

# Consuming nanogold and nanosilver nanomaterials to increase self-efficacy and spirituality for cancer volunteers

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Consumir nanomateriales de nanooro y nanoplata para aumentar la autoeficacia y la espiritualidad de los voluntarios con cáncer

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## Abstract

**C**ancer is a deadly disease and the second leading cause of death in the world. This study examines the success of nanogold and nanosilver nanomaterials in increasing self-efficacy and spirituality in cancer volunteers. This research method uses quantitative and qualitative approaches. This study uses an experimental design with the type of research design is a one-group pre-test-post-test design. This study involved ten volunteers at the Indonesian Cancer Museum. Data was obtained using questionnaires, in-depth interviews, observation and documentation. The experimental design in the study is used to determine the results of giving a treatment or treatment. The results showed that consuming nanogold and nanosilver nanomaterials could increase the self-efficacy and spirituality of cancer volunteers. Physiological characteristics of cancer volunteers have high confidence to recover. Psychological characteristics of cancer volunteers are shown by perseverance, tenacity, and patience in treatment. Spirituality and religiosity beliefs increase confidence in consuming nanogold and nanosilver nanomaterials for cancer volunteers.

**Keywords:** Cancer Patient 'experience, Nanomaterials, Self-Efficacy, Spiritual Dimension

## Resumen

**E**l cáncer es una enfermedad mortal y la segunda causa de muerte en el mundo. Este estudio examina el éxito de los nanomateriales de nanooro y nanoplata en el aumento de la autoeficacia y la espiritualidad en voluntarios con cáncer. Este método de investigación utiliza enfoques cuantitativos y cualitativos. Este estudio utiliza un diseño experimental con el tipo de diseño de investigación que es un diseño de prueba previa y posterior de un grupo. Este estudio involucró a diez voluntarios en el Museo del Cáncer de Indonesia. Los datos se obtuvieron mediante cuestionarios, entrevistas en profundidad, observación y documentación. El diseño experimental en el estudio se utiliza para determinar los resultados de dar un tratamiento o tratamiento. Los resultados mostraron que consumir nanomateriales de nanooro y nanoplata podría aumentar la autoeficacia y la espiritualidad de los voluntarios con cáncer. Las características fisiológicas de los voluntarios con cáncer tienen una alta confianza para recuperarse. Las características psicológicas de los voluntarios con cáncer se muestran en la perseverancia, la tenacidad y la paciencia en el tratamiento. Las creencias de espiritualidad y religiosidad aumentan la confianza en el consumo de nanomateriales de nanooro y nanoplata para voluntarios con cáncer.

**Palabras clave:** experiencia del paciente con cáncer, nanomateriales, autoeficacia, dimensión espiritual

**C**ancer is a deadly disease, according to individual perceptions. Cancer is the second leading cause of death in the world. The process of treating cancer patients is carried out medically and psychologically. The medical treatment given to cancer patients is chemotherapy, radiotherapy, or even surgery. Psychological treatment is done by accepting reality and the spirit of fighting against cancer<sup>1,2</sup>. Therefore, treatment management strategies and clinicians' clinical judgment are essential<sup>2-4</sup>.

Further treatment tactics require an increase in the number of these clinical case studies<sup>5-7</sup>. Accepting cancer in patients is related to the quality of life, functional status, stressors, and health care use<sup>8,9</sup>. Patients' negative perceptions result in a quality of life marked by increased depression, stress, and low recovery self-efficacy. The quality of life of cancer patients can be improved if family or close people are directly involved in providing support during the treatment process<sup>10-12</sup>. So, the patient's quality of life can be used as a benchmark to determine their level of self-efficacy. Financial status, having children, type of surgery, medical coping style, self-efficacy, and perceived social support were significantly associated with the demoralization of breast cancer patients in China<sup>13-16</sup>.

Self-efficacy is self-confidence in one's ability to master life situations or circumstances to achieve the desired result. Self-efficacy in an individual is a belief in one's ability to solve the problems faced. Self-efficacy is an individual's perception of how well one can function in certain situations and is related to the belief that one can take the expected action<sup>17,18</sup>. Forming self-efficacy has four cognitive, motivation, affection; cognitive processes are concerned with self-knowledge to make choices, weigh and integrate assessment factors into the desired outcome. The process of motivation forms self-efficacy by setting goals for oneself and planning programs designed to achieve goals<sup>19-21</sup>.

Self-efficacy is considered one of the influential parameters affecting the patient's health.<sup>3,7,30</sup> Cancer patients' trust when consuming nanogold and nanosilver drugs to recover is a determinant of their self-efficacy<sup>22-25</sup>. The higher the confidence of cancer patients to recover by consuming nanogold and nanosilver drugs, the higher their self-efficacy<sup>26-28</sup>. However, when the trust of cancer volunteers is low when consuming nanogold and nanosilver drugs to recover, their self-efficacy will also be below<sup>29,30</sup>. The high self-efficacy possessed by individuals can reduce the fear of failure, increase aspirations and problem solving, and the ability to think analytically.<sup>20</sup> Someone who has low self-efficacy will display an inappropriate attitude in making decisions. Individuals with low self-efficacy will tend to give up easily in facing difficult situations, have excessive feelings of anxiety, and are often overshadowed by nega-

tive thoughts in the form of failure. As a result, cancer patients experience moderate anxiety and depression.

Nanomaterials have presented promising strategies for tumour treatment in recent years.<sup>1</sup> Nanotechnology-based drug delivery systems can bring hope to solving problems in cancer treatment<sup>31-33</sup>. The unique properties of nanomaterials make them superior to traditional materials<sup>28</sup>. The treatment of cancer of nanomaterials is divided into two, namely nanogold and nanosilver. The activity of nanogold as an anticancer in reducing free radicals is extreme. Nanogold offers a remarkable array of physiochemical, biocompatible and photonic properties for anticancer drugs<sup>22</sup>. Tissue damage due to cancer is followed by the formation of free radicals damped by nanogold to minimise tissue damage. Applying nanogold and nanosilver drugs as antimicrobials in cancer patients is a breakthrough in the medical world. When research results can convince cancer patients that taking nanogold and nanosilver drugs can cure cancer, it will impact self-efficacy. Cancer patients' self-efficacy (sense of success) by consuming nanogold and nanosilver drugs is a form of psychological effort. While the factors that influence cancer patients' self-efficacy are the experience of success, the experience of others, verbal persuasion, physiological and affective states. The experience of success generates the strength and confidence of cancer patients to recover. The experience of others is a direct source of information to achieve success. Verbal persuasion serves as a means of strengthening self-confidence by looking at the abilities and experiences of others. Physiological and affective states are sources of information on self-ability obtained from somatic and forwarded to physiological and affective. Self-efficacy (sense of success) of cancer patients who consume nanogold and nanosilver drugs can be seen from the physical, psychological, and spiritual aspects.

Individuals who have cancer and experience uncertainty during the treatment period will have low self-efficacy. At the same time, individuals who have high self-efficacy will seek information from doctors for treatment. Cancer patients realize that the primary key in undergoing cancer treatment is mental readiness. When the patient can accept cancer he is suffering from, his perception and emotions will be positive. If they have positive perceptions and emotions, cancer patients will have a higher self-efficacy (sense of success) to recover.<sup>9</sup> This study aims to examine the success of nanogold and nanosilver nanomaterials in increasing the self-efficacy and spirituality of cancer volunteers

This research method used quantitative and qualitative approaches with experimental design. This study uses a one group pre-test-post-test design. This study involved ten volunteers at the Indonesian Cancer Museum. Data were obtained using questionnaires, in-depth interviews, observation and documentation. The subjects in the study were observed for six months. The first step that researchers must take is to find research subjects, namely cancer volunteers at the Indonesian Cancer Museum. Questionnaires were given to obtain pre-test data and process the data to determine the level of self-efficacy (sense of success). Cronbach's alpha is utilized to validate the test. The data taken are volunteers who have not consumed nanogold and nanosilver nanomaterials. Volunteers were then given treatment to consume nanogold and nanogold. The experimental design in the study is used to determine the results of giving a treatment.

### Pre-test and post-test results

The results of the average level of self-efficacy (sense of success) and spirituality of pre-test and post-test cancer volunteers can be seen in Table 1.

Respondents	Pre-Test Score	Post-Test Score	Score Difference	Description
X-1	105	110	+5	Increase
X-2	96	105	+9	Increase
X-3	89	95	+6	Increase
X-4	96	100	+4	Increase
X-5	87	98	+12	Increase
X-6	105	107	+2	Increase
X-7	96	102	+6	Increase
X-8	89	96	+7	Increase
X-9	96	101	+5	Increase
X-10	87	89	+2	Increase

Based on table 1, all volunteers involved in the study had increased self-efficacy scores from the pre-test and post-test. Based on the statistical test output, it is known that the Sig (2-tailed) value is 0.005 because the value is 0.005 < 0.05. Therefore, it can be concluded that the hypothesis is accepted. This means that there is a difference between the results of the pre-test and post-test scores. Therefore, consuming nanogold and nanosilver can increase cancer sufferers' self-efficacy (sense of success) and spirituality.

### Physiological Characteristics

Cancer volunteers who consumed nanogold and nanosilver showed signs of improved physiological conditions. Physiological conditions such as a fitter body, weight loss, increased endurance. The administration of nanogold and nanosilver drugs can increase the success of a healthy quality of life. Nanosilver can overcome terrible broad-spectrum microbial disease and heterogeneous cancer with higher nominal efficacy and toxicity. Nanosilver exhibits antimicrobial activity against multidrug-resistant microbes and can be considered an effective agent against strains<sup>6</sup>. Nanomaterials can be used to treat various types of drug-resistant cancer patients<sup>11</sup>.

Positive perceptions about nanogold and nanosilver nanomaterial technology make a pleasant experience a learning experience. This situation encourages volunteers to have the ability to control themselves and accept themselves better. The ability to control themselves and accept themselves makes cancer volunteers have positive perceptions and emotions. Positive perceptions and emotions make the physiological state of cancer patients experience health changes. Improving self-efficacy is very important for pulmonary rehabilitation in lung cancer patients<sup>29</sup>. Nanomaterials can serve as an integrated platform for multiple drugs or therapeutic strategies, simultaneously targeting multiple steps of the cancer-immune cycle to enhance the outcome of the anticancer immune response<sup>15</sup>.

### Psychological Characteristics

Cancer volunteers experience increased self-efficacy (feelings of success) to recover. High self-confidence in their ability to make cancer volunteers regulate self-function through cognitive, motivational, affective, and decision-making processes to influence behaviour. One of the interview excerpts from cancer volunteers can be seen as follows:

"I feel more prepared to undergo cancer treatment and able to make friends with this cancer. Because for me, mental readiness is the main factor in order to recover. When we can sincerely accept this reality, it makes my life more vibrant and healthier. So, I am grateful for what God has ordained for me. I believe death is the right of Allah, but we are always obliged to try to be better. For example, I am trying to recover from this cancer by consuming nanogold and nanosilver, but I am still taking medicine from the doctor. I feel that I still have to learn discipline in consuming nanogold and nanosilver drugs. I did it all in order to live a normal life like everyone else. The most important thing is that I want to stay healthy so that I can continue to be with my family."

Psychological characteristics are shown by having the high discipline to take nanogold and nanosilver drugs on time. Cancer volunteers have mental readiness in undergoing treatment, and being able to make friends with cancer through suggestions has a positive impact on mental peace. Cancer volunteers can be grateful for the conditions they experience to make life feel happy and always enthusiastic about welcoming tomorrow. Cancer volun-

teers have a high commitment and can motivate others to survive cancer so that it has an impact on psychological conditions<sup>8</sup>. The quality of life of cancer patients is related to their self-efficacy (sense of success). Medication adherence and self-efficacy of motivated patients increased significantly<sup>2</sup>. Quality of life and family support have a positive effect on the psychology of cancer patients. The higher the support provided by the family, the quality of life of cancer patients will increase<sup>25</sup>.

### Spirituality and Religious Belief

The experience of cancer volunteers who consumed nanogold and nanosilver felt that spirituality and religiosity had a positive impact on health. Excerpts from interviews from cancer volunteers regarding the spirituality and religiosity of cancer volunteers are as follows:

"I leave it to God for the destiny that has been outlined but still accompanied by efforts to recover. I believe that life is a destiny that must be lived, and I must try my best. However, as I believe in my religion, God will not change the destiny of a people if the people do not want to try to be better."

"I have tried medically and psychologically to recover from cancer. As a form of perfection of the efforts that I do, then the affairs of the results I leave to God. At every opportunity in life that God has given me, I emphasize that the human mind is like soil, and what we sow will grow. When we can think positively, the life we go through will be following what we think."

Medical and psychological efforts have been made as a form of recovery from cancer. Psychological efforts are to increase self-efficacy or confidence that individuals can get through cancer and recover. Prayer is a means of communication between humans and God. Emotional cancer volunteers get motivation and support from their families and peace of mind from their spiritual beliefs that make cancer patients' ability to perform daily activities better<sup>23</sup>. Prayer and belief in the hope of recovery motivate cancer patients to carry out treatment<sup>17</sup>. Belief in spirituality and religiosity is one of the keys to success in undergoing cancer treatment. Self-efficacy (sense of success) can affect how cancer patients perceive their self-esteem. So that cancer patients can maintain and improve their health status. Motivate and train yourself to be able to perform daily activities independently. This is in line with the theory that self-efficacy can help individuals make choices, strive to become better, and persevere and persevere in life.

## Conclusions

Consuming nanogold and nanosilver can increase the self-efficacy and spirituality of people with cancer. Cancer patients who consume nanogold and nanosilver have a greater desire to recover. This is evidenced by the physiological characteristics that show changes in a positive direction. In addition, cancer patients can display the psychological characteristics of self-efficacy (a sense of success) and spirituality in the form of perseverance, persistence, and patience. Finally, the belief in spirituality and religiosity that cancer volunteers have is a form of completing the efforts made to recover from cancer.

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### Conflict of interest

the authors declare that there is no conflict of interest.

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