  $\chi^2 = 37.546, p < .001$ ;  $\chi^2 = 75.932, p < .001$  ตามลำดับ) เมื่อเปรียบเทียบรายคู่พบว่า ความทุกข์ทรมานจากอาการ ความวิตกกังวล ภาวะซึมเศร้า คุณภาพชีวิตโดยรวมของทุกกลุ่มมีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติ ยกเว้นภาวะซึมเศร้าของกลุ่มที่ 1 และ 3 ซึ่งพบว่าไม่แตกต่างกันอย่างมีนัยสำคัญทางสถิติ

**ข้อเสนอแนะ** ผลการศึกษานี้สามารถนำไปประยุกต์ใช้ในการวางแผนพัฒนาแนวทางการพยาบาลเพื่อจัดการกับอาการและลดความทุกข์ทรมานจากอาการ ลดความวิตกกังวลและภาวะซึมเศร้า รวมถึงช่วยส่งเสริมคุณภาพชีวิตของผู้ป่วยมะเร็งปากมดลูกภายหลังการรักษา พยาบาลควรมีการประเมินอาการ การรับรู้ อาการ ความวิตกกังวล และภาวะซึมเศร้าอย่างสม่ำเสมอในแต่ละช่วงเวลาหลังการรักษา เพื่อให้สามารถให้การดูแลที่เหมาะสม ทันทีที่ และเฉพาะเจาะจงตามความต้องการของผู้ป่วยในแต่ละระยะได้อย่างมีประสิทธิภาพ

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**คำสำคัญ** ความทุกข์ทรมานจากอาการ ความวิตกกังวล ภาวะซึมเศร้า คุณภาพชีวิต ผู้รอดชีวิตจากมะเร็งปากมดลูก

วันที่ได้รับ 7 ต.ค. 68 วันที่แก้ไขบทความเสร็จ 8 ธ.ค. 68 วันที่รับตีพิมพ์ 18 พ.ค. 69

## **Background and Significance**

Worldwide, every two minutes, a woman dies from cervical cancer. This highlights one of the challenges: a largely preventable disease that continues to claim over 340,000 lives annually, with 90% of these deaths occurring in low and middle-income countries where access to screening and treatment remains limited.<sup>1</sup> The global cancer landscape in 2022 painted a devastating picture, with the World Health Organization (WHO) documenting 19.98 million new diagnoses and 9.74 million deaths, equivalent to losing the entire population of Sweden to cancer in a single year.<sup>1</sup> Within this grim tapestry, cervical cancer emerges as a particularly cruel adversary, striking women in their prime reproductive years and reverberating through families and communities across generations.

In Southeast Asia, this battle takes on heightened urgency. Thailand, despite advances in healthcare infrastructure, confronts a sobering reality: 8,662 women received cervical cancer diagnoses in 2022, roughly 25 new cases every day.<sup>2</sup> Cervical cancer remains the third most common malignancy among Thai women, following breast and colorectal cancers.<sup>2</sup> Data from the National Cancer Institute highlight an unsettling trend: in 2021, 225 new cases accounted for 12.4% of all female cancers, while in 2022, 4,576 deaths translated to more than six women lost daily, at a rate of 6.9 per 100,000 population.<sup>1</sup>

Modern cervical cancer treatment has undergone a revolutionary transformation, evolving from crude surgical interventions to sophisticated multimodal approaches that combine surgery, chemotherapy, and precision radiation therapy.<sup>3</sup>

Concurrent chemoradiotherapy has become the gold standard for patients with stage IB disease and beyond, delivering significant improvements in survival and reductions in recurrence achievements unimaginable just decades ago.<sup>4</sup> However, these therapeutic advances are accompanied by substantial burdens. Life-saving treatments unleash a cascade of consequences: nausea, nephrotoxicity, mucositis, hematologic toxicity, dermatitis, cystitis, and premature menopause.<sup>5,6</sup> Chemotherapy agents such as cisplatin and carboplatin act as double-edged swords, targeting cancer cells while simultaneously damaging renal function, immune defenses, blood cell production, and peripheral nerves.<sup>5,7</sup> These are not merely side effects but life-altering transformations that redefine survivorship.

The ripple effects extend beyond the physical realm, penetrating emotional, social, and spiritual dimensions.<sup>8</sup> Survivors often struggle with daily functioning, strained relationships, and the redefinition of “normal.” In this context, healthcare providers, particularly nurses and physicians, must transcend traditional roles, serving as scaffolding to support the reconstruction of lives.<sup>9</sup> Here lies a critical gap that demands our attention. While emerging research suggests that quality of life may begin to recover approximately six months post-treatment,<sup>8,10</sup> evidence remains sparse regarding longer-term trajectories. How do women fare at one year, five years, or a decade after treatment? Literature offers limited guidance, leaving survivors, families, and healthcare providers to navigate uncharted territory. A review of existing studies indicates that quality of life among cervical cancer survivors is dynamic, varying across different post-treatment phases. During the first year, patients often experience persistent fatigue,

reproductive and urinary dysfunction. In the intermediate phase, adaptation improves, with gradual declines in complications and enhanced functioning.<sup>10</sup> Consistent with findings by Chuabmee,<sup>11</sup> patients increasingly resume daily activities over time.

However, beyond five years, many survivors continue to experience chronic conditions such as sexual dysfunction, psychosocial difficulties, and lingering anxiety about recurrence.<sup>12,13</sup> These highlight the necessity of systematic monitoring across survivorship phases to inform tailored care and rehabilitation strategies. This study addresses these gaps directly by examining symptom distress, anxiety, depression, and quality of life across three distinct phases within one year, between one and five years, and beyond five years post-treatment. By illuminating the long-term recovery landscape, our findings aim to transform survivorship care, shifting focus from immediate post-treatment concerns toward a comprehensive understanding of the survivor journey.

The disease burden emphasizes the critical importance of this research. With cervical cancer incidence projected to rise in developing regions and treatment advances creating larger populations of long-term survivors, the need for evidence-based, temporally informed care strategies has never been more urgent. This research is not merely academic; it represents a roadmap for hope, offering the potential to transform suffering into healing, uncertainty into understanding, and survival into truly living.

## Objectives

To compare symptom distress, anxiety, depression, and quality of life in participants after completing chemoradiation treatment within 1 year, more than 1 to 5 years, and over 5 years.

## Research Hypothesis

1. Participants after completing chemoradiation treatment over 5 years have lower symptom distress, anxiety, and depression than those who completed treatment within 1 year or between 1 and 5 years.

2. Participants after completing chemoradiation treatment over 5 years have higher quality of life than those who completed treatment within 1 year or between 1 and 5 years.

## Conceptual Framework

This study employed a conceptual framework of quality of life derived from a comprehensive review of the relevant literature, in conjunction with the Functional Assessment of Cancer Therapy–Cervix (FACT–Cx) instrument,<sup>14</sup> a disease-specific measure for women with cervical cancer. The FACT–Cx encompasses five dimensions: physical well-being, social/family well-being, emotional well-being, functional well-being, and cervical cancer-specific concerns.<sup>14</sup> Cervical cancer survivors who undergo concurrent chemoradiotherapy experience profound physical and psychological challenges that may persist long after treatment.<sup>14</sup> The framework emphasizes that each woman's experience is unique; symptoms interact dynamically across physical, emotional, and social dimensions, shaping individual perceptions of recovery and well-being. This multidimensional approach moves beyond traditional biomedical models, empowering healthcare professionals to adopt holistic, patient-centered care. By understanding the interconnected nature of survivorship experiences, nurses and clinicians can design interventions that address not only symptoms but also restore hope, identity, and

resilience, supporting women in reclaiming their lives after cancer.

## **Methodology**

### **Research Design**

This study employed a cross-sectional descriptive design.

### **Population and sample**

**Target population** comprised women diagnosed with cervical cancer, who attended a follow-up after treatment at the Gynecology Clinic of the National Cancer Institute.

**Sample** comprised 150 women diagnosed with cervical cancer, aged 18 years and older, who attended a follow-up after treatment at the Gynecology Clinic of the National Cancer Institute from May 2023 to October 2024.

**Sampling** Participants were purposively selected according to the following **inclusion criteria**: Participants were required to be: Aged 18 years or older, Diagnosed with cervical cancer and treated with concurrent chemoradiotherapy; Cognitively intact (for those over 60 years), as assessed by the Six-item Cognitive Impairment Test (6CIT), with scores below 8/28; and **exclusion criteria**: Patients currently undergoing concurrent chemoradiotherapy, Patients with severe comorbid conditions resulting in significant limitations in self-care or the ability to perform only minimal self-care activities.

**Sample size determination** sample size was calculated using G\*Power version 3.1.9.7, referencing Rahman, Singh, and Qureshi,<sup>10</sup> who reported an effect size of  $f = 0.19$ —classified as small to medium per Cohen's criteria. With  $\alpha = .05$  and power = .80, the required sample size was

46 participants per group. To account for potential attrition, the sample was increased by 5%, resulting in 50 participants per group. The final sample comprised 150 cervical cancer survivors, stratified into three groups based on time since treatment completion: Group 1: Within 1 year, Group 2: More than 1 to 5 years Group 3: Over 5 years

### **Research instruments**

This study employs a curated quartet of validated instruments, each selected to illuminate a distinct dimension of the cervical cancer survivorship experience. Together, these tools create a comprehensive assessment framework that captures the full spectrum of post-treatment challenges and triumphs.

#### **1. Personal Information questionnaire**

A custom-designed demographic compass was developed by the researchers through extensive literature synthesis to map the personal landscape of each survivor and capture essential characteristics, including age, family structure, socioeconomic factors, and intimate health concerns such as sexual well-being and vaginal dilator use, sensitive topics often overlooked in standard assessments but crucial to understanding survivorship quality.

**2. Memorial symptom assessment scale (MSAS) Thai Enhanced Version**; The gold standard for symptom burden assessment, originally crafted by Portenoy et al. and masterfully adapted for Thai populations by Suwisith et al., with culturally sensitive enhancements by Sumdangrit et al.<sup>15</sup> This 36-item questionnaire evaluates both physical and psychological symptoms, with four culturally relevant additions (fever, headache, vaginal discharge, anal inflammation) that reflect the unique Thai survivor

experience. Scores range from 0–144, with higher score indicating greater distress.

### **3. Hospital anxiety and depression scale:**

**Thai version (Thai HADS)** A psychological wellness barometer developed by Zigmond and Snaith and expertly translated by Nilchaikovit et al.<sup>16</sup> This 14-item instrument serves as a sensitive detector of emotional distress, with anxiety and depression subscales that reveal the hidden psychological burden survivors carry. Scores from 0–7 signal normal adjustment, 8–10 raise yellow flags for possible concerns, while 11–21 sound red alerts for probable psychiatric disorders.

**4. Functional assessment of cancer therapy–cervix: Thai version (FACT-CX)** This quality-of-life measurement was created by Cella<sup>14</sup> specifically for cervical cancer survivors. The instrument divides quality of life into five meaningful domains: physical well-being (0–28), social/family well-being (0–28), emotional well-being (0–24), functional well-being (0–28), and cervical cancer-specific concerns (0–60). Higher scores indicate better quality of life, transforming numbers into narratives of resilience and recovery.

### **Reliability**

The instrument was pilot-tested with 20 cervical cancer patients at the National Cancer Institute, Thailand, who were not included in the study sample. Their demographic and clinical profiles closely corresponded to those of the three study cohorts (7 patients completed treatment within 1 year, 7 between 1 and 5 years, and 6 beyond 5 years). Internal consistency reliability was acceptable, with Cronbach's alpha coefficients indicating satisfactory reliability across all measures: MSAS ( $\alpha = .73$ ), Thai HADS ( $\alpha = .80$ ), and FACT-CX ( $\alpha = .78$ ).

### **Ethical consideration**

The Human Research Ethics Committee of the Faculty of Medicine Ramathibodi Hospital, Mahidol University, approved this study on January 5, 2023 (COA. MURA 2023/23), and the National Cancer Institute approved this study on April 28, 2023 (EC COA 022/2023). Both approvals were granted in accordance with the three fundamental principles of research ethics: beneficence, respect for persons, and justice.

### **Data collection**

This study employed a mixed-mode data collection approach, prioritizing participant accessibility, comfort, and comprehensive inclusion. The staff identified cervical cancer survivors who had completed treatment and were attending follow-up visits at the Gynecologic Clinic of the National Cancer Institute, Thailand. Eligible participants were selected based on predefined criteria using medical record data, and an enrollment list was subsequently compiled. The strategy consisted of two distinct, flexible prongs:

**1. Clinic-based collection (In-person administration)** Eligible survivors attending routine follow-up visits were invited to participate. Following an initial personalized introduction to the study, informed consent was secured. The primary investigator (PI) provided standardized explanations of study objectives and questionnaire instructions, allowing ample time for questions and clarification. The assessment period typically lasted 20 to 30 minutes. To maximize inclusivity and minimize exclusion due to physical or literacy constraints, a flexible administration protocol was utilized. Most participants completed the assessment independently. However, for those requesting or requiring assistance,

the PI provided individualized support, including reading items aloud and transcribing responses.

**2. Mail-based collection (remote administration)** For the 80 participants who were unable to attend clinic visits or who preferred home completion, the PI contacted them by telephone to provide detailed information about the study and obtain verbal informed consent. Subsequently, all relevant study documents were mailed to the participants' addresses to facilitate systematic data collection. A remote, mail-based system was implemented. This method addressed common barriers, such as transportation challenges, work constraints, and the need for privacy when completing sensitive questionnaires. Participants were contacted by telephone to provide study information and obtain verbal consent for data collection. Subsequently, the study documents were mailed to their home address. Complete study packages, including the informed consent form and the questionnaires, were dispatched via post. Participants were instructed to return the signed consent form and completed materials using the provided prepaid envelope. This strategy ensured broad geographic inclusion and served as a critical measure for minimizing study non-response and attrition.

#### **Data analysis**

All data were analyzed using SPSS Statistics. Descriptive statistics were used to summarize demographic characteristics, symptom distress, anxiety, depression, and quality of life scores. Assessment of data distribution using the Kolmogorov-Smirnov test indicated that the data did not follow a normal distribution (non-normal distribution). To examine differences across the three post-treatment time

intervals, the Kruskal-Wallis test was employed due to the non-parametric nature of the data. Where significant differences were identified, pairwise comparisons using Dunn-Bonferroni were conducted to explore variations in symptom distress, anxiety, depression, and quality of life among groups.

#### **Results**

Participants included 150 cervical cancer survivors representing a diverse tapestry of Thai women aged 31-82 years (mean = 54.5), predominantly married 64.7% mothers with two children (34.7%) from central Thailand (76.7%). Most identified as Buddhist (94.7%) with primary or secondary education (32.0% each), working in trade before (36.0%) and after treatment (32.7%). Despite experiencing cancer, over half (54.7%) maintained financial stability with savings, supported by Thailand's universal health coverage (64.0%). Disease characteristics revealed an equal distribution between stage II and III cancers (41.3% each). Sexual adaptation varied: 52% reported unchanged sexual response while 48% experienced changes, with vaginal dilator use nearly evenly split (49.3% vs. 50.7%).

Significant differences were found across groups in symptom distress, anxiety, depression, and overall quality of life ( $\chi^2 = 75.932$ ,  $p < .001$ ;  $\chi^2 = 48.558$ ,  $p < .001$ ;  $\chi^2 = 37.546$ ,  $p < .001$ ;  $\chi^2 = 75.932$ ,  $p < .001$ , respectively). Results revealed significant differences in psychological distress and quality of life among cervical cancer survivors across the three groups. Anxiety and depression were highest in survivors more than five years after treatment, with mean scores of 5.18 and 3.56 respectively, compared to the 0-1 year

and >1–5-year groups. Symptom distress showed the opposite pattern, being most severe in the early post-treatment group ( $M = 9.42$ ) and declining steadily over time, reaching its lowest level in the >5 year group ( $M = 1.06$ ). Quality of life (QOL) domains demonstrated progressive improvement with longer time since treatment. Physical well-being scores increased from 25.98 in the 0–1 year group to 27.06 in the >5 year group. Social/family, emotional, and functional well-being also improved significantly, with the >5 year group consistently reporting the highest scores. For example, social/

family well-being rose from 17.08 in the early group to 23.60 in the >5 year group. Similarly, emotional well-being increased from 20.46 to 22.86, and functional well-being from 17.66 to 22.73. The additional concerns domain showed improvement, with scores rising from 43.56 in the 0–1 year group to 47.43 in the >5 year group. Overall QOL followed the same trajectory, increasing from 124.74 in the early group to 144.60 in the >5 year group. All comparisons were statistically significant ( $p < .001$ ), indicating robust differences across time groups (Table 1).

**Table 1** Comparisons of symptom distress, anxiety, depression, and quality of life in three groups of cervical cancer survivors following completion of concurrent chemoradiation therapy, using Kruskal Wallis test

|                              | 0–1 year (n = 50) |               |              | > 1 – 5 years (n =50) |               |              | > 5 years (n =50) |               |               | $\chi^2$      | p               |
|------------------------------|-------------------|---------------|--------------|-----------------------|---------------|--------------|-------------------|---------------|---------------|---------------|-----------------|
|                              | mean              | SD            | Mean rank    | mean                  | SD            | Mean rank    | mean              | SD            | Mean rank     |               |                 |
| Anxiety                      | 2.62              | 2.230         | 72.45        | 1.24                  | 1.255         | 47.19        | 5.18              | 2.819         | 106.86        | 48.558        | <.001           |
| Depression                   | 2.46              | 1.940         | 83.60        | .88                   | 1.825         | 46.52        | 3.56              | 2.681         | 96.86         | 37.546        | <.001           |
| Symptom distress             | 9.42              | 7.016         | 110.40       | 4.20                  | 3.658         | 80           | 1.00              | 2.77          | 36.10         | 75.932        | <.001           |
| <b>Quality of life (QOL)</b> |                   |               |              |                       |               |              |                   |               |               |               |                 |
| 1. Physical                  | 25.98             | 2.810         | 66.05        | 26.06                 | 3.171         | 69.81        | 27                | 2.286         | 90.64         | 11.188        | <.001           |
| 2. Social/family             | 17.08             | 3.827         | 43.07        | 21.66                 | 6.330         | 80.69        | 23.62             | 4.304         | 102.74        | 48.880        | <.001           |
| 3. Emotional                 | 20.46             | 2.794         | 51.00        | 21.34                 | 2.564         | 69.79        | 22.86             | 1.750         | 105.71        | 42.990        | <.001           |
| 4. Functional                | 17.66             | 3.217         | 45.08        | 21.18                 | 3.062         | 80.69        | 23.64             | 4.848         | 100.73        | 44.933        | <.001           |
| 5. Additional concerns       | 43.56             | 5.092         | 53.52        | 46.94                 | 4.012         | 85.11        | 47.48             | 4.122         | 87.87         | 19.443        | <.001           |
| <b>Overall QOL</b>           | <b>124.74</b>     | <b>10.864</b> | <b>41.13</b> | <b>137.18</b>         | <b>12.551</b> | <b>80.44</b> | <b>144.60</b>     | <b>10.988</b> | <b>104.93</b> | <b>75.932</b> | <b>&lt;.001</b> |

The Dunn–Bonferroni post hoc tests revealed significant differences across time groups of cervical cancer survivors. Symptom distress was significantly higher in the 0–1 year group compared with the >1–5 year group ( $p = .004$ ), and both early groups reported greater distress than the >5 year group ( $p < .001$ ). For anxiety, survivors in the >5 year group had markedly higher scores than both the 0–1 year and >1–5 year groups ( $p < .001$ ). The >1–5 year group also reported significantly lower

anxiety than the 0–1 year group ( $p = .010$ ). Depression was lowest in the >1–5 year group, which differed significantly from both the 0–1 year group ( $p < .001$ ) and the >5 year group ( $p < .001$ ). However, the difference between the 0–1 year and >5 year groups was not statistically significant ( $p = .392$ ).

In terms of QOL, physical well-being improved significantly in the >5 year group compared with both earlier groups ( $p = .006$  and

*A Comparative Study of Symptom Distress, Anxiety, Depression, And Quality of Life in Women with Cervical Cancer  
from the Completion of Radiotherapy Combined with Chemotherapy to over 5 Years of Survivorship*

p = .026). Social/family well-being showed progressive improvement, with significant differences across all three comparisons (p < .001 for early vs. later groups; p = .032 for >1–5 vs. >5 years). Emotional well-being was significantly higher in the >5 year group compared with both earlier groups (p < .001), while the difference between 0–1 and >1–5 years was not significant (p = .080). Functional well-being improved significantly between the 0–1 year group and both later groups (p < .001),

though the difference between >1–5 and >5 years was marginal (p = .052). For additional concerns, significant improvements were observed between the 0–1 year group and both later groups (p = .001 and p < .001), but no difference was found between the >1–5 and >5 year groups (p = 1.00). Finally, overall QOL improved steadily over time, with significant differences between the 0–1 year group and both later groups (p < .001), and between the >1–5 and >5 year groups (p = .014). (Table 2)

**Table 2** Pairwise comparisons of symptom distress, anxiety, depression, and quality of life among cervical cancer survivors following completion of concurrent chemoradiation therapy using Dunn–Bonferroni

| Variables               | Pairwise Comparison  | Test Statistic | Adjusted p-value |
|-------------------------|----------------------|----------------|------------------|
| <b>Symptom Distress</b> | > 5 vs. > 1–5 years  | 45.62          | <.001            |
|                         | > 5 vs. 0–1 year     | 73.27          | <.001            |
|                         | 0–1 vs. > 1–5 years  | 27.65          | .004             |
| <b>Anxiety</b>          | >1–5 vs. 0–1 year    | 25.26          | .010             |
|                         | >1–5 vs. >5 years    | –59.67         | < .001           |
|                         | 0–1 vs. >5 years     | –34.00         | < .001           |
| <b>Depression</b>       | >1–5 vs. 0–1 year    | 37.08          | < .001           |
|                         | >1–5 vs. >5 years    | –49.86         | < .001           |
|                         | 0–1 vs. >5 years     | –12.78         | .392             |
| <b>Quality of Life</b>  | <b>Physical</b>      |                |                  |
|                         | 0–1 vs. >1–5 years   | –3.76          | 1.00             |
|                         | 0–1 vs. >5 years     | –24.59         | .006             |
|                         | >1–5 vs. >5 years    | –20.83         | .026             |
|                         | <b>Social/Family</b> |                |                  |
|                         | 0–1 vs. >1–5 years   | –37.62         | < .001           |
|                         | 0–1 vs. >5 years     | –59.67         | < .001           |
|                         | >1–5 vs. >5 years    | –22.05         | .032             |
|                         | <b>Emotional</b>     |                |                  |
|                         | 0–1 vs. >1–5 years   | –18.79         | .080             |
|                         | 0–1 vs. >5 years     | –54.71         | < .001           |
|                         | >1–5 vs. >5 years    | –35.92         | < .001           |
|                         | <b>Functional</b>    |                |                  |
|                         | 0–1 vs. >1–5 years   | –35.61         | < .001           |
|                         | 0–1 vs. >5 years     | –55.65         | < .001           |
|                         | >1–5 vs. >5 years    | –20.04         | .052             |

**Table 2** Pairwise comparisons of symptom distress, anxiety, depression, and quality of life among cervical cancer survivors following completion of concurrent chemoradiation therapy using Dunn–Bonferroni (Cont.)

| Variables                  | Pairwise Comparison | Test Statistic | Adjusted p-value |
|----------------------------|---------------------|----------------|------------------|
| <b>Additional Concerns</b> |                     |                |                  |
|                            | 0–1 vs. >1–5 years  | –31.59         | .001             |
|                            | 0–1 vs. >5 years    | –34.35         | < .001           |
|                            | >1–5 vs. >5 years   | –2.76          | 1.00             |
| <b>Overall QOL</b>         |                     |                |                  |
|                            | 0–1 vs. >1–5 years  | –39.31         | < .001           |
|                            | 0–1 vs. >5 years    | –63.80         | < .001           |
|                            | >1–5 vs. >5 years   | –24.49         | .014             |

## Discussion

### Symptom Distress

Results reveals a profound truth about human recovery: the journey from patient to survivor follows predictable patterns that demand our attention, understanding, and clinical response. By examining symptom perception and distress across three critical timeframes: early (0–1 year), intermediate (1–5 years), and long-term (>5 years) survivorship, we have uncovered both the promise and complexity of life after cervical cancer.

### Early Survivorship

The first-year post-treatment emerges as a period of intense symptom burden, dominated by fatigue, anxiety, sleep disruption, appetite loss, dizziness, weight fluctuations, and constipation. These findings resonate powerfully with Rahman et al.'s<sup>10</sup> observations of similar symptom clusters within three months post-treatment, validating the universality of early survivorship challenges. The convergence with Juabmee et al.'s<sup>11</sup> identification of anxiety and sleep difficulties as prominent early concerns reinforces that this initial phase represents a predictable and therefore targetable period of heightened vulnerability.

### Intermediate Survivorship

The 1–5-year interval reveals a more complex picture: while overall symptom burden decreases, certain challenges remain remarkably persistent. Fatigue, anxiety, sexual dysfunction, sleep disturbances, and peripheral neuropathy continue to shape the survivor experience. These findings align closely with Li et al.'s<sup>17</sup> documentation of enduring physical and psychosocial issues, particularly the troubling persistence of neuropathy that impairs balance and compromises daily activities like stair climbing or cycling. This phase represents not recovery but adaptation, as survivors learn to live with altered capacities while rebuilding their lives.

### Long-Term Survivorship

Beyond five years, a fascinating paradox emerges: while most symptoms diminish, certain challenges prove stubbornly persistent, and some particularly psychological ones may intensify. The constellation of fatigue, neuropathy, sleep difficulties, urinary discomfort, anxiety, sexual dysfunction, and altered self-perception that characterizes long-term survivors' echoes Sumdaengrit et al.'s<sup>15</sup> findings while challenging conventional assumptions about recovery trajectories. The persistence of these symptoms,

though often mild, carries profound implications. As Stuoelytè et al.<sup>8</sup> documented, long-term survivors continue struggling with emotional and social concerns, particularly fear of recurrence and social isolation that can emerge or intensify years after treatment completion. This suggests that survivorship is not a destination but an ongoing journey requiring sustained support and understanding.

Perhaps no symptom better exemplifies the complexity of survivorship than chronic fatigue, which emerges as a persistent companion across all timeframes. Steen et al.'s<sup>18</sup> documentation of 28% prevalence among long-term chemoradiation survivors, linked to menopausal status, reduced physical activity, anxiety, and depression, illuminates the multifactorial nature of this challenge. Similarly, Wang et al.'s<sup>19</sup> finding that 30–40% of platinum-based chemotherapy recipients experience long-lasting neuropathy underscores how treatment choices create enduring consequences that survivors must navigate for years. These findings demand a fundamental shift in how we conceptualize symptom management from acute intervention to chronic condition management, requiring sustained monitoring and individualized care strategies that evolve with the survivor's changing needs.

#### **Anxiety and depression**

The most striking finding of this study is perhaps the non-linear trajectory of psychological well-being, a pattern that challenges fundamental assumptions about recovery and demands urgent attention from the survivorship care community. Both anxiety and depression follow an unexpected U-shaped pattern: declining during the 1–5 year “honeymoon period” before resurging significantly beyond five years ( $p < .001$ ). This counterintuitive

finding aligns with Liu et al.'s<sup>12</sup> emphasis on the complex interplay between fear of recurrence and persistent physical symptoms, while extending their observations into previously unexplored long-term territory. Pfaendler et al.'s<sup>20</sup> documentation of high emotional distress in early survivorship, with apparent resolution by six months and near-normal functioning by two years, captures only part of this story. Our findings suggest that the apparent psychological recovery of the intermediate years may mask underlying vulnerabilities that emerge when survivors confront the long-term implications of their cancer experience.

The resurgence of psychological distress among veteran survivors likely reflects existential challenges that transcend the immediate medical consequences of cancer treatment. As survivors move beyond the intensive medical surveillance of early survivorship, they may confront profound questions about mortality, life meaning, and identity that were previously overshadowed by immediate survival concerns. This pattern suggests that emotional recovery not only lags behind physical recovery, but it may follow an entirely different trajectory that requires sustained, specialized support extending well beyond conventional follow-up periods. The clinical implications are profound: mental health services must be reconceptualized as a long-term survivorship need rather than an acute intervention.

#### **Quality of life in patients with cervical cancer after treatment**

The study demonstrated a consistent upward trend in overall and domain-specific quality of life across post-treatment intervals. These results are in line with previous research by Sumdaengrit et al.<sup>21</sup>

and Juabmee et al.,<sup>11</sup> who found significant improvements in quality of life, especially beyond six months to five years post-treatment, as treatment-related side effects waned and survivors adapted to post-treatment life. Liu et al.<sup>12</sup> further stressed the value of physical rehabilitation, psychological support, and social reintegration in enhancing survivorship outcomes. Quality of life was assessed across five key domains: 1) physical well-being: shows steady, modest improvement reflecting gradual adaptation to treatment residuals and growing confidence in physical capacity; 2) social/family well-being: demonstrates the most dramatic gains, suggesting that cancer experiences may ultimately strengthen rather than weaken interpersonal relationships a finding that challenges deficit-focused models of survivorship; 3) emotional well-being: improves gradually but consistently, though our psychological findings suggest this domain requires sustained attention throughout the survivorship journey; 4) functional well-being: shows significant improvement, reflecting survivors' remarkable capacity to reclaim independence and daily functioning despite persistent challenges; and 5) cervical cancer-specific concerns: While improving over time, these concerns remain elevated across all groups, indicating that disease-specific fears and impacts require specialized, long-term attention. While some survivors continued to experience fatigue, anxiety, insomnia, neuropathy, and sexual issues, these did not significantly impede daily life. Nonetheless, the persistence of emotional challenges like depression and fear of recurrence highlights the need for long-term supportive care and continuous clinical follow-up.

### **Clinical Implications: Revolutionizing Survivorship Care**

These findings demand a fundamental reconceptualization of survivorship care, one that abandons linear recovery models in favor of dynamic, stage-specific, and individually tailored approaches that honor both the challenges and triumphs of life after cervical cancer.

Our findings support a temporally stratified approach to survivorship care: Years 0–1: Intensive symptom management and psychological support during the acute recovery phase Years 1–5: Adaptation support focusing on rehabilitation and social reintegration during the “honeymoon period.” Beyond 5 Years: Renewed psychological attention and existential support during the vulnerable long-term phase

### **Study Limitations**

The sample was drawn exclusively from the National Cancer Institute, limiting the generalizability of the findings. To enhance external validity, future research should include participants from other hospitals with similar treatment contexts, thereby ensuring a more diverse and representative sample of cervical cancer survivors. An additional limitation is that the three groups compared in this study comprised different participants, thereby raising the possibility of individual differences influencing the results.

### **Recommendation**

These findings offer practical guidelines for nursing interventions. Nurses should conduct routine assessments of symptom perception, distress, anxiety, and depression at regular intervals post-treatment. Timely, individualized care can help

address evolving physical and psychological needs across the survivorship continuum. Engaging family members and caregivers in education about symptom monitoring and management will empower them to support patients effectively during recovery, thereby promoting faster adaptation and better quality of life.

This study supports the development of comprehensive symptom management frameworks and self-care assessment tools. Future research should evaluate diverse patient profiles to design tailored educational interventions and optimize long-term care for cervical cancer survivors. In addition, future studies should track the same group of cervical cancer survivors through multiple post-treatment stages (e.g., 0 – 1, 1 – 5, > 5 years) to capture longitudinal changes in symptoms and QOL with greater accuracy.

### Acknowledgment

This research exists because of the extraordinary generosity of 150 cervical cancer survivors who courageously shared their most intimate experiences of struggle, adaptation, and triumph during challenging periods of recovery, an act that serves the entire survivor community.

### Declaration Statements

**Conflict of interest:** The authors declare no conflict of interest

**Author Contribution:** Jaruwan Sihawong: Conceptualization, Methodology, Data curation, Writing original draft **Tiraporn Junda:** Conceptualization, Methodology, Data Curation, Supervision, Writing review and editing, Final Approval of the Manuscript, Corresponding author **Bualuang Sumdaengrit:**

Conceptualization, Methodology, Data Curation, Supervision, Writing Review and Editing, Final Approval of the Manuscript

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*A Comparative Study of Symptom Distress, Anxiety, Depression, And Quality of Life in Women with Cervical Cancer  
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