

# Knowledge, Attitudes, and Practices of Gynecologic Cancer Patients at Maharaj Nakorn Chiang Mai Hospital Toward COVID-19: A Cross-Sectional Survey

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**Background and Aim:** During the Covid-19 pandemic, the knowledge, attitudes, and practices about COVID-19 infection in gynecologic cancer patients were still limited. This study aimed to explore these issues.

**Methods:** Gynecologic cancer patients who attended our gynecologic oncology unit between February and June 2022 were invited to a cross-sectional survey using a WHO survey tool.

**Results:** 363 patients participated with 20.9% undergoing treatment and receiving the COVID-19 vaccine significantly less than the surveillance participants (85.4% vs. 57.9%,  $P < 0.01$ ). Forty-eight participants developed a COVID-19 infection. The most common vaccine used for the two first doses was AstraZeneca. Regarding attitudes issues, most participants felt health literacy was obtained easily. They considered that they had a moderate probability to have severe symptoms of COVID-19 infection and almost all knew the proper behavior for prevention. The participant reported little stress and most trusted healthcare workers and family doctors. They agreed with lifting regular rules to control the COVID-19 pandemic. The other opinions that were significantly higher in participants who did not receive the vaccine versus those who received the vaccine, were as follows: "If everyone is vaccinated, no need for me to vaccinate", "the stress made me not want to vaccinate", "no need to vaccine due to rare disease" and "the vaccine is unsafe".

**Conclusion:** Gynecologic cancer patients who were under treatment received the COVID-19 vaccine less than those under surveillance. Most participants revealed a good attitude toward this pandemic. However, unvaccinated participants were concerned about the severe side effects of the vaccine.

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## Introduction

The novel coronavirus disease 2019 (COVID-19) created a global pandemic for the last two years. In Thailand, about four million cases were confirmed cases and deaths of 33,940 cases with the peak incidence in June-September 2021 and March 2022 (<https://covid19.who.int/region/searo/country/th>) [1].

The infected patients who had comorbidities such as chronic obstructive pulmonary disease (COPD), diabetes Mellitus, hypertension, and cancer were related to developing severe symptoms [2]. Patients with cancer might be immunocompromised and have an easier possibility of infection by the effects of chemotherapy or supportive medications such as steroids [3]. Kuderer et al., (2020) recently reported a cohort study of 928 cancer patients who were infected with COVID-19, and 39% of them were on active anticancer treatment [3]. The

independent factors related to the increase in 30-day mortality were increased age, male sex, smoking status, increased number of co-morbidities, Eastern Cooperative Oncology Group performance status of 2 or higher, active cancer, and receipt of azithromycin plus hydroxychloroquine [3]. In addition, Saini et al., (2020) performed a systematic review of 52 studies involving a total of 18,650 cancer patients infected with COVID-19 and found the probability of death as high as 25.6% [4]. Therefore, patients with cancer should be a target population for COVID-19 vaccination. However, Chun et al., (2021) recently presented their study from Korea about the willingness to take COVID-19 vaccination among cancer patients and found only 61.8% of them were willing to receive COVID-19 vaccination [5]. For gynecologic cancer patients, Poddar et al., (2022) presented the knowledge, attitude, and practice of their Indian gynecologic cancer patients and revealed good overall knowledge, attitude, and practice towards the COVID-19 pandemic. However, for Thai gynecologic cancer patients, the data on the knowledge, attitude, and practice about COVID-19 disease, especially the vaccination acceptance rate was still limited. Thus, we conducted a cross-sectional survey to evaluate the knowledge, attitude, practice, and vaccination acceptance rate of COVID-19 in our gynecologic cancer patients. Understanding the current level of knowledge, attitude, and practices of the population is beneficial for preventive strategies and health promotion policies [6].

## Materials and Methods

### Patients Selection

After permission from the local Research Ethics Committee, this cross-sectional study was carried out between February 1 and June 30, 2022. The inclusion criteria consisted of the gynecologic cancer patients treated at Maharaj Nakorn Chiang Mai Hospital and able to communicate well in the Thai language. The patients who received the COVID-19 vaccine before being diagnosed with gynecologic cancer were excluded.

All patients who met the inclusion criteria were invited to participate in the study and gave informed consent. The studied patients were interviewed by well-trained interviewers for 15-20 minutes to complete the World Health Organization (WHO) Regional Office for Europe survey tool ([https://\\_data/assets/pdf\\_file/0007/436705/COVID-19-surveytool-and-guidance.pdf](https://_data/assets/pdf_file/0007/436705/COVID-19-surveytool-and-guidance.pdf)) [7] during the waiting time to meet the physicians at the outpatient unit or by telephone. The WHO survey tool was the guidance to conduct behavioral insights studies related to COVID-19. The questionnaire consisted of 16 issues as follows; 1) demographic data 2) the history of infected COVID-19 3) the data on COVID-19 vaccination 4) the health literacy of COVID-19 (rating scales 1 to 7 from hardest to easiest) 5) probability and severity of covid-19 infection (rating scales 1 to 7 from never to the most) 6) behavior for the prevention of covid-19 infection in the last 7 days (rating scales 1 to 7 from never to always) 7) the impact of COVID-19 (rating scales 1 to 7 from the most to the least) 8) the trust in the source of information (rating scales 1 to 7 from the least to the most) 9) the trust in the Institute to handle covid-19 infection (rating scales 1 to 7 from the least to the most) 10) the lifting regular rules for COVID-19 pandemic (rating scales 1 to 7 from strongly disagree to strongly agree) 11) the unwanted behavior within two weeks during COVID-19 pandemic (3 choices of the answers; yes, no, not regularly done) 12) the general well-being within two weeks during COVID-19 pandemic (rating scales 1 to 7 from always to never) 13) the opinion of COVID-19 unvaccinated (rating scales 1 to 7 from strongly disagree to strongly agree) 14) the factors for decision to vaccinated COVID-19 vaccine (rating scales 1 to 7 from the least to the most) 15) the side effect of COVID-19 vaccine (rating scales 1 to 7 from the least to the most) 16) the encourage factors to receive COVID-19 vaccine (2 choice answer; yes or no). All issues were interviewed in the Thai language after validating the original English version and collected for further analysis.

### Sample Size Calculation

The sample size was calculated using the following formula [8].

Where p meant the population of cancer patients who were willing to receive the COVID-19 vaccine is 0.62 (5)

Error (d) = 0.05

Level of significance

Alpha ( $\alpha$ ) = 0.05

Z (0.975) = 1.959964

Then a minimum sample size of 363 patients was needed.

### Statistical Analysis

Statistical analysis of the data was carried out using IBM SPSS statistics V22.0 for Windows program (IBM, Armonk, New York, USA). The mean with standard deviation was calculated for descriptive analysis. The Chi-square or Fisher’s exact test was used to compare the analysis of the factors between the COVID-19 vaccinated and non-vaccinated groups, and the Mann-Whitney U test including the Kruskal-Wallis test was used to compare the differences in attitude between the COVID-19 vaccinated and non-vaccinated groups. A p-value of < 0.05 was considered statistically significant.

### Results

Three hundred and sixty-three patients participated in the study. The majority were interviewed at the outpatient unit with 50 patients interviewed via telephone. The demographic data were presented in Table 1.

	N (%)
Mean age	56.6 (+13.2)
Median age (range)	58 (14-89)
Type of cancer	
Cervix	126 (34.7)
Endometrium	79 (21.8)
Ovary	96 (26.4)
Fallopian tube	20 (5.5)
Uterus	12 (3.3)
Peritoneum	4 (1.1)
Vulva	9 (2.5)
Vagina	6 (1.7)
Gestational trophoblastic disease	10 (2.8)
Ovary and uterus	1 (0.3)
During treatment	76 (20.9)
Chemotherapy	72 (19.8)
Radiotherapy	4 (1.1)
Surveillance	287 (79.1)
Education	
None	23 (6.3)
Elementary	134 (36.9)

High school	81 (22.3)
Bachelor	94 (25.9)
Postgraduate	31 (8.5)
Health-professional	
Yes	30 (8.3)
No	331 (91.2)
Underlying disease	
Yes	198 (54.5)
No	163 (44.9)
Unknown	2 (0.6)
Household member	
Alone	41 (11.3)
Children under 18-year-old	67 (18.5)
People over 65 years and/or with chronic disease	77 (21.1)
Other	178 (49.0)
The private financial situation over the past3 months	
Improve	17 (4.7)
Unchanged	202 (55.6)
Worse	137 (37.7)
Unknown	7 (1.9)

**Table 1. Demographic Data.**

The median age of the participants was 58 years old with a range of 14-89 years old. The three most common types of cancer were cervix, ovary, and endometrium. About 20% of the participants were receiving treatment. The most common highest education of the participants was elementary and over 90% were not health professionals.

Regarding the history of COVID-19 infection, 48 patients (13.2%) reported experiencing COVID-19 infection with one case presenting with a severe form of pneumonia and needing oxygen therapy. The vaccination rate in patients who were infected and non-infected with COVID-19 was non-significant different (83.3% in infected patients versus 82.9% in non-infected patients,  $P=0.562$ ). Furthermore, about 91.7% of the participants received COVID-19 testing if they had been contacted by someone who tested positive for COVID-19 infection. For COVID-19 vaccination, 301 patients (82.9%) received the COVID-19 vaccine as follows; 1 dose (11 cases), 2 doses (134 cases), 3 doses (136 cases), and 4 doses (20 cases). Five types of COVID-19 vaccine were available in Thailand consisting of Sinovac, Astra Zeneca, Pfizer, Moderna, and Sinopharm. The information on COVID-19 vaccine type in each immunization dosage was summarized in Table 2.

	Dose 1 (%)	Dose 2 (%)	Dose 3 (%)	Dose 4 (%)
Sinovac	110 (30.3)	31 (8.5)	-	-
AstraZeneca	117 (32.2)	144 (39.7)	31 (8.5)	-
Pfizer	26 (7.2)	66 (18.2)	101 (27.8)	11 (3.0)
Moderna	14 (3.9)	16 (4.4)	23 (6.3)	9 (2.5)
Sinopharm	34 (9.4)	33 (9.1)	1 (0.3)	-
Not received	62 (17.1)	73 (20.1)	207 (57.0)	343 (94.5)

**Table 2. Types of COVID-19 Vaccine Used in Each Immunization Dosage.**

Most of the patients received Sinovac and Astra Zeneca in the first and second doses. In addition, the percentage of patients during surveillance who received the COVID-19 vaccine was significantly higher than those who during the treatment period (85.4% vs.57.9%,  $P < 0.01$ ). The median score of the COVID-19 vaccine side effects using a scale of 1 to 7 (the least to the most) was 3 (quite a bit).

For the knowledge, attitude, and practice of COVID-19, the details were presented in Figure 1S

**Figure 2. Compare the Attitude of Vaccinated vs Non-vaccinated Participants.**

Most of the participants respond to these questionnaires as follows; 1) felt quite easy to get health literacy from the media (Figure 1S A), 2) moderate probability and got severity of COVID-19 infection (Figure 1S B), 3) underwent good behavior for COVID-19 infection in the last 7 days (Figure 1S C), 4) felt the COVID-19 impact to them but a little stress of this disease (Figure 1S D), 5) quite a lot trust in COVID-19 information from health-care worker (Figure 1S E), 6) quite a lot trust in family doctors, employers, hospitals, and ministry of health to handle with COVID-19 infection (Figure 1S F), 7) agree with vaccination along with the recommendation and forced to wear a mask in a close system (Figure 1S G), 8) no regular unwanted behavior within two weeks (Figure 1S H), and 9) often general wellbeing within two weeks (Figure 1S I). Figure 2S provided the attitudes of 62 patients who were unvaccinated COVID-19 vaccine as follows; 1) most of them agreed that the vaccine can control the spread of COVID-19, and their families or other people would like them to get the vaccine (Figure 2SA), 2) the most important factors for the decision to get vaccine was the possibility of serious side effects (Figure 2SB), and, 3) quite a lot of trust in Moderna and Pfizer COVID-19 vaccines (Figure 2SC).

For the decision to get the COVID-19 vaccine factors of 301 who were already vaccinated, the details were presented in Figure 3S. The most common factor was everyone should be vaccinated during the pandemic status. When comparing the attitude between the vaccinated and unvaccinated patients. The study found significant differences in four items. Three of them were significantly higher in the unvaccinated group as follows; 1) if everyone is vaccinated, no need for me to vaccinate, 2) the stress made me not want to vaccinate, and 3) no need to vaccinate due to rare diseases. Another item significantly higher in the vaccinated group was that the vaccine was safe.

The details of this issue were presented in Figure 1.

For the survey of the side effects of COVID-19 vaccination patients, the data was missing in one case. Therefore 300 patients responded to this item. Most patients trust the healthcare provider quite a lot who gave the patients a COVID-19 vaccine and had few side effects. The factor that most encourage the patients to get the vaccine was the easy access to the vaccination sites as presented in Figures 3SB and 3SC.

## Discussion

The first verified COVID-19 case in Thailand was reported on 12 January 2020 by a Chinese visitor [sitrep-1-2019-ncov.pdf](#) [9] and spread in five waves thereafter: 1) the first wave occurred during March-May 2020 due to transmission linked to boxing events and entertainment venues in Bangkok, 2) the second wave (December 2020-January 2021) that triggered by spread among migrants working at the Central Shrimp Market, Samut Sakhon Province, 3) the third wave (April-June 2021) with the increase of COVID-19 cases linked to an entertainment venue in the Thonglor District of Bangkok. This wave was severe and driven by a more transmissible Alpha variant, leading to rising hospitalizations and overwhelming healthcare facilities. In this wave, many vaccination campaigns were rolled out on 7 June 2021 with two vaccine types (Sinovac and Astra Zeneca) available at that time, and 4) the fourth wave (July-December 2021) caused by the highly contagious Delta variant. This variant was transmitted faster than the alpha type, 5) the fifth wave (January-March 2022) was caused by the Omicron variant which increased the risk of infectivity with a less severe clinical presentation [10, 11]. Therefore, the present study was surveyed during the omicron wave.

For the knowledge, attitude, and practice survey of our gynecologic cancer patients, most of them gave a positive response to the survey such as health literacy issues, and behavior for the prevention of COVID-19 while they were moderately concerned about the severity of COVID-19 infection that might be from less morbidity of the Omicron wave. Our outcomes were quite similar to a study from India, Poddar et al., (2022) that surveyed the knowledge, attitudes, and practices of COVID-19 from 521 gynecologic cancer patients from February to May 2021. They reported overall good knowledge, attitudes, and practices that most of them established with a high score of 80% [6]. However, this good outcome was quite different from a Romanian study [12]. A cross-sectional multicentric study in 1585 Romanian cancer patients during April-May 2020 revealed only 10.8% of them had good knowledge about COVID-19 infection [12]. The difference might be from the different times of the survey. The present study and Indian studies surveyed the epidemic outbreak in February-March 2022 and February to May 2021, respectively. Therefore, at that time, most populations had faced COVID-19 for over two years.

Regarding the acceptance of the COVID-19 vaccination, 82.9% of our patients received at least one dose of the vaccine and most of them did not develop severe adverse effects from the vaccine. However, about 40% of the patients who during treatment status did not receive the vaccine while 10.4% of the patients in the surveillance phase refused the vaccine. Unfortunately, we did not survey the reasons why the patients during the treatment phase did not receive the vaccine but the significantly different scores of the factors when compared between the vaccinated patients and non-vaccinated were the non-vaccinated patients revealed more concern about the side effects of vaccine and believed the vaccine to be unnecessary if the others were vaccinated already. Mueangpoon et al., (2022) recently reported a descriptive cross-sectional study between 13 September 2021 and 14 January 2022 to evaluate the prevalence and influencing factors of COVID-19 vaccine hesitancy and willingness to pay in Thailand. The authors surveyed the 705 general Thai population aged > 18 years and revealed that 10.4% of them reported hesitancy with the significant reason being low complacency and confidence in the vaccine. In addition, they found that the following factors included female sex, higher education level, non-healthcare workers, and those who lived in rural areas were independent factors for vaccine hesitancy. For the cost of the COVID-19 vaccine that the participants were willing to pay, 77.2% of the participants were willing to pay in the range of 501-1000 Thai Baht (1 US dollar=33 Thai baht) per dose. In the present study, the unvaccinated patients had more trust in the m-RNA COVID-19 vaccine such as Moderna and Pfizer [13]. A recent study confirmed that the booster dose within three months with the m-RNA vaccine after two doses of previous m-RNA vaccines was effective for the Omicron variant protection [14]. Therefore, both unvaccinated and vaccinated patients should receive or booster with the m-RNA vaccine that is commonly available in Thailand nowadays for effective control of COVID-19.

The strength of the present study was a survey using well-trained interviewers, though we were assured that the data was reliable. However, some questions reflected short-term responses, though some behavior might be changed due to the alteration of the current situation.

In conclusions, during the Omicron epidemic wave, most of our gynecologic oncology patients revealed good knowledge, attitude, and practice during the COVID-19 outbreak and most of them received the COVID-19 vaccine especially those who were in surveillance situations. The important factor for the unvaccinated group was being concerned about the severe side effects of the vaccine.

#### *Conflict of Interest*

The authors declare no potential conflict of interest.

#### *Ethical Approval*

The study was approved by Chiang Mai University Research Ethics Committees: Research ID:



08662 Study Code: OBG-2564-08662 / and all the participants gave informed consent.

#### *Authors contribution statement*

P.S and V.C conceived of the presented idea. V.C collected the data. P.S verified the analytical methods. All authors discussed the results and contributed to the final manuscript.

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