

Chemotherapy Adherence as a Determining Factor For Quality Of Life In Cancer Patients

Heriyanti Widyaningsih*, Husnul Khotimah, Alvi Ratna Yuliana, Anita Dyah Listyarini, Noor Faidah, Sri Hartini, Biyanti Dwi Winarsih

Cendekia Utama Kudus Health Technology Institute, Indonesia

*Corresponding Author: widyaningsih.sunarto@gmail.com

Abstract. Cancer is one of the leading causes of mortality worldwide and continues to increase every year. Cancer and its treatment, particularly chemotherapy, play a crucial role in the healing process; however, chemotherapy often leads to adverse side effects that may result in morbidity and decreased quality of life. Patient adherence to chemotherapy has a positive impact on treatment effectiveness and quality of life. Therefore, it is important to determine the relationship between chemotherapy adherence and quality of life among cancer patients in order to improve therapeutic outcomes and patient well-being. This study employed a quantitative research design with a descriptive correlational approach and a cross-sectional method. The study population consisted of cancer patients undergoing chemotherapy from January 2024 to January 2025, totaling 241 patients. A sample of 54 respondents was selected. Chemotherapy adherence was measured using the Morisky Medication Adherence Scale (MMAS), and quality of life was measured using the WHO Quality of Life-BREF (WHOQOL-BREF) questionnaire. Data were analyzed using the Spearman rank correlation test. The results of the Spearman rank test showed a significance value of $0.002 < 0.05$, indicating that the alternative hypothesis (H_a) was accepted and the null hypothesis (H_o) was rejected. This demonstrates a positive relationship between chemotherapy adherence and the quality of life of cancer patients. The correlation coefficient was 0.408, indicating a moderate level of association between the two variables. There is a significant relationship between chemotherapy adherence and the quality of life of cancer patients at RSUD RAA Soewondo Pati.

Keywords: Chemotherapy Adherence, Quality of Life, Cancer Patients

INTRODUCTION

Cancer is a medical condition characterized by uncontrolled growth of abnormal cells that may form tumors or masses. These cells have the potential to spread (metastasize) to other parts of the body, causing damage to healthy tissue. Cancer includes various types of malignant tumors, which differ from benign tumors that do not spread. It involves abnormal cell proliferation within body tissues that may invade any part of the body (Mu'ijah, 2021).

According to the World Health Organization (WHO, 2024), cancer is the leading cause of death worldwide, accounting for nearly 10 million deaths in 2023. Data from the Ministry of Health of the Republic of Indonesia reported approximately 274,000 cancer-related deaths annually, with an estimated incidence of 100 cases per 100,000 population per year. The number of cancer patients undergoing chemotherapy in Pati Regency reached 189 patients from January to December 2024. In January 2025, an additional 52 patients were recorded, bringing the total number of chemotherapy patients from January 2024 to January 2025 to 241 patients, based on medical records from RSUD RAA Soewondo Pati. Improvement in quality of life is influenced by the success of treatment, including chemotherapy. Successful treatment greatly increases the possibility of recovery, enabling patients to fulfil daily needs independently, which consequently improves their quality of life. Therefore, adherence to chemotherapy is essential for treatment success.

Severe side effects of chemotherapy cause many patients to experience a decline in their quality of life, including nausea, vomiting, fatigue, hair loss, and decreased overall functioning. Conditions experienced by cancer patients may lead to psychological stress, affecting both physical and mental well-being (Anggraini, 2019). According to Santi & Sulastri (2020), symptoms of cancer and

repeated chemotherapy have a direct impact on physical, psychosocial, and spiritual changes that influence quality of life. These physiological and functional changes may disrupt the patient's self-concept. Almost all cancer patients experience body image changes, and when these changes are not well integrated into their self-concept, their quality of life may decrease significantly. Common side effects of chemotherapy include nausea, vomiting, altered taste, severe hair loss (alopecia), skin infections, fatigue, dry skin, changes in nails and skin pigmentation, loss of appetite, and bone pain. These effects often lead to discomfort, fear, anxiety, reluctance to continue treatment, or even depression.

Quality of life in cancer patients encompasses physical, psychological, social, and spiritual aspects. Decreased quality of life is often caused by treatment side effects, uncertainty regarding treatment outcomes, and psychosocial problems. Therefore, investigating the relationship between chemotherapy adherence and quality of life is highly relevant. The side effects of chemotherapy, such as fatigue, nausea, vomiting, loss of appetite, and psychological distress, can significantly reduce quality of life. Patients who adhere to chemotherapy treatment tend to achieve better therapeutic outcomes, which may enhance their quality of life (Marwin et al., 2021). Research by Dewi (2020) showed a significant relationship between chemotherapy adherence and quality of life among cancer patients. Another study by Wulandari et al. (2022) at RSUD Tarakan Jakarta reported that 75% of respondents with low adherence had poor quality of life, while 100% of respondents with high adherence had good quality of life.

At RSUD RAA Soewondo Pati, the number of cancer patients undergoing chemotherapy continues to increase. The hospital is a chemotherapy referral center serving the areas of Kudus, Pati, and Jepara. Patients undergo chemotherapy according to predetermined schedules, consisting of six sessions—three in the first cycle and three in the second cycle, each administered every three weeks. Based on a preliminary study conducted on January 24, 2025, through interviews with 15 cancer patients, 12 stated that they adhered to the scheduled chemotherapy sessions, while 3 reported postponing or missing treatment, resulting in deteriorating health. Regarding quality of life, two patients undergoing chemotherapy for the first time reported fear, stress, and anxiety, while 13 patients who had completed their third cycle felt accustomed to treatment and more motivated to recover.

Based on literature review and preliminary study results, cancer prevalence continues to increase, and patients remain at risk of poor treatment adherence despite its importance in supporting quality of life. Therefore, the research question formulated is: Is there a relationship between chemotherapy adherence and the quality of life of cancer patients?

The general objective of this study is to determine the relationship between chemotherapy adherence and the quality of life of cancer patients at RSUD RAA Soewondo Pati. The specific objectives are: (1) to describe chemotherapy adherence, (2) to describe the quality of life of cancer patients, and (3) to analyze the relationship between chemotherapy adherence and quality of life in cancer patients.

METHODS

Type and Research Design This study employed a quantitative research approach. The research design used was an analytical cross-sectional design. This quantitative method was conducted using a defined population and sample with a random sampling technique. Data collection utilized structured research instruments aimed at testing predetermined hypotheses. A cross-sectional approach was applied, meaning that data for both the independent and dependent variables were measured or observed at a single point in time (Nursalam, 2018). Research Setting at RSUD RAA Soewondo Pati.

The research setting refers to the location where the study is carried out.

The population is the entire group of subjects that meet the established criteria. The population in research refers to subjects (such as humans or patients) who fulfil the inclusion criteria (Nursalam, 2018). The population in this study comprised all cancer patients undergoing chemotherapy from January to December 2024, totaling 189 individuals. There were two stages in the sampling process for this study, namely total sampling and simple random sampling. Total sampling was applied to the target population of patients undergoing first-cycle chemotherapy from January to April 2025, consisting of 62 patients. The researchers selected first-cycle chemotherapy patients because it represents the initial treatment regimen (Medical Records, RSUD RAA Soewondo Pati, 2025).

A sample is a portion of the accessible population used as research subjects selected through sampling. A sample represents the number and characteristics possessed by the population. Sampling is the process of selecting a portion of the population that can represent the entire group (Nursalam, 2018). The sample in this study consisted of cancer patients undergoing chemotherapy at RSUD RAA Soewondo Pati. In nursing research, sample criteria include inclusion and exclusion criteria. The sampling technique used was simple random sampling, meaning that each subject had an equal chance of being selected (Nursalam, 2018). Respondents were determined based on the following inclusion criteria: Cancer patients with a minimum stage of 2B undergoing chemotherapy, patients receiving chemotherapy and/or combination therapy (chemotherapy/radiation/surgery) and patients willing to participate in the study. The exclusion criteria included: patients unwilling to participate, and patients identified as not having cancer.

The sample size calculation using the Slovin formula was as follows:

$$n = \frac{N}{1 + N(d)^2}$$

Description:

N = population size

n = sample size

d = significance level (p = 0,05)

The questionnaire used to measure chemotherapy adherence was the Morisky Medication Adherence Scale (MMAS-8), which has been translated into Indonesian. This questionnaire consists of eight items. The total score obtained from these items is categorized into three levels of adherence: low adherence if the total score is below 6, moderate adherence if the score ranges from 6 to 7, and high adherence if the total score is 8 (Morisky et al., 2017, in Anwar & Hasan, 2020). The MMAS-8 has been widely employed in more than ten studies on chemotherapy adherence in Indonesia and internationally. Its frequent use is attributed to its established validity and reliability in measuring patient adherence to medical treatments, including chemotherapy (Arikunto, 2017). A validity test of the MMAS-8 conducted at a public health center in Sleman Regency, Yogyakarta in 2017 involving 10 respondents demonstrated good validity, with an r-calculated value of 0.883 compared to an r-table value of 0.750 (Anwar & Hasan, 2020). The reliability test conducted with the same sample size yielded a reliability coefficient of 0.881 (Anwar & Hasan, 2020).

Quality of life was measured using the standardized World Health Organization Quality of Life–BREF (WHOQOL-BREF) questionnaire. The WHOQOL-BREF consists of 26 questions, including two general items assessing overall quality of life and general health that are incorporated into overall scoring, and 24 items covering four domains of quality of life: physical, psychological, social, and environmental. Item numbers 1 and 2 assess overall quality of life and general health. Domain 1

(physical health) includes items 3, 4, 10, 15, 16, 17, and 18; Domain 2 (psychological) includes items 5, 6, 7, 11, 19, and 26; Domain 3 (social relationships) includes items 20, 21, and 22; and Domain 4 (environmental) includes items 8, 9, 12, 13, 14, 23, 24, and 25. The WHOQOL-BREF consists predominantly of positively worded questions except for three negatively scored items (questions 3, 4, and 26). In research settings, raw scores for each domain are transformed to a 0–130 scale (Koesmanto, 2020). Validity testing of the WHOQOL-BREF conducted in Menur Hospital, Surabaya in 2018 involving 30 respondents showed an r-calculated value of 0.874 with an r-table value of 0.850. The instrument's reliability test produced a coefficient value of 0.882 (Koesmanto, 2020).

Data analysis was conducted to obtain a comprehensive picture of the research findings, confirm the hypotheses, and draw general conclusions (Notoatmodjo, 2018). This study employed both univariate and bivariate analyses. Univariate analysis was used to describe the characteristics of each variable prior to conducting bivariate analysis. Bivariate analysis was performed to examine differences or relationships between two research variables (Alhamda, 2020). Univariate data were processed using percentage distribution, as this method effectively illustrates the proportion of patients with high, moderate, or low chemotherapy adherence, as well as those with good, moderate, or poor quality of life. Bivariate data were analyzed using the Spearman rank correlation test with computer assistance. This test was selected because the data were measured on an ordinal scale (Imron, 2020).

RESULTS AND DISCUSSION

1. Respondent Characteristics Gender, Age, Occupation, and Education

Table 1

Frequency Distribution of Cancer Patients by Gender, Age, Occupation, and Education (n=54)

Characteristics	Frequency	Percentage (%)
Gender		
Male	22	40.7
Female	32	59.3
Total	54	100.0
Age (Year)		
Adulthood (18-59 year)	31	57.4
Elderly (> 60 year)	23	42.6
Total	54	100.0
Occupation		
Unemployed	23	42.6
Self-employed	16	29.5
Civil Servant	3	5.6
Laborer	7	13.0
Private sector workers	5	9.3
Total	54	100.0
Education		
Primary Education	17	31.5
Secondary Education	31	57.4
Higher Education (	6	11.1
Total	54	100.0

Source: Primary Data, 2025

Based on Table 1, it was found that the majority of cancer patients at RAA Soewondo Regional Hospital Pati were female, with 32 respondents (59.3%), while 22 respondents (40.7%) were male. Furthermore, most patients were adults, totaling 31 respondents (57.4%), followed by elderly patients aged >60 years, amounting to 23 respondents (42.6%). With regard to occupation, the largest proportion of patients were unemployed (housewives), totaling 23 respondents (42.6%), followed by entrepreneurs (16 respondents, 29.5%), private employees (5 respondents, 9.3%), laborers (7 respondents, 13.0%), and a small proportion working as civil servants (3 respondents, 5.6%). In terms of educational level, 17 respondents (31.5%) had basic education (elementary–junior high school), 31 respondents (57.4%) had secondary education (senior high school), and only a small proportion had higher education (college/university), consisting of 6 respondents (11.1%).

2. Compliance and Quality of Life of Chemotherapy in Cancer Patients

Table 2

Distribution Frequency Based on Chemotherapy Adherence and Quality of Life of Chemotherapy in Cancer Patients

Variable	Frequency	Percentage (%)
Chemotherapy Adherence	1	1.8
Non-Adherent		
Adherent	7	13.0
Highly Adherent	46	85.2
Total	54	100.0
Quality of Life		
Poor	2	3.7
Good	10	18.5
Very Good	42	77.8
Total	54	100.0

Source: Primary Data, 2025

Based on Table 2, the frequency distribution of chemotherapy adherence shows that the majority of respondents demonstrated very high adherence, with 46 respondents (85.2%), followed by 7 respondents (13.0%) categorized as adherent, and only 1 respondent (1.8%) categorized as non-adherent.

Meanwhile, regarding the frequency distribution of cancer patients' quality of life, most respondents reported a very good quality of life, totaling 42 respondents (77.8%), followed by 10 respondents (18.5%) who reported a good quality of life, and only 2 respondents (3.7%) who reported a poor quality of life.

3. Chemotherapy Adherence As A Determining Factor For Quality Of Life

Table 3

Chemotherapy Adherence As A Determining Factor For Quality Of Life

Chemotherapy Adherence	Quality Of Life			P value	R
	Poor or	Good	Very Good		

	n	%	N	%	n	%		
Non-Adherent	1	1.8	0	0.0	0	0.0	0,002	0,408
Adherent	1	1.8	3	5.6	3	5.6		
Highly Adherent	0	0.0	7	13.0	39	72.2		
Total	2	3.6	10	18.6	42	77.8		

Source: Primary Data, 2025

Based on Table 3, it was found that 39 respondents (72.2%) with very high chemotherapy adherence reported a very good quality of life. Additionally, 7 respondents (13.0%) with very high adherence reported a good quality of life. Among respondents with high adherence, 3 respondents (5.6%) reported a very good quality of life and 3 respondents (5.6%) reported a good quality of life, while 1 respondent (1.8%) reported a poor quality of life. Meanwhile, 1 respondent (1.8%) with non-adherence reported a poor quality of life. Thus, the total sample consisted of 54 respondents (100%).

The results of the Spearman rank correlation test showed a significance value of 0.002 ($p < 0.05$), indicating that the alternative hypothesis (H_a) was accepted and the null hypothesis (H_o) was rejected. This demonstrates a significant positive relationship between chemotherapy adherence and the quality of life of cancer patients. The correlation coefficient value was 0.408, which indicates a moderate level of association between the two variables.

DISCUSSION

1. Chemotherapy Adherence

Among cancer patients, 46 respondents (85.2%) demonstrated very high chemotherapy adherence, indicating that the majority understood the importance of following the prescribed chemotherapy regimen. High adherence is crucial because chemotherapy is one of the primary treatment modalities for cancer management, aimed at slowing disease progression and increasing the potential for recovery. Patients who consistently comply with chemotherapy typically experience a better quality of life compared to those with low adherence (Anggraini, 2022). The level of adherence is also influenced by educational attainment and gender, where patients with higher education levels and female patients tend to show higher adherence rates than those with lower educational backgrounds or male patients (Sukma et al., 2021). Factors contributing to adherence include effective health education, strong family support, and patients' awareness of the therapeutic benefits of chemotherapy (Kusumoningrum, 2023). Research conducted by Sari, Wulandari, and Nugroho (2022) at Dr. Sardjito General Hospital Yogyakarta also demonstrated that 80% of breast cancer patients showed high adherence and that chemotherapy adherence was positively associated with improved quality of life.

There were 7 respondents (13.0%) who were categorized as adherent. Although relatively low, this level of adherence may significantly affect patient outcomes. Adherence to chemotherapy is an essential factor for successful cancer treatment and improved quality of life. Patients who comply with chemotherapy treatment generally have better quality of life outcomes than those who do not adhere (Laksana et al., 2022). Several factors contribute to reduced adherence, including severe side effects, inadequate family support, financial barriers, limited understanding of the treatment benefits, and psychological issues such as anxiety and depression. Therefore, interventions to improve adherence are necessary, including continuous education, psychosocial support, and active involvement of healthcare professionals in providing motivation and clear information (Hia Nofridy, 2022). A previous study by Dewi

(2022) at Dr. Moewardi Hospital Surakarta found that 15.8% of patients adhered to chemotherapy and demonstrated a significant association between chemotherapy adherence and quality of life.

Only 1 respondent (1.8%) demonstrated non-adherence to chemotherapy, which was associated with poor quality of life outcomes. Questionnaire items indicated that patients tended to forget scheduled chemotherapy or intentionally reduced or discontinued treatment without informing their physicians because they felt their condition worsened following chemotherapy. This finding is consistent with research by Wulandari et al. (2022) at Tarakan Hospital Jakarta,

reporting that low adherence is significantly related to poor quality of life. Non-adherence may result from treatment side effects, psychological distress, impaired self-concept, financial limitations, lack of family support, and insufficient knowledge.

2. Quality of Life

A total of 42 respondents (77.8%) reported a very good quality of life while undergoing chemotherapy. This suggests that most cancer patients at RAA Soewondo Regional Hospital Pati maintained high-quality life conditions throughout treatment. This positive outcome reflects the benefits of chemotherapy adherence, which contributes to improved physical, psychological, and social functioning (Parastian et al., 2023). High adherence typically supports optimal therapeutic effectiveness, reducing symptoms, slowing cancer progression, and increasing survival expectations. Patients who adhere to treatment experience more manageable side effects, leading to better quality of life. These findings reinforce the need to provide comprehensive education and support to maintain adherence (Hia Nofridy, 2022). Similar results were reported by Rahmawati and Hidayat (2021) at Dr. Soetomo Hospital Surabaya, where 80% of patients who adhered to chemotherapy reported very good quality of life, establishing a strong significant relationship.

Meanwhile, 10 respondents (18.5%) reported a good quality of life. This reinforces that cancer patients adhering to chemotherapy tend to achieve better quality of life compared to non-adherent patients (Santi et al., 2022). Factors influencing quality of life include education level, income, cancer stage, treatment duration, side effects, and psychosocial and social support (Laksana, 2022). Putri et al. (2024) noted that cancer stage and systemic side effects also influence adherence and quality of life. Research by Putri and Santoso (2022) demonstrated that most patients adhering to chemotherapy reported good to very good quality of life (approximately 20.5%).

A small proportion of patients, 2 respondents (3.7%), reported poor quality of life. Questionnaire results showed high dissatisfaction with health, body image, emotional well-being, social support, financial ability, and recreational opportunities. This finding aligns with research by Kolin (2022), which indicated that dissatisfaction with physical, psychological, social, and environmental aspects significantly contributes to poor quality of life among chemotherapy patients. Poor quality of life is commonly associated with treatment side effects, decreased physical functioning, sleep disturbances, and limited access to information and support.

3. Chemotherapy Adherence As A Determining Factor For Quality Of Life

The Spearman rank correlation test produced a significance value of 0.002 ($p < 0.05$), indicating that the alternative hypothesis (H_a) was accepted and the null hypothesis (H_o) was rejected. This result demonstrates a statistically significant positive relationship between chemotherapy adherence and quality of life. A significance value lower than 0.05 confirms that

the relationship did not occur by chance. The positive relationship indicates that higher levels of adherence contribute to better quality of life. This association may be explained by improved treatment effectiveness, reduced complications, and enhanced psychological control, confidence, and hope among patients (Putri et al., 2024). The findings emphasize the essential role of healthcare professionals in providing education, psychosocial support, motivation, and identifying barriers such as side effects, accessibility, or economic problems. Similar findings were reported by Gunawan (2020), who showed that adherence contributes to improving quality of life in cancer care.

Research conducted by Rahmawati, Sari, and Wulandari (2021) found a significant positive relationship ($p = 0.003$) between chemotherapy adherence and quality of life among cancer patients at the Oncology Hospital Surabaya. Likewise, Putri and Hidayat (2021) reported that 78% of lung cancer patients were highly adherent, 17% adherent, and 5% non-adherent, with $p = 0.003$, reinforcing the significance of adherence.

One respondent (1.8%) who adhered to chemotherapy experienced poor quality of life due to severe side effects, psychological distress, and insufficient social support. This condition indicates that good adherence alone may not guarantee a good quality of life if other influencing factors are unfavorable. Dewi (2022) also confirmed that cancer stage, treatment side effects, psychological factors, and demographic characteristics significantly impact quality of life, even among adherent patients.

CONCLUSION

Based on the results of the study and the discussion presented, conclusions regarding the relationship between chemotherapy adherence and the quality of life of cancer patients at RAA Soewondo Regional Hospital Pati are as follows: Chemotherapy adherence is categorized into three levels: non-adherent, adherent, and highly adherent. The highest proportion of respondents was classified as highly adherent, totaling 46 respondents (85.2%). Quality of life is categorized into five levels: very poor, poor, moderate, good, and very good. The majority of respondents reported a very good quality of life, totaling 42 respondents (77.8%).

The results of the Spearman rank test showed a significance value of 0.002 (< 0.05), indicating that the alternative hypothesis (H_a) is accepted and the null hypothesis (H_o) is rejected. This finding demonstrates a positive relationship between chemotherapy adherence and quality of life among cancer patients. The strength of the correlation between chemotherapy adherence and quality of life is 0.408, indicating a moderate positive correlation. Thus, the better the adherence to chemotherapy, the higher the quality of life experienced by cancer patients.

ACKNOWLEDGEMENT [OPTIONAL]

-

RECOMMENDATIONS

1. For Soewondo Regional Hospital Pati : It is expected that healthcare professionals in the chemotherapy unit continue to improve service quality and strengthen the role of nurses as health educators in promoting the importance of chemotherapy adherence. It is also recommended that the hospital develop support programs, such as WhatsApp reminder groups, to help patients maintain treatment schedules and avoid missed chemotherapy sessions.
2. For Healthcare Providers at Soewondo Regional Hospital Pati : Healthcare providers are encouraged to continue facilitating patient assistance programs, monitoring treatment side effects, and providing motivation to ensure sustained treatment commitment, thereby

maintaining and improving patients' quality of life.

3. For Health Institutions : It is recommended that both patients and families receive regular health education related to cancer information and the importance of adherence to chemotherapy treatment.
4. For Families of Cancer Patients : Families are expected to provide continuous emotional and practical support, monitor treatment schedules, maintain positive social and familial relationships, and offer encouragement to ensure consistent chemotherapy adherence.
5. For Future Researchers : Future research is expected to further explore the relationship between chemotherapy adherence and quality of life using different methods or qualitative approaches to gain a deeper understanding of patient experiences and influencing factors.

REFERENCES

- Alhamda, S. (2020). Buku Ajar Metlit dan Statistik. Deepublish Publisher: Yogyakarta. Anggraini, M. (2022). Hubungan Kepatuhan Menjalani Kemoterapi Dengan Kualitas Hidup Pasien Kanker Serviks Di Rsud Dr. Moewardi. *Journal of Chemical Information and Modeling*, 53(9), 1689–1699.
- Anwar & Hasan. (2020). Morisky Medication Adherence Scale (MMAS-8) Kuesioner. Jakarta.
- Arikunto, Suharsimi. (2017). Pengembangan Instrumen Penelitian dan Penilaian Program. Pustaka Belajar. Yogyakarta.
- Dewi, R. K. (2022). Hubungan Kepatuhan Menjalani Kemoterapi dengan Kualitas Hidup Pasien Kanker Payudara di RSUD Dr. Moewardi Surakarta. *Jurnal Ilmiah Kesehatan Masyarakat : Media Komunikasi Komunitas Kesehatan Masyarakat*, 12(4), 158–163.
- Gunawan, J. & Ramadhan. (2020). Perawatan Kanker dengan Kemoterapi. Sulawesi Tengah: YCAB.
- Hia, Nofridy. (2022). Hubungan Efikasi Diri Pasien Kanker dengan Kepatuhan Menjalani Kemoterapi di Rumah Sakit Santa Elisabeth Medan Tahun 2019. *Journal of Nursing Invention E-ISSN 2828-481X*, 2(1), 13–20.2019
- Imron, M. (2020). Metodologi Penelitian Bidang Kesehatan. Sagung Seto: Jakarta. Irawan. (2021). Hubungan Penggunaan Terapi Modern dan Komplementer Terhadap Kualitas Hidup Pasien Kanker Payudara. Sumedang: JKP.
- Koesmanto. (2020). Validitas dan Reabilitas Kuisisioner WHOQOL-BREF. Semarang. Jawa Tengah.
- Kusumoningrum, Tri A. dkk. (2023). Hubungan dukungan keluarga dan kepatuhan minum obat terhadap kesembuhan penderita tuberkulosis (TB) di Kabupaten Bantul. *Jurnal Formil (Forum Ilmiah) KesMas Respati*. Vol. 5(1), issn. 2502-5570, p. 29-35.
- Laksana. Rahmi, N., & Andika, F. (2022). Kualitas Hidup Pasien Kanker yang Menjalani Kemoterapi. Yogyakarta: Pustaka Pelajar.
- Marwin, M., Perwitasari, D. A., Purba, F. D., Candradewi, S. F., & Septiantoro, B. P. (2021). Hubungan Karakteristik Terhadap Kualitas Hidup Pasien Kanker Payudara yang Menjalani Kemoterapi di RSUP Dr. Kariadi Semarang. *Jurnal Sains Dan Kesehatan*, 3(3), 505–512.
- Mu'ijah, H. (2021). Klasifikasi kanker usus besar berdasarkan citra histopatologi menggunakan metode gray level run length matrix-extreme learning machine. Universitas Islam Negeri Sunan Ampel. Surabaya.
- Nursalam. (2018). Konsep dan Penerapan Metodologi Penelitian Ilmu Keperawatan Pedoman Skripsi, Tesis, dan Instrumen Penelitian Keperawatan. Salemba Medika: Jakarta
- Parastian J, Susilowati Y, Nuryanti N, Septimar ZM, Haeriyah S. (2023). Hubungan Efek Samping Kemoterapi dengan Kualitas Hidup Pasien Kanker Payudara di Rumah Sakit Kanker Dharmas Provinsi DKI Jakarta Tahun 2023. *Termometer*. 2023;2(1):2808.

- Putri, A., & Santoso, B. (2022). Hubungan Kepatuhan Kemoterapi dengan Kualitas Hidup Pasien Kanker di RSUP Dr. Sardjito Yogyakarta. *Jurnal Kesehatan Masyarakat*, 15(2), 123-130.
- Putri IA, Retnaningsih D, Ni'mah MI, Deraya RA, Selviana S. (2024). Dukungan Keluarga dengan Kualitas Hidup Pasien Kanker yang Menjalani Kemoterapi. *Indonesian Journal of Nursing and Health Sciences*. 2024;6(1):19–24.
- Putri, M. A., & Hidayat, R. (2019). Kepatuhan Kemoterapi dan Kualitas Hidup Pasien Kanker Paru-Paru di RSUD Dr. Soetomo Surabaya. *Jurnal Onkologi Indonesia*, 8(1), 45-52.
- Rahmawati, D., Sari, N., & Wulandari, F. (2021). Kepatuhan kemoterapi dan kualitas hidup pasien kanker di Rumah Sakit Onkologi Surabaya. *Jurnal Keperawatan Indonesia*, 24(2), 112-120.
- Rahmawati, F., & Hidayat, T. (2021). Hubungan Kepatuhan Kemoterapi dengan Kualitas Hidup Pasien Kanker di RSUD Dr. Soetomo Surabaya. *Jurnal Ilmu Kesehatan*, 10(3), 200-207.
- Santi, M. P. L., & Sulasrti (2022). *Public Health Journal (Analisis Spasial Distribusi Kanker)*. diakses melalui www.ejournalhealth.com. Pada tanggal 10 Januari 2025
- Sari, D. P., Wulandari, R., & Nugroho, A. S. (2022). Hubungan Kepatuhan Kemoterapi dengan Kualitas Hidup Pasien Kanker Payudara di RSUP Dr. Sardjito Yogyakarta. *Jurnal Kesehatan Masyarakat*, 15(2), 123-130.
- Sukma AA, Yuliyanasari N, Prijambodo T, Primadina N. (2021). Pengaruh Siklus Kemoterapi terhadap Kualitas Hidup Pasien Kanker Payudara Menggunakan EORTC QLQ-C30 di RSUD Dr. Soetomo Surabaya. *Jurnal Implementa Husada*. 2021;1(2):4900.
- Wulandari, S. M., Winarti, E., & Sutandi, A. (2022). Hubungan Kepatuhan Menjalani Kemoterapi dengan Kualitas Hidup Pasien Kanker Kolon di RSUD Tarakan Jakarta. *Binawan Student Journal (BSJ)*, 4(2), 1-6. e-ISSN 2715-1824.

-