

Digital storytelling intervention to support hemodialysis decision-making among chronic kidney disease patients

BACKGROUND

Chronic kidney disease (CKD) patients face substantial psychological and informational burdens when deciding whether to initiate hemodialysis (HD). Anxiety, uncertainty, low self-efficacy, limited therapy readiness, and inadequate understanding of treatment options contribute to delayed or poorly informed decisions. Digital storytelling offers a patient-centered approach to support engagement and confidence during complex decision-making in renal and critical care pathways. This study developed and evaluated NephroStory, a narrative-based digital storytelling intervention, to strengthen self-efficacy, therapy readiness, and HD decision-making among CKD patients preparing for dialysis.

PARTICIPANTS AND PROCEDURE

This research employed a research and development (R&D) design using a sequential explanatory mixed-methods approach conducted in five phases: needs assessment, application design, expert validation, pilot implementation, and pre-post outcome evaluation. A total of 30 CKD patients preparing for hemodialysis participated in the intervention over two weeks, attending 2-3 sessions per week with an average duration of 20 minutes per session.

RESULTS

Significant improvements were observed across all primary outcomes following the intervention. Mean self-efficacy scores increased from 22.43 ± 4.52 to 35.33 ± 5.07 , therapy readiness improved from 23.10 ± 7.78 to 36.70 ± 6.65 , and decision-making scores rose from 27.97 ± 13.51 to 39.87 ± 8.20 (all $p < .001$). Although participants with higher educational levels demonstrated greater numerical gains, no statistically significant differences were identified between groups. Large effect sizes were observed across all outcomes ($r = .69-.87$), indicating substantial changes following intervention exposure.

CONCLUSIONS

NephroStory was associated with significant improvements in self-efficacy, therapy readiness, and hemodialysis decision-making among CKD patients. Narrative-based digital decision-support tools may represent a promising and scalable approach for improving patient engagement and confidence during time-sensitive treatment decisions.

KEY WORDS

chronic kidney disease; hemodialysis; digital storytelling; self-efficacy; therapy readiness

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BACKGROUND

Chronic kidney disease (CKD) is a long-term progressive condition that causes substantial morbidity, mortality, and economic burden worldwide. The World Health Organization (WHO) estimates that CKD affects over 10% of the global adult population, and its prevalence continues to rise annually (Elwyn et al., 2012; WHO, 2021). The disease not only reduces patients' quality of life but also places a heavy strain on healthcare systems due to the cost of renal replacement therapies and complications (Rohmaniah & Sunarno, 2022). In Indonesia, CKD remains a growing concern. According to the 2018 Basic Health Research (Riskesdas, 2018), the national prevalence was 0.38%, showing a steady increase over the past decade.

At the advanced stages of CKD, patients often require renal replacement therapy, particularly hemodialysis (HD), to sustain life. However, the decision to initiate HD is complex and often accompanied by fear, anxiety, and uncertainty (Stacey et al., 2017). Many newly diagnosed patients are unprepared to make timely treatment decisions because of limited disease knowledge, lack of confidence, and inadequate education regarding HD (Lee & Cho, 2025; Neale et al., 2020). Studies have shown that such hesitation may result in treatment delays, worsened health outcomes, and lower quality of life.

Initiating hemodialysis is not merely a clinical decision but also a complex psychological process that requires patients to evaluate treatment benefits, risks, lifestyle changes, and personal values. Within the framework of shared decision-making (SDM), patients are encouraged to actively participate in treatment planning together with healthcare professionals, ensuring that decisions align with their preferences, goals, and expectations (Elwyn et al., 2012; Stacey et al., 2017). However, many patients with CKD experience decisional conflict, uncertainty, and low confidence when confronted with the decision to initiate dialysis, which may compromise their ability to make informed treatment choices (Song et al., 2013; Winterbottom et al., 2016).

Self-efficacy is considered a central determinant of health-related decision-making. According to Bandura's Social Cognitive Theory, individuals who possess higher self-efficacy are more likely to seek information, engage in problem-solving behaviors, and participate actively in healthcare decisions (Bandura, 1997). In the context of CKD, self-efficacy may influence patients' readiness to initiate hemodialysis and their confidence in selecting appropriate treatment options (Curtin et al., 2008; Lin et al., 2012). Therefore, interventions that simultaneously strengthen self-efficacy, therapy readiness, and decision-making capacity may facilitate more informed and patient-centered dialysis decisions (Bandura, 1997; Narva et al., 2016).

Conceptually, self-efficacy may function as a precursor to therapy readiness and decision-making. Patients who believe they are capable of managing the challenges associated with hemodialysis are more likely to develop psychological readiness for treatment and participate actively in treatment decisions. In this pathway, increased self-efficacy may facilitate greater readiness, which in turn supports more confident and informed decision-making regarding dialysis initiation (Bandura, 1997; Curtin et al., 2008; Lin et al., 2012).

In many healthcare institutions, patient education about CKD and HD remains largely conventional, centered on lectures or printed materials that fail to engage patients emotionally or cognitively (Neale et al., 2020; Pal et al., 2024). These methods often emphasize information delivery rather than behavioral change or empowerment. For individuals facing life-altering treatment decisions, education that integrates both cognitive understanding and emotional connection is essential.

Digital storytelling has recently emerged as an innovative educational strategy that combines narrative and multimedia elements to deliver health information in a more engaging and meaningful way (Sulfikar et al., 2024). By presenting authentic patient experiences, this approach enhances understanding, empathy, and motivation to adhere to medical advice. In nephrology, digital storytelling has been shown to improve self-efficacy and treatment adherence among patients undergoing HD (Lee & Cho, 2025; Moreau et al., 2018). Yet, research focusing on newly diagnosed CKD patients, particularly those deciding whether to start HD, remains limited.

Preliminary interviews with HD nurses at Bhayangkara Hospital Makassar revealed that many newly diagnosed CKD patients postpone HD initiation due to fear, misconceptions, and poor readiness (Chen et al., 2019; Hafidz et al., 2024). Such findings highlight the need for innovative, interactive education models that go beyond traditional teaching. To address this gap, we developed NephroStory, a digital storytelling based interactive application designed to enhance patients' understanding, self-efficacy, and readiness to make informed decisions about HD.

Although digital storytelling has demonstrated positive effects on patient education, health literacy, engagement, and self-management across various chronic conditions (Zamani et al., 2025), evidence regarding its use as a decision-support intervention for patients newly diagnosed with chronic kidney disease (CKD) remains limited (Gazaway et al., 2025). Existing interventions in CKD have predominantly focused on disease education, self-management support, and treatment adherence among patients already undergoing dialysis or receiving long-term kidney care (Lightfoot et al., 2025). Few studies have specifically addressed the psychological and decisional chal-

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Figure 1

Overview of the NephroStory digital storytelling application showing the home interface, educational modules, and decision-support features



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lenges associated with preparing for and initiating hemodialysis, particularly through patient-centered digital approaches grounded in shared decision-making principles (Elwyn et al., 2012; Stacey et al., 2017). Therefore, the development of NephroStory addresses an important gap by integrating digital storytelling, self-efficacy enhancement, and decision-support principles within a patient-centered educational platform.

Unlike previous digital health interventions in nephrology that primarily focus on disease education, self-management support, or treatment adherence (Lightfoot et al., 2025; Narva et al., 2016), NephroStory was specifically designed as a patient-centered decision-support intervention for individuals preparing to initiate hemodialysis. The application uniquely integrates digital storytelling, self-efficacy enhancement, therapy readiness, and shared decision-making principles within a single educational platform. To our knowledge, few studies have combined these components to support treatment initiation decisions among newly diagnosed CKD patients, representing a novel contribution to the digital health and nephrology literature.

Therefore, the purpose of this study was to develop and conduct a preliminary evaluation of the NephroStory interactive application in improving self-efficacy, therapy readiness, and decision-making among patients newly diagnosed with CKD. We hypothesized that participation in the digital story-

telling intervention would be associated with greater patient engagement, improved readiness for treatment, and enhanced confidence in decisions regarding the initiation of hemodialysis.

PARTICIPANTS AND PROCEDURE

STUDY DESIGN

This study employed a research and development (R&D) approach within a sequential explanatory mixed-methods design, integrating qualitative and quantitative methods to support both intervention development and preliminary outcome (Creswell & Clark, 2017). The study was conducted through five iterative phases: needs assessment, application development, expert validation, pilot implementation, and outcome evaluation.

As part of the pilot evaluation phase, a one-group pre-post design was used to assess the feasibility, acceptability, and preliminary impact of the NephroStory intervention on self-efficacy, therapy readiness, and decision-making outcomes. A control group was not included because the primary objective at this stage was to obtain initial evidence regarding intervention performance prior to conducting a larger randomized controlled trial. Therefore, the findings should be interpreted as exploratory and

hypothesis-generating rather than confirmatory evidence of effectiveness.

PARTICIPANTS

A total of 30 adult patients newly diagnosed with CKD and clinically advised to initiate HD were recruited using purposive sampling from Bhayangkara Hospital Makassar, Indonesia. The sample consisted of patients aged 18-65 years who were able to operate a smartphone and willing to provide informed consent.

Inclusion criteria were: (a) confirmed first diagnosis of CKD by a nephrologist, (b) recommendation to initiate HD, (c) ability to use a mobile device, and (d) consent to participate. Exclusion criteria included severe cognitive impairment, unstable medical conditions, or refusal to consider HD as a treatment option.

Purposive sampling was selected to ensure recruitment of patients who met the specific clinical and technological requirements of the intervention. However, this non-probability sampling method may limit representativeness and increase the potential for selection bias, which should be considered when interpreting the findings.

An a priori power analysis was performed using G*Power 3.1. Assuming a medium effect size ($d = 0.50$), a significance level of 0.05, and statistical power of 0.80, the minimum required sample size was 27 participants. Therefore, the inclusion of 30 participants in this study was considered adequate to detect meaningful intervention effects.

PROCEDURE

The study was conducted in sequential stages. Initially, qualitative data were collected through focus group discussions and semi-structured interviews with patients and healthcare providers to identify educational needs and psychological barriers in HD decision-making. These findings informed the development of the NephroStory application.

Participants were then enrolled in a two-week intervention phase, during which they engaged with the application 2-3 times per week, with each session lasting approximately 20 minutes. Pre- and post-intervention assessments were conducted to evaluate changes in self-efficacy, therapy readiness, and decision-making ability.

INTERVENTION

NephroStory is a narrative-based digital storytelling application developed to support psychological preparation and treatment decision-making among

patients newly diagnosed with CKD. The intervention was designed based on principles of patient-centered education, social cognitive theory, and shared decision-making.

The application consisted of six sequential learning modules: (1) understanding chronic kidney disease, (2) experiences of patients undergoing hemodialysis, (3) managing fear and uncertainty related to treatment initiation, (4) preparation for hemodialysis, (5) treatment decision-support guidance, and (6) family and social support. Each module combined short educational videos, patient narratives, visual infographics, reflective questions, and interactive decision-support prompts.

Authentic patient stories were presented through video-based digital narratives describing challenges, coping strategies, adaptation experiences, and treatment outcomes. These narratives were intended to facilitate observational learning, emotional engagement, and confidence building through exposure to relatable patient experiences.

Participants accessed the intervention independently using their smartphones over a two-week period, completing 2-3 sessions per week. Each session lasted approximately 20 minutes and included both educational and reflective activities designed to encourage active engagement with treatment-related decisions.

MEASURES

Self-efficacy was assessed using the General Self-Efficacy Scale (GSES; Schwarzer & Jerusalem, 1995), a widely validated instrument measuring individuals' confidence in managing challenging situations. Therapy readiness was measured using an adapted Readiness-for-Therapy Questionnaire for CKD patients. Decision-making ability was evaluated using the 9-item Shared Decision-Making Questionnaire (SDM-Q-9), which assesses patient involvement in clinical decision-making processes (Kriston et al., 2010). Demographic data, including age, gender, education level, and disease characteristics, were also collected.

The adapted Readiness-for-Therapy Questionnaire underwent content validation by three experts in nephrology nursing and health education prior to implementation. Content validity indices indicated satisfactory agreement regarding item relevance and clarity. Internal consistency reliability was assessed during pilot testing and demonstrated acceptable reliability (Cronbach's $\alpha = .87$).

DATA ANALYSIS

Quantitative data were analyzed using descriptive and inferential statistics. Pre-post differences were

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examined using the Wilcoxon signed-rank test due to non-normal data distribution. Qualitative data from the needs assessment and user feedback phases were analyzed using thematic analysis to identify recurring patterns and insights (Braun & Clarke, 2006). Integration of findings followed a sequential explanatory approach, where qualitative results were used to interpret quantitative outcomes.

In addition to statistical significance testing, effect sizes (r) were calculated for Wilcoxon signed-rank test results using the formula $r = Z/\sqrt{N}$. Effect sizes were interpreted according to Cohen's criteria, where 0.10 indicated a small effect, 0.30 a medium effect, and 0.50 a large effect. Where appropriate, 95% confidence intervals were reported to provide additional information regarding the magnitude and precision of observed changes.

ETHICAL CONSIDERATIONS

This study received ethical approval from an authorized institutional Research Ethics Committee (Approval No. 199/STIKES-NH/KEPK/I/2025). Written informed consent was obtained from all participants prior to participation. All procedures were conducted in accordance with the ethical principles of the Declaration of Helsinki. Participant confidentiality, anonymity, and voluntary participation were strictly maintained throughout the study.

RESULTS

DEMOGRAPHIC CHARACTERISTICS

A total of 30 patients with CKD who were recommended to initiate HD participated in this study. The mean age was 50.27 ± 10.65 years (range: 24-68 years), with most respondents aged 46-55 years (36.7%), followed by 56-65 years (30.0%). More than half were female (53.3%).

Regarding education, the majority had completed senior high school (66.7%), while 6.7% had only elementary education. The most common occupations were self-employed (43.3%) and housewives (33.3%). Almost all participants were married (90.0%). In terms of comorbidities, hypertension (90.0%) was predominant, followed by diabetes mellitus (10.0%). Detailed demographic data are presented in Table 1.

PRE-POST INTERVENTION OUTCOMES

Before the intervention, mean pre-test scores were 22.43 ± 4.52 for self-efficacy, 23.10 ± 7.78 for therapy readiness, and 27.97 ± 13.51 for decision-making ability.

Table 1

Demographic characteristics of participants (N = 30)

Characteristic	n (%)
Age (years), $M \pm SD$	50.27 $\pm$ 10.65
Age (years), range	24-68
17-25	1 (3.3)
26-35	2 (6.7)
36-45	6 (20.0)
46-55	11 (36.7)
56-65	9 (30.0)
> 65	1 (3.3)
Sex	
Male	14 (46.7)
Female	16 (53.3)
Education	
Elementary school	2 (6.7)
Junior high school	3 (10.0)
Senior high school	20 (66.7)
Diploma/bachelor degree	5 (16.7)
Occupation	
Housewife	10 (33.3)
Self-employed	13 (43.3)
Civil servant	2 (6.7)
Private employee	3 (10.0)
Unemployed/retired	2 (6.7)
Marital status	
Married	27 (90.0)
Unmarried/widowed	3 (10.0)
Comorbidities	
Hypertension	27 (90.0)
Diabetes mellitus	3 (10.0)

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After the two-week NephroStory intervention, significant increases were observed in all three variables, as illustrated in Figure 2.

Post-test scores rose to 35.33 ± 5.07 , 36.70 ± 6.65 , and 39.87 ± 8.20 , respectively.

Most participants shifted from moderate to high categories for self-efficacy and readiness, while decision-making scores improved from low to moderate levels.

The detailed pre-post distributions are presented in Table 2.

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As shown in Table 2, improvements were observed across all outcome measures, with non-overlapping confidence intervals between pre-test and post-test assessments. Large effect sizes were identified for self-efficacy ($r = .87$), therapy readiness ($r = .85$), and decision-making ability ($r = .69$), indicating substantial changes following intervention exposure. Nevertheless, these findings should be interpreted cautiously, because the study employed a one-group pre-post design without a control group, which limits causal inference regarding intervention effectiveness.

ASSOCIATION BETWEEN DEMOGRAPHIC FACTORS AND STUDY OUTCOMES

Correlation analyses indicated no statistically significant associations between demographic factors (age, sex, occupation, marital status, and comorbidities) and any of the outcome variables ($p > .05$). Participants

with higher education levels demonstrated numerically higher post-intervention self-efficacy, therapy readiness, and decision-making scores. However, these differences were not statistically significant (p -values: .089-.094). These findings suggest that educational attainment may be associated with differences in treatment-related outcomes, although this relationship requires further investigation in larger samples.

SUMMARY OF FINDINGS

Participants who completed the NephroStory intervention demonstrated significant improvements in self-efficacy, therapy readiness, and decision-making outcomes. However, because this study employed a one-group pre-post design, these findings should be interpreted as preliminary evidence of a potential benefit rather than definitive evidence of effectiveness.

DISCUSSION

This pilot study found that participation in the NephroStory digital storytelling intervention was associated with significant improvements in self-efficacy, therapy readiness, and decision-making among patients with newly diagnosed CKD who were preparing to initiate hemodialysis. Large effect sizes were observed across all outcome measures, suggesting meaningful changes following intervention exposure. However, because the study used a one-group pre-post design without a comparison group, the findings should be interpreted cautiously and cannot be considered evidence of a causal intervention effect.

ENHANCEMENT OF SELF-EFFICACY

At baseline, participants exhibited low-to-moderate self-efficacy levels, reflecting uncertainty and diminished confidence in managing their illness—an issue

Figure 2

Comparison of pre-test and post-test mean scores for self-efficacy, therapy readiness, and decision-making among participants following the NephroStory intervention (N = 30)

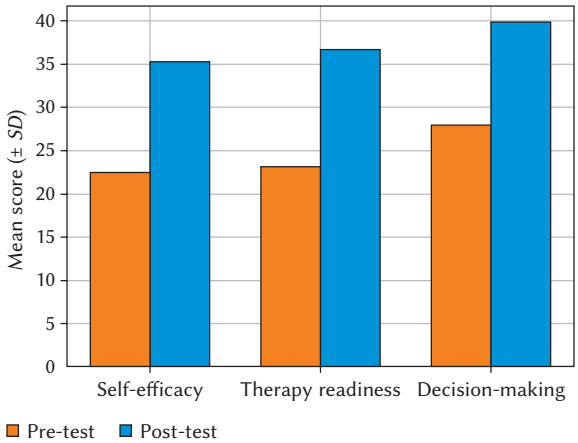


Table 2

Changes in study outcomes following the NephroStory intervention (N = 30)

Variable	Pre-test M ± SD (95% CI)	Post-test M ± SD (95% CI)	Z	p	Effect size (r)
Self-efficacy	22.43 ± 4.52 (20.75-24.12)	35.33 ± 5.07 (33.44-37.23)	-4.79	< .001	.87
Therapy readiness	23.10 ± 7.78 (20.19-26.01)	36.70 ± 6.65 (34.22-39.18)	-4.65	< .001	.85
Decision-making ability	27.97 ± 13.51 (22.92-33.01)	39.87 ± 8.20 (36.80-42.93)	-3.77	< .001	.69

Note. CI – confidence interval. Within-group comparisons were performed using the Wilcoxon signed-rank test. Effect sizes (r) were calculated using $r = Z/\sqrt{N}$ and interpreted according to Cohen’s criteria (0.10 – small, 0.30 – medium, 0.50 – large).

frequently reported among CKD patients (Ma et al., 2022; Rantepadang & Tombokan, 2024). After using NephroStory, self-efficacy scores increased substantially, with the majority reaching the high category. This improvement aligns with previous studies showing that digital storytelling interventions foster empowerment by connecting patients with relatable experiences (Mitchell et al., 2025; Moreau et al., 2018).

Through exposure to personal narratives, patients may develop vicarious learning and emotional engagement, enhancing motivation for self-management. This process resonates with Bandura's social cognitive theory, which posits that observing others successfully managing similar challenges reinforces self-belief and goal-oriented behavior (Bandura, 1997). Consequently, NephroStory appears to serve not only as an informational resource but also as a motivational catalyst that strengthens perceived control over disease management – an essential component in chronic illness adaptation.

IMPROVEMENT IN THERAPY READINESS

Readiness to initiate hemodialysis is shaped by both cognitive understanding and emotional acceptance. In this study, readiness scores improved significantly after exposure to NephroStory, suggesting that interactive storytelling may contribute to bridging the gap between knowledge and emotional preparedness. Prior research has highlighted that multimedia educational strategies are more effective than conventional approaches in reducing fear, uncertainty, and denial among CKD patients (Chiou & Chung, 2011; Kuwabara et al., 2020).

By integrating factual education with narrative-based learning, NephroStory may facilitate internalization of information and promote reflective engagement, allowing patients to visualize life with hemodialysis in a realistic yet encouraging context. This aligns with the Health Belief Model, which suggests that individuals are more likely to adopt health-related behaviors when they perceive clear benefits and manageable barriers (Cengiz & Ozkan, 2022). Thus, NephroStory may help transform passive information reception into active readiness for therapy initiation.

The effectiveness of digital storytelling may be explained through the interaction of cognitive and emotional learning processes. Cognitively, narrative-based content simplifies complex medical information and improves understanding of treatment options. Emotionally, exposure to authentic patient experiences may reduce fear, uncertainty, and perceived stigma while fostering empathy and hope. Together, these processes may enhance patients' confidence, readiness, and willingness to engage in informed treatment decisions.

STRENGTHENING OF DECISION-MAKING ABILITY

The ability to make informed and confident treatment decisions is a cornerstone of patient-centered care. Initially, participants displayed low decision-making scores, consistent with literature reporting decisional conflict and limited participation among newly diagnosed CKD patients (Lee & Cho, 2025). After the intervention, significant improvements were observed, indicating enhanced clarity and confidence in decision-making processes.

Storytelling-based interventions, such as NephroStory, have been shown to support shared decision-making (SDM) by presenting real-life experiences and clarifying treatment expectations (Gazaway et al., 2024). The observed improvement suggests that digital storytelling may reduce decisional anxiety and increase patient engagement, thereby improving alignment between patients' choices and their personal values. This reflects a growing body of evidence supporting SDM-integrated digital tools in nephrology as promising approaches for empowering patients to take a more active role in treatment planning.

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INFLUENCE OF DEMOGRAPHIC AND EDUCATIONAL FACTORS

Although demographic characteristics were not statistically associated with self-efficacy, readiness, or decision-making outcomes, trends indicated that participants with higher educational attainment showed numerically higher scores on these measures. This finding is consistent with previous evidence suggesting that health literacy enhances comprehension, self-regulation, and motivation in chronic disease management (Afni, 2021; Dinh & Bonner, 2023; Hamza et al., 2025).

Higher education may enhance individuals' ability to interpret health information and navigate digital applications, leading to greater engagement and outcome improvement. Therefore, future interventions should consider incorporating adaptive content delivery, for instance, simplified interfaces, visual narratives, and voice-guided modules to ensure inclusivity among patients with varying literacy levels.

CLINICAL AND NURSING IMPLICATIONS

From a clinical and nursing perspective, these findings highlight the value of digital storytelling as an adjunct to traditional patient education. Conventional health education methods often focus solely on cognitive aspects, overlooking the emotional and experiential dimensions of learning. NephroStory bridges this gap by combining medical information with

emotional resonance, fostering deeper understanding and psychological adaptation.

Integrating such digital interventions into routine nursing care could help healthcare providers deliver personalized, accessible, and engaging education that promotes self-efficacy and readiness for long-term therapy. This approach aligns with global movements toward digital health transformation, emphasizing patient empowerment and collaborative care as key strategies for improving health outcomes (Avineri et al., 2018; Sulfikar & Rajab, 2024).

Beyond statistical significance, the observed improvements may have important clinical implications. Increased self-efficacy, therapy readiness, and decision-making confidence may help patients engage more actively in treatment planning, reduce decisional uncertainty, and facilitate timely initiation of hemodialysis. These outcomes are clinically meaningful because delays in dialysis decision-making have been associated with poorer health outcomes and increased psychological distress among patients with advanced CKD.

LIMITATIONS AND FUTURE DIRECTIONS

Several limitations should be considered when interpreting these findings. First, the one-group pre-post design without a control group limits the ability to establish causal relationships between the intervention and observed outcome changes. Improvements may have been influenced by repeated measurement effects, regression to the mean, increased attention from researchers, or external factors unrelated to the intervention. Second, purposive sampling and recruitment from a single healthcare institution may limit the representativeness of the sample and reduce generalizability. Third, all outcomes were assessed using self-report measures, which may be subject to response bias and social desirability effects. Finally, the relatively small sample size limited the statistical power of subgroup analyses and prevented more robust examination of demographic influences on intervention outcomes.

Future research should include larger multicenter randomized controlled trials to confirm these preliminary findings, evaluate long-term sustainability of outcomes, and examine clinical indicators such as dialysis adherence and treatment initiation timing. Qualitative exploration of patient experiences may also provide deeper insight into the cognitive and emotional mechanisms through which digital storytelling influences treatment readiness and decision-making.

CONCLUSIONS

This pilot study suggests that participation in the NephroStory digital storytelling intervention was

associated with improvements in self-efficacy, therapy readiness, and decision-making among patients newly diagnosed with CKD who were preparing to initiate hemodialysis. The findings indicate that narrative-based digital education may represent a promising strategy for supporting patient engagement and treatment preparation. However, given the exploratory nature of the study and the absence of a control group, further research using larger samples and randomized controlled designs is required before definitive conclusions regarding effectiveness can be drawn.

DISCLOSURES

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REFERENCES

- Afni, N. (2021). The role of health literacy in chronic disease management: Challenges, interventions, and policies. *Journal of Health Literacy and Qualitative Research*, 1, 57–68. <https://doi.org/10.61194/jhlqr.v1i2.526>
- Avineri, N., Graham, L. R., Johnson, E. J., Riner, R. C., & Rosa, J. (2018). *Language and social justice in practice*. Routledge. <https://doi.org/10.4324/9781315115702>
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. Macmillan.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77–101. <https://doi.org/10.1191/1478088706qp0630a>
- Cengiz, Z., & Ozkan, M. (2022). Applying the health belief model to the rational use of drugs for hemodialysis patients: a randomized controlled trial. *Patient Education and Counseling*, 105, 679–685. <https://doi.org/10.1016/j.pec.2021.06.024>
- Chen, R. Y., Huang, L. C., Su, C. T., Chang, Y. T., Chu, C. L., Chang, C. L., & Lin, C. L. (2019). Effectiveness of short-term health coaching on diabetes control and self-management efficacy: a quasi-experimental trial. *Frontiers in Public Health*, 7, 1–9. <https://doi.org/10.3389/fpubh.2019.00314>
- Chiou, C. P., & Chung, Y. C. (2011). Effectiveness of multimedia interactive patient Education on knowledge, uncertainty and decision-making in patients with end-stage renal disease. *Journal of Clinical Nursing*, 21, 1223–1231. <https://doi.org/10.1111/j.1365-2702.2011.03793.x>

- Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research*. Sage Publications.
- Curtin, R. B., Walters, B. A. J., Schatell, D., Pennell, P., Wise, M., & Klicko, K. (2008). Self-efficacy and self-management behaviors in patients with chronic kidney disease. *Advances in Chronic Kidney Disease*, 15, 191–205. <https://doi.org/10.1053/j.ackd.2008.01.006>
- Dinh, T. T. H., & Bonner, A. (2023). Exploring the relationships between health literacy, social support, self-efficacy and self-management in adults with multiple chronic diseases. *BMC Health Services Research*, 23, 923. <https://doi.org/10.1186/s12913-023-09907-5>
- Elwyn, G., Frosch, D., Thomson, R., Joseph-Williams, N., Lloyd, A., Kinnersley, P., Cording, E., Tomson, D., Dodd, C., Rollnick, S., Edwards, A., & Barry, M. (2012). Shared decision making: a model for clinical practice. *Journal of General Internal Medicine*, 27, 1361–1367. <https://doi.org/10.1007/s11606-012-2077-6>
- Gazaway, S., Gutierrez, O., Wells, R., Nix-Parker, T., Lyas, C., Daniel, S., Lang-Lindsey, K., Bryant, T., Knight, R., & Odom, J. N. (2024). Exploring the health-related decision-making experiences of people with chronic kidney disease and their caregivers: a qualitative study. *Health Expectations*, 27, e13907. <https://doi.org/10.1111/hex.13907>
- Gazaway, S., Wells, R., Gutierrez, O. M., Azuero, A., Cole, A., Nix-Parker, T., Pitts, L., Lyas, C., Lang-Lindsey, K., Knight, R., Pazant, P., Gustafuson, N., Rayburn, A., Umeukeje, E., & Odom, J. N. (2025). Decision support training for chronic kidney disease dyads: The ImPart Study protocol. *Pilot and Feasibility Studies*, 12, 14. <https://doi.org/10.1186/s40814-025-01749-8>
- Hafidz, F., Dewi, C., Supriyati, Puspandari, D. A., Purnomo, J. V., Yuniarti, T. F., & Aristianti, V. (2024). *Studi eksplorasi: Faktor penghambat orang yang kontak dengan pasien TBC dan telah dirujuk namun tidak melakukan pemeriksaan TBC (Final research report)* [Exploratory study: Barriers preventing individuals who have been in contact with TB patients and subsequently referred from undergoing TB screening. Penabulu Research Institute. Retrieved from <https://researchinstitute.penabulufoundation.org/laporan-akhir-studi-eksplorasi-faktor-penghambat-orang-kontak-dengan-pasien-tbc-dan-telah-dirujuk-namun-tidak-melakukan-pemeriksaan-tbc/>
- Hamza, M. A., Ullah, S., Ahsan, H., Ali, W., Masud, M., & Ahmed, A. (2025). Health literacy, illness perception, and their association with medication adherence in end-stage renal disease. *International Urology and Nephrology*, 57, 2979–2994. <https://doi.org/10.1007/s11255-025-04472-8>
- Kriston, L., Scholl, I., Hölzel, L., Simon, D., Loh, A., & Härter, M. (2010). The 9-item Shared Decision Making Questionnaire (SDM-Q-9). Development and psychometric properties in a primary care sample. *Patient Education and Counseling*, 80, 94–99. <https://doi.org/10.1016/j.pec.2009.09.034>
- Kuwabara, A., Su, S., & Krauss, J. (2020). Utilizing digital health technologies for patient education in lifestyle medicine. *American Journal of Lifestyle Medicine*, 14, 137–142. <https://doi.org/10.1177/1559827619892547>
- Lee, H., & Cho, M. K. (2025). Effects of shared decision-making, health literacy, and self-care knowledge on self-care behavior among hemodialysis patients in Korea: a cross-sectional survey. *Healthcare*, 13, 175. <https://doi.org/10.3390/healthcare13020175>
- Lightfoot, C. J., Wilkinson, T. J., Graham-Brown, M. P. M., & Smith, A. C. (2025). Supporting people with chronic kidney disease to self-manage their condition: Understanding the lived experiences, needs and requirements, and barriers and facilitators. *Journal of Nephrology*, 38, 1969–1984. <https://doi.org/10.1007/s40620-025-02349-8>
- Lin, C. C., Wu, C. C., Anderson, R. M., Chang, C. S., Chang, S. C., Hwang, S. J., & Chen, H. C. (2012). The chronic kidney disease self-efficacy (CKD-SE) instrument: Development and psychometric evaluation. *Nephrology, Dialysis, Transplantation*, 27, 3828–3834. <https://doi.org/10.1093/ndt/gfr788>
- Ma, L. C., Liu, Y. M., Lin, Y. C., Liao, C. T., Hung, K. C., Chen, R., Lu, K. C., Ho, K. F., & Zheng, C. M. (2022). Factors influencing self-management behaviors among hemodialysis patients. *Journal of Personalized Medicine*, 12, 1816. <https://doi.org/10.3390/jpm12111816>
- Mitchell, H. A., Waights, V., & Hart, T. (2025). Digital storytelling within a community-based mental health improvement programme (ARCLIGHT) in Guyana. *Action Research*, 23, 387–407. <https://doi.org/10.1177/14767503241296717>
- Moreau, K. A., Eady, K., Sikora, L., & Horsley, T. (2018). Digital storytelling in health professions education: a systematic review. *BMC Medical Education*, 18, 208. <https://doi.org/10.1186/s12909-018-1320-1>
- Narva, A. S., Norton, J. M., & Boulware, L. E. (2016). Educating patients about CKD: The path to self-management and patient-centered care. *Clinical Journal of the American Society of Nephrology*, 11, 694–703. <https://doi.org/10.2215/CJN.07680715>
- Neale, E. P., Middleton, J., & Lambert, K. (2020). Barriers and enablers to detection and management of chronic kidney disease in primary healthcare: a systematic review. *BMC Nephrology*, 21, 1–17. <https://doi.org/10.1186/s12882-020-01731-x>
- Pal, S., Panduragan, S. L., Said, F. M., & Poddar, S. (2024). Effect of self-management intervention on improvement of quality of life in chronic kidney disease patients: a scoping review. *The Open Nursing Journal*, 18, 1–14. <https://doi.org/10.2174/0118744346323309241009074442>

- Rantepadang, A., & Tombokan, O. S. (2024). Self-efficacy and quality of life chronic kidney disease patients undergoing hemodialysis. *International Scholars Conference, 2024*, 166–174.
- Riskesdas (2018). *Laporan Riskesdas 2018 Nasional* [2018 National Riskesdas Report]. Retrieved from <https://www.badankebijakan.kemkes.go.id/repository/id/eprint/3514>
- Rohmaniah, F. A., & Sunarno, R. D. (2022). Efikasi diri untuk meningkatkan kualitas hidup pasien gagal ginjal kronik yang menjalani hemodialisis [Self-efficacy to improve the quality of life of chronic kidney failure patients undergoing hemodialysis]. *Jurnal Ilmu Keperawatan Dan Kebidanan*, 13, 164–175. <https://doi.org/10.26751/jikk.v13i1.1305>
- Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy Scale. In J. Weinman, S. Wright, & M. Johnston (Eds.), *Measures in health psychology: a user's portfolio. Causal and control beliefs* (pp. 35–37). NFER-Nelson.
- Song, M. K., Lin, F. C., Gilet, C. A., Arnold, R. M., Bridgman, J. C., & Ward, S. E. (2013). Patient perspectives on informed decision-making surrounding dialysis initiation. *Nephrology, Dialysis, Transplantation*, 28, 2815–2823. <https://doi.org/10.1093/ndt/gft238>
- Stacey, D., Légaré, F., Lewis, K., Barry, M. J., Bennett, C. L., Eden, K. B., Holmes-Rovner, M., Llewellyn-Thomas, H., Lyddiatt, A., Thomson, R., & Trevena, L. (2017). Decision aids for people facing health treatment or screening decisions. *The Cochrane Database of Systematic Reviews*, 4, CD001431. <https://doi.org/10.1002/14651858.CD001431.pub5>
- Sulfikar, A., & Rajab, M. A. (2024). Evaluation of the feasibility of digital health applications based on best practice guidelines for diabetes management: a scoping review. *Informatics in Medicine Unlocked*, 51, 101601. <https://doi.org/10.1016/j.imu.2024.101601>
- Sulfikar, A., Thalib, A., & BN, I. R. (2024). The effectiveness of digital storytelling in improving self-efficacy of chronic kidney failure patients undergoing hemodialysis. *Indonesian Journal of Global Health Research*, 6, 4277–4286. <https://doi.org/10.37287/ijghr.v6i6.5292>
- Winterbottom, A. E., Gavaruzzi, T., Mooney, A., Wilkie, M., Davies, S. J., Crane, D., Tupling, K., Baxter, P. D., Meads, D. M., Mathers, N., & Bekker, H. L. (2016). Patient acceptability of the Yorkshire Dialysis Decision Aid (YoDDA) booklet: a prospective non-randomized comparison study across 6 predialysis services. *Peritoneal Dialysis International*, 36, 374–381. <https://doi.org/10.3747/pdi.2014.00274>
- WHO (2021). *World health statistics 2021*. World Health Organization.
- Zamani, S., Abdoli, S., Ghadirian, F., & Mardanian Dehkordi, L. (2025). The impact of digital storytelling on psychosocial well-being in individuals with type 1 diabetes: a randomized clinical trial study in Iran. *BMC Psychology*, 13, 942. <https://doi.org/10.1186/s40359-025-03258-y>