# Factors related to stigma among patients with cervical cancer having chemotherapy after surgery in China: A cross-sectional study

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## Abstract

**Background:** Stigma is a significant issue among patients with cervical cancer undergoing postoperative chemotherapy, yet the factors contributing to stigma are not well understood. While research has explored the relationships between self-efficacy, illness perception, self-esteem, social support, and stigma, fewer studies have focused on Chinese patients, and even fewer have specifically examined stigma within this population.

**Objective:** This study aimed to describe stigma and assess its association with self-efficacy, self-esteem, illness perception, and social support in postoperative chemotherapy patients diagnosed with cervical cancer.

**Methods:** A total of 132 participants were recruited from the gynecology department of Wenzhou Medical University's First Affiliated Hospital using a random sampling technique. Data were collected between December 2023 and April 2024 using validated instruments. Descriptive statistics and Spearman's rank correlation were used for data analysis.

**Results:** The average stigma score was 76.3 (SD = 10.84), indicating a high level of stigma. Self-efficacy, self-esteem, illness perception, and social support were negatively correlated with stigma ($r$ = -0.085, $r$ = -0.158, $r$ = -0.254, $r$ = -0.238, all $p$ <0.05).

**Conclusion:** All participants experienced significant stigma. The negative correlations found between stigma and self-efficacy, self-esteem, illness perception, and social support offer a theoretical basis for developing nursing interventions to reduce stigma in these patients.

## Keywords

## Background

Cervical cancer ranks as the fourth most prevalent cancer among women worldwide, following breast, colorectal, and lung cancer (Jain & Limaiem, 2023). Globally, the average age at diagnosis for cervical cancer is 53 years, with a range of 44 to 68 years. The average age of death from cervical cancer is 59 years, ranging from 45 to 76 years (Arbyn et al., 2020). It is projected that approximately 604,000 new cases of cervical cancer occur annually, resulting in an estimated 342,000 deaths due to this disease each year (Sung et al., 2021). In developing countries, cervical cancer is the second most common cancer in terms of both incidence and mortality rates (Abbas et al., 2020). In China, cervical cancer is the sixth most common cancer and the seventh leading cause of cancer-related fatalities among women, posing a significant threat to women's health (Abbas et al., 2020; Sung et al., 2021). Despite its high prevalence and mortality rates, cervical cancer can be prevented and treated if detected early (Kang et al., 2022).

Stigma is a complex issue involving many disciplines, such as nurses, physicians, sociologists, and psychologists, and is receiving increasing attention from researchers and caregivers. It has become an important issue in health care. The term 'stigma' was initially introduced by Goffman (1963). The stigma that patients face because of their illness affects their psychological suffering, resulting from society's unfavorable views. It illustrates how patients internalize and react to the negative attitudes and judgments they encounter due to their conditions, leading to discrimination. It also signifies the shame experienced by this population due to their own negative labels (Goffman, 1963).

This study focuses on stigma as a personal experience related to a health issue characterized by feelings of rejection, self-blame, and stigmatization. This can lead to the development of mental, physical, and social challenges (Cataldo et al., 2011; Major & O'Brien, 2005). Stigma represents one of the psychosocial obstacles encountered by cancer patients, lasting from the initial diagnosis through treatment and into the recovery (Hamann & Pujol, 2018). The level of stigmatization varies across cancer types and is

influenced by multiple factors. These variations are partially due to the distinct causes, treatments, and prognoses associated with each type of cancer (Else-Quest & Jackson, 2014).

Research indicates that cervical cancer is associated with stigma, which is often experienced by individuals diagnosed with the disease. It is a highly stigmatized condition frequently encountered by patients. In China, cervical cancer is recognized as a health issue linked to significant stigma (Lianhua & Xiaodan, 2019; Rong, 2015). Studies suggest that individuals with cervical cancer in China experience a relatively high level of stigma (Li et al., 2016; Min & ChunXia, 2017). This stigma exacerbates the adverse effects of the disease and creates unfavorable psychological and social conditions for patients. As a result, some individuals may avoid social interactions and, in severe cases, withdraw completely from social contact (Yuan et al., 2018).

Patients who experience stigma may engage in self-blame and self-criticism while also facing discrimination from others, which can significantly impact their psychological well-being. This creates a negative cycle that adversely affects treatment outcomes, physical health, mental well-being, and social functioning (Min & ChunXia, 2017; Ying & Juan, 2019). Radical cervical cancer surgery often results in the loss of the uterus, infertility, and sexual dysfunction in women of childbearing age. Additionally, chemotherapy can cause various adverse effects, including nausea, vomiting, changes in bowel movements, bowel obstructions, inflammation of the mucosa, fluctuations in body weight, and hormonal imbalances (Dahiya et al., 2016).

Considering the cultural context in China, the stigma surrounding cervical cancer significantly affects patients undergoing chemotherapy after surgery. Beyond psychological distress, stigma also influences social interactions, family relationships, and patients' perceptions of treatment. From a psychological perspective, stigma is rooted in negative stereotypes and misconceptions about the disease. In China, cancer is often closely associated with death, a deeply ingrained belief that leads patients with cervical cancer and their families to experience shame and fear when confronting the disease. Many patients may feel inferior or depressed, believing they "deserve" the stigma, which further exacerbates their emotional burden. Socially, the sense of shame contributes to rejection and discrimination against patients with cervical cancer. In Chinese society, the concept of "face" is crucial, and many fear losing social respect and recognition if labeled as a "cancer patient." Consequently, some individuals choose to conceal their illness, avoid interactions, and withdraw from social activities. This isolation not only increases feelings of loneliness but may also diminish their motivation for treatment and recovery. Within families, stigma can lead to tension and conflict. Patients may blame themselves and fear becoming a burden, while family members may experience anxiety and distress due to fear and a lack of understanding of the disease. If these negative emotions are not effectively communicated and managed, they can disrupt family harmony and negatively impact the patient's treatment environment and recovery process (Min & ChunXia, 2017; Ying & Juan, 2019).

The literature review highlights various factors associated with stigma in cancer patients, with self-efficacy, illness perception, self-esteem, and social support being the most significant. First, a study on Chinese nasopharyngeal cancer survivors found a significant negative relationship between stigma and self-efficacy (Yan et al., 2022). Specifically, higher morbidity stigma levels were associated with lower self-efficacy in patients. Similarly, a study examining the effect of a total care model on morbidity stigma and self-efficacy in patients after radical cervical cancer surgery reported that patients with cervical cancer experienced lower self-efficacy, with a notable negative correlation between morbidity stigma and self-efficacy (Lu et al., 2022).

Stigma in patients with cervical cancer is closely linked to their illness perception. Enhancing patients' understanding of the disease can help reduce feelings of stigma (Huang & Wei, 2021). Many patients hold misconceptions about cervical cancer, believing it is associated with risky sexual behavior. They often lack awareness of its incidence, treatment options, efficacy, and prognosis, making them more vulnerable to external and self-imposed discrimination, which increases their sense of stigma (Chen et al., 2018). A qualitative study in Karnataka, India, found that negative illness perceptions contribute to cervical cancer stigma, with misconceptions such as the belief that cervical cancer is contagious, a form of punishment, or an incurable disease (Nyblade et al., 2017). Similarly, a qualitative study from Brazil reported that women with cervical cancer were not only perceived as sick but were also labeled as dirty, lazy, and promiscuous, further reinforcing the stigma (Gregg, 2011).

Research also indicates a relationship between self-esteem and stigma in cancer patients. Patients with lower self-esteem tend to experience higher levels of stigma than those with higher self-esteem (Else-Quest et al., 2009; Liu et al., 2020; Pasmatzi et al., 2016). A study on factors related to stigma in cancer patients found that decreased self-esteem was associated with increased stigma (Huang & Wei, 2021). Since cervical cancer is linked to HPV infection, which is sexually transmitted, patients may feel stigmatized due to the disease's association with sexual activity. Additionally, radical cervical cancer surgery often involves the removal of reproductive organs, leading to a loss of femininity and reproductive function. This can result in feelings of discrimination and contribute to low self-esteem (Li et al., 2016; Li & Liu, 2019). A cross-sectional study on lung cancer patients also found a significant negative relationship between self-esteem and stigma (Liu et al., 2020).

Furthermore, studies have highlighted a link between social support and stigma among cancer patients (Hofman et al., 2021; Xiang-xiang et al., 2022). A study on lung cancer patients found that individuals experiencing higher levels of stigma received less social support compared to those with lower stigma levels (Johnson et al., 2019). Similarly, research on cancer-related stigma in Japan reported a significant relationship between social support and stigma (Fujisawa et al., 2020). Additionally, a study in Korea found that among various factors, social support had the strongest association with cancer stigma (Shrestha et al., 2020).

Although there is evidence of the relationships between self-efficacy, illness perception, self-esteem, social support, and stigma, fewer studies have been conducted on Chinese patients, and even fewer have specifically examined stigma in this population. To address this gap, the present study

explores stigma and its selected predictors—self-efficacy, illness perception, self-esteem, and social support—among patients with cervical cancer undergoing chemotherapy. This study aims to provide a deeper understanding of the factors influencing stigma in this patient population, offering a scientific foundation for comprehensive interventions and improved clinical care practices. Additionally, the findings will help Chinese caregivers better understand and address stigma in patients with cervical cancer.

## Conceptual Framework

The theoretical foundation of this study is based on the identity-threat model of stigma proposed by Major and O'Brien (2005), along with an extensive review of the literature. This framework suggests that individuals with a devalued and widely recognized stigmatized social identity are more likely to encounter situations that may be stressful or threatening to their identity. These situations impact their well-being and are influenced by collective representations, immediate situational cues, and personal characteristics. Stigma is shaped by both individual and external factors. In this model, individual factors include collective representations and personal characteristics, while external factors relate to situational cues.

According to Crocker et al. (1998), collective representations encompass an awareness that individuals are not held in high regard by others, an understanding of cultural stereotypes associated with their stigmatized identities, and a recognition that they may face discrimination. The way individuals encounter and internalize stigma varies depending on situational factors, particularly when their condition challenges their sense of identity.

Cancer patients may experience discrimination when returning to work. When seeking support from healthcare providers, a discrepancy between their expectations and the support they receive can lead to feelings of stigma. The burden on caregivers may contribute to the internalization of stigma. Patients may also face stigma from their cultural or social communities (Knapp et al., 2014). These various situational cues influence how patients perceive social support.

Personal characteristics also play a crucial role in stigma perception. Individuals who expect to be judged based on their group affiliation or who are sensitive to rejection due to their group membership tend to be more vigilant toward stigma-related threats. Consequently, they are more likely to perceive stigma-relevant situations as threatening. Those who consider their stigmatized social identity a core aspect of their self-concept are particularly prone to viewing themselves as targets of both individual and group discrimination. Individuals with strong identification in a negatively stereotyped group are more likely to interpret performance feedback as personally relevant, increasing their susceptibility to identity threats. Additionally, personal goals and motivations significantly influence how individuals perceive and appraise stigma-related situations (Major & O'Brien, 2005).

In this study, patients with cervical cancer undergoing chemotherapy after hysterectomy may experience varying degrees of stigma. This stigma may be influenced by collective representations (illness perception), situational cues (social support), and personal characteristics (self-efficacy and self-esteem), as outlined in the identity-threat model of stigma. The relationships among these variables are depicted in **Figure 1**.
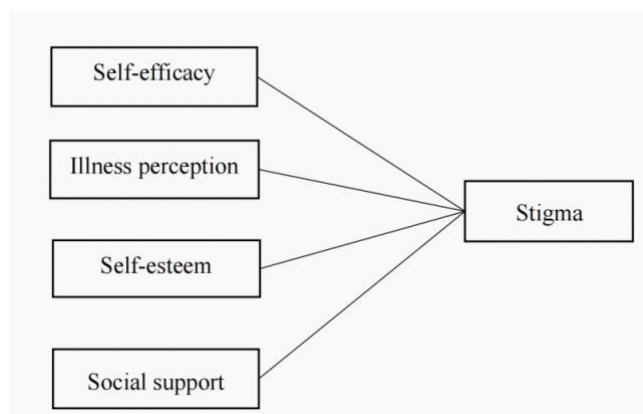


**Figure 1** Conceptual framework

# Methods

## Study Design

This study employed a cross-sectional design.

## Samples/Participants

Participants were recruited from postoperative patients with cervical cancer undergoing chemotherapy who were hospitalized in the gynecology ward of the First Affiliated Hospital of Wenzhou Medical University. The inclusion criteria were as follows: adult patients aged 18 to 60 years, those who had undergone a hysterectomy for cervical cancer, those who had received at least one cycle of chemotherapy, and those able to read and write in Chinese and comprehensively answer the questions. Patients were excluded if they had a history of psychiatric disorders, as recorded in their medical history, or if they had recurrent or metastatic cancer.

The sample size was calculated using G*Power 3.1.9.7 (Faul et al., 2009). The study used the bivariate normal correlation model as the statistical test to examine the relationship between stigma and selected factors. A significance level of 0.05 and a statistical power of 0.80 were set. Based on the literature review, the effect size was found to range between 0.22 and 0.28 (Peterson & Foley, 2021; Serdar et al., 2021), leading to the selection of a moderate effect size of 0.25. The calculated sample size was 120, with an additional 10% added to account for non-completion (Faul et al., 2009), resulting in a final sample size of 132.

## Instruments

Data were collected using the Demographic Questionnaire, Social Impact Scale (SIS), General Self-Efficacy Scale (GSES), Brief Illness Perception Questionnaire (BIPQ), Rosenberg Self-Esteem Scale (RSES), and Multidimensional Scale of Perceived Social Support (MSPSS). All questionnaires used were authorized by the original authors/copyright owners.

***Demographic Form:*** To collect data on participants' age, gender, marital status, educational background, employment status, body mass index (BMI), primary tumor location, cancer stage, total chemotherapy dosage, and existing comorbidities.

***Social Impact Scale (SIS):*** To assess stigma among patients who received chemotherapy following radical cervical cancer surgery. The SIS was initially developed by Fife and Wright (2000) to measure stigma in individuals with cancer, HIV infection, or AIDS. Later, it was translated into Chinese by

Pan et al. (2007), and the Chinese version of the SIS has been validated, demonstrating acceptable psychometric properties for assessing stigma in Chinese cancer patients. This version is widely used in China to evaluate stigma among patients with cervical cancer (Yu et al., 2021). In this study, the Cronbach's alpha reliability coefficient for the SIS was 0.900. The SIS consists of four dimensions: social exclusion, economic insecurity, internalized shame, and social isolation, with a total of 24 items. Social exclusion is measured by nine items, which assess the discrimination patients experience in social life and work, including feelings of embarrassment, disrespect, dissatisfaction, and rejection. The possible score for this dimension ranges from 9 to 36. Economic insecurity, measured by three items, evaluates patients' experiences of economic discrimination related to employment instability and inadequate income. The possible score for economic insecurity ranges from 3 to 12. Internalized shame, consisting of five items, assesses patients' internalized feelings of isolation, self-blame, and concerns about disease exposure due to economic discrimination and social exclusion. The possible score for internalized shame ranges from 5 to 20. Social isolation, measured by seven items, evaluates patients' experiences of loneliness and their sense of helplessness, with the possible score for this dimension ranging from 7 to 28 (Pan et al., 2007).

The total score for the SIS ranges from 24 to 96, with higher scores indicating a stronger sense of stigma. The stigma can be categorized into three levels. A mild level of stigma (24-48) is characterized by patients hiding or minimizing their illness, avoiding social interactions to prevent discrimination, or selectively sharing their condition with others. A moderate level of stigma (48-72) indicates more severe stigma, where patients may feel low self-esteem, shame, embarrassment, self-blame, or guilt and actively avoid situations that may reveal their illness. A significant level of stigma (72-96) can severely impact an individual's quality of life and psychological well-being, potentially leading to greater social withdrawal and isolation (Li et al., 2016; Yu et al., 2021).

***General Self-Efficacy Scale (GSES)***, developed by Schwarzer and Jerusalem (1995), was used to assess general self-efficacy based on Bandura's self-efficacy theory. It has been translated into over 25 languages and is widely utilized. The Chinese version, revised by Zhang in 1995 (Zhang & Schwarzer, 1995), has demonstrated strong reliability and validity (Clavijo et al., 2020; Furukawa et al., 1993; Monticone et al., 2009). The scale consists of 10 items rated on a 4-point Likert scale, with total scores ranging from 10 to 40. Higher scores indicate greater self-efficacy. The Cronbach's alpha coefficient for this study was 0.895.

***Rosenberg Self-Esteem Scale (RSES)***, developed by Rosenberg (1965), is a highly reliable, simple, and convenient tool, making it the most widely used instrument for assessing self-esteem. The Chinese version of the RSES has demonstrated a Cronbach's alpha reliability coefficient of 0.84 (Shuang & Xiangkui, 2018). In a study on the quality of life among liver cancer patients, Cronbach's alpha for the RSES was reported to exceed 0.77 (Zheng & Pan, 2021). The scale consists of 10 items, each rated on a 4-point Likert scale, with responses ranging from 1 (strongly agree) to 4 (strongly disagree). The total score can range from 10 to 40, with higher

scores indicating greater self-esteem. The RSES yielded a Cronbach's alpha coefficient of 0.883 in this study.

***Brief Illness Perception Questionnaire (BIPQ)***, developed by Broadbent et al. (2006), is used to assess illness perceptions, focusing on how patients with various health conditions perceive their own illnesses. The Chinese version of the BIPQ demonstrated a Cronbach's alpha reliability coefficient of 0.77, indicating satisfactory internal consistency. Additionally, the split-half reliability was reported as 0.81, further supporting the Chinese version's strong internal consistency (Yaqi et al., 2015). The BIPQ includes items such as affect, duration, personal control, therapeutic control, symptom recognition, concern, understanding, emotional response, and etiology. These items are rated on an 11-point scale, ranging from 0 to 10, where higher scores represent stronger feelings and more intense cognitive beliefs about the symptoms and phenomena addressed in the questions. Items 3, 4, and 7 are reverse-scored, and the total score is calculated by summing the scores of the eight items. Higher scores reflect a greater perception of the disease's threat (Broadbent et al., 2006). The questionnaire is straightforward, clear, easy to understand, and suitable for conducting rapid surveys with large groups. It has been available in multiple languages, including a Chinese version (Zhang et al., 2017). In this study, the Cronbach's alpha reliability coefficient for the scale was 0.896.

***Multidimensional Scale of Perceived Social Support (MSPSS)***, developed by Zimet et al. (1988), is one of the most widely used tools for assessing social support in recent years. It consists of 12 items designed to evaluate the social support that patients receive from their family, friends, and significant others. This scale has been used extensively both in China and internationally. In a review by Dambi et al. (2018), 22 translations in various languages, including Arabic, Lebanese, French, and Korean, were identified across 70 studies, demonstrating its broad applicability. The translated versions have proven useful for assessing social support (Yang & Han, 2021). The Chinese version of the MSPSS, back-translated by Chou (2000), showed a Cronbach's alpha coefficient of 0.877, with a split-half reliability of 0.778, indicating good reliability. Additionally, the test-retest reliability was 0.735, demonstrating its stability over time (Li et al., 2022). The MSPSS includes three subscales: family support (items 3, 4, 8, and 11), friend support (items 6, 7, 9, and 12), and support from significant others (items 1, 2, 5, and 10). Patients rate each item on a 7-point Likert scale, where 1 means "strongly disagree" and 7 means "strongly agree." The total score for perceived social support ranges from 12 to 84, with higher scores reflecting greater social support (Dahlem et al., 1991). In this study, the Cronbach's alpha coefficient for the scale was 0.859.

## Data Collection

This study was conducted at the First Affiliated Hospital of Wenzhou Medical University, following the Institutional Review Board (IRB) approval. Participants were randomly selected using a random sampling method without replacement. Each day, the researcher assigned numbers to the eligible patients using Excel and randomly selected 50% for inclusion. The researcher explained the study's purpose, human subject protections, and data collection procedures to the patients.

Informed written consent was obtained before data collection. Participants were given sufficient time to complete the questionnaires in a private setting. Those who preferred digital participation were provided with a QR code to access the survey via WeChat. Patients without mobile phones or those unwilling to use WeChat completed the questionnaires in person. All responses were securely stored.

**Data Analysis**

A *p*-value of less than 0.05 was considered statistically significant. The data analysis proceeded as follows: Descriptive statistics, including frequency, percentage, range, mean, and standard deviation, were used to summarize demographic data, stigma, self-efficacy, illness perception, self-esteem, and social support. Normality, homoscedasticity, and outliers were examined to validate assumptions for Pearson's correlation analysis. Since stigma exhibited a non-normal distribution, Spearman's rank correlation coefficient was employed to explore relationships between stigma and self-efficacy, illness perception, self-esteem, and social support.

The strength of correlations was interpreted based on the guidelines provided by Grove et al. (2012): a correlation of 0.00 to 0.30 indicated a weak relationship, 0.31 to 0.50 represented a moderate relationship, and values above 0.50 suggested a strong relationship.

**Ethical Considerations**

The study protocol was approved by the Ethics Committee of Burapha University, Thailand (G-HS084/2566), and the First Affiliated Hospital of Wenzhou Medical University, China (2023) No. (230). Participants were informed about the study's aims, potential benefits and risks, their rights, data confidentiality, and their right to withdraw without consequences. Informed consent was obtained before participation.

# Results

**Demographic Characteristics and Health Information**

The participants' ages ranged from 18 to 60 years, with a mean age of 47.7 years (SD = 7.68). Among the age groups, those aged 40-49 comprised the largest portion, accounting for 50% of the total participants, followed by those aged 50-60, who made up 43.2%. Three younger patients chose radical cervical cancer surgery because they were married and had children, and they felt they no longer had a future need for more children. These patients voluntarily requested a hysterectomy due to concerns about cancer recurrence, either personally or within their families.

Regarding marital status, the majority of participants were married, making up 79.5%. Regarding education, most participants had completed middle or high school, representing 47% and 43.2%, respectively. The majority of participants (82.6%) reported having no religious beliefs. In terms of employment, 78% of participants were employed, while 22% were unemployed (**Table 1**).

**Table 1** Characteristics of the participants (*N* = 132)

| Characteristics | Number (n) | Percentage (%) |
|---|---|---|
| **Age (years)** | | |
| 18-29 | 3 | 2.3 |
| 30-39 | 6 | 4.5 |
| 40-49 | 66 | 50 |
| 50-60 | 57 | 43.2 |
| (Mean = 47.7; SD = 7.68; Min = 21; Max = 60) | | |
| **Marital status** | | |
| Single | 2 | 1.5 |
| Married | 105 | 79.5 |
| Divorced | 22 | 16.7 |
| Widowed | 3 | 2.3 |
| **Education level** | | |
| Primary School | 4 | 3 |
| Middle School | 62 | 47 |
| High School | 57 | 43.2 |
| University or above | 9 | 6.8 |
| **Religious belief** | | |
| Yes | 23 | 17.4 |
| No | 109 | 82.6 |
| **Employment status** | | |
| Employment | 103 | 78 |
| Unemployment | 29 | 22 |

All participants had cervical cancer as their primary tumor site, and the majority were diagnosed with tumor stages IIa and IIb. According to the World Health Organization [WHO] (2004) classification of body mass index (BMI), 72.7% of participants had normal BMI levels (18.5-24.9). In terms of chemotherapy cycles, most participants underwent 3 to 5 cycles. Regarding comorbid diseases, 77.3% of participants had no comorbid conditions, while 22.7% had one or more comorbidities. Among those with comorbidities, hypertension and diabetes mellitus were the most common, affecting 8.3% and 6.8% of participants, respectively (**Table 2**).

Table 2 Characteristics of health information of the participants (*N* = 132)

| Health information | *n* | % |
|---|---|---|
| **Primary tumor site** | | |
| Cervix | 132 | 100 |
| **Tumor stages** | | |
| Ib | 3 | 2.3 |
| IIa | 53 | 40.1 |
| IIb | 59 | 44.7 |
| IIIa | 17 | 12.9 |
| **Body mass index (BMI)** | | |
| <18.5 (Underweight) | 26 | 19.7 |
| 18.5-24.9 (Normal weight) | 96 | 72.7 |
| 25-29.9 (Overweight) | 8 | 6.1 |
| ≥30 (Obesity) | 2 | 1.5 |
| (Mean = 22; SD = 2.97; Min = 14.85; Max = 31.51) | | |
| **Cumulative dose of chemotherapy (mg/m2)** | | |
| (Mean = 1645.22; SD = 641.02; Min = 749.43; Max = 3542.99) | | |
| **Chemotherapy cycle** | | |
| 3 | 35 | 26.5 |
| 4 | 50 | 37.9 |
| 5 | 41 | 31.1 |
| 6 | 5 | 3.8 |
| 7 | 1 | 0.7 |
| **Comorbid diseases** | | |
| No | 102 | 77.3 |
| Yes | 30 | 22.7 |
| High blood pressure | 11 | 8.3 |
| Diabetes | 9 | 6.8 |
| Cholecystitis | 1 | 0.8 |
| Pelvic inflammation | 1 | 0.8 |
| Gout | 2 | 1.5 |
| Fibroid tumor of the uterus | 6 | 4.5 |

**Description of Stigma in Participants**

The results revealed that the mean stigma score was 76.3 (SD = 10.84), indicating a high level of stigma among participants. The majority (74.2%) reported experiencing a high level of stigma, 21.2% reported a moderate level, and 4.5% experienced a mild level (**Table 3**). Regarding the dimensions of stigma, the mean score for social exclusion was 27.48 (SD = 3.82); for internalized shame, it was 17.00 (SD = 2.46); for economic insecurity, it was 9.78 (SD = 2.60); and for social isolation, it was 22.05 (SD = 3.79). Higher scores reflect a stronger sense of stigma. These relatively high scores across all dimensions suggest that participants experienced significant levels of social exclusion, internalized shame, economic insecurity, and social isolation, all of which are negative experiences, as detailed in **Table 4**.

Table 3 Frequency, percentage, mean, and standard deviation of stigma (*N* = 132)

| Level of stigma | Possible score | Actual score | *n* | % |
|---|---|---|---|---|
| Mild | 24-48 | 43-47 | 6 | 4.55 |
| Moderate | 48-72 | 49-71 | 28 | 21.21 |
| High | 72-96 | 73-94 | 98 | 74.24 |
| (Mean = 76.3; SD = 10.84; Min = 43; Max = 94) | | | | |

Table 4 Range, mean, and standard deviation of stigma in each dimension (*N* = 132)

| Dimension | Range | | Mean | SD |
|---|---|---|---|---|
| | Possible score | Actual score | | |
| Social exclusion | 9-36 | 15-34 | 27.48 | 3.82 |
| Internalized shame | 5-20 | 10-20 | 17.00 | 2.46 |
| Economic insecurity | 3-12 | 3-12 | 9.78 | 2.60 |
| Social isolation | 7-28 | 12-28 | 22.05 | 3.79 |

**Description of Factors Related to Stigma in Participants**

The factors related to stigma in participants were assessed using several scales. For General Self-Efficacy, the possible scores ranged from 10 to 40, with actual scores ranging from 10 to 38, and the mean score was 18.73 (SD = 7.78). For self-esteem, the possible scores ranged from 10 to 40, with actual scores between 10 and 37, and the mean score was 16.69 (SD = 5.92). Regarding the Brief Illness Perception, the scoring range was from 0 to 80, with actual scores ranging from 16 to 76, and the mean score was 50.45 (SD = 16.00). For social support, the possible scores ranged from 12 to 84, with actual scores ranging from 12 to 66, and the mean score was 31.46 (SD = 16.72). Specifically, the possible score range for family support was 4 to 28, with actual scores ranging from

3 to 24, and the mean score was 11.16 (SD = 6.32). For friend support, the possible score range was 4 to 28, with actual scores ranging from 3 to 22, and the mean score was 9.98 (SD = 4.98). Lastly, for support from other factors, the possible score range was 4 to 28, with actual scores ranging from 4 to 22, and the mean score was 10.32 (SD = 5.92) (**Table 5**).

**Table 5** Range, mean, standard deviation of stigma's related factors (*N* = 132)

| Variables | Range | | Mean | SD |
|---|---|---|---|---|
| | Possible score | Actual score | | |
| Self-efficacy | 10-40 | 10-38 | 18.73 | 7.78 |
| Self-esteem | 10-40 | 10-37 | 16.69 | 5.92 |
| Illness perception | 0-80 | 16-76 | 50.45 | 16 |
| Social support | 12-84 | 12-66 | 31.46 | 16.72 |
| Family | 4-28 | 3-22 | 11.16 | 6.32 |
| Friends | 4-28 | 3-22 | 9.98 | 4.98 |
| Significant other | 4-28 | 4-22 | 10.32 | 5.92 |

**Relationships between Self Efficacy, Self-Esteem, Illness Perception, Social Support, and Stigma**

The results indicated that self-efficacy, self-esteem, illness perception, and social support were negatively associated with stigma, with correlation coefficients of $r$ = -0.085, $r$ = -0.158, $r$ = -0.254, and $r$ = -0.238, respectively. These relationships were statistically significant, with *p*-values less than 0.05 (**Table 6**).

**Table 6** Relationships between self-efficacy, self-esteem, illness perception, social support, and stigma (*N* = 132)

| Variables | Correlation coefficient (*r*) |
|---|---|
| Self-efficacy | -0.085* |
| Self-esteem | -0.158* |
| Illness perception | -0.254** |
| Social support | -0.238** |

*Note:* * *p* <0.05, ** *p* <0.01

## Discussion

### Summary of the Findings

The study's results showed that all participants reported stigma, with a high mean stigma score of 76.3 (SD = 10.84), indicating a high level of stigma. This finding aligns with studies by Chen et al. (2022) and Min and ChunXia (2017), who also found high stigma scores in patients with cervical cancer after surgery.

Participants' age distribution revealed that 50% were aged 40-49 years, with 43.2% aged 50-60 years, aligning with the typical age range for cervical cancer diagnosis (Arbyn et al., 2020). Younger patients tend to experience greater stigma due to concerns about fertility loss and social role expectations (Chen et al., 2018; Li et al., 2016; Liu et al., 2021; Min & ChunXia, 2017). Additionally, 79.5% of participants were married, and marital status influenced stigma levels, with concerns about reproductive function and sexual relationships commonly reported (Yu et al., 2021). The study also found that patients with lower education levels experienced higher perceived stigma, possibly due to better adaptive coping skills and greater disease awareness in those with higher education (Min & ChunXia, 2017; Yu et al., 2021). Moreover, 17.4% of participants had religious beliefs, which could help mitigate stigma by fostering confidence and coping with the disease (Yildirim et al., 2021). Employment status also influenced stigma, as employed individuals, particularly those seeking to reintegrate into social environments, were more sensitive to stigma-related experiences (Chen et al., 2018; Lianhua & Xiaodan, 2019).

The study revealed a significant negative correlation between self-efficacy, self-esteem, illness perception, social support, and stigma. According to the identity-threat model of stigma (Major & O'Brien, 2005), this model suggests that having a devalued social identity (stigma) increases exposure to identity-threatening situations. Stigma is influenced by both individual and external factors. Individual factors include personal characteristics and collective representations, while external factors are situational cues. In this study, self-efficacy and self-esteem represent personal characteristics, illness perception represents collective representations, and social support represents situational cues.

Consistent with the study's hypothesis, self-efficacy was found to be negatively correlated with stigma. This result aligns with previous studies showing that self-efficacy is negatively correlated with stigma among cancer patients (Liu et al., 2020; Lu et al., 2022; Tang et al., 2023; Yan et al., 2022). The correlation between stigma and self-efficacy was r = -0.085. The identity-threat model of stigma provides an explanation for the relationship between self-efficacy and stigma. Stigma can be viewed as an identity threat, and self-efficacy, as a personal characteristic, is related to the degree of stigma experienced. Participants with lower self-efficacy are more likely to report higher levels of stigma (Lu et al., 2022; Tang et al., 2023; Yan et al., 2022). In this study, participants exhibited low self-efficacy. One possible reason could be the participants' education level and chemotherapy-related factors. Most participants completed only middle or high school education, with only a small portion receiving higher education. Higher education has been shown to positively impact self-efficacy.

Additionally, chemotherapy often involves adverse effects like fatigue, vomiting, pain, and immune system suppression. These physical discomforts may decrease individuals' confidence in their ability to perform daily activities and cope with challenges. Chemotherapy can also contribute to mental health issues, such as anxiety and depression, which significantly affect self-efficacy. In poor psychological states,

individuals are more likely to feel helpless and lose confidence. All of these factors can contribute to a perceived low self-efficacy. Patients with cervical cancer, affected by the dual stress of illness and surgery, often have lower confidence in their treatment and are more dependent on healthcare professionals for care. This lack of self-determination further reduces self-efficacy (Zheng & Pan, 2021). Low self-efficacy can lead to behavioral changes that result in negative emotions and perceptions, ultimately increasing feelings of stigma (Li et al., 2016).

Self-esteem is negatively associated with stigma among patients with cervical cancer undergoing chemotherapy after surgery in Wenzhou, China. This finding aligns with previous research indicating that patients with low self-esteem report stronger stigma compared to those with high self-esteem (Huang et al., 2021; Pasmatzi et al., 2016). According to the identity-threat model of stigma, self-esteem as a personal characteristic is linked to identity threat (stigma). In this study, the mean self-esteem score was 16.69 (SD = 5.92), indicating participants had low self-esteem. The stigma level was negatively correlated with self-esteem. A possible explanation for low self-esteem in these patients may be age-related. Most participants were aged 40-49, and some had not yet reached menopause. Radical cervical cancer surgery, which involves the removal of the uterus, may significantly impact self-esteem. Additionally, many participants were married and still had sexual needs, which were affected by the disease and treatment. Chemotherapy also contributes to adverse psychological effects, leading to lower self-esteem. The association of cervical cancer with human papillomavirus infection, a sexually transmitted disease, and the loss of femininity and reproductive function due to surgery may lead to feelings of discrimination and lower self-esteem (Chen et al., 2022; Yu et al., 2021).

According to the identity-threat model, illness perception as a collective representation is associated with identity threat. In this study, the mean illness perception score was 50.45 (SD = 16), which is relatively high. Based on this score, illness perception should theoretically be positively correlated with stigma. However, the results of this study showed a negative correlation between stigma and illness perception, which contradicts previous findings. Possible reasons for this discrepancy may include the patients' health conditions, personal beliefs, values, or coping strategies. These factors might influence the relationship between illness perception and stigma. Furthermore, a reverse causal relationship between stigma and illness perception may exist. High illness perception scores could reflect poor illness perception, as some patients with cervical cancer may associate the disease with risky sexual behavior, lack knowledge about the disease, or misunderstand the treatment and prognosis, making them more vulnerable to stigma (Huang & Wei, 2021).

As hypothesized, social support was negatively correlated with stigma, consistent with previous research showing a negative relationship between social support and stigma (Coleman et al., 2024; Queenan et al., 2010; Shrestha et al., 2020). In the identity-threat model, social support, as a situational cue, is linked to identity threat (stigma). The mean social support score in this study was 31.46 (SD = 16.72), indicating a low level of perceived social support. Family support had a mean score of 11.16 (SD = 6.32), reflecting a

moderate level of support, while support from friends and others was low. Stigma was negatively correlated with social support. While families are the primary source of social support, not all families can provide adequate support. Many participants had jobs, and their illness and treatment affected their work and income, increasing the economic pressure on other family members. As a result, some patients may receive inadequate support due to work or life pressures, leading to low perceived social support. Additionally, due to social barriers and stigma, patients may avoid socializing with friends and participating in community activities, further decreasing social support. Patients with cervical cancer are often concerned about how family and others perceive them, leading to guilt and self-blame. Social support plays a significant role in the health and recovery of cancer patients (Li et al., 2016). Promoting positive social support could help reduce the stigma associated with cervical cancer (Chen et al., 2018).

**Implications for Nursing Practice**

This study highlights the significant relationship between stigma and factors such as self-efficacy, self-esteem, illness perception, and social support in patients with cervical cancer undergoing chemotherapy after surgery. Nurses should integrate psychosocial support into patient care plans to address the emotional and mental burdens of stigma. By providing counseling, referring patients to support groups, and regularly assessing mental well-being, nurses can help enhance self-esteem and foster a positive outlook, reducing stigma-related distress.

Self-efficacy is another area where nursing interventions can make a difference. Nurses should empower patients through education, skill-building, and self-care practices to help them feel more confident in managing their health. Educating patients on their condition, treatment options, and recovery process can alleviate misconceptions and reduce stigma by improving illness perception.

Given the role of social support in mitigating stigma, nurses should encourage family involvement and connect patients to external support networks like cancer support groups. Promoting open communication within families and offering guidance on emotional support can help reduce feelings of isolation. Nurses can also advocate for changes within healthcare settings to ensure a stigma-free environment, providing both physical care and emotional support.

Considering age and gender-specific challenges faced by patients, particularly those in middle adulthood, nurses should offer tailored care. Addressing concerns related to fertility loss, sexual health, and the psychological impact of treatment can help reduce stigma. Overall, by addressing stigma and its associated factors, nurses can significantly improve the quality of life, mental well-being, and recovery of patients with cervical cancer undergoing chemotherapy.

Furthermore, this study highlights the importance of incorporating stigma-related topics into nursing education. By emphasizing these issues, nursing educators can increase awareness among students and prepare future nurses to offer compassionate and effective care, addressing the emotional and psychological challenges faced by these particular patients.

## Limitations

This study has limitations, including limited generalizability due to its focus on a single hospital and an exclusively Chinese sample, which may not apply to other populations. Although the correlations between the selected factors and stigma were weak but statistically significant, future research with larger sample sizes and additional factors is needed to further explore these relationships. The study focused on self-efficacy, illness perception, self-esteem, social support, and stigma, and future research could explore causality or predictive studies, as well as examine other factors related to stigma using the identity threat model. Intervention studies are also recommended to develop nursing strategies to enhance self-efficacy and self-esteem, modify illness perception, and strengthen social support to reduce stigma.

# Conclusion

This study applied the identity-threat model of stigma to explore the factors associated with stigma in patients with cervical cancer undergoing chemotherapy after surgery. The findings revealed that all examined factors, including self-efficacy, illness perception, self-esteem, and social support, were negatively correlated with stigma. This study's findings offer a valuable framework for developing continuous care strategies to reduce stigma among these patients. The challenge of studying stigma in women who have undergone a hysterectomy lies in the complexity of the issue. By addressing stigma from multiple perspectives, nurses can foster a more compassionate and empathetic environment, ultimately alleviating the negative impact of stigma on patients' health and well-being.

## Declaration of Conflicting Interest

There is no conflict of interest to declare.

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None.

## Authors' Contributions

All authors contributed to the study's conception and design, data acquisition, and data analysis, wrote the first draft of the manuscript, revised the final draft, and gave final approval of the version to be published.

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## Data Availability

Supporting data for this study are available from the corresponding author upon reasonable request.

## Declaration of Use of AI in Scientific Writing

There is nothing to declare.

## References

Abbas, K. M., van Zandvoort, K., Brisson, M., & Jit, M. (2020). Effects of updated demography, disability weights, and cervical cancer burden on estimates of human papillomavirus vaccination impact at the global, regional, and national levels: A PRIME modelling study. *The Lancet Global Health*, 8(4), e536-e544. https://doi.org/10.1016/S2214-109X(20)30022-X

Arbyn, M., Weiderpass, E., Bruni, L., de Sanjosé, S., Saraiya, M., Ferlay, J., & Bray, F. (2020). Estimates of incidence and mortality of cervical cancer in 2018: A worldwide analysis. *The Lancet Global Health*, 8(2), e191-e203. https://doi.org/10.1016/S2214-109X(19)30482-6

Broadbent, E., Petrie, K. J., Main, J., & Weinman, J. (2006). The brief illness perception questionnaire. *Journal of Psychosomatic Research*, 60(6), 631-637. https://doi.org/10.1016/j.jpsychores.2005.10.020

Cataldo, J. K., Slaughter, R., Jahan, T. M., Pongquan, V. L., & Hwang, W. J. (2011). Measuring stigma in people with lung cancer: Psychometric testing of the cataldo lung cancer stigma scale. *Oncology Nursing Forum*, 38(1), E46–E54. https://doi.org/10.1188/11.ONF.E46-E54

Chen, H., Li, X., & Mao, Y. (2018). Investigation on the status and influencing factors of stigma in patients undergoing radical cervical cancer operation. *Chinese Remedies & Clinics*, 18(11), 1905-1907.

Chen, Y., Chen, L., Huang, X., Ke, M., & Wu, M. (2022). Analysis of stigma and factors affecting patients with advanced recurrent cervical cancer treated with immunization combined with targeted therapy [in Chinese]. *Fujian Medicine Magazine*, 44(5), 141-178.

Chou, K.-L. (2000). Assessing Chinese adolescents' social support: The multidimensional scale of perceived social support. *Personality and Individual Differences*, 28(2), 299-307. https://doi.org/10.1016/S0191-8869(99)00098-7

Clavijo, M., Yevenes, F., Gallardo, I., Contreras, A. M., & Santos, C. (2020). The general self-efficacy scale (GSES): Reevaluation of its reliability and validity evidence in Chile. *Revista Medica de Chile*, 148(10), 1452-1460. https://doi.org/10.4067/s0034-98872020001001452

Coleman, D., Hurtado-de-Mendoza, A., Montero, A., Sawhney, S., Wang, J. H.-y., Lobo, T., & Graves, K. D. (2024). Stigma, social support, and spirituality: Associations with symptoms among Black, Latina, and Chinese American cervical cancer survivors. *Journal of Cancer Survivorship*, 18(3), 710-726. https://doi.org/10.1007/s11764-022-01283-z

Crocker, J., Major, B., & Steele, C. (1998). Social stigma. In *The handbook of social psychology* (4th ed., pp. 504-553). McGraw-Hill.

Dahiya, N., Acharya, A. S., Bachani, D., Sharma, D. N., Gupta, S., Haresh, K. P., & Rath, G. K. (2016). Quality of life of patients with advanced cervical cancer before and after chemoradiotherapy. *Asian Pacific Journal of Cancer Prevention*, 17(7), 3095-3099.

Dahlem, N. W., Zimet, G. D., & Walker, R. R. (1991). The multidimensional scale of perceived social support: A confirmation study. *Journal of Clinical Psychology*, 47(6), 756-761. https://doi.org/10.1002/1097-4679(199111)47:6%3C756::AID-JCLP2270470605%3E3.0.CO;2-L

Dambi, J. M., Corten, L., Chiwaridzo, M., Jack, H., Mlambo, T., & Jelsma, J. (2018). A systematic review of the psychometric properties of the cross-cultural translations and adaptations of the Multidimensional Perceived Social Support Scale (MSPSS). *Health and Quality of Life Outcomes*, 16, 80. https://doi.org/10.1186/s12955-018-0912-0

Else-Quest, N. M., & Jackson, T. L. (2014). Cancer stigma. In P. W. Corrigan (Ed.), *The stigma of disease and disability: Understanding causes and overcoming injustices* (pp. 165-181). American Psychological Association. https://doi.org/10.1037/14297-009

Else-Quest, N. M., LoConte, N. K., Schiller, J. H., & Hyde, J. S. (2009). Perceived stigma, self-blame, and adjustment among lung, breast and

prostate cancer patients. *Psychology and Health*, *24*(8), 949-964. https://doi.org/10.1080/08870440802074664

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G* Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149-1160. https://doi.org/10.3758/BRM.41.4.1149

Fife, B. L., & Wright, E. R. (2000). The dimensionality of stigma: A comparison of its impact on the self of persons with HIV/AIDS and cancer. *Journal of Health and Social Behavior*, 50-67.

Fujisawa, D., Umezawa, S., Fujimori, M., & Miyashita, M. (2020). Prevalence and associated factors of perceived cancer-related stigma in Japanese cancer survivors. *Japanese Journal of Clinical Oncology*, *50*(11), 1325-1329. https://doi.org/10.1093/jjco/hyaa135

Furukawa, T., Suzuki-Moor, A., Saito, Y., & Hamanaka, T. (1993). Reliability and validity of the Japanese version of the coping inventory for stressful situations (CISS): A contribution to the cross-cultural studies of coping. *Seishin Shinkeigaku Zasshi = Psychiatria et Neurologia Japonica*, *95*(8), 602-620.

Goffman, E. (1963). *Stigma: Notes on the management of spoiled identity* (1st ed.). New York: Prentice-Hall. https://books.google.com.sg/books?id=zuMFXuTMAqAC

Gregg, J. L. (2011). An unanticipated source of hope: Stigma and cervical cancer in Brazil. *Medical Anthropology Quarterly*, *25*(1), 70-84. https://doi.org/10.1111/j.1548-1387.2010.01137.x

Grove, S. K., Burns, N., & Gray, J. (2012). *The practice of nursing research: Appraisal, synthesis, and generation of evidence* (7th ed.). St.Louis, Missouri: Elsevier Health Sciences.

Hamann, H. A., & Pujol, J.-L. (2018). Introduction to the special section: The experience and impact of lung cancer stigma. *Journal of Thoracic Oncology*, *13*(8), 1053-1054. https://doi.org/10.1016/j.jtho.2018.06.006

Hofman, A., Zajdel, N., Klekowski, J., & Chabowski, M. (2021). Improving social support to increase QoL in lung cancer patients. *Cancer Management and Research*, *13*, 2319-2327. https://doi.org/10.2147/CMAR.S278087

Huang, Y., & Wei, Q. (2021). Study on the effect of feedback method combined with narrative nursing intervention on the stigma of cervical cancer patients [in Chinese]. *Journal of Snake*, *33*(4), 456-458.

Huang, Z., Yu, T., Wu, S., & Hu, A. (2021). Correlates of stigma for patients with cancer: A systematic review and meta-analysis. *Supportive Care in Cancer*, *29*(3), 1195-1203. https://doi.org/10.1007/s00520-020-05780-8

Jain, M. A., & Limaiem, F. (2023). *Cervical squamous cell carcinoma*. Treasure Island, FL: StatPearls.

Johnson, L. A., Schreier, A. M., Swanson, M., Moye, J. P., & Ridner, S. H. (2019). Stigma and quality of life in patients with advanced lung cancer. *Oncology Nursing Forum*, *46*(3), 318-328. https://doi.org/10.1188/19.ONF.318-328

Kang, S., Wu, J., Li, J., Hou, Q., & Tang, B. (2022). Prognostic significance of clinicopathological factors influencing overall survival and event-free survival of patients with cervical cancer: A systematic review and meta-analysis. *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research*, *28*, e934588-934581–e934588-934524. https://doi.org/10.12659/MSM.934588

Knapp, S., Marziliano, A., & Moyer, A. (2014). Identity threat and stigma in cancer patients. *Health Psychology Open*, *1*(1), 2055102914552281. https://doi.org/10.1177/2055102914552281

Li, L., Mingzhu, S., Di, S., Yingtao, M., Ning, P., & Nengliang, Y. (2022). Analysis of the credibility of the Chinese version of the perception social support scale in elderly cancer patients [in Chinese]. *Modern Preventive Medicine*, *49*(18). https://doi.org/10.20043/j.cnki.MPM.202203150

Li, R., Li, G. Q., Yan, R., Zhang, X. F., Li, J., Liu, X., & Hu, X. (2016). Analysis of the current situation of cervical cancer patients' stigma and its related influencing factors [in Chinese]. *Modern Clinical Nursing*, *15*(4), 1-5.

Li, Y., & Liu, J. (2019). Influencing factors of disease stigma among gynecologic cancer. *Tianjin Journal of Nursing*, *27*(4), 405-408.

Lianhua, B., & Xiaodan, L. (2019). Discussion on the current status of stigma and its influencing factors among patients with cervical cancer [in Chinese]. *Chinese General Practice Nursing*, *17*(14), 1768-1771.

Liu, T. W., Pei, H., & Zhang, C. F. (2021). The relationship between stigma and depression, social support and family function in patients with depression [in Chinese]. *Clinical Nursing Journal*, *20*(6), 2-5.

Liu, X. H., Zhong, J. D., Zhang, J. E., Cheng, Y., & Bu, X. Q. (2020). Stigma and its correlates in people living with lung cancer: A cross-sectional study from China. *Psycho-Oncology*, *29*(2), 287-293. https://doi.org/10.1002/pon.5245

Lu, J., Feng, X., Chang, X., Qin, Y., Fang, J., Gao, K., & Chen, Y. (2022). Study on the effect of total care nursing model on patients' sense of shame and self-efficacy after radical cervical cancer surgery [in Chinese]. *Modern Journal of Integrated Traditional Chinese and Western Medicine*, *31*(14), 2012-2015.

Major, B., & O'Brien, L. T. (2005). The social psychology of stigma. *Annual Review of Psychology*, *56*, 393-421. https://doi.org/10.1146/annurev.psych.56.091103.070137

Min, Z., & ChunXia, R. (2017). Study on the state of stigma and the related factors in patients with cervical cancer after radical surgery. *Oncology Progress*, *15*(10), 1232-1234.

Monticone, M., Baiardi, P., Ferrari, S., Foti, C., Mugnai, R., Pillastrini, P., Vanti, C., & Zanoli, G. (2009). Development of the Italian version of the Oswestry Disability Index (ODI-I): A cross-cultural adaptation, reliability, and validity study. *Spine*, *34*(19), 2090-2095. https://doi.org/10.1097/BRS.0b013e3181aa1e6b

Nyblade, L., Stockton, M., Travasso, S., & Krishnan, S. (2017). A qualitative exploration of cervical and breast cancer stigma in Karnataka, India. *BMC Women's Health*, *17*, 58. https://doi.org/10.1186/s12905-017-0407-x

Pan, A.-W., Chung, L., Fife, B. L., & Hsiung, P.-C. (2007). Evaluation of the psychometrics of the Social Impact Scale: A measure of stigmatization. *International Journal of Rehabilitation Research*, *30*(3), 235-238. https://doi.org/10.1097/MRR.0b013e32829fb3db

Pasmatzi, E., Koulierakis, G., & Giaglis, G. (2016). Self-stigma, self-esteem and self-efficacy of mentally ill. *Psychiatrike = Psychiatriki*, *27*(4), 243-252. https://doi.org/10.22365/jpsych.2016.274.243

Peterson, S. J., & Foley, S. (2021). Clinician's guide to understanding effect size, alpha level, power, and sample size. *Nutrition in Clinical Practice*, *36*(3), 598-605. https://doi.org/10.1002/ncp.10674

Queenan, J. A., Feldman-Stewart, D., Brundage, M., & Groome, P. A. (2010). Social support and quality of life of prostate cancer patients after radiotherapy treatment. *European Journal of Cancer Care*, *19*(2), 251-259. https://doi.org/10.1111/j.1365-2354.2008.01029.x

Rong, L. (2015). *Stigma and its correlation with quality of life in cervical cancer radical surgery patients [in Chinese]* [Master Thesis, Shan Dong University]. China.

Rosenberg, M. (1965). *Society and the adolescent self-image*. New Jersey: Princeton university press.

Schwarzer, R., & Jerusalem, M. (1995). Generalized self-efficacy scale. In J. Weinman, S. Wright, & M. Johnston (Eds.), *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp. 35-37). NFER-NELSON.

Serdar, C. C., Cihan, M., Yücel, D., & Serdar, M. A. (2021). Sample size, power and effect size revisited: simplified and practical approaches in pre-clinical, clinical and laboratory studies. *Biochemia Medica*, *31*(1), 27-53. https://doi.org/10.11613/BM.2021.010502

Shrestha, G., Mulmi, R., Phuyal, P., Thakur, R. K., & Siwakoti, B. (2020). Experiences of cervical cancer survivors in Chitwan, Nepal: A qualitative study. *PloS One*, *15*(11), e0234834. https://doi.org/10.1371/journal.pone.0234834

Shuang, G., & Xiangkui, Z. (2018). Use Rasch Model to analyze the Rosenberg Self-Esteem Scale. *Psychological Exploration*, *38*(5), 445-450.

Sung, H., Ferlay, J., Siegel, R. L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2021). Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians*, *71*(3), 209-249. https://doi.org/10.3322/caac.21660

Tang, W.-z., Yusuf, A., Jia, K., Iskandar, Y. H. P., Mangantig, E., Mo, X.-s., Wei, T.-f., & Cheng, S.-l. (2023). Correlates of stigma for patients with breast cancer: A systematic review and meta-analysis. *Supportive Care in Cancer*, *31*(1), 55. https://doi.org/10.1007/s00520-022-07506-4

World Health Organization [WHO]. (2004). Appropriate body-mass index for Asian populations and its implications for policy and intervention

strategies. *Lancet*, *363*, 157-163. https://doi.org/10.1016/s0140-6736(03)15268-3

Xiang-xiang, Z., Yi-ling, P., & Tian-qiong, H. (2022). Investigation into the status quo of stigma and alexithymia in patients with gynecological tumors in the Second Affiliated Hospital of Hainan Medical University and the effectiveness of predicting depression. *Journal of Hebei Medical University*, *43*(4), 412-416.

Yan, M. h., Fan, Y. y., & Zhang, J. e. (2022). Stigma, self-efficacy and late toxicities among Chinese nasopharyngeal carcinoma survivors. *European Journal of Cancer Care*, *31*(1), e13528. https://doi.org/10.1111/ecc.13528

Yang, X., & Han, X. (2021). Reliability and validity of the Chinese version of the Multidimensional Perceived Social Support Scale in a group of primary and secondary school students. *Chinese Journal of Clinical Psychology*, *29*(5), 952-955. https://doi.org/10.16128/j.cnki.1005-3611.2021.05.012

Yaqi, M., Huiping, L., Yajuan, Y., Sudan., Malan., T., Z.,, & Wanjun, D. (2015). Reliability and validity of Chinese version of the Brief Illness Perception Questionnaire in patients with breast cancer [in Chinese]. *Journal of Nursing*, *22*(24), 11-14. https://doi.org/10.16460/j.issn1008-9969.2015.24.011

Yildirim, M., Kizilgecit, M., Secer, İ., Karabulut, F., Angın, Y., Dagcı, A., Vural, M. E., Bayram, N. N., & Cinici, M. (2021). Meaning in life, religious coping, and loneliness during the coronavirus health crisis in Turkey. *Journal of Religion and Health*, *60*, 2371–2385. https://doi.org/10.1007/s10943-020-01173-7

Ying, L., & Juan, L. (2019). Analysis of the current situation and factors influencing the sense of stigma in patients with gynecologic malignancies [in Chinese]. *Tianjin Nursing*, *27*(4), 405-408.

Yu, H., Tan, Z., & Yang, X. (2021). Effect of self-efficacy nursing on stigma and limb edema in patients with radical mastectomy [in Chinese]. *Journal of North Sichuan Medical College*, *30*(6), 805-808.

Yuan, J. M., Zhang, J. E., Zheng, M. C., & Bu, X. Q. (2018). Stigma and its influencing factors among Chinese patients with stoma. *Psycho-Oncology*, *27*(6), 1565-1571. https://doi.org/10.1002/pon.4695

Zhang, J. X., & Schwarzer, R. (1995). Measuring optimistic self-beliefs: A Chinese adaptation of the general self-efficacy scale. *Psychologia: An International Journal of Psychology in the Orient*, *38*(3), 174–181.

Zhang, N., Fielding, R., Soong, I., Chan, K. K. K., Lee, C., Ng, A., Sze, W. K., Tsang, J., Lee, V., & Lam, W. W. T. (2017). Psychometric assessment of the Chinese version of the brief illness perception questionnaire in breast cancer survivors. *PloS One*, *12*(3), e0174093. https://doi.org/10.1371/journal.pone.0174093

Zheng, H., & Pan, C. (2021). The impact of negative emotions, self-efficacy and social support on the quality of life of patients after cervical cancer surgery [in Chinese]. *China Maternal and Child Health*, *36*(14), 3335-3339. https://doi.org/10.19829/j.zgfybj.issn.1001-4411.2021.14.055

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment*, *52*(1), 30-41. https://doi.org/10.1207/s15327752jpa5201_2