

Ginger supplement's effect on Chemotherapy-Induced Nausea and Vomiting among Women with Breast Cancer

Amira Hosny abd el-Fatah kame1¹, Dalia Salah Eldeen Abd el muneim ² and Samia Huseiny Gaballah ³

1. Nursing specialist at Oncology Educational Hospital, Ismailia, Egypt
2. Assistant Professor of Medical Surgical Nursing, Faculty of Nursing-Cairo University, Cairo, Egypt
3. Lecturer of Medical Surgical Nursing, Faculty of Nursing -Suez Canal University, Ismailia, Egypt

Abstract

Background: Chemotherapy-induced nausea and vomiting (CINV) is a frequent adverse reaction that leads to women inactivity, therapy rejection, and a reduction in compliance. **Aim:** The current study aimed to evaluate ginger supplement's effect on chemotherapy-induced nausea and vomiting among breast cancer women. **Design:** Quasi-experimental design. **Setting:** the current study was conducted at outpatient chemotherapeutic clinics in Ismailia Teaching Oncology Hospital. **Sample:** 60 women diagnosed with breast cancer were recruited to participate in the current study. **Tools:** two tools were used to conduct this study. **Tool I:** included two parts which involved assessment of the demographic data and cancer history. **Tool II:** Rhodes Inventory of Nausea, Vomiting, and Retching (INVR). **Intervention:** The studied women received 400 mg ginger tablets three times daily for three days starting 30 minute before chemotherapy administration on the first day of chemotherapy. All studied and control groups received the routine prophylactic antiemetic medications for chemotherapy induced nausea and vomiting (CINV) before chemotherapy session. **Results:** There was a decrease in nausea severity and number of vomiting and retching in the study group after administration of ginger tablets with highly statistically significant differences as ($P < 0.001$). **Conclusion:** Studied women who received ginger had a significantly decreased CINV. **Recommendations:** Endorse the ginger as one of additional adjuvant line of treatment for CINV.

Key words: Breast Cancer, Chemotherapy induced nausea and vomiting, Ginger.

1.Introduction

Breast Cancer (BC) is the second major cause of cancer-related mortality in women, after lung cancer (Arslan & Ozdemir, 2015). It's accounting for 22.9% and 37.7% of all female cancers worldwide and in Egypt, respectively. BC in Egypt carries an unfavorable prognosis with 29% mortality (Farahat et al., 2018). Chemotherapy Induced Nausea and Vomiting (CINV) is the most distressing side effects of chemotherapy as it may interfere with patients' daily

functioning and negatively affect their quality of life. It can also have detrimental clinical implications for patients, including non-compliance with or premature discontinuation of chemotherapy as well as impeding patients' willingness or ability to eat and/or drink leading to nutritional deficits. Without appropriate antiemetic prophylaxis, up to 90% of all cancer patients receiving chemotherapy may experience nausea and/or vomiting (Jordan et al., 2014)

Ginger has been used for cancer because, it has many benefits as a direct anti-inflammatory, anti-carcinogenic, anti-oxidative, and anti-tumoral effects. Ginger has been proved that the active ingredients in ginger can kill cancer cells due to apoptosis and auto phagocytosis. Besides that, it has fewer side effects compared with pharmacological drugs (Shokri et al., 2017)

The nursing profession has a long history of caring for clients in a holistic manner and integrating the healing arts with conventional treatments. Many CAM treatments such as massage, therapeutic touch, use of relaxation methods, cold and heat therapies, imagery, music intervention, and creating an optimal healing environment are among the traditional nursing activities. Integrating CAM therapies in nursing not only enables nurses to provide comprehensive and holistic care, but also would improve nurse-patient relationship and increases patient satisfaction (Shorofi & Arbon, 2010)

1.2. Significance of the study:

Complementary and Alternative Medicine (CAM) can offer nurses additional treatment options for managing their patients' pain and discomfort. This therapeutic approach focuses on the holistic care of the individual with a particular emphasis on client

involvement. Nurses and other healthcare professionals have attempted to integrate the complementary medicine into clinical practice to provide more holistic approach in treatment and improve the patient's outcome and compliance.

2. Subjects and Methods

2.1. The aim of the study: The current study aims to evaluate ginger supplement's effect on chemotherapy induced nausea and vomiting among women with breast cancer.

2.2. Study design: Quasi-experimental (pre - post test) research design was used in this study.

2.3. The sample of the study: Sample of 60 women were conveniently selected to participate in the study Sample size was calculated using this formula (Charan and Biswas 2013):

$$n = \frac{\left(\frac{z_{\alpha} + z_{\beta}}{2}\right)^2 (P_1(1-P) + (P_2(1-P_2))}{(P_1 - P_2)^2}$$

n= sample size

$Z_{\alpha/2} = 1.96$ (The value for a type I error of 5%)

$Z_{\beta} = 0.84$ (The value for a type II error of 20%)

P_1 = proportion of patients who received ginger and developed chemotherapy-induced nausea and vomiting = 32% (Panahi, Y. 2012).

P_2 = Prevalence of patients who didn't receive ginger and developed chemotherapy-induced vomiting and retching = 45% (Panahi, Y. 2012).

$P_1 - P_2$ = effect size.

2.4. Study setting: The current study was carried out at teaching oncology hospital in Ismailia, Egypt.

2.5. Research Hypothesis:

H1: There will be a statistically significant difference in the occurrence of nausea and vomiting among women receiving ginger tablets compared to women receiving routine hospital care only.

H0: There will be no statistically significant differences in relation to mean score of nausea and vomiting among women receiving ginger tablets compared to women receiving routine hospital care only.

2.6. Tools of data collection:

2.6.1. Tool (1): A structured interview questionnaire:

involved two parts as part I covered demographic data as age, level of education, occupation and part II covered cancer history as grade of cancer, time of chemotherapy initiation, type of chemotherapy, number of chemotherapy cycle.

2.6.2. Tool (2): Tool II: Rhodes Inventory of Nausea, Vomiting, and Retching (INVR):

It is self-report questionnaire that measures nausea, vomiting, and retching as separate entities based on 8 items with 5-points Likert scale (Rhodes & McDaniel, 1999) The frequency and distress of all entities were measured as well as the duration of nausea and amount of vomiting. This tool was suitable for use during each phase of CINV (i.e. anticipatory, acute, and delayed) it was used to measure symptoms over a 12-hour period and to assess the degree of nausea and vomiting after receiving ginger tablets.

2.6.3. Scoring system:

The woman had to record the grade of nausea, vomiting, as follows: Zero=none, 1=mild discomfort, 2= moderate, 3= severe and, 4=very severe discomfort that prevents taking fluids or food by mouth. As regard the amount of vomiting; it was graded as very large when the amount of vomitus is more

than or equal to (3 cups), large ranged from (2-3 cups), moderate when the amount of vomitus is ranged from (1/2-2 cups), mild when the amount of vomitus is less than (1/2 cup), and None. . Finally, the score of nausea = 12, the score of vomiting = 12, the score of retching = 8, with total score of the Rhodes = 32.

2.6.4. Reliability of the Tool:

Reliability of the RINVR was determined using Cronbach's α provided a reliability estimate of 0.897 for the eight items. Reliability of Arabic version estimate of 0.877. The Guttman split-half Procedure yielded a correlation of $r = 0.947$ between the two 5-item forms (**Susan Jane Fetzer, Hand, Bouchard, Smith, & Jenkins, 2004**).

2.7. Field work:

The study was conducted at teaching oncology hospital in Ismailia, Egypt. Data was collected five days/week and the time of data collection lasted for seven months from February 2019 to August 2019. The participant had to fulfill in the questionnaire. Each one was given 9 ginger tablets each chemotherapy session with a written prescription paper and complete instruction. The application of ginger tablets was on the following term of: the first dose of ginger 30

minute before chemotherapy administration, the second one after 2 hrs from chemotherapy session, the third dose after 10 hrs from the chemotherapy session and every 8 hrs in the second and the third days. All participating women also received hospital routine antiemetic protocol (ondansetron, ranitidine, pheniramine, and dexamethasone) before chemotherapy session. We provided each participant was provided with an Arabic copy of Rhodes scale to fill at home to assess the degree of nausea, vomiting, and retching; this was the base line data and follow up card to fill at home after each ginger tablet intake. We collected the copy of the Rhodes at the next visit and coded it. The copies of the Rhodes form were collected and coded on the following visit.

2.8. Administrative design:

An official permission for data collection was obtained from Ismailia Teaching Oncology Hospital in Ismailia city from the vice dean of faculty of nursing at Suez Canal University. Ethical approval was obtained from the research ethics committee of the faculty of nursing – Suez Canal University.

2.9. Ethical considerations:

Acceptance and informed consent had obtained from each participant. Participation

in this study was voluntary. Each participant had the right to withdrawal from the study at any time without any consequence. Confidentiality of the collected data had been maintained. The results used as a component of the necessary research for master thesis, as well as for future publication and education. The topic of this study would not touch religious, ethical, moral and culture issues among participants.

2.10. Statistical design:

The collected data was coded, organized, categorized, tabulated, computerized and analyzed using statistical package of the social sciences (SPSS) software program version 24.

3. Results

Table (1): Demonstrated that the total mean scores of nausea, vomiting, and retching in the study group was 65.03 ± 4.5 in pre-ginger administration phase while it was 49.006 ± 7.8 in post1-ginger administration phase and 48.300 ± 9.3 in post2-ginger administration with highly statistically significant differences.

Table (2): Demonstrated the total nausea, vomiting, and retching mean scores in the control group was 62.80 ± 5.9 in pre-ginger administration phase while it was 62.80 ± 7.1 in post1-ginger administration phase and

62.233 ± 7.9 in post2-ginger administration with no statistically significant differences.

4. Discussion

Chemotherapy- induced nausea and vomiting is the most distressing side effects of chemotherapy as it may interfere with patients' daily functioning and negatively affect their quality of life. So, advances in our understanding of the pathophysiology of CINV, the identification of patient risk factors, and the development of new antiemetic have led to significant improvements in CINV prevention (**Jordan et al., 2014**). Ginger is used widely in history for its many natural medicinal properties and particularly as an antiemetic drug (**Palatty et al., 2013**). accordingly, the present study evaluated ginger supplement's effect on chemotherapy- induced nausea and vomiting among women with breast cancer.

Indeed, the research findings illustrated that CINV was decreased significantly after administration of ginger supplements. These results were supported by **Sanaati et al., (2016)** who evaluated the effect of ginger and chamomile on nausea and vomiting caused by chemotherapy observed that ginger and chamomile were both significantly effective in reducing nausea and vomiting. These

results are congruent with **Yekta, (2012)** who reported the ginger effect as a miracle against chemotherapy-induced vomiting and reported that ginger could relieve chemotherapy-induced nausea and vomiting in all phases.

The research findings illustrate that CINV was significantly decreased after administration of ginger supplements. These results are supported by **Sanaati et al., (2016)** who evaluated the effect of ginger and chamomile on nausea and vomiting caused by chemotherapy in Iranian women with breast cancer and observed that ginger and chamomile were both significantly effective in reducing nausea and vomiting. So, these results are congruent with **Yekta, (2012)** who reported the ginger effect as a miracle against chemotherapy-induced vomiting and reported that ginger could relieve chemotherapy-induced nausea and vomiting in all phases

Additionally, **Arsan & Ozdemir, (2015)** which evaluate the oral intake of ginger on CINV among women with breast cancer and report that number of vomiting episodes were significantly lower in the intervention group as compared to the control group ($p > 0.05$), but ginger had no effect on retching.

On the same line, these results are consistent with study done by **Ryan, (2012)** who evaluate ginger effect in reduction acute chemotherapy-induced nausea and showed that Ginger supplementation at a daily dose of 0.5 g– 1.0 g significantly decreased the severity of acute chemotherapy-induced nausea only in adult cancer patients.

Furthermore, these results concur with a study done by **Arsan & Ozdemir, (2015)** study evaluate oral intake of ginger for chemotherapy-induced nausea and vomiting among women with breast cancer and reported that number of vomiting episodes were significantly lower in the intervention group than in the control group ($p > 0.05$).

Moreover, current results are consistent with **(Lua, Salihah, & Mazlan, 2015)** who evaluate effects of inhaled ginger aromatherapy on chemotherapy-induced nausea and vomiting and health-related quality of life in women with breast cancer and showed decrease in nausea after ginger oil inhalation. In the same context, study on 78 patients with breast cancer compared 1.5 g of ginger daily for 5 days with placebo done by **Panahi, (2012)** showed a significantly lower prevalence of nausea in the ginger group during 6 to 24 hrs post-chemotherapy that ginger had an effect on nausea only.

Moreover, (Kuumawardani, (2018) (Stanisiere, Mousset, & Lafay, 2018) (Alhajri, (2017) (Saber, (2014) who evaluate the effectiveness of ginger in decreasing nausea and vomiting during early pregnancy and found a significant decrease in nausea and vomiting with no risk to the mother and her baby .Furthermore, sharifzadeh, (2017) study which compared the effects of ginger, pyridoxine (vitamin B6) and placebo. And so, these results are supported by Saber, (2014) which showed that ginger is effective in reducing vomiting associated with pregnancy but did not affect the retching episodes.

On the same line these results are in agreement with(Hosseini & Adib-Hajbaghery, 2015) study to compare the effect of ginger essence on nausea and vomiting after opened versus laparoscopic nephrectomies and (Montazeri et al., (2013) study that performed for the evaluation of oral ginger efficacy against Postoperative Nausea and Vomiting which revealed that ginger was effective at decreasing postoperative nausea.

Conversely, these results are contradicted with the results of Li et al, (2018) study aimed at evaluating Efficacy of Ginger in Ameliorating Acute and Delayed Chemotherapy-Induced Nausea and Vomiting

among Patients with Lung Cancer Receiving Cisplatin-Based Regimens. And reported that Ginger had no evidence in the reduction of the incidence and severity of nausea and vomiting.

Moreover, Thamlikitkul et al., (2017) concluded that ginger had no benefit in terms of reducing nausea severity and vomiting in breast cancer patients receiving AC and ondansetron and dexamethasone for CINV prophylaxis.

Furthermore, Bossi, (2017) study the effect of ginger extract in the management of chemotherapy-induced nausea and vomiting in patients receiving high-dose cisplatin which concluded that the daily addition of ginger, even if safe, it did **not** have a protective effect on CINV. As well (Giacosa et al., 2015) on study performed to examine the effect of ginger extract on nausea and vomiting which reported that ginger had no effect on nausea and vomiting

Additionally, current results are contradicting with the results of Ansari et al., (2016) who found that ginger had no effect on CINV on study aimed to evaluate the Efficacy of Ginger in Control of Chemotherapy Induced Nausea and Vomiting in Breast Cancer Patients Receiving Doxorubicin-

Based Chemotherapy. **Fahimi, (2011)** summarized that the daily addition of ginger, even if safe, it did not have a protective effect on CINV.

5. Conclusion

The following conclusion was drawn from the previously mentioned study findings, that, "ginger supplements' effect for chemotherapy- induced nausea and vomiting among women with breast cancer " achieve significant improvement in chemotherapy-induced nausea and vomiting as it decline nausea severity and number of vomiting/retching episodes associated with

chemotherapy in the study group when compared to control group.

6. Recommendations

In the light of the finding of the current study, Further studies are recommended with using a larger sample size and randomly selected from different geographical areas in Egypt in order to provide a more accurate and broader representation of this group of patients in Egypt, receiving moderate and low emetogenic agents, and comparing ginger with other antiemetics are needed to evaluate accurate efficiency of ginger on CINV

Table (1): Total nausea, vomiting, and retching means scores of the study group during pre and (post1 and post2) ginger administration phase (n=30).

Total Rhodes index	Study n=30			F test	P- value
	Pre-ginger administration	Post1-ginger Administration	Post2-ginger Administration		
	Mean ±SD (assessment)	Mean ±SD (1 st cycle)	Mean ±SD (2 nd cycle)		
1 st day	21.63±2.32	17.0667±2.803	16.2333±3.1259	59.99	<.001*
2 nd day	21.26±2.18	16.533 ± 3.411	16.1333±3.5982	28.635	<.001*
3 rd day	22.13±2.43	15.466 ± 3.350	15.9333±3.3624	57.157	<.001*
Total	65.03±4.51	49.066±7.803	48.3000±9.2927	72.256	<.001*

F is repeated measures anova, p value is<.05

Table (2): Total nausea, vomiting, and retching mean scores of the study group during pre and (post1 - post2) ginger administration phase (n=30).

Total Rhodes index	Control n=30			F test	P-value
	Pre-ginger administration Mean ±SD (assessment)	Post1-ginger Administration Mean ±SD (1 st cycle)	Post2-ginger Administration Mean ±SD (2 nd cycle)		
1 st day	20.60±2.29	20.766 ± 3.460	20.933±2.7029	.345	.711
2 nd day	21.10±2.33	20.866 ± 2.417	20.3667±3.056	.766	.474
3 rd day	21.10±3.30	21.166 ± 2.889	20.9333±3.106	.103	.903
Total	62.80±5.87	62.80±7.136	62.2333±7.933	.224	.801

F is

repeated measures anova, p value is<.05

7. References

Abushady, H. M., El-Shatoury, E. H., & Abd-elmegeed, A.S. S.

(2014). Antibacterial and Antioxidant Properties of some Selected Egyptian Plants. *Anali Mečnikiv's'kogo Institutu*, 1(95), 71-95

AlHajri, L., AlFalasi, M., Abdelrahim, M., & AlKaabi, R. (2017): The efficacy of ginger for pregnancy-induced nausea and vomiting: a systematic review. *Journal of Natural Remedies*, 17, 48-56

Arslan, M., & Ozdemir, L. (2015). Oral intake of ginger for chemotherapy-induced nausea and vomiting among women with breast cancer. *Clinical journal of oncology nursing*, 19(5).

Bossi, P., Cortinovis, D., Fatigoni, S., Cossu Rocca, M., Fabi, A., Seminara, P., Bergamini, C. (2017). A randomized, double-blind, placebo-controlled, multicenter study of a ginger extract in the management of chemotherapy-induced nausea and vomiting (CINV) in patients receiving high-dose cisplatin. *Annals of oncology*, 28(10), 2547-2551.

Fahimi, F., Khodadad, K., Amini, S., Naghibi, F., Salamzadeh, J., & Baniyadi, S. (2011). Evaluating the effect of Zingiber officinalis on nausea and vomiting in patients receiving cisplatin based regimens. *Iranian journal of pharmaceutical research: IJPR*, 10(2), 379.

Farahat, T. M., Abd El-Bary, N. M., Shaheen, H. M., Khalil, N. A., & Hussein, Y. H. (2018). Patients with breast cancer: screening of the disease among their families in Menoufia University Hospital, Egypt. *Menoufia Medical Journal*, 31(4), 1470.

Fetzer, S. J., Hand, M. C., Bouchard, P. A., Smith, H., & Jenkins, M. B. (2004). Evaluation of the Rhodes Index of Nausea and Vomiting for ambulatory surgery patients. *Journal of advanced nursing*, 47(1), 74-80.

Giacosa, A., Morazzoni, P., Bombardelli, E., Riva, A., Bianchi Porro, G., & Rondanelli, M. (2015): Can nausea and vomiting be treated with ginger extract. *Eur Rev Med Pharmacol Sci*, 19(7), 1291-1296.

Hosseini, F. S., & Adib-Hajbaghery, M. (2015): Ginger essence effect on nausea and vomiting after open and laparoscopic nephrectomies. *Nursing and Midwifery Studies*, 4(2).

Jordan, K., Schaffrath, J., Jahn, F., Mueller-Tidow, C., & Jordan, B. (2014). Neuropharmacology and management of chemotherapy-induced nausea and vomiting in patients with breast cancer. *Breast Care*, 9(4), 246-253.

Li, X., Qin, Y., Liu, W., Zhou, X.-y., Li, Y.-n., & Wang, L. y. (2018). Efficacy of Ginger in Ameliorating Acute and Delayed Chemotherapy-Induced Nausea and Vomiting Among Patients With Lung Cancer Receiving Cisplatin-Based Regimens: A Randomized Controlled Trial. *Integrative cancer therapies*, 1534735417753541.

Lua, P. L., Salihah, N., & Mazlan, N. (2015). Effects of inhaled ginger aromatherapy on chemotherapy-induced nausea and vomiting and health-related quality of life in women with breast cancer. *Complementary therapies in medicine*, 23(3), 396-404.

McDaniel, R. W. (1999): Rhodes VA, The index of nausea, vomiting, and retching: a new format of the index of nausea and vomiting. *Oncology Nursing Forum*. 1999; 26(5):889–94.

Montazeri, A. S., Raei, M., Ghanbari, A., Dadgari, A., Montazeri, A. S., & Hamidzadeh, A. (2013). Effect of herbal

therapy to intensity chemotherapy-induced nausea and vomiting in cancer patients. *Iranian Red Crescent Medical Journal*, 15(2), 101

Panahi, Y., Saadat, A., Sahebkar, A., Hashemian, F., Taghikhani, M., & Abolhasani, E. (2012).Effect of ginger on acute and delayed chemotherapy-induced nausea and vomiting: a pilot, randomized, open-label clinical trial. *Integrative cancer therapies*, 11(3), 204-211.

Palatty, P. L., Haniadka, R., Saldanha, E., Sunita, V., Fayad, R., & Baliga, M. S. (2013). A review of the gastroprotective effects of ginger (*Zingiber officinale* Roscoe). *Food & function*, 4(6), 845-855.

Ryan, J. L., Heckler, C. E., Roscoe, J. A., Dakhil, S. R., Kirshner, J., Flynn, P. J., & Morrow, G. R. (2012). Ginger (*Zingiberofficinale*) reduces acute chemotherapy- Induced nausea: A URCC CCOP study of 576 Patients. *Supportive Care in Cancer*, 20(7), 1479–1489.

Sanaati, F., Najafi, S., Kashaninia, Z., & Sadeghi, M. (2016). Effect of ginger and chamomile on nausea and vomiting caused by chemotherapy in iranian women with breast cancer. *Asian Pacific Journal of Cancer Prevention*, 17(8), 4125-4129.

Sharifzadeh, F., Kashanian, M., Koochpayehzadeh, J., Rezaian, F., Sheikhansari, N., & Eshraghi, N. (2018). A comparison between the effects of ginger, pyridoxine (vitamin B6) and placebo for the treatment of the first trimester nausea and vomiting of pregnancy (NVP). *The Journal of Maternal-Fetal & Neonatal Medicine*, 31(19), 2509-2514.

Shokri, F., Gharebaghi, P. M., Esfahani, A., Sayyah-Melli, M., Shobeiri, M. J., Ouladsahebmadarek, E., & Ghojazadeh, M. (2017).Comparison of the complications of platinum-based adjuvant chemotherapy with and without ginger in a pilot study on ovarian cancer patients. *Int J Womens Health Reprod Sci*, 5(4), 324-331.

Shorofi, S. A., & Arbon, P. (2010). Nurses' knowledge, attitudes, and professional use of complementary and alternative medicine (CAM): A survey at five metropolitan hospitals in Adelaide. *Complementary therapies in clinical practice*, 16(4), 229-234.

Sontakke, S., Thawani, V., & Naik, M. (2003). Ginger as an antiemetic in nausea and vomiting induced by chemotherapy: a randomized, cross-over, double blind study. *Indian journal of pharmacology*, 35(1), 32-36.

Stanisiere, J., Mousset, P.-Y., & Lafay, S. (2018). How safe is ginger rhizome for decreasing nausea and vomiting in women during early pregnancy? *Foods*, 7(4), 50.

Takei, S., Ishibe, a., Watanabe, J., Watanabe, K., Suwa, Y., Suzuki, S., Nakagawa, K., Suwa, H., Ota, M., Ichikawa, Y., Kunisaki, C., Yamanaka, T., & Endo, I. (2020). Risk factors of chemotherapy-induced nausea and vomiting in patients with metastatic Colorectal cancer: a prospective cohort study (YCOG1301). *Int Journal of Cancer*, 35:2323–2329.

Thamlikitkul, L., Srimuninnimit, V., Akewanlop, C., Ithimakin, S. Techawathanawanna, S., Korphaisarn, K., Soparattanapaisarn, N. (2017). Efficacy of ginger for prophylaxis of chemotherapy-induced Nausea and vomiting in Breast cancer patients receiving Adriamycin Cyclophosphamide regimen: A Randomized, double-blind, Placebo controlled crossover study. *Supportive Care in Cancer*, 25(2), 459–464.

Yekta, Z. P., Ebrahimi, S. M., Hosseini, M., Nasrabadi, A. N., Sedighi, S., Surmaghi, M.-H. S., & Madani, H. (2012). Ginger as a miracle against chemotherapy-induced vomiting. *Iranian Journal of Nursing and Midwifery Research*, 17(5), 325.

Zakaria , A., EL- Kinaal , N.,Loay , I., Nassar ,H ,R., Darwish ,T., El -Defetar , M ., Allam , R ,M., & Nabil , H. (2018). Triple Negative Breast Cancer, Clinicopathologic Study of Egyptian Patients, NCI Experience. *Med. J. Cairo Univ.*, 86, 2747-2753.

Zick, S. M., Ruffin, M. T., Lee, J., Normolle, D. P., Siden, R., Alrawi, S., & Brenner, D. E. (2009).Phase II trial of encapsulated ginger as a treatment for chemotherapy-induced nausea and vomiting. *Supportive care in cancer*, 17(5), 563-572.