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FROM THE PAST TO THE FUTURE

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INTERNATIONAL SPEAKERS



Alex Molasiotis, Prof

Prof. Alex Molasiotis is an academic and researcher in health sciences, currently serving as the Pro Vice-Chancellor and Dean of the College of Arts, Humanities, and Education at the University of Derby, UK. He is also the Editor-in-Chief of the European Journal of Oncology Nursing and holds visiting professorships at institutions including King's College London, the Karolinska Institute, and the University of Technology Sydney.



Eran Ben-Arye, MD, Prof

Eran Ben-Arye has an MD degree from the Faculty of Medicine of the Hebrew University of Jerusalem, Israel. Prof. Ben-Arye is on the faculty of the Bruce Rappaport Faculty of Medicine, The Technion, and since 2022 serves as the Chairman, Department of family Medicine, in the Faculty of Medicine. Prof. Ben-Arye is the founder and director of the Integrative Oncology Program at Lin, Carmel, and Zebulun Medical Centers, Haifa, Israel. He has been the chairperson of the Israel Society for Complementary Medicine of the Israel Medical Association. He is the Primary Researcher of the Middle East Research Group in Integrative Oncology (MERGIO) within the Middle East Cancer Consortium (MECC) and is an elected member of the Society for Integrative Oncology (SIO) Board of Trustees and serves as the SIO Regional Ambassador to Europe and the Middle-East.



Jeannine M. Brant, Ph.D., APRN-CNS, AOCN, FAAN

Dr. Jeannine M. Brant, Ph.D., APRN-CNS, AOCN, FAAN, is an oncology clinical nurse specialist and Director of Clinical Science and Innovation at City of Hope Cancer Center in Duarte, California. Dr. Brant received a bachelor's degree from Montana State University, a master's degree in physiological nursing from the University of California at San Francisco, and a doctorate in cancer nursing from the University of Utah in Salt Lake City. She is a past president of the Oncology Nursing Society. She is editor of the Journal of Advanced Practitioners in Oncology. She also serves as adjunct faculty at the University of Montana Geriatric Education Center, University of Southern Indiana and Montana College of Nursing, Bozeman.

INTERNATIONAL SPEAKERS



Manal Abdul Majeed Hussain Al-Zadjali, RN. MSN. PhD

Manal Abdul Majeed Hussain Al-Zadjali is the Dean of the Higher Institute of Health Specialties, Oman. She is also the Secretary General of Oman Cancer Association. Dr. Manal has a PhD in Nursing and Healthcare Innovation and a Master degree in Nursing Science - Community Health Nursing from Arizona State University. She teaches in the Postgraduate Diploma in Community Health Nursing Practice Program- a program that she has developed. Dr. Manal is a volunteer in Oman Cancer Association for the past ten years. In addition, she is also a reviewer in several International Journals. Her research interest includes palliative care, healthcare workforce education and training, chronic diseases... etc. Further, Dr. Manal received the Oman Woman of the Year-2019 award in the category of Education.



Maryam Rassouli, Prof.

Prof. Maryam Rassouli is a professor of nursing at the University of Nizwa, Oman, where she is affiliated with the School of Nursing in the College of Health Sciences. Previously, she served as a full professor at Shahid Beheshti University of Medical Sciences (SBMU) in Tehran, Iran, and held the position of Director General of Nursing Services. Dr. Rassouli is a member of the International Society of Nurses in Cancer Care (ISNCC) and the ISNCC Knowledge Development and Dissemination Committee (since 2022). She was also a member of the Iranian National Network of Nursing Research (2016-2021) and a founding board member of the Iranian Scientific Palliative Care Association under the Ministry of Health in Tehran. Additionally, she has been serving as a Temporary Adviser on Palliative Care for the Eastern Mediterranean Region of the World Health Organization (WHO) since 2019. Her research interests include palliative care, spirituality in healthcare, cancer care, mixed-method research, and scale development.



Funda Rohde, Assoc. Prof.

Assoc. Prof. Funda Rohde is a Palliative Care and Psychiatric Nurse. She works as a psychotherapist in her private practice in Germany. Ms Rohde is also an honorary lecturer in nursing departments and reputable institutions providing health and social work education. She collaborates nationally and internationally to develop psychiatric and palliative care nursing.

OP - 071

The Effect of Breathing Exercises on Chemotherapy-Induced Nausea and Vomiting in Autologous Hematopoietic Stem Cell Transplantation Patients: A Randomized Controlled Trial

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Abstract:

In patients undergoing hematopoietic stem cell transplantation, high-dose chemotherapies used as conditioning regimens have high emetic potential. This research was conducted as a randomized controlled trial to examine the effect of breathing exercises on managing chemotherapy-induced nausea and vomiting in patients undergoing autologous hematopoietic stem cell transplantation. A randomized controlled trial was conducted to select patients who underwent autologous hematopoietic stem cell transplantation, including an experimental group (n=35) performing breathing exercises for chemotherapy-induced nausea and vomiting and a control group (n=35) receiving standard care. Various variables were evaluated, such as frequency and degree of nausea and vomiting, nutritional status of the patient, and need for antiemetics. Data were analyzed and interpreted using Mann Whitney U, Pearson chi-square test, Independent t-test, and multiple linear regression methods. It was found that there was a negative relationship between the number of breathing exercises, the number of nausea and vomiting, and the severity of nausea. As the number of breathing exercises increased, there was a significant decrease in the number of nausea and vomiting and the severity of nausea. It was found that the use of antiemetics decreased in the experimental group. It was found that the daily food consumption of the experimental group was higher on days 3, 7, and 9. This study showed that the application of breathing exercises is a practical approach to managing chemotherapy-induced nausea and vomiting

Keywords: Breathing exercise, chemotherapy, hematopoietic stem cell transplantation, nausea, vomiting

Introduction

Nausea and vomiting caused by chemotherapy are among the most common side effects in hematopoietic stem cell transplantation. High-dose chemotherapies used as conditioning regimens in hematopoietic stem cell transplantation have a high emetogenic potential (1). Patients experiencing nausea and vomiting may face adverse effects such as metabolic disorders, functional impairments, dehydration, and impaired drug absorption (2). Nurses play a crucial role and bear significant responsibilities in managing nausea and vomiting in patients undergoing hematopoietic stem cell transplantation. This study was conducted as a randomized controlled trial to examine the effect of breathing exercises on managing chemotherapy-induced nausea and vomiting in patients undergoing autologous hematopoietic stem cell transplantation.

Materials-Methods

This study was conducted between February 2022 and March 2023 in patients undergoing autologous hematopoietic stem cell transplantation. Patients were assigned to intervention and control groups using a computerized randomization program (www.random.org). A randomized controlled design was used, including an intervention group (n=35) that performed breathing exercises for chemotherapy-induced nausea and vomiting and a control group (n=35) that received standard care. All participants were assigned to groups through blinded randomization; however, the researchers were not blinded as they were responsible for teaching the breathing exercises to the patients. At the beginning of the study, all patients completed a Patient Information Form.

Previous studies have shown that chemotherapy-related nausea and vomiting in hematopoietic stem cell transplant patients most commonly develops within the first 15 days (3). Therefore, starting one day before treatment and continuing for 14 days, patient follow-up forms were completed using the Rhodes Index of Nausea, Vomiting and Retching (RINVR), a daily food intake diary prepared by the researcher, and the Visual Analog Scale (VAS). In addition, the patients' primary nurses recorded the number of additional antiemetic treatments used each day.

Ethical approval was obtained from the Koç University Clinical Research Ethics Committee (2022.065. IRB1.034), and institutional permission was granted by the hospital. Written informed consent was also obtained from patients' relatives. Data were analyzed and interpreted using Mann–Whitney U, Pearson chi-square test, independent t-test, and multiple linear regression methods.

Results

The mean age was 55.86 in the intervention group and 57.66 in the control group, with no statistically significant difference between the two groups. The majority of patients were male and married. When examining the conditioning regimens in both groups, most patients received either melphalan (44.3%) or BEAM (44.3%) protocols.

Multiple linear regression analysis was conducted to evaluate the independent variables affecting the frequency and severity of nausea, and the frequency of vomiting. It was observed that as patient age increased, the number of nausea and vomiting episodes also increased. A negative relationship was found between the number of breathing exercises and the number and severity of nausea and vomiting. As the number of breathing exercises increased, a significant decrease in the frequency and severity of nausea and vomiting was observed.

A positive relationship was found between the number of antiemetics used and the frequency of nausea and vomiting. As the frequency and severity of nausea increased, the need for antiemetic treatment also increased. When comparing the groups, the need for antiemetic treatment was significantly lower in the intervention group ($p < 0.05$). It was found that the use of antiemetics decreased in the intervention group.

On days 3, 7, and 9, the daily food intake was higher in the intervention group. Overall, the intervention group had higher average daily food consumption compared to the control group.

Discussion

This study aimed to examine the effect of breathing exercises on the management of chemotherapy-induced nausea and vomiting in patients undergoing autologous hematopoietic stem cell transplantation. In the literature, no studies have been found specifically investigating the effect of breathing exercises on nausea and vomiting in patients undergoing hematopoietic stem cell transplantation.

Nausea is a common expected side effect in patients receiving high-emetogenic chemotherapy regimens during autologous hematopoietic stem cell transplantation. It is reported that nausea and vomiting are among the most frequently observed side effects in these patients (4). In a study conducted by Pasyar et al. (2022), it was found that 70–80% of patients undergoing hematopoietic stem cell transplantation and chemotherapy experienced nausea and vomiting, with 36% experiencing acute nausea and vomiting, and 59% experiencing delayed nausea and vomiting (5).

In contrast to existing literature, this study found that gender alone did not have a significant effect on

the number or severity of nausea, or on the frequency of vomiting, based on multiple regression analysis. Similarly, previous studies have shown that neither gender nor age (above or below 50 years) significantly affected the incidence of ≥ grade 2 gastrointestinal symptoms in patients undergoing autologous stem cell transplantation (6).

Unlike the existing literature, this study observed that as patient age increased, the number of nausea and vomiting episodes also increased, although the severity of nausea did not change.

Due to the growing interest in breathing exercises and their healing effects, they are increasingly being used in various fields for symptom management. Several studies have demonstrated the effects of breathing exercises in managing symptoms among patients undergoing hematopoietic stem cell transplantation. However, no studies have specifically investigated the effect of breathing exercises on nausea and vomiting in this patient group. Our study is the first to examine the impact of breathing exercises on nausea and vomiting in these patients.

However, these patients often experience very difficult times during transplantation. Therefore, we believe it is important to make frequent visits to monitor breathing exercises and to encourage regular repetition of the exercises. At the end of the study, researchers may gather feedback and suggestions from patients regarding the implementation of the breathing exercises.

The effects of breathing exercises on nausea and vomiting have primarily been studied in breast cancer patients. In one study examining the impact of deep breathing exercises on nausea and vomiting in breast cancer patients, the intervention group experienced reductions in nausea severity, as well as in the frequency and intensity of nausea, vomiting, and retching (7). Nelwati and Noviyani (2024) found that diaphragmatic breathing exercises could reduce nausea and vomiting and improve the functional status of breast cancer patients receiving chemotherapy (8).

The effectiveness of breathing exercises on nausea and vomiting has often been studied in conjunction with progressive relaxation exercises. A systematic review found that breast cancer patients who practiced progressive relaxation exercises for 25–30 minutes every one or two days showed no difference in the incidence of acute or delayed nausea and vomiting between groups (9). Studies typically limit the number of daily breathing exercises to specific boundaries (9). However, depending on the patient's experience of nausea and vomiting, more frequent breathing exercises may be required beyond these standard limits. In this study, patients performed breathing exercises when they felt nauseous.

A study by Aybar et al. examined the effect of breathing exercises on nausea and vomiting without setting a fixed limit on the number of daily exercises based on the patient's needs, making it a different approach (7). This study also found that patients in the control group required additional antiemetic treatment beyond the standard protocol, indicating that they experienced more severe nausea compared to the intervention group.

The study showed that 5-HT3 antagonist antiemetic treatments used by patients have side effects such as dizziness, constipation, and headache (10). Nurses play an important role and bear significant responsibility in managing nausea and vomiting in patients undergoing chemotherapy and hematopoietic stem cell transplantation. Nurses should be directed to certification programs on breathing techniques and their awareness should be raised. Furthermore, they should provide counseling and training to patients on breathing exercises. Nurses can integrate breathing exercises into patients' daily routines to help manage a variety of issues.

Future studies should be conducted as multi-center trials with larger sample sizes. This study has some limitations. The small sample size and the fact that data were collected from a single center limit the generalizability of the findings to all patients undergoing autologous hematopoietic stem cell transplantation.

Conclusion

This study demonstrated that breathing exercises have a positive effect on the frequency and severity of nausea and vomiting. The findings showed that breathing exercises reduced the number and severity of nausea and vomiting episodes, improved patients' nutritional status, and decreased the need for antiemetic treatment. It is recommended that standard breathing exercise protocols be developed and implemented in clinical settings to manage chemotherapy-induced nausea and vomiting. Additionally, because breathing exercises are easy to perform, they can also be incorporated into discharge education programs.

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