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*Original Article*

# Prevalence of Immunotherapy Practices in a certain region in Libya

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**ABSTRACT**
**Background:** In recent years, immunotherapy has emerged as one of the most promising approaches in cancer treatment. This therapeutic strategy enhances the body's natural immune system to recognize and eliminate cancer cells. Unlike traditional chemotherapy and radiation therapy, immunotherapy aims to target cancer tumors while minimizing damage to healthy tissues. **Aim of the Study:** The study aimed to identify and evaluate key strategies that enhance the immune system's ability to combat cancer. These strategies include the use of immune-stimulatory factors and modifications to chemotherapy protocols that support immune function. **Materials and Methods:** This study included 30 cancer patients recruited from several hospitals in Libya. Fifteen cases were obtained from Tripoli Teaching Medical Hospital, nine from Sabratha Oncology Hospital, five from Al-Yasmeen Center for Radiotherapy, and one case from Misurata Oncology Hospital. Data collected included age, gender, presence of chronic diseases, cancer type, and disease stage. The study was conducted over a three-month period from October to December 2023.**Results:** The results showed that 46.7% of the participating patients received immunotherapy, highlighting the critical role of. The immune system is a primary defense mechanism against cancer. The immune system targets cancer cells through specialized immune cells such as T lymphocytes and natural killer cells, as well as through the secretion of immune-mediated compounds that attack tumors. **Conclusion:** The immune system represents a fundamental barrier against cancer development and progression. Understanding immune mechanisms and the factors influencing immune responses is essential for developing more effective cancer treatment strategies, particularly in Libya.
**Keywords**: *Cancer, Immunotherapy, Chemotherapy, and Radiation, Tripoli Teaching Medical Hospital, Sabratha Oncology Hospital, Al-Yasmeen Center for Radiotherapy, Misurata Oncology Hospital, Libya.*

## Introduction:

Immunotherapy for cancer is a treatment that helps stimulate the body's immune system to recognize and destroy cancer cells [1], and [11]. It works by either boosting the immune system or by using specific substances, known as immune checkpoint Inhibitors, to block proteins that help cancer cells evade immune detection [2], and [10]. There are different types of immunotherapy treatments, including immune checkpoint inhibitors, adoptive cell transfer, cancer vaccines, and cytokines [4] and [13]. These approaches aim to enhance the immune response against cancer cells, either by unleashing the immune system's natural ability to target cancer or by introducing specific immune cells or substances to enhance the response. Immunotherapy has shown promising results in treating various types of cancer, including melanoma, lung cancer, kidney cancer, bladder cancer, and certain types of lymphoma [5]. However, it's important to note that not all patients respond to immunotherapy, and the effectiveness of treatment can vary depending on the individual's cancer [6], [14], and [17]. Due to the side effects that may occur as a result of chemotherapy, which can cause weakness of the immune system, making the patient more susceptible to infections, such as anorexia, vomiting, nausea, hair loss, fatigue, skin changes, immune system weakness digestive and respiratory problems [7]. Chemotherapy causes psychological and emotional effects on the patient's condition, including anxiety, stress, and depression. That's why the world is trending to use immunotherapy as an alternative to chemotherapy [15] and [16]. This study aims to identify and evaluate important strategies to enhance the immune system's ability to fight cancer. These strategies may involve using immune stimulatory factors or modifications in chemotherapy to support the immune system.

## Materials and Methods:

***Place of Study***


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A cross-sectional study was conducted at some hospitals in Libya; the fifteen cases received from Tripoli Teaching Medical Hospital, followed by nine cases from Sabratha Oncology Hospital, and five cases from Al-Yasmeen Center for Radiotherapy. Only one case was obtained from Misurata Hospital Oncology.

***Study population***

The study consisted of 30 cases of cancer patients, which included age, gender, chronic diseases suffered by the participants, type, and stages of cancer disease.

***Time limits***

This study lasted for a period of three months, starting from the end of October 2023 to December 2023, during which data were collected.

***Ethical Considerations***

The study protocol was approved by the ethics committee of the participating hospitals. They were also guaranteed anonymity and that no personal identifying information would be collected.

***Data Analysis***

Descriptive statistics (frequencies and percentages) were used to summarize the demographic characteristics of patients. The data were analyzed using statistical software SPSS version 25.

## Results:

***Target Place***

The study focused on cancer patients obtained in some hospitals in Libya; the largest percentage, 50% (15 cases), came from Tripoli Teaching Medical Hospital, followed by 30% (9 cases) from Sabratha Oncology Hospital, and 16.7% (5 cases) from Al-Yasmeen Center for Radiotherapy. Only one case was obtained from Misurata Hospital Oncology. As shown in Figure 1.

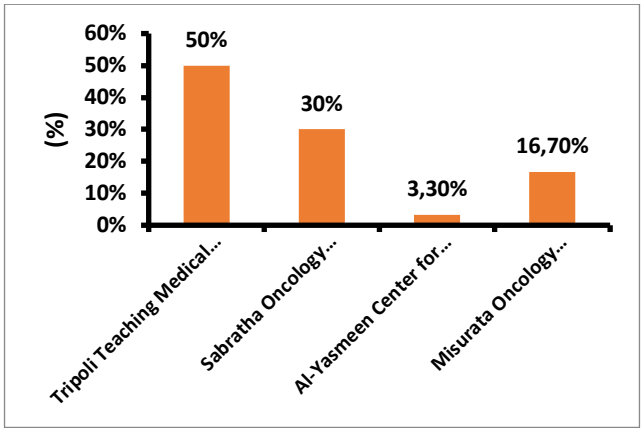


***Figure 1. Shows the target place.***

***Distribution according to gender***

The data in Figure 2. Shows that most patients participating in the study were females (66.5%), while males represented (33.3%).

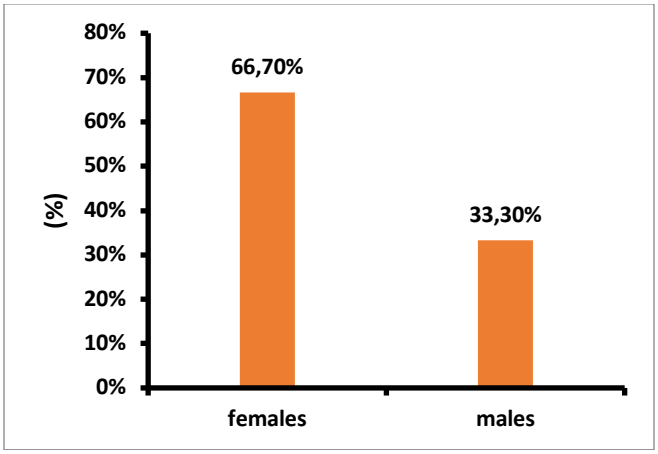


***Figure 2. Distribution according to gender.***

***Distribution according to age group***

(Figure 3) shows that the over-45 age group was the largest, representing 30%, followed by the 36-45 age group at 20%. Individuals aged less than 15 represented 16.7%, and those aged 26-35 represented 10%. A further 3.33% of the 16-25 age group.

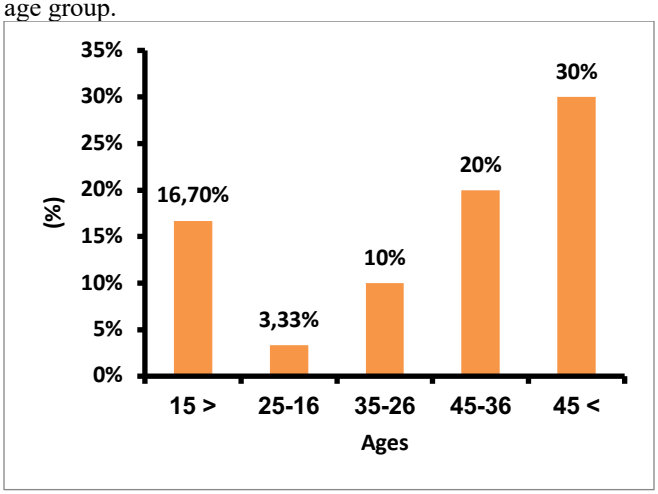


***Figure 3. Distribution according to ages.***

***Distribution according to chronic diseases***

The study found that 20% of the patients participating suffer from diabetes, while 6.67% suffer from hypertension and 3.33% of the patients suffer from heart disease, while 70% do not suffer from any chronic diseases. As shown in (Figure 4).


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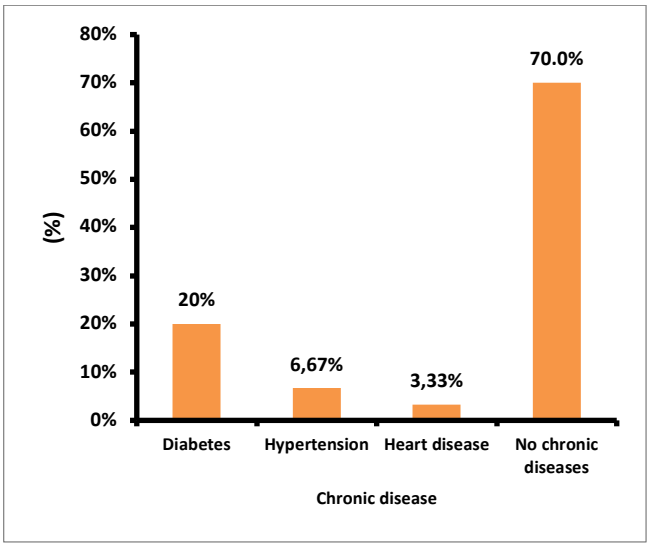


*Figure 4. Distribution according to chronic disease.*

***Distribution according to type of cancer***

As shown in (Figure 5). Different types of cancers such as breast cancer represent (26.7%), B cell type Leukemia (6.65%), small bowel cancer (6.65%), prostate cancer (20%), lung cancer (13.3%) and ovarian cancer (26.7%).

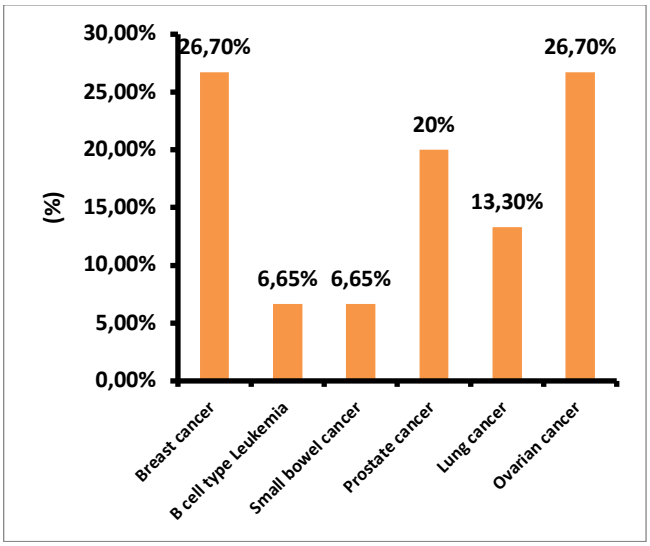


*Figure 5. Distribution according to type of cancer disease.*

***Distribution according to stages of the disease***

As shown in (Figure 6), found that 46.7% of participants are in stage four of the disease, followed by 26.7% in stage three, 16.7% in stage two, while only 10% are in stage one.

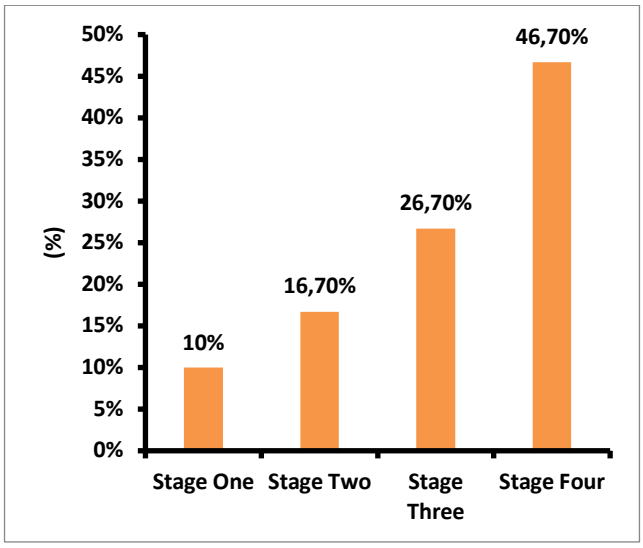


*Figure 6. Distribution according to stages of the disease*

***Distribution according to immunotherapy used***

As shown in (Figure 7), found that 46.7% of participants used immunotherapy, while 53.3% did not.

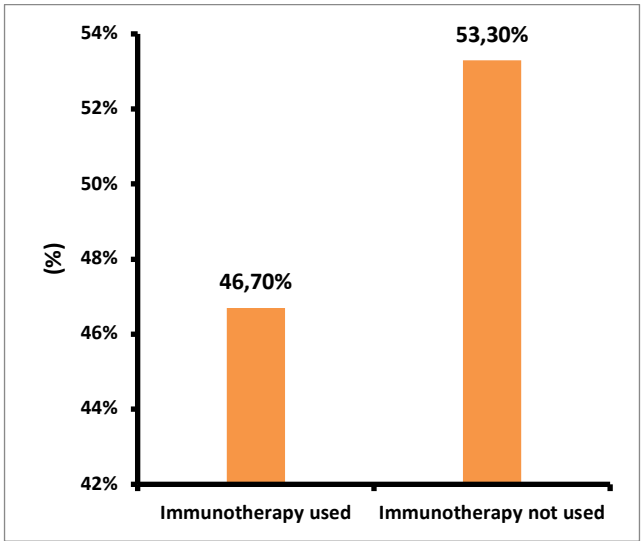


*Figure 7. Distribution according to immunotherapy used*

***Distribution according to time it take to respond to immunotherapy***

The results in the following (Figure 8). Show that the duration of response to immunotherapy was as follows: 3% had a response time of 4-7 days and 13% had a response time of 1-3 months, while30.7% had a response time of 1-2 years and


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53.3% of participants reported that they had not used any immunotherapy.

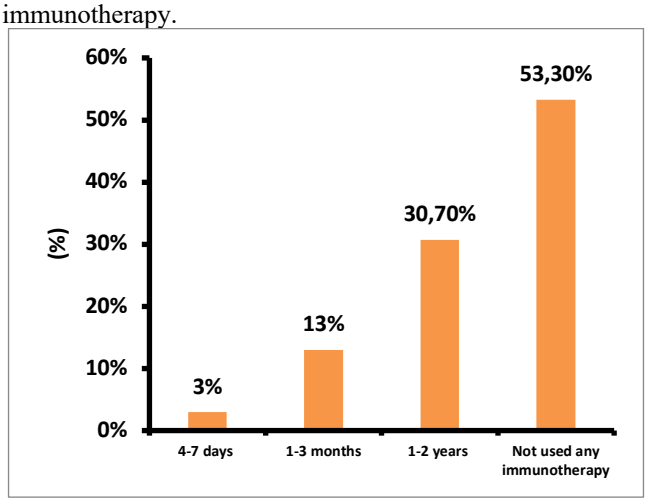


***Figure 8. Distribution according to time it takes to respond to immunotherapy***

## DISSCUSION

The immune system represents the body's primary natural defense line against cancer cells. It plays a vital role in combating and reducing the growth of cancer cells. Therefore, understanding the mechanisms of the immune system and improving its response against cancer is of utmost importance in developing more effective treatments. The study results indicate that 46.7% of the participating patients used immunotherapy, emphasizing the importance of the immune system as a first line of defense against cancer. The immune system recognizes cancer cells and targets them through specialized immune cells, such as T cells and natural killer cells. It also secretes specialized immune compounds to attack tumors [20]. Despite the effectiveness of chemotherapies in fighting cancer, they can have a negative impact on the immune system. The results showed that 53.3% of the participants did not receive any immunotherapy, which may indicate that chemotherapies have weakened the immune system's response. Therefore, understanding these effects is crucial to improving treatment outcomes. In a previous study conducted by the researchers Prang, N *et al*.,(2005). It was observed that 60% of the participating patients had used immunotherapy as part of their treatment regimen. This proportion is higher than the percentage mentioned in the current study, which indicates that only 46.7% of the participants used immunotherapy. Furthermore, the duration of response to immunotherapy was longer in the study by Shiravand, Y *et al*.,(2022), with 25% of the patients exhibiting a response for 6 months or more. While in the current study, the response duration was 1-3 months for only 13 % of the participants.

## CONCLUSION

The immune system represents the primary and essential barrier against cancer cells in the body. Therefore, understanding the mechanisms of the immune system and the factors that influence its response against cancer is of utmost importance to develop more effective treatment strategies in Libya. Overall, this study provides valuable insights into the role of the immune system in the fight against cancer in Libya. It highlights the need for further research and investment in this vital field to develop more effective treatments and improve cancer care in the country.

### *Disclaimer*

The article has not been previously presented or published and is not part of a thesis project.

### *Conflict of Interest*

There are no financial, personal, or professional conflicts of interest to declare.

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