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ORIGINAL RESEARCH

Detection of Financial Toxicity in Italian Uremic Patients: A Single Center Cross-Sectional Study

Alessio Di Maria[1,*], Matteo Capone[1,*], Raul Mancini[1], Alfredo De Giorgi[2], Elisa Gavazzoli[1], Laura Maria Scichilone[1], Marco Veronesi[1], Simone Nicoletti[1], Fabio Fabbian[1,3]

[1]Dialysis Unit, University Hospital of Ferrara, Ferrara, Italy; [2]Clinica Medica Unit, University Hospital of Ferrara, Ferrara, Italy; [3]Department of Medical Sciences, University of Ferrara, Ferrara, Italy

*These authors contributed equally to this work

Correspondence: Fabio Fabbian, Department of Medical Sciences, University of Ferrara, via Luigi Borsari 46, Ferrara, I-44124, Italy, Tel +390532239385, Email f.fabbian@ospfe.it

Purpose: Financial toxicity (FT) describes the strain individuals and families feel when they struggle with money due to medical expenses and related costs associated with their healthcare. Management of chronic kidney disease is expensive. The aim of this study was to detect FT in Italian patients undergoing renal replacement therapy.

Patients and Methods: FT was investigated using the Patient-Reported Outcome for Fighting Financial Toxicity (PROFFIT) questionnaire in 238 individuals, of whom 147 (61.8%) received hemodialysis, 30 (12.6%) peritoneal dialysis, and 61 had renal transplantation (25.6%). The PROFFIT score was normalized to a 0–100% range, with 100% indicating the highest level of toxicity, and mean values were compared in the different groups of uremic patients stratified by age, sex and treatment.

Results: Mean age of the population was 66.2±13.7 years (range 23–89). The probability of FT due to financial distress in the whole population that was 42.1±24.1%, whilst mean probability of FT due to medical expenses response was 44.9±27.6%, mean probability of FT due to transportation response was 37.1±29.4% and mean probability of FT due to support from the Health System was 25.5 ±23.3%. FT was higher in the hemodialysis group.

Conclusion: Hemodialysis patients showed worse financial burden than peritoneal dialysis and kidney transplanted patients, while peritoneal dialysis subjects felt better cared for by health care professionals than kidney transplanted individuals, however the latter group could afford monthly expenses better than hemodialysis patients. Health care professionals should discuss financial problems or other social challenges that may impact on the health of uremic individuals.

Plain Language Summary: Financial toxicity (FT) describes the harmful effect of high cost of medical treatment on people's quality of life. Chronic disease management such as chronic kidney disease (CKD) can lead to substantial out-of-pocket prescription costs for patients, moreover CKD is often linked with poverty and other social determinants of health, including social environmental stressors and psychological factors. FT is usually investigated with questionnaires, and its impact could depend on the organization of the national health system. In Italy, a country with a fully public health-care system, the Patient-Reported Outcome for Fighting Financial Toxicity (PROFFIT) questionnaire was developed for investigating FT, and the latter was proposed to 238 individuals, of whom 147 (61.8%) received hemodialysis, 30 (12.6%) peritoneal dialysis, and 61 had renal transplantation (25.6%). FT was significantly present in the investigated cohort and hemodialysis patients showed worse financial burden than peritoneal dialysis and kidney transplanted patients, while peritoneal dialysis subjects felt better cared for by health care professionals than kidney transplanted individuals, however the latter group could afford monthly expenses better than hemodialysis patients. Younger hemodialysis individuals felt better than older ones, and the latter group spent more money on private medical examinations. Only in the items related to support from the health system patients answered that they agree substantially, whilst in all the other items they agree partially. FT should be considered by health care professionals due to its impact on patients' wellbeing.

Keywords: financial burden, financial hardship, kidney disease, renal replacement therapy PROFFIT questionnaire

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Introduction

Financial distress, particularly in the face of illness, is influenced by a complex interplay of factors. Key among these are the diseased person's wage-earner status and pre-illness associated costs. The impact of the illness and its treatment on their ability to work is also crucial, as are the type of national healthcare assistance available, household income, and the individual's social stratum. When it comes to measuring financial distress, several material conditions provide clear indicators. These include out-of-pocket medical costs, especially when viewed as a percentage of income. Other significant measures are a reduction in income and assets, medical debt, and difficulty paying medical bills and for necessities. Finally, the psychological response to an increased financial burden offers insight into the overall impact on an individual's well-being.[1,2] Financial difficulties are included in the social determinants of health (SDoH) and the latter remain poorly considered by the general population[3] and in many countries, the health effects associated with financial hardship in dialysis patients have been hardly analyzed. Financial hardship describes the strain individuals and families feel when they struggle with money. It means facing challenges like being unable to pay bills, affording necessities, or even just making ends meet to maintain a decent standard of living. Many things can cause financial hardship, such as unemployment or underemployment, low wages, high living costs, unexpected expenses, medical debt, and general economic downturns. Although the screening for financial toxicity (FT) remains heterogenous, such a problem is well known in cancer patients.[4] FT is related to the economic burden or hardship that individuals encounter because of medical expenses and related costs associated with their healthcare. FT impacts access to care and adherence to treatment affecting patients' decision-making processes and the patient-physician relationship.[5] Management of long-term chronic disease is expensive,[6] and chronic kidney disease (CKD) requires significant amount of expenditure.[7] A multidisciplinary Italian group developed and validated a questionnaire as a diagnostic mean able to detect FT that was defined as Patient-Reported Outcome for Fighting Financial Toxicity (PROFFIT) and consists of 16 items. It is the first score assessing FT in a country with a fully public health-care system.[8] CKD is a significant non-communicable condition that has been reported to affect more than 850 million people worldwide,[9] commonly diagnosed in subjects with low socioeconomic status,[10] and its progression appears to be influenced by socioeconomic disadvantage.[11] Our aim was to detect FT using the PROFFIT questionnaire in Italian patients undergoing renal replacement therapy.

Materials and Methods

The methods used to perform this study were previously published.[12] The project was conducted in accordance with the Declaration of Helsinki and the guidelines of good clinical practice. The local ethics committee of the Italian region of Emilia Romagna approved the study (650/2023/Oss/AOUFe).

Patients

Informed consent was obtained from the study participants prior to study commencement. All patients signed informed consent, and the study was conducted in agreement with the Declaration of Istanbul. The PROFFIT questionnaire was administered, in paper format, to adult outpatients who were receiving renal replacement therapy, hemodialysis, peritoneal dialysis or kidney transplantation. Patients were eligible independently of renal diagnosis and comorbidity, they were only required to understand Italian language and to be able to fill the questionnaire. Sample size calculation was performed as previously reported.[12] We enrolled 147 hemodialysis, 30 peritoneal dialysis and 61 renal transplanted patients from the renal unit of the university hospital of Ferrara.

PROFFIT Questionnaire

The subjects who participated in the study completed the PROFFIT questionnaire.[8] The PROFFIT questionnaire is designed to measure FT and its potential influencing factors. It comprises two main sections: a 7-item FT-score and 9 single items investigating various determinants of FT (Box 1). These 9 individual items are categorized as follows: i) medical expenses (4 items): this section assesses aspects such as coverage by the National Health Service, costs of private visits and examinations, expenses for medicines and/or supplements, and other additional costs; ii) transportation (2 items): this section addresses the impact of distance from the hospital and associated transportation costs; iii) support from the Health System (3 items): this section explores the level of support received from doctors and nurses, administrative staff, and the effectiveness of

Box 1 The PROFFIT (Patient-Reported Outcome for Fighting Financial Toxicity) questionnaire

Outcome items
1. I can afford my monthly expenses without difficulty.
1. My illness has reduced my financial resources.
1. I am concerned about the economic problems I may have in the future due to my illness.
1. My economic situation affects the possibility of receiving medical care.
1. I have reduced my spending on leisure activities such as holidays, restaurants or entertainment to cope with expenses related to my illness.
1. I have reduced spending on essential goods to cope with expenses related to my illness.
1. I am worried that I will not be able to work due to my illness.
Determinant items
1. The National Health Service covers all health costs related to my illness.
1. I have paid for one or more private medical examinations for my illness.
10. I have paid for additional medicines or supplements related to my illness.
11. I must pay for additional treatment myself (eg, physiotherapy, psychotherapy, dental care).
12. The treatment center is a long way from where I live.
13. I have spent a considerable amount of money on travel for treatment.
14. Medical staff (ie, doctors, nurses) have been helpful throughout my medical care.
15. Staff in hospital administration (ie, for booking appointments, secretaries) have been helpful throughout my medical care.
1. 16. Medical staff and medical facilities I attended communicated with each other.

communication among different parties. Responses for all PROFFIT items are captured using a 4-point Likert scale, where respondents indicate their level of agreement with each statement, ranging from 1 ("I do not agree at all") to 4 ("I very much agree"). Beyond these 16 PROFFIT items, the paper questionnaire also gathered demographic data on sex and age. After collecting, all questionnaire data was transferred to an electronic Excel database.

Statistical Analysis

We analysed data considering both the value chosen by people at the time of filling the PROFFIT questionnaire, considering the FT-score (encompassing items 1 through 7) and the nine distinct items that represent determinants of FT. As per the defined methodology, all scores are normalized to a 0–100% range, with 100% indicating the highest level of toxicity.[8] The calculation of the FT-score, which includes items 1 to 7, requires an initial step: reversing the score for Item 1 using this formula:

$$X_{1-\text{reverse}} = 5 - X_1$$

where X1 is the response given to item 1; (2) calculate the FT-score according to the following formula:

$$(X_{1-\text{reverse}} + X_1 + X_2 + X_3 + X_4 + X_5 + X_6 + X_7 - Y/3^{*}Y)^{*}100$$

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where X is the response given for each item and Y is the number of items with valid response; if Y is 3 or less the score should be considered missing. At least 4 valid responses are needed to calculate the FT-score. For calculation of the score for items 8, 14, 15 and 16 use the following formula:

$$((4 - Xj)/3)^{*}100$$

where X is the response given and j is the item (8, 14, 15, or 16). For calculation of the score for items 9, 10, 11, 12, 13 use the following formula:

$$((Xj - 1)/3)^{*}100$$

where X is the response given and j is the item (9, 10, 11, 12 or 13).

Statistical analyses were essentially descriptive. Categorical variables are described with frequencies and percentages. PROFFIT scores were reported both as mean (and standard deviation). FT scores were compared between groups by *T*-test (for variables with 2 groups), ANOVA and Kruskal Wallis test (for variables with more than 2 groups). Finally, the coefficients between the different sections of the PROFFIT questionnaire were correlated by the Spearman analysis. For detecting an independent relationship between age and sex with the probability of FT, of FT due to medical expenses, of FT due to transportation response and of FT due to support from the Health System, a logistic regression analysis was performed. The median values of the probability of FT, of FT due to medical expenses, of FT due to transportation response and of FT due to support from the Health System were the dependent variables, whilst age and sex were the independent ones.

All statistical tests were two-tailed and p-values less than 0.05 were considered statistically significant. Analyses were performed with SPSS for Windows (version 24.0, IBM Corp., Armonk, NY, USA).

Results

In this cross-sectional study we enrolled 238 individuals, of whom 142 were males (59.7%) and 96 were females (40.3%). Mean age of the population was 66.2±13.7 years (range 23–89), and 33 (13.9%) were aged ≤ 50 years, 99 (41.6%) were aged > 50 and ≤ 70 years, and 106 (44.5%) were aged > 70 years. Hemodialysis was the most frequent method for replacing renal function and was recorded in 147 cases (61.8%), 61 individuals had renal transplantation (25.6%), and peritoneal dialysis was performed in 30 patients (12.6%). Mean age of hemodialysis group was 69±13.3 years, kidney transplanted patients had 59.6±11.9 years, and peritoneal dialysis group was aged 65.6±13.3 years. Hemodialysis patients were significantly older than kidney transplanted ones ($p<0.0001$). Demographic characteristics of the population are reported in Table 1. The score obtained answering the 16 items of the questionnaire by the total population, males, females and subjects undergoing the different types of renal replacement treatment is reported in

Table 1 Demographic Features of the Population Investigated

	Number of Cases (%)	Mean Age (Years)
Total population	238	66.2±13.5
Males	142 (59.7)	65.4±13.7
Females	96 (40.3)	67.4±13.2
Subjects aged ≤ 50 years	33 (13.9)	42±7.2
Subjects aged > 50 and ≤ 70 years	99 (41.6)	61.7±5.8
Subjects aged > 70 years	106 (44.5)	77.9±4.9
Subjects on hemodialysis	147 (61.8)	69±13.3
Subjects on peritoneal dialysis	30 (12.6)	65.6±13.3
Kidney transplanted patients	61 (25.6)	59.6±11.9

Table 2. Hemodialysis group had better score in answering questions 2, 4, 5 and 6 than kidney transplanted patients, and better score in answering question 9 than peritoneal dialysis group. Peritoneal dialysis group had better score than hemodialysis group in answering question 16, and better score than kidney transplanted patients in answering question 5. Kidney transplanted patients had better score than hemodialysis group in answering question 1. The score obtained answering the 16 questions of the questionnaire by the different age groups is reported in Table 3. The group aged ≤ 50 years, and the one aged > 50 and ≤ 70 years had better score than the one aged > 70 years in answering question 7. The group aged > 70 years had better score than the one aged > 50 and ≤ 70 years in answering question 9. The score obtained from the 7 items estimating the financial distress (PROFFIT score, questions 1–7), the 4 items regarding the medical expenses (Medical expenses, questions 8–11), the 2 items related to transportation (Transport, questions 12–13), and the 3 items investigating the support from the health staff (Support, questions 14–16), were compared in males and females (Table 4), in different groups of renal replacement treatment (Table 4) and in the subjects belonging to increasing age (Table 5). None of the comparisons detected a significant difference between groups (data not shown). We calculated the probability of FT due to financial distress in the whole population that was 42.1±24.1%, whilst mean probability of FT due to medical expenses response was 44.9±27.6%, mean probability of FT due to transportation response was 37.1 ±29.4% and mean probability of FT due to support from the Health System was 25.5±23.3%. The same parameters stratified on the basis on type of renal replacement therapy and age are reported in Tables 4 and 5. FT probability was higher in hemodialysis group than in kidney transplanted one, and the same group had higher values for medical expenses and support from the Health System than the peritoneal dialysis one. Kidney transplanted individuals aged > 70 years had higher FT for medical expenses than peritoneal dialysis patients. Finally, there was a correlation between the different sections of the PROFFIT score (Table 6), however FT and support from health system and the latter and transportation response were not related.

Age and sex were not independently associated with the probability of FT, of FT due to medical expenses, of FT due to transportation response and of FT due to support from the Health System.

Discussion

This is the first study evaluating FT in an Italian population on renal replacement therapy. Hemodialysis patients showed worse financial burden than peritoneal dialysis and kidney transplanted patients, while peritoneal dialysis subjects felt better cared for by health care professionals than kidney transplanted individuals, however the latter group could afford monthly expenses better than hemodialysis patients. Younger hemodialysis individuals felt better than older ones, and the latter group spent more money on private medical examinations. Only in the 3 items related to support from the health system the mean value of the answers was around 3 (ie "I agree substantially"), whilst in all the other items the mean values were between 2 and 2.5 (ie "I agree partially"). Our data show that FT was higher in hemodialysis, although kidney transplanted individuals aged > 70 years suffered more medical expenses than peritoneal dialysis patients. It should be underlined that age differed significantly across analyzed renal replacement treatments, hemodialysis patients were older than transplant recipients, suggesting that this imbalance could partly explain the differences in financial burden between the different groups. Age is strongly associated with employment status, income stability, retirement, and out-of-pocket healthcare behaviors, and higher comorbidity, suggesting that the observed differences in FT may reflect demographic imbalance rather than treatment modality per se. On the other hand, logistic regression analysis showed that age was not independently associated with the different components of FT. Finally, we could detect a partial correlation between the different sections of the PROFFIT questionnaire, suggesting its efficacy in detecting FT. Managing CKD can lead to substantial out-of-pocket prescription costs for patients due to the inherent expense of chronic disease management.[6,7,13] CKD is often linked with poverty and other SDoH, including social environmental stressors and psychological factors.[14] These financial burdens can negatively affect a patient's physical and mental health, reduce satisfaction with social activities and relationships, and lead to a decline in overall quality of life.[15] A recent scoping review published at the beginning of 2025, which analyzed 16 papers published between 2013 and 2023, evaluated the connection between FT and kidney disease. The review highlights that FT is a common problem for patients of all ages with CKD, as well as those with nephrolithiasis and renal tumors. The financial strain on these patients comes from both direct costs like treatment and disease management, and indirect costs such as lost wages from missing work and

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Table 2 The Score of Every Single Question Obtained by the Investigated Individuals is Shown

	Total Population	Males	Females	Hemodialysis (G1)	Peritoneal Dialysis (G2)	Kidney Transplantation (G3)	p
	N=238	N=142	N=96	N=147	N=30	N=61	
Q1	2.57±0.93	2.51±0.95	2.66±0.90	2.38±0.95	2.67±0.71	2.98±0.86	G3>G1 p<0.0001
Q2	2.40±1.08	2.41±1.09	2.40±1.07	2.60±1.09	2.13±0.93	2.07±1.01	G1>G3 p<0.0001
Q3	2.63±1.09	2.65±1.09	2.59±1.09	2.68±1.13	2.40±0.89	2.61±1.06	ns
Q4	2.08±1.00	2.11±1.01	2.04±1.00	2.27±1.05	1.87±0.90	1.74±0.81	G1>G3 p=0.001
Q5	2.39±1.18	2.39±1.18	2.38±1.18	2.54±1.20	2.57±1.04	1.92±1.08	G2>G3 p=0.037 G1>G3 p=0.001
Q6	1.78±0.95	1.83±0.96	1.71±0.95	1.91±1.02	1.83±0.87	1.44±0.71	G1>G3 p=0.004
Q7	2.13±1.21	2.15±1.23	2.09±1.19	2.12±1.27	2.20±1.18	2.10±1.10	ns
Q8	2.74±1.00	2.75±0.93	2.71±1.11	2.63±1.02	2.90±1.02	2.92±0.93	ns
Q9	2.27±1.18	2.17±1.10	2.43±1.27	2.46±1.19	1.70±0.91	2.11±1.17	G1>G2 p=0.004
Q10	2.55±1.10	2.54±1.04	2.56±1.20	2.58±1.11	2.13±1.04	2.69±1.08	ns
Q11	2.31±1.17	2.21±1.11	2.46±1.23	2.37±1.15	2.07±1.17	2.28±1.21	ns
Q12	2.34±1.10	2.35±1.09	2.34±1.11	2.45±1.14	2.33±0.88	2.10±1.06	ns
Q13	1.89±1.00	1.90±0.99	1.86±1.02	1.87±1.00	2.03±0.99	1.85±0.99	ns
Q14	3.61±0.70	3.60±0.71	3.61±0.68	3.51±0.75	3.80±0.40	3.74±0.65	ns
Q15	3.09±0.94	3.11±0.92	3.07±0.96	3.03±0.98	3.20±0.83	3.09±0.94	ns
Q16	3.00±1.05	2.99±1.03	3.03±1.09	2.86±1.09	3.43±0.89	3.15±0.98	G2>G1 p=0.019

Abbreviation: ns, not significant.

Table 3 The Score of Every Single Question Obtained by the Three Different Age Groups is Shown

	Age ≤ 50 Years	**Age > 50 and ≤ 70 Years**	**Age > 70 Years**	**p**
	N=33	N=99	N=106	
Q1	2.33±0.92	2.53±0.97	2.69±0.89	ns
Q2	2.48±1.22	2.42±1.08	2.36±1.03	ns
Q3	2.91±0.98	2.67±1.08	2.50±1.11	ns
Q4	2.12±0.99	2.09±1.02	2.07±1.00	ns
Q5	2.24±1.25	2.22±1.17	2.58±1.14	ns
Q6	1.73±0.94	1.70±0.90	1.88±1.00	ns
Q7	2.88±1.05	2.45±1.27	1.58±0.95	Age ≤ 70 years had higher score than age > 70 years, p<0.0001
Q8	2.64±1.02	2.84±0.97	2.67±1.03	ns
Q9	2.21±1.16	2.07±1.13	2.48±1.20	Age > 70 years had higher score than age > 50 and ≤ 70 years, p=0.039
Q10	2.64±1.02	2.47±1.13	2.59±1.11	ns
Q11	2.15±1.21	2.15±1.18	2.51±1.15	ns
Q12	2.24±1.00	2.30±1.07	2.42±1.16	ns
Q13	2.09±1.01	1.83±0.96	1.88±1.03	ns
Q14	3.64±0.65	3.59±0.75	3.61±0.67	ns
Q15	2.94±1.05	3.13±0.93	3.10±0.91	ns
Q16	2.94±1.11	3.15±1.00	2.89±1.08	ns

Abbreviation: ns, not significant.

Table 4 The FT-Score, the Mean Medical Expenses Response, the Mean Transportation Response and the Mean Support From the Health System in Hemodialysis, Peritoneal Dialysis and Kidney Transplanted Groups

	Hemodialysis Group (G1)	**Peritoneal Dialysis Group (G2)**	**Kidney Transplanted Group (G3)**	**p**
	N=147	N=30	N=61	
FT-score (%)	46.4±24.8	40±21.8	32.7±20.7	G1>G3, p=0.001
Medical expenses response (%)	48±27.6	33.3±24.4	43±27.7	G1>G2, p=0.021
Transportation response (%)	38.5±29.5	39.4±29.1	32.5±29.5	ns
Support from the Health System (%)	29±24.2	17.4±17.9	21.3±22.1	G1>G2, p=0.015

Abbreviation: ns, not significant.

expenses for travel and lodging near clinics. The review also notes the difficulty for many people with kidney disease to get health insurance in various countries. The COmprehensive Score for financial Toxicity (COST) questionnaire was used in 7 out of 16 studies, and the prevalence of FT varied between 16 and 71%.[16] The COST was developed and subsequently validated in 2014 in United States. The score includes 11 items and can detect the influence of socio-economic conditions on cancer patients' outcomes.[17,18] However, this score has not been validated in Italy, and this is the main reason why we decided to use the PROFFIT questionnaire. Researchers have proposed various tools to measure FT.

Table 5 The FT-Score, the Mean Medical Expenses Response, the Mean Transportation Response and the Mean Support from the Health System in Individuals Aged ≤ 50 years, Those Aged > 50 and ≤ 70 years, and Those Aged > 70 Years

	Age ≤ 50 years (A1)	**Age > 50 and ≤ 70 years (A2)**	**Age > 70 years (A3)**	**p**
	N=33	N=99	N=106	
FT-score (%)	47.1±25.8	42.3±25.9	40.3±21.7	ns
Medical expenses response (%)	44.7±28	40.3±28.2	49.3±26.4	A3>A2, p=0.040
Transportation response (%)	38.9±29	35.3±28.8	38.2±30.4	ns
Support from the Health System (%)	27.6±24.4	23.7±24	26.7±22.5	ns

Abbreviation: ns, not significant.

Table 6 Spearman Correlations Coefficients Between the Different Sections of the PROFFIT Questionnaire

	FT-Score (%)	**Medical Expenses Response (%)**	**Transportation Response (%)**	**Support from the Health System (%)**
FT-score (%)	1.000	0.377 *(<0.0001)*	0.262 *(p<0.0001)*	0.086 *(p=0.185)*
Medical expenses response (%)	0.377 *(<0.0001)*	1.000	0.264 *(p<0.0001)*	0.302 *(p<0.0001)*
Transportation response (%)	0.262 *(p<0.0001)*	0.264 *(p<0.0001)*	1.000	0.087 *(p=0.182)*
Support from the Health System (%)	0.086 *(p=0.185)*	0.302 *(p<0.0001)*	0.087 *(p=0.182)*	1.000

Witte et al[19] conducted a systematic review of 41 publications (40 studies) to analyze the wording, scales, and domains of instruments used to assess FT. Their review highlighted six key items reflecting perceptions and reactions to FT: expenditure, exhaustion of financial resources, psychosocial responses, seeking support, managing care, and adapting to lifestyle changes. However, the study also revealed inconsistencies in how these six domains are used across different instruments. This makes it challenging to compare and quantify the prevalence of FT accurately. Furthermore, not all existing instruments are well-suited for patients within third-party payer systems. The COST is the most investigated worldwide; it is a well-established tool that assesses how financial distress affects a patient's quality of life.[17] A different option is the Financial Index of Toxicity (FIT), which specifically looks at the psychological and social impact of financial burden.[20] Research indicates that FT may also lead patients to avoid following their treatment plans and can also increase their risk of depression, ultimately affecting their prognosis and quality of life.[21,22] Several sociodemographic characteristics, geographic location and comorbidity could be related to FT.[23] FT describes the economic strain individuals face due to medical expenses and healthcare-related costs. This burden is particularly common with serious conditions like cancer,[24–26] cardiovascular disease[27] and inflammatory bowel disease.[28] FT has been reported also in kidney disease, being a long-term health issue.[16] Several factors contribute to FT such as medical expenses, insurance coverage, lost income, caregiver costs, travel and lodging, emotional and psychological costs, and all these problems impact on quality of life. It has been recently reported that at a population-wide level increasing age, higher education, and higher income reduced the risk of FT, whilst involuntary unemployment, transient loss of health insurance, and high-deductible health plans were associated with higher risk of FT.[29] Nearly half of adults in the United States find it challenging to afford their healthcare expenses. This difficulty is significantly more pronounced for lower-income households: those earning under $40,000 annually are over three times more likely to struggle with healthcare costs compared to adults in households earning over $90,000.[30] However, detecting the similar figures in Italian population is very difficult. According to official national and international estimates, private healthcare spending totals around €41

billion in Italy. This expenditure is split, with roughly 35% going towards medical goods and 65% towards services.[31] FT data in dialysis population is still a matter of debate. In 2024 a Chinese study investigated cross-sectionally 148 peritoneal dialysis patients aged 48 years using the COST-FACIT score and found a mean value of 15.25±6.10 (range 3–33). Nearly 95% of the population suffered FT, of whom more than 50% had mild and more than 40% moderate FT. Age, working status, household income and peritoneal dialysis complications were associated with FT.[32] A Brazilian study published in 2023 surveyed 214 hemodialysis patients and found that FT was a significant issue. The average FT score was 20.30 with 71% of the patients experiencing some level of financial distress. Specifically, 48% had mild FT, 23% had moderate FT, and less than 1% had high FT.[33] Ryohei et al[34] conducted a multicenter, cross-sectional study including Japanese adults undergoing in-center hemodialysis and evaluated FT using the COST. Moreover, they evaluated medication adherence that was assessed using the 12-item Adherence Starts with Knowledge (ASK-12) scale. Authors enrolled 455 participants aged 71 years, and the mean COST score was 22.0, and 68% of the participants experienced at least mild FT. Lower FT (ie higher COST score) was associated with better medication adherence. Besides, the COST score calculated in Japanese dialysis patients was significantly higher than that reported for patients undergoing HD in Brazil and patients undergoing peritoneal dialysis in China.[34] A recent study from United States surveyed 112 patients treated by dialysis, transplant after dialysis or pre-emptive transplant, by COST score. The median COST score was 17 and 71% of patients suffered FT. Ethnic groups different from White race and those who needed dialysis were more likely to report FT. Individuals with low COST score reported insufficient income to meet their needs, employment reduction and decreased household income.[35] In end-stage kidney disease, FT appears to be the consequence of socioeconomic bearing such as treatment-related work limitation, reduced social roles, and inability to work, moreover direct costs due to pathological conditions associated to kidney failure should be added. Poverty is a complex issue, it's not just about a lack of money or material things, it also involves a scarcity of psychological resources and time. It's much harder to handle simple daily tasks when you are dealing with scarcity, and these problems could cause cognitive burden of poverty, meaning that for individuals in poverty, daily life is often marked by more severe stress. Poverty is more than just a lack of money; it's also a psychological burden. Both aspects of poverty can harm a person's health in different ways.[36] Shankar et al[37] analyzed the key themes, emotions, and challenges expressed by the dialysis community on social media platforms such as X (formerly known as Twitter) from April 2006 to August 2024 and they identified 8 key thematic clusters such as medical procedures and outcomes, daily life impact, risks and complications, patient education and support, health care access and costs, symptoms and side effects, patient experiences and socioeconomic challenges, and diet and fluid management. Negative sentiment was the highest for daily life impact and socioeconomic challenges, inducing the clustering of the two themes.[37]

Limitations

This study has several limitations. The main one is its design being cross sectional, single centre and based on a questionnaire, causal inferences cannot be explored as well as changes due to improved or worsen financial availability. Being single centre, we enrolled a limited group of patients, although our sample size calculation suggested that we evaluated an appropriate number of cases.[12] On the other hand, data on this specific item are scarce, and its precise prevalence is unknown, Italy is a country where public health insurance minimises out-of-pocket costs. Due to such a design, generalisability to countries with higher cost sharing may be limited. However, studies conducted in settings without universal health coverage are likely to observe even more pronounced FT. Several demographic parameters were not collected, and therefore not analysed, such as ethnic group, marital status, educational aspects, employment or unemployment, retirement, social support, neighbourhood attitudes, and household income. Also, clinical characteristics are missing, such as comorbidity and mental health, as well as quality of life data. We did not quantify out-of-pocket medical costs and living costs. However, our aim was merely to perform a survey about FT in in a country with fully public health-care system. Moreover, we could not include in our study patients that did not understand Italian language and were not able to fill the questionnaire. The social composition of Italian society is changing due to migration flows from Africa and Asia of poor people. In our study we did not consider patients experience such as depression and lifestyle changes, that are described in association with exhausting available resources.[38]

Conclusion

FT was significantly present in the investigated cohort and hemodialysis patients showed worse financial burden than peritoneal dialysis and kidney transplanted patients, while peritoneal dialysis subjects felt better cared for by health care professionals than kidney transplanted individuals, however the latter group could afford monthly expenses better than hemodialysis patients. To combat FT, healthcare providers, policymakers, and patient advocacy groups are pushing for better insurance coverage, more affordable healthcare access, clear pricing and billing, and support programs for patients struggling financially. Patients with financial problems cannot afford services or procedures that are not subsided. On the other hand, shared decision-making in nephrology care is desirable.[39] Physicians should create a safe space for patients to have open conversations about personal struggles like financial problems or other social challenges that may impact their health. Tsutsui et al suggested that flexible dialysis shift could be useful for individual lifestyles as in the case of unemployment.[40]

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