RESEARCH LETTER

Home Dialysis Curriculum Implementation for Health Care Workers Using Project ECHO Principles: A Feasibility Report From NKF-KDOQI

To the Editor:

The National Kidney Foundation (NKF) facilitated a series of NKF-KDOQI (NKF–Kidney Disease Outcomes Quality Initiative) conferences with the aim to remove barriers toward home dialysis adoption in the United States.[1] Given that knowledge base and provider awareness continued to be limited, a home dialysis project Extension for Community Healthcare Outcome (ECHO) was proposed as an important and implementable strategy.

The rationale of our home Dialysis Project ECHO was previously published.[1] Project ECHO is a known remote health educational model that uses videoconferencing technology to connect clinicians across multiple geographic settings with different areas of expertise. The NKF–home Dialysis Project ECHO was registered through the University of New Mexico ECHO project repository in November 2020. Curriculum topics are presented in Table S1. Our overall goal was to assess the feasibility of implementing a sustainable ECHO model in home dialysis. In brief, our project was based on a hub and spokes model. The home dialysis clinical hub faculty team consisted of nephrologists, a home dialysis nurse, a certified biomedical dialysis technician, a social worker, a dietitian, and a patient representative. Our hub team was charged to cover a broad scope of clinical topics and scenarios. On a biweekly basis, audience-predetermined clinical scenarios were presented to the clinical hub team. The faculty members facilitated informal case discussion, which mimicked that of residency training followed by a short didactic session.

An open invitation to participate was sent to all dialysis facilities within end-stage renal disease Networks 16 and 18. Baseline and exit surveys were created to assess the aforementioned domains. A secure videoconferencing platform was developed with standardized forms, which facilitated case submission to encourage a learning community for informal case discussion. Each session included informal case presentation and didactic curriculum topic discussion.

NKF–Home Dialysis Project ECHO was conducted from March 11, 2021 to March 24, 2022. One hundred seven health care workers registered (including 19 faculty and facility administrators) for our home dialysis ECHO project. The median number of participated sessions was 1.5 (range = 16). The registrants represented a diverse background (including dietitians [n = 15], facility administrators [n = 19], nurses [n = 36] and social workers [n = 17], fellows [n = 2], physicians [n = 10], technicians [n = 1], and others [n = 6]).

Home Dialysis Project ECHO sessions were consistently well received. Ninety-four percent of our participants agreed or strongly agreed that the learning objectives were met. Ninety-nine percent of participants reported that they would recommend the activity to their peers. Participants (93%) confirmed that the project assisted in the clinical management of home dialysis and enhanced interprofessional team dynamics and will make changes to their daily clinical practice. Sessional participants' survey results are summarized in Tables 1 and 2. Our program is neither designed nor powered to ascertain the impact of the Home Dialysis Project ECHO on the adoption of home dialysis. Descriptively, at baseline, the participating centers' median home dialysis rate was 9.3% (0.0%-18.5%) (interquartile range, 25%-75%) and was 12.8% (0.0%-24.6%) at the end of 12 months of the implementation of the Home Dialysis Project ECHO.

The NKF–Home Dialysis Project ECHO was a feasible virtual educational program. We are encouraged to see the potential of our strategy to be a sustainable program. Project ECHO has been implemented across multiple clinical disciplines with different levels of success.[2-5] Most studies have reported improvements in knowledge awareness, enhancement in team dynamics or integration, and providers' self-efficacy. We are limited in our observational design and hence are unable to discern any

Table 1. Survey Results—Changes to Practice

I Plan to Make Changes in My Practice on the Basis of the Information in This Activity	Yes	No
How to establish a culture of promoting home dialysis	12	1
Assumptions about barriers to PD summary evaluation	9	0
Modality education	10	1
Infection prevention	7	0
Patient/family/home assessment	8	1
Psychosocial adjustment	12	1
Best practice training techniques	8	0
Ingredients for a successful home dialysis team	6	1
Clinical strategies to help patients feel comfortable performing dialysis at home	3	0
PD catheter placement and growing relationship with PD catheter surgeons	6	0
Involving the family/support people in training and follow-up	7	0
Hernias and leaks in peritoneal dialysis	5	0
Transitional units	5	0
Nutrition and home dialysis	8	1
Home hemodialysis prescription using various platforms	2	2
Troubleshooting the PD prescription	5	1
Improvement of technique survival	3	0
Technological safety	2	0
Comanagement with the patient	2	0
Acute PD, urgent start PD	2	0

Abbreviation: PD, peritoneal dialysis.

Table 2. Survey Results—Activity Evaluation

Activity Evaluation: This Activity Will Assist to Improve My: (Select All That Apply)	Competence	Communication	Skills/ Strategies	Patient Outcomes	Performance
How to establish a culture of promoting home dialysis	3	8	7	6	4
Assumptions about barriers to PD summary evaluation	3	5	4	5	0
Modality education	4	6	9	6	3
Infection prevention	3	3	3	3	2
Patient/family/home assessment	4	2	3	3	2
Psychosocial adjustment	5	9	9	7	4
Best practice training techniques	5	5	7	6	4
Ingredients for a successful home dialysis team	3	3	3	3	4
Clinical strategies to help patients feel comfortable performing dialysis at home	1	2	2	2	2
PD catheter placement and growing relationship with PD catheter surgeons	3	6	3	3	1
Involving the family/support people in training and follow-up	3	3	4	5	3
Hernias and leaks in peritoneal dialysis	3	1	2	2	1
Transitional units	2	1	3	4	4
Nutrition and home dialysis	5	3	4	5	1
Home hemodialysis prescription using various platforms	4	2	1	2	1
Troubleshooting the PD prescription	5	3	3	4	2
Improvement of technique survival	3	3	3	2	3
Technological safety	1	1	1	0	0
Comanagement with the patient	1	1	1	0	1
Acute PD, urgent start PD	0	0	2	0	1

Abbreviation: PD, peritoneal dialysis.

potential causal link between our educational efforts and change in home dialysis rate. Additionally, there are other residual confounders, including changes in dialysis policy and/or reimbursement, which may also impact on home dialysis uptake.[6-8] Finally, given that we conducted our project during the coronavirus disease 2019 pandemic, the likelihood of home dialysis adoption has also varied and may represent a secular trend.[9]

Our project ECHO was able to disseminate a virtual education program to a relatively large number of clinicians. However, similar to previously published reports, the need for outreach poses a challenge for sustained recruitment.[10,11] We noted that our project ECHO had a median attendance of 1.5 sessions with a large range. For our project ECHO to operate, ongoing communication is required to engage our audience. Removal of barriers to attend may also facilitate participation. However, a second-year Home Dialysis Project ECHO program has expanded participation across 4 End-Stage Renal Disease Networks, resulting in more than double the attendance and participation as the pilot year.

Home dialysis is generally underutilized in the United States compared with other western countries. Overall, it is widely perceived that the lack of easily accessible broad-based clinical education for clinicians and patients may be one of the foundational elements contributing to the present distribution of dialysis modalities.[12] The NKF–Home Dialysis Project ECHO fulfills the perquisites for an accessible, broad-based virtual clinical education platform.[13]

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SUPPLEMENTARY MATERIAL

Supplementary File (PDF)

Table S1: Curriculum and Learning Objectives.

ARTICLE INFORMATION

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REFERENCES

1. Chan CT, Collins K, Ditschman EP, et al. Overcoming barriers for uptake and continued use of home dialysis: an NKF-KDOQI conference report. *Am J Kidney Dis*. 2020;75(6):926-934.
2. Addala A, Filipp SL, Figg LE, et al. Tele-education model for primary care providers to advance diabetes equity: findings from Project ECHO Diabetes. *Front Endocrinol (Lausanne)*. 2022;13:1066521.
3. Hodge A, Manson J, McTague L, Kyerematenge S, Taylor P. Creating virtual communities of practice for ambulance paramedics: a qualitative evaluation of the use of Project ECHO in end-of-life care. *Br Paramed J*. 2022;7(3):51-58.
4. Panjwani S, Porto A, Motz R, et al. Participation in Project ECHO to advance rural primary care providers' ability to address patient mental health needs. *Med Educ Online*. 2023;28(1):2164470.
5. Tilmon SJ, Lee KK, Gower PA, et al. Impact of an urban project ECHO: safety-net clinician self-efficacy across conditions. *Am J Prev Med*. 2023;64(4):535-542.
6. Bhat JG, Weiss S. ETC model: how one small dialysis organization is navigating uncharted policy waters. *Adv Chronic Kidney Dis*. 2022;29(1):45-51.
7. Reddy YNV, Mendu ML, Weinhandl ED. Funding innovative dialysis technology in the United States: home dialysis and the ESRD transitional add-on payment for new and innovative equipment and supplies (TPNIES). *Am J Kidney Dis*. 2021;78(6):892-896.
8. Reddy YNV, Tummalapalli SL, Mendu ML. Ensuring the equitable advancement of American kidney health—the need to account for socioeconomic disparities in the ESRD treatment choices model. *J Am Soc Nephrol*. 2021;32(2):265-267.
9. Truong T, Dittmar M, Ghaffari A, Lin E. Policy and pandemic: the changing practice of nephrology during the coronavirus disease-2019 outbreak. *Adv Chronic Kidney Dis*. 2020;27(5):390-396.
10. Sockalingam S, Rajaratnam T, Gambin A, Soklaridis S, Serhal E, Crawford A. Interprofessional continuing professional development programs can foster lifelong learning in healthcare professionals: experiences from the Project ECHO model. *BMC Med Educ*. 2022;22(1):432.
11. Abra G, Poyan Mehr A, Chan CT, Schiller B. The implementation of a virtual home dialysis mentoring program for nephrologists. *Kidney360*. 2022;3(4):734-736.
12. Morita PP, Huynh K, Zakir A, et al. Supporting the establishment of new home dialysis programs through the Explore Home Dialysis Program. *Kidney Int Rep*. 2018;4(2):293-300.
13. Ashley J, Abra G, Schiller B, et al. The use of virtual physician mentoring to enhance home dialysis knowledge and uptake. *Nephrology (Carlton)*. 2021;26(7):569-577.