

A Call to Action: Ensuring Life Amidst Conflict - The Plight of Cancer and Kidney Dialysis Patients in the Gaza Strip

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The Gaza Strip faces a severe healthcare crisis, especially in cancer care and kidney dialysis, which is worsened by existing socioeconomic issues. Highly prevalent poverty and unemployment levels, coupled with a fragile healthcare system of just two oncology facilities, create significant challenges. The ongoing Israeli war on Gaza exacerbates the situation, with Israeli forces targeting healthcare facilities and fuel shortages endangering thousands, including vulnerable groups like children and women. Damaged infrastructure and restricted movement lead to chronic shortages of medical supplies, disrupting essential care. The possible mechanisms by which such conditions increase the risks of complications, morbidity, and mortality in kidney and cancer patients in Gaza are depicted in Figure 1.

IMPACT OF CONFLICT ON CANCER CARE IN GAZA

Before October 7th, 2023, the Gaza Strip grappled with significant socioeconomic difficulties, with 75% of its residents below the poverty line and a 52% unemployment rate in 2018 [1]. The healthcare system, particularly in oncology, faced major challenges with only two facilities serving the entire region which are The Ranteesy Hospital and The European Gaza Hospital. Chronic shortages of essential medications significantly affected cancer care, impacting 7415 patients [1].

The Israeli war on Gaza further exacerbated challenges in the healthcare system. The death toll in Gaza reached 18,272 as of December 11, with 7875 children and 6130 women among the casualties [1]. Israeli forces targeted cancer facilities, and the Turkish Friendship Hospital faced operational constraints due to fuel shortages, risking the lives of 2000 cancer patients [2].

The cancer incidence rate in Gaza was 91.3 cases per 100,000 people in 2021, with 1,952 new diagnoses and 610 deaths [3]. The ongoing conflict has placed approximately 2,000 cancer patients on active treatment at serious risk [4].

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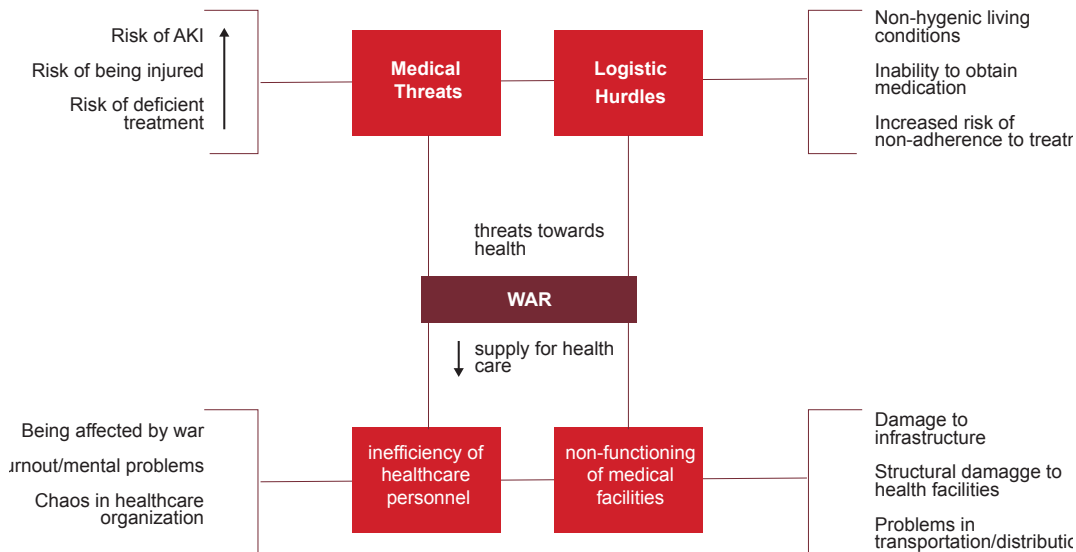
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Figure 1. Shows the possible mechanisms by which the current conflict increases the risks of complications, morbidity, and mortality in kidney and cancer patients in Gaza.



Restricted movement and damaged infrastructure have led to chronic shortages of medical supplies, affecting treatment availability and disrupting ongoing care. Critical medical facilities, including the Turkish-Palestinian Friendship Hospital, suffered damage from Israeli airstrikes, posing increased risks to patients [2]. The Israeli bombardment has caused panic among patients with cancer and staff. The hospital, funded by Turkey and having 180 beds, now poses increased risks to its patients [5]. On the 3rd of November, four patients with cancer were reported dead after the Turkish-Palestinian Friendship Hospital in Gaza ceased operations due to a fuel crisis [5]. All patients were moved to Dar Al Salam Hospital (10.7 Km on the Southern Gaza Strip and located in Khan Yunis City), as the hospital halted services amidst Israeli attacks and fuel shortages, endangering 70 cancer patients' lives [5].

Delays in medical transfers due to war-related restrictions have resulted in missed treatment opportunities and preventable deaths. The repercussions of the Israeli war on Gaza on cancer care will persist for years. Disruptions in preventative care and routine screenings may lead to late-stage diagnoses, reducing the chances of successful treatment. The broader humanitarian crisis necessitates collaborative efforts for the care of vulnerable individuals.

CRISIS IN GAZA: IMPACT ON DIALYSIS PATIENTS

The Gaza Strip is currently facing a humanitarian crisis, exacerbated by the ongoing Israeli war on Gaza. Among the most vulnerable are kidney

patients who are dependable on regular dialysis treatments.

During wars, people on maintenance hemodialysis (HD) often experience underdialysis due to the disruption of water and energy supplies. This, combined with suboptimal follow-up, non-adherence to dietary restrictions, and increased interdialytic weight gain, can lead to intradialytic complications [6]. The heavy workload and stress on dialysis personnel further contribute to complications, including vascular access problems, higher infection rates, and increased mortality. Reductions in treatment sessions from three to two times a week falling below international standards and shortened session durations from four to three hours have become a harsh reality, emphasizing the life-threatening consequences of missed dialysis sessions [7,8]. The lack of fuel and medicine further compounds the challenges, jeopardizing the lives of patients who are dependent on respirators and incubators.

Moreover, Iyad Issa Abu Zaher, the general director of Al-Aqsa Martyrs Hospital, reports the reduction of dialysis sessions to once or twice a week, jeopardizing the lives of patients who previously received treatment thrice a week. Out of 1,100 kidney failure patients, 450 receive treatment at Al-Shifa Hospital, facing further challenges due to dwindling electricity, and fuel supplies and Israel's raid [9].

Raquel Martí, the executive director of UNRWA in Spain, warns of the impending halt of hemodialysis machines, crucial for over 1,000 Gazans

suffering from kidney failure, including 38 children [7]. The ongoing blockade and war have disrupted the supply chain, hindering the entry of vital materials needed for dialysis treatments.

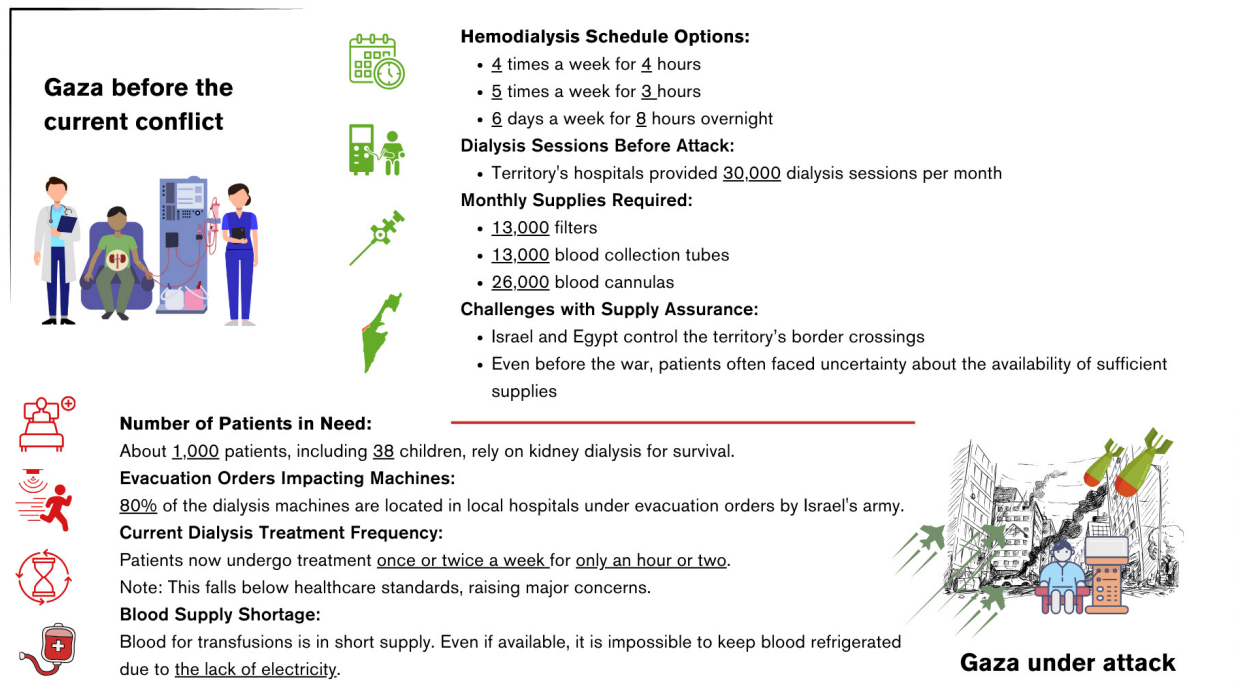
For people on peritoneal dialysis (PD) during disasters, challenges include problems in obtaining dialysis solutions, hypervolemia, leakage, exit-site infections, and peritonitis in unhygienic conditions. The dependence of Continuous ambulatory PD (CAPD) on relatives and the lack of electricity for automated peritoneal dialysis (APD) pose additional obstacles [10].

In war zones, transplantation activity decreases due to disorganization, and shortages in medical facilities, personnel, and medications. Transplant recipients may face interruptions in maintenance treatment, with a lack of stockpiled medications during emergencies. Unhygienic conditions can lead to infections, and inadequate nutrition and dehydration may contribute to graft dysfunction [11]. Suboptimal follow-up may result in delayed diagnosis and treatment, necessitating empirical approaches.

As of December 11, 2023, the cumulative casualty count among medical personnel in Gaza has risen to 295 individuals [1]. Among them was Dr. Hammam Alloh, the sole nephrology specialist in Gaza, who worked at Al-Shifa Hospital. Dr. Alloh tragically lost his life on November 12, 2023, at the age of 36, steadfastly attending to his professional duties and prioritizing patient care despite the challenging circumstances, including evacuation orders issued by the Israeli army [12].

This emphasizes the gravity of the situation and highlights the immediate need for proper care to prevent the impending loss of hundreds of lives among dialysis patients in Gaza. Figure 2 demonstrates how the current crisis in Gaza is deteriorating dialysis services and healthcare amidst the Israeli war on Gaza. It also, highlights the stark contrast in the dialysis conditions before and during the Israeli war on Gaza, shedding light on challenges in treatment frequency, machine accessibility, and critical shortages in essential medical supplies.

Figure 2. Demonstrates the deterioration in dialysis services and healthcare amidst the Israeli war on Gaza. It also compares the dialysis conditions before and during the Israeli war on Gaza.



To address the critical healthcare crisis in Gaza, urgent action is recommended. Here we state some Action Recommendations for Gaza's Healthcare Crisis:

1. Prioritization of immediate humanitarian aid to address shortages of medical supplies, medications, and fuel, especially for cancer and dialysis patients.
 2. Establishment of efficient mechanisms for medical transfers to reduce delays and ensure timely treatment opportunities.
 3. Advocation for international cooperation to safeguard healthcare facilities from attacks, ensuring the safety of patients and medical personnel.
 4. Collaboration with relevant parties to secure a stable fuel supply for medical facilities, preventing interruptions in life-saving treatments.
 5. Providing mental health support for dialysis and oncology healthcare professionals facing increased workload and trauma.
 6. Implementation of a coordinated emergency response system involving local and international organizations to address immediate healthcare needs.
 7. Mobilizing global collaboration and support to ensure comprehensive care for cancer and dialysis patients.
 8. Conducting public awareness campaigns on medical adherence, dietary restrictions, and hygiene practices.
 9. Prioritizing protection and support of vulnerable populations, including children and women, through targeted interventions.
 10. Preparation of efficient disaster responses and patient overflow in conflict zones, exploring strategies to decrease healthcare demand.
 11. Exploration of telemedicine options to provide therapeutic advice, addressing challenges like internet unavailability and computer illiteracy.
 12. Integration of disaster nephrology principles into teaching curricula and scientific programs for improved responses to kidney patients during crises.
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