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SHORT COMMUNICATION
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In-center hemodialysis transportation: an Italian citizens' committee point of view

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ABSTRACT

Introduction: Transportation insecurity is a problem for people fighting against chronic diseases, and the organization of transportation for in-center hemodialysis (HD) is a complex challenge and long travel times to dialysis centers have been associated with increased mortality risk and poorer health-related quality of life.
Methods: We carried out a cross-sectional survey with the aim of identifying and understanding the transportation options available to in-center HD patients and to describe their experiences from their perspective**.**
Results: We investigated 132 out of 166 patients treated with HD in the province of Ferrara (mean age 68.6 ± 13.9 years, 65% males). An investigation was performed by using a questionnaire. The average distance from residence to the dialysis center was 20 ± 14.7 km. 48.5% of users used their own vehicle, while 41.7% used an ambulance. A minority of the population used social services vehicles. The average travel time was 29 ± 15 minutes, and when the vehicle was not personal, it was shared with 2.6 passengers in 85% of cases. Transportation fee was reimbursed in 48.5% of cases. Users were dissatisfied or very dissatisfied in 7.5-15.1% of cases. Duration of the journey was the main determinant of patients' satisfaction, independently of age, gender, and receiving financial support for transportation.
Conclusion: Although the majority of investigated subjects were satisfied with their transportation arrangements, the burden of traveling to HD is an issue, and its organization should consider economic resources and patients' needs. A validated instrument is needed to understand this complex phenomenon, which is not a logistic item.

Keywords: Hemodialysis, Patients' perspective, Patients' satisfaction, Transportation

Introduction

The organization of transportation for in-center hemodialysis (HD) is a complex challenge and can be considered one of the Social Determinants of Health (SDoH). Long travel times to dialysis centers have been associated with increased mortality risk and poorer health-related quality of life (1). SDoH remain a problem for the general population (2). In many countries, the health effects associated with transportation difficulties in dialysis patients have been largely overlooked and are often underestimated by healthcare professionals. Despite being a key factor in access to HD, even though suboptimal arrangements are frequently reported as sources of stress and anxiety. Transportation arrangements depend on family involvement, health status, social support, and household income, and may vary widely across different healthcare systems organizations around the world. The Italian National Health Service is a universalistic system that guarantees coverage for all citizens with health needs. A validated questionnaire developed to investigate logistic issues in HD patients is missing. This study aimed to identify and better understand the transportation options available to in-center HD patients and to describe their experiences from the perspective of Italian citizens by using a pilot-tested questionnaire.

Methods

This study is a cross-sectional survey conducted outside the formal healthcare system; therefore, no ethical approval was requested. The Committee for Violated Rights is composed of private citizens and provides input and recommendations on a wide range of public health issues in the province of Ferrara, Italy. The primary objective of the Committee is to increase and formalize citizen engagement by creating a structured forum for public participation, and by empowering residents to have a voice in matters concerning their community, with the aim of enhancing democratic participation, improving the quality of governance, and addressing specific community needs. The Committee reviews expenditure reports, monitors the implementation of projects, and publicly reports its findings, enhancing the transparency and

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accountability of government actions. The Committee for Violated Rights developed a questionnaire to assess the impact of transportation on adult individuals undergoing in-center HD. The members of the Committee gave the questionnaire to all in-center HD patients treated in the province of Ferrara, Italy. The questionnaire was distributed by hand by people belonging to the Committee to patients before and after the HD session outside the clinic in the period of time from February 2025 to April 2025. The instrument was pilot-tested, and it was not validated. Only subjects who gave informed consent and filled out the questionnaire were included in the analysis. The questionnaire was anonymous and asked information about sex, year of birth, residence, dialysis center, dialysis shift, transportation modality and sharing, and satisfaction with the journey to and from the dialysis center. The latter parameter was evaluated on a Likert scale (not at all satisfied, unsatisfied, satisfied and very satisfied) (Fig. 1). The distance between the patient's residence and the dialysis center was calculated based on actual travel routes. The study design was a cross-sectional survey research and involved the HD centers serving the province of Ferrara. Only subjects who gave their consent to fill out the questionnaire were enrolled. Those who refused to fill the questionnaire, those with cognitive decline and those who could not understand Italian were excluded. Descriptive analysis was carried out, and logistic regression analysis was used to determine the factors influencing satisfaction with transportation.

Results

We investigated 132 out of 166 patients (mean age 68.6 ± 13.9 years, 65% males), of whom 73 were treated at the hospital and 59 in the limited assistance centers. Demographic data of non-responders or excluded patients were not different from those of the investigated population (data not shown). The average distance from residence to the dialysis center was 20 ± 14.7 km. 48.5% of users used their own vehicle, while 41.7% used an ambulance. Only 9.8% of patients were transported by social services vehicles. Table 1 reports data taking into consideration the transportation of patients treated in the main hospital, considering HD shifts. Interestingly, the majority of them were transported by ambulance, and no social services vehicles were available in the afternoon. The average travel time was 29 ± 15 minutes, and when the vehicle was not personal, it was shared with 2.6 passengers in 85% of cases. Transportation fee was reimbursed in 48.5% and referring to this latter group, it was covered by the municipality in 48.5% of cases. Users were dissatisfied or very dissatisfied in 7.5% of cases, referring to the journey from home to the dialysis center, and the percentage rose to 15.1% of cases referring to the journey from the dialysis center back to home. Only four people thought that the car or the ambulance was inadequate, and 11.3% of the population were not happy about the length of the journey. The main findings of the investigation are reported in Figure 2. Satisfaction regarding the journey from the dialysis center to home was independently associated with the distance traveled (OR 1.060, 95% CI 1.008-1.113; p = 0.022) and the duration of the journey (OR 0.944, 95% CI 0.904-0.985; p = 0.007). Satisfaction regarding the ambulance was independently associated with the length of the journey (OR 0.902, 95% CI 0.830-0.979; p = 0.014). Finally, satisfaction with the length of the journey was independently associated with its duration (OR 0.943, 95% CI 0.903-0.985; p = 0.008). Satisfaction level was not affected by age, gender and receiving financial support for transportation, but appeared to be determined by the short duration of the journey. Age, sex, dialysis clinic, HD shift, and traveling service were not associated with the satisfaction level of the investigated population.

Discussion

To the best of our knowledge, this is the first Italian study evaluating transportation in the HD population. The main finding of this study, looking at transportation from the citizens' committee point of view, is that HD patients living in the province of Ferrara appear to be happy about transportation arrangements. Therefore, they do not suffer transportation insecurity, a condition that defines people unable to reach different places safely and timely manner due to material, social, and economic impediments in relation to transportation (3). A recent study from the United States evaluated the association between transportation and dialysis outcome, investigating over 115.000 HD subjects. Individuals who could not reach the dialysis center using private transportation had higher mortality that was related to a higher risk of missing dialysis sessions (4). In HD patients, feelings of anxiety and frustration are common problems associated with transportation (5). This emotional toll is frequently attributed to a range of practical challenges, including logistical hurdles in reaching the treatment center, the psychosocial stress of depending on others, limitations of public transportation, and the financial strain of associated costs (5). The choice of the mode of transport that includes private cars, public transport, transport services, volunteer or subsidized transport services, or ambulance services, depends on factors such as the patient's financial situation and health status (5). Unfortunately, we could not compare our results with different Italian studies, because we could not find them in the scientific literature.

Addressing transportation-related challenges requires active dialogue among patients, caregivers, healthcare professionals, and social services. Coordination between all different parts and adapting the journey to patients' clinical conditions is a necessary step that should be managed by a centralized scheduling system, partnered by healthcare and social stakeholders (6). An indirect indication of the lack of a centralized transportation system is that the majority of patients traveled by private car, data that support the findings of Grüble et al. (7). A different point to take into account is that nearly 42% of the whole population used an ambulance, and the percentage was higher in HD subjects treated in the main hospital, a choice that increases enormously the cost of transportation (8). The data from the REIN register suggested that 44% of patients transported by ambulance are self-sufficient for walking; therefore, a better reclassification of their transport as seated transport could increase the amount of savings (9). Moreover, transportation in an ambulance could increase the duration of the journey to and from the dialysis clinic. On the other hand, ambulances could be the only way to reach the HD center, because different municipalities do not organize transportation

Dear Customer,

To help us to have better understand the transportation problem for people who need dialysis treatment, we are asking for your valuable input through this anonymous survey. Your answers will only be used for analysis, and no personal information will be shared. Participating is voluntary, and you can stop anytime. Thanks for taking part!

Gender: Male ◻ Female ◻ Diverse ◻

Year of birth:

Residence:

Center of dialysis treatment:

Hemodialysis shift: Morning ◻ Afternoon ◻

Monday ◻ Tuesday ◻ Wednesday ◻ Thursday ◻ Friday ◻ Saturday ◻

How do you travel to the dialysis center:

Private car ◻

Taxi ◻

Transportation organized by your municipality ◻

Volunteer driving service ◻

Ambulance ◻

How long does it take to reach the dialysis center (in minutes):

Do you receive financial support for transportation?

No ◻

I receive reimbursement from municipality ◻

I receive reimbursement from local health authority ◻

Are you sharing the transportation with other people? No ◻ Yes ◻ How many? ◻

	Very satisfied	Satisfied	Unsatisfied	Not at all satisfied
What is your satisfaction about the waiting time to be picked up for dialysis?				
What is your satisfaction about the waiting time to be collected from the dialysis?				
Do you think the car is adequate?				
What is your opinion about the journey time for being treated?				

FIGURE 1 - The questionnaire developed by the Committee for Violated Rights for targeting the impact of transportation on adult individuals treated by HD.

TABLE 1 - Distribution of percentage of type of transportation of patients treated in the main hospital, considering HD shifts

Type of transportation	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Morning						
Ambulance	39%	55%	56%	47%	50%	47%
Private transportation	50%	28%	32%	47%	39%	35%
Social service vehicles	11%	17%	12%	6%	11%	18%
Afternoon						
Ambulance	61%	70%	50%	83%	47%	84%
Private transportation	39%	30%	50%	17%	53%	16%
Social service vehicles	0%	0%	0%	0%	0%	0%

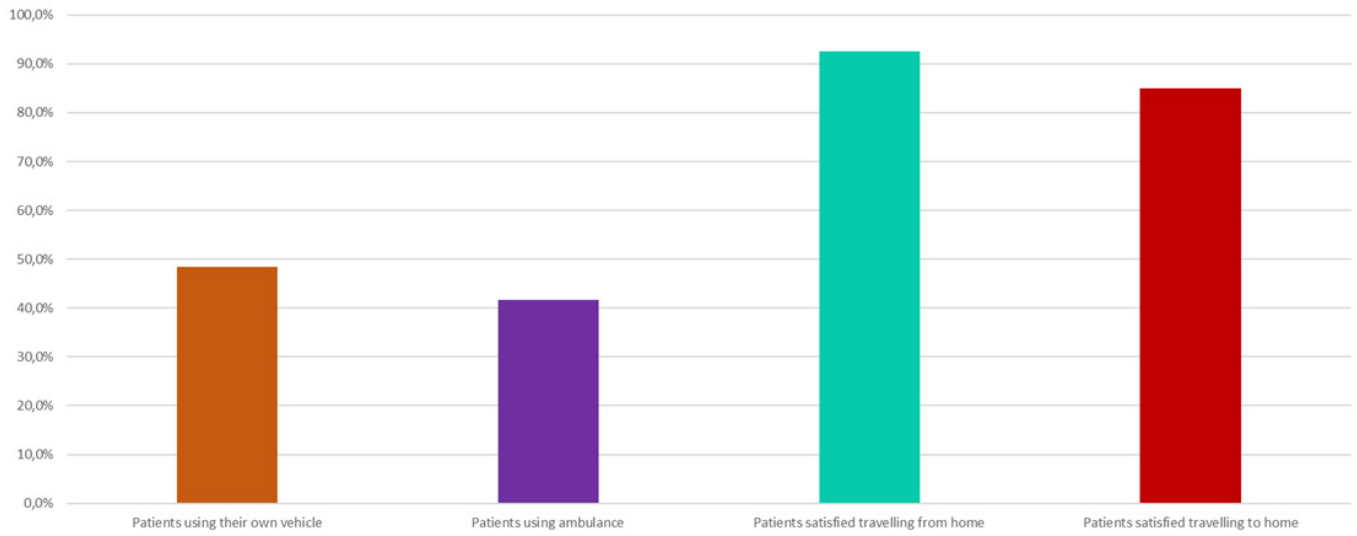

FIGURE 2 - Percentage of patients using their own vehicle, using an ambulance, satisfied with traveling from home and to home to the dialysis clinic, considering the whole population.

by social service vehicles. In our study, this fact is demonstrated in the analysis of the distribution of percentage of type of transportation of patients treated in the main hospital, considering HD shifts, showing that nobody was using social services vehicles in the afternoon.

However, in our population, only a minority of patients declared to be unhappy about transportation, and they were those who needed to travel longer. Obviously, this survey has several limitations; the first one is its cross-sectional design; we did not analyze any clinical outcome, but only satisfaction. We are conscious that our method is based on a non-validated questionnaire, but our aim was merely to describe a situation in a limited area of Italy, in order to sensitize healthcare professionals about the problem of transportation that could be dramatic in a big city. The study was not conducted in a formal healthcare system, and we analyzed data derived from a questionnaire developed by a citizens' Committee and involved only a limited number of individuals from a single Italian province. However, this study has merit; it was the first time that data about Italian dialysis transportation have been evaluated. Only data associated with patients who filled the questionnaire could be analyzed, those with cognitive decline and those who could not understand Italian could not fill the questionnaire, and therefore were not evaluated, but their demographic characteristics were not different from those of the investigated population. Finally, family income and costs of different types of transportation were not taken into account.

Conclusion

We described the local approach to transportation of patients receiving in-center HD through a citizens' Committee and providing a unique perspective often missing in medical literature. Even if the number of patients involved in this study is small, the majority of them were happy about the arrangements. The burden of traveling is a factor that needs to be considered in the evaluation of the quality of life of HD individuals, although its organization should take into consideration economic resources and patients' needs. Probably the development of a validated questionnaire could be a first step for understanding this complex phenomenon.

Razon et al. (10) suggested that to better identify individuals facing transportation insecurity, policymakers and health systems should use a two-step process: first, a brief screening question, followed by a more comprehensive assessment for those who screen positive. This approach would help in the development of targeted solutions that address patients' transportation needs.

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Data Availability Statement: The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Institutional review board statement: This study was conducted in accordance with the Declaration of Helsinki. This study is a cross-sectional survey conducted outside the formal healthcare system. The study was developed by a committee external to the Italian

National Health System and focused on transportation without providing any insight related to disease, diagnosis, or pharmacological treatment. Therefore, the study was in agreement with Article 3 of the Italian Human Research Act that applies to research concerning human disease and concerning the structure and function of the human body. Due to the focus of the study and the fact that the research does not fall under the Italian Human Research Act, formal ethical approval was not required.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

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