

# Enhancing Disaster Preparedness in Peritoneal Dialysis Care



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Earthquakes, as capricious acts of nature, pose substantial threats to both human life and infrastructure.<sup>1</sup> The recent twin earthquakes that struck southern Turkey in 2023 serve as stark reminders of the devastating potential of such events.<sup>2</sup> Their aftermath extends well beyond immediate physical damage, profoundly impacting health care systems and exacerbating vulnerabilities within affected communities. Nephrology, given the prevalence of acute kidney injury and chronic kidney disease, plays a pivotal role in disaster response efforts, leading to the emergence of the field known as “disaster nephrology.”<sup>3</sup> Amid such crises, peritoneal dialysis (PD) emerges as a vital lifeline, offering patients a versatile and efficient home-based kidney replacement therapy.

In light of this, the Turkey earthquakes highlighted the critical need for disaster preparedness, particularly among vulnerable populations such as patients undergoing

PD whose specific challenges remain poorly understood. To address this gap, we conducted a retrospective multicenter investigation to delve into the postearthquake experiences of PD survivors following the Kahramanmaraş earthquake in 2023. Our study aimed to comprehensively assess various aspects of patients’ lives and treatment before and after the earthquake, using an extensive anonymized online questionnaire distributed to patients undergoing PD and direct communication with health care providers in the affected region.

The study involved 101 patients undergoing PD from the earthquake-affected region of Kahramanmaraş, with data collected approximately 92 days after disaster. The median age of patients was 45 years, with a median PD duration of 24 months, and a majority were using continuous ambulatory PD (78%). During the earthquake, 3 patients were trapped but rescued within a median time of 10 hours, whereas postdisaster challenges included power outages, water shortages, and limited access to hygiene materials. Two patients experienced impaired access to PD supplies lasting 4 days, and

transitions between automated PD and continuous ambulatory PD modalities were observed. Communication with PD care centers was maintained by 60% of patients, and 16% had undergone disaster preparedness training. Temporary hemodialysis was initiated for 3 patients, and 3 patients discontinued PD after the earthquake, with 1 case attributed to fungal peritonitis. Clinical parameters remained stable overall, although a mild decrease in median hemoglobin levels was observed. Seven patients experienced peritonitis after the earthquake, with successful resolution in most cases except for 1 instance, which required transfer to hemodialysis.<sup>4</sup>

These findings underscore the critical importance of disaster preparedness in nephrology, particularly for patients undergoing PD. The study reveals the resilience of patients undergoing PD in maintaining clinical stability despite facing challenges such as power outages and water shortages. Moreover, it highlights the need for tailored disaster response protocols to address the unique needs of patients undergoing PD, including provisions for alternative treatment modalities and enhanced infection control measures.

The findings from our study, when correlated with existing data, emphasize the consistent resilience and adaptability of patients undergoing PD during natural disasters. For instance, experiences following the 1999 Marmara earthquake in Turkey demonstrated how patients undergoing PD effectively maintained therapy despite challenging circumstances.<sup>5</sup> Moreover, urgent-start PD emerged as a life-saving strategy, optimizing resource allocation and ensuring swift dialysis initiation.<sup>6</sup> However, our study also highlights the vulnerability of

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patients undergoing PD to complications, particularly the increased risk of peritonitis in disaster settings because of compromised sanitation and less-than-optimal hygienic conditions. Intelligent solutions to prevent peritonitis occurrences during disasters are crucial, considering the potential for unusual organisms causing infection, as evidenced by cases such as the surge in fungal peritonitis following the 2010 Chilean earthquake.<sup>7</sup> Additionally, our study underscores the importance of disaster preparedness in dialysis care, especially in regions prone to natural disasters such as the Asia-Pacific region.<sup>7</sup> The adoption of urgent-start PD in general practice could further bolster disaster preparedness and resources, thus ensuring the timely provision of care to patients amid infrastructure disruptions.<sup>8</sup> These insights are corroborated by a cross-sectional study assessing the impact of Hurricane Maria on patients undergoing dialysis in Puerto Rico, which found a significant increase in the number of people receiving dialysis outside of Puerto Rico after the disaster.<sup>9</sup> However, the study also noted no significant differences in mortality rates before and after the hurricane, suggesting the effectiveness of disaster emergency preparedness among dialysis facilities and the population with kidney failure, as well as efforts from other stakeholders.

In conclusion, it is evident that the vulnerability of infrastructure and the challenges faced by patients undergoing PD and health care providers during disasters demand proactive interventions. By implementing effective measures and garnering robust support from various stakeholders, achieving

seamless disaster preparedness in PD care becomes not only achievable but also imperative for safeguarding the health and well-being of vulnerable populations amid environmental volatility.

## DISCLOSURE

TS has received speaker honorariums from AstraZeneca, Amgen, Sanofi, Nobel Ilac, Baxter, Boehringer Ingelheim, Astellas, and Abdi Ibrahim-Otsuka, none of which are associated with this work. RK has received speaker honorariums from Baxter and Astellas, none of which are associated with this work.

This study adhered to the ethical principles outlined in the Declaration of Helsinki. The study protocol received approval from the Ethics Committee (Marmara University ID 09.2023.584). Given the retrospective design of the study and the use of anonymized data, patient consent was not deemed necessary.

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