



UNIVERSITY OF LEEDS

This is a repository copy of *Adherence assessment practices in haemodialysis settings: A qualitative exploration of nurses and pharmacists' perspectives*.

White Rose Research Online URL for this paper:
<http://eprints.whiterose.ac.uk/145941/>

Version: Accepted Version

Article:

Ghimire, S, Lee, K, Jose, MD et al. (2 more authors) (2019) Adherence assessment practices in haemodialysis settings: A qualitative exploration of nurses and pharmacists' perspectives. *Journal of Clinical Nursing*, 28 (11-12). pp. 2197-2205. ISSN 0962-1067

<https://doi.org/10.1111/jocn.14821>

© 2019 John Wiley & Sons Ltd. This is the peer reviewed version of the following article: Ghimire, S, Lee, K, Jose, MD et al. (2 more authors) (2019) Adherence assessment practices in haemodialysis settings: A qualitative exploration of nurses and pharmacists' perspectives. *Journal of Clinical Nursing*, 28 (11-12). pp. 2197-2205. ISSN 0962-1067, which has been published in final form at <https://doi.org/10.1111/jocn.14821>. This article may be used for non-commercial purposes in accordance with Wiley Terms and Conditions for Use of Self-Archived Versions.

Reuse

Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

Takedown

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.



eprints@whiterose.ac.uk
<https://eprints.whiterose.ac.uk/>

Adherence assessment practices in haemodialysis settings: a qualitative exploration of nurses and pharmacists' perspectives

Abstract

Aims and objectives. To explore clinician assessment of patient adherence, and identify strategies to improve adherence assessment practices in haemodialysis settings.

Background. Patients with chronic kidney disease undergoing haemodialysis are typically prescribed complex regimens; as such, they are at high risk of medication nonadherence. Current clinical practices focus on prescribing medications, however, little attention is paid to measuring and ensuring patient adherence to their prescribed treatments.

Design. A qualitative study.

Methods. Semi-structured individual interviews were conducted in November and December 2016, with 12 nurses and six pharmacists, working in Australian haemodialysis settings. The study was conducted and reported in accordance with COREQ guidelines.

Results. Participants were 25-60 years old and had 1-27 years of experience in dialysis. Seven themes related to assessing adherence were identified: prioritization of resources, interplay between workload and available time, awareness of formalized adherence measures and training deficits, concerns about practicality/suitability of adherence measures, communication of assessment services, patient participation, and trust. Three themes related to strategies for improving adherence assessment practices were identified: formalization of adherence assessment process, integration of assessment processes and tools into routine, and use of multidisciplinary support to assess and promote adherence.

Conclusions. Current adherence assessment practices could be improved through formalization and integration of the assessment process into dialysis unit policy/procedures. Additionally, as barriers to assessing adherence were identified at organizational, professional and patient levels, there is a need to address barriers from each level in order to improve adherence assessment practices in haemodialysis settings.

Relevance to clinical practice. This qualitative study highlights the challenges and practical ways by which adherence assessment practices could be improved in haemodialysis settings. This would encourage renal clinicians to actively participate in adherence assessment and promotion activities to ensure patients benefit from their therapies.

Key words

Adherence assessment practices; dialysis; haemodialysis; kidney failure, chronic; medication adherence; qualitative research

Introduction

Medication nonadherence is a well-recognized problem in chronic diseases that requires urgent research to address the underlying causes (Lemstra, Nwankwo, Bird, & Moraros, 2018). Avoidable healthcare costs attributed to medication nonadherence in the US is estimated between \$100 and \$300 billion annually representing between 3% and 10% of the total US healthcare costs (Iuga & McGuire, 2014). Patients with end-stage kidney disease (ESKD) undergoing haemodialysis are at high-risk of medication nonadherence, due to increased burden of concomitant illness and dialysis-associated complications that demands complex treatment regimens (Ghimire, Castelino, Lioufas, Peterson, & Zaidi, 2015; Manley, Cannella, Bailie, & St Peter, 2005). The prevalence of medication nonadherence in patients undergoing haemodialysis range between 12.5% and 98.6% (Ghimire et al., 2015). Poor adherence has led to increased morbidity and mortality (Denhaerynck et al., 2007), disruption in hypertension management resulting uncontrolled blood pressure (Burnier, Pruijm, Wuerzner, & Santschi, 2015), increased risk of hospitalization, emergency [presentations](#) and intensive-coronary care unit admissions (Chan, Thadhani, & Maddux, 2014).

Background

The primary step towards improving medication adherence involves assessment of whether patients have followed their treatment regimens (Martin, Williams, Haskard, & DiMatteo, 2005). Providing an opportunity for patients to express their concerns to their health professionals can elicit information [about](#) the patients' beliefs and attitudes towards medications, social and cultural contexts, and emotional health challenges that may impede adherence (Ghimire, Castelino, Jose, & Zaidi, 2017; Martin et al., 2005; Osterberg & Blaschke, 2005). All of these components are crucial in influencing adherence intentions, and thus need

to be explored during therapeutic consultations (Martin et al., 2005). However, current clinical practices focus more on improving treatment outcomes rather than measuring and ensuring patient adherence to their regimens (Brown & Bussell, 2011), despite associations between poor adherence, and morbidity and mortality rates. As proper assessment of patients' medication-taking behaviour is important to ensure the benefit of prescribed therapies, ongoing assessment of adherence is necessary to ensure that patients are taking their medications appropriately (Brown & Bussell, 2011; Martin et al., 2005).

Understanding renal clinicians' perspectives can help identify challenges and practical ways by which adherence assessment practices could be improved. However, these are often less explored aspects of patient adherence reported in medical literatures. In two separate surveys (Ghimire, Banks, Jose, Castelino, & Zaidi, 2017, 2018), renal nurses and pharmacists reported time constraints (Ghimire et al., 2017), lack of support from hospital administration (Ghimire et al., 2017), and patient's unwillingness to discuss medication-related issues with nurses (Ghimire et al., 2018) as potential barriers to assessing adherence during routine care. Although these quantitative studies provide some insights into barriers to adherence measurement practices, these are less robust in exploring **clinicians'** perspectives on their challenges of assessing adherence during routine care. Patients with ESKD **usually** undergo haemodialysis three times a week, for three to five hours **per** session (Group, 2010). This **schedule provides opportunities** for renal nurses and pharmacists to interact with their patients. Renal **clinicians** can use this opportunity to assess adherence, educate patients, and promote medication adherence. Therefore, the present study aims to explore the perspectives of renal clinicians in regard to medication adherence assessment practices. Specifically, the present study aims to qualitatively:

1. Explore clinician assessment of treatment adherence in patients undergoing haemodialysis, and

2. Identify strategies to improve adherence assessment practices in Australian haemodialysis settings.

Method

The consolidated criteria for reporting qualitative research (COREQ) guidelines (Tong, Sainsbury, & Craig, 2007) were used to conduct and report the findings of this study (See **Supplementary File 1**). The Tasmanian Social Sciences Human Research Ethics Committee granted approval (H0015433). Reply to the invitation email was considered implied consent for participation.

Participants

Renal pharmacists and nurses working in Australian dialysis centers were eligible to participate. Recruitment was sought from participants who had previously participated in a survey of renal clinicians that measured perceptions and practices of assessing adherence in patients undergoing haemodialysis. Twenty renal clinicians expressed their interest to participate in this study, however, two participants later **withdrew** due to lack of time.

Data collection and analysis

A pharmacist researcher who had been trained in qualitative research, conducted semi-structured, individual **telephone** interviews in November and December 2016 (Interview guide: **Online Appendix 1**). The participants and the interviewer were **not** known to each other before the study. At the beginning of each interview, participants were informed of the professional status of the interviewer and the scope of this study. **Each** Participant was provided AUD \$50

voucher. This was deemed a reasonable reimbursement for the participants' time, and in accordance with common practice of the community in which the research was conducted. All interview were audio-recorded and transcribed verbatim. The median interview duration was 31 minutes (range 22-50 minutes).

Interview transcripts were thematically analysed following Braun and Clarke's six-step method of thematic analyses (Braun & Clarke, 2006). Transcripts were read repeatedly for familiarization and data immersion. Initial codes were generated from the data without using any a priori themes. The codes were sorted and aggregated into initial themes. Refinement of the themes followed discarding irrelevant themes and collapsing similar themes or sub themes into an overarching theme. At this point, the themes were defined and further refined for analysis. These final themes were then reported as findings. The pharmacist researcher independently coded the interview transcripts. Other investigators reviewed the codes independently to ensure agreement. NVivo software (QSR International Pty Ltd. Version 11.0) was used to organise codes and themes from the transcripts. Data saturation was considered as the point where no new codes were generated from the transcripts. Data was saturated after the 15th transcript as no new codes were generated from the remaining three transcripts.

Findings

Eighteen renal clinicians comprising 12 nurses and six pharmacists participated. The median age of participants was 44 years old (range 25-60 years), and a median of 11.5 years (range 1-27 years) of experience working in renal unit(s). Other participant characteristics are presented in Table 1.

The sections below describe the themes identified, with quotations from participants. A more detailed compilation has been included as **Online Appendix 2 and 3** to facilitate

confirmability auditing (Krefting, 1991). The following abbreviations are used for the sections below when quoting participants: P = Pharmacist, N = Nurse, and the number indicates interview sequence.

A. Barriers to assessing medication adherence

Seven themes were identified that have been organized into three main categories: organizational, professional, and patient-level barriers. A summary of the barriers to assessing adherence is depicted in Figure 1, and further details regarding each theme is described in the following sections.

1. Organizational

Sub theme 1A: Prioritization of resources

A key barrier to assessing medication adherence was workplace **allocation** of resources:

It depends on the organizational priorities. If they are supportive of this [assessment process] or have a vested interest in this..., then the organization is more likely to pursue this, but otherwise if they can't see any value in it, any direct dollar savings then it's unlikely to be pursued. [P3]

Funding was a major factor for resource prioritization. Participants expressed the need for dedicated **clinicians**, **access to** interpreter services for non-English speaking patients, and a private space/interview room in the haemodialysis **unit** for conducting adherence assessment and promotion activities.

[A] big limitation for conducting such activity [i.e. assessing adherence] is the absence of pharmacist in the unit. We wish to have a dedicated pharmacist to carry these activities. [N7]

[Interpreters are] not massively accessible. That is a barrier. Availability of an interpreter services is a barrier in the case of non-English speaking patients. [P4]

Privacy can be an issue because most of our patients sit very close to other patients and there is no way to go to the staff with anything privately. [N11]

2. Professional

Sub theme 2A: Interplay between workload and available time

Amidst a variety of tasks performed while caring for patients undergoing haemodialysis, renal clinicians may not have sufficient time to spend with patients, and assessing medication adherence may not be a high priority when time is limited.

If patients have health matters that are urgent, if they have been experiencing pain or having a lot of falls, or *whatever that sounds like it's a new problem, the focus becomes on that, rather than other aspects like medications.* Whereas, if the person is quite stable, probably there is more emphasis towards medicines. [P9]

Staff compliance towards assessment services would also diminish due to task prioritization and increased workload.

Staff participation may be poor. Unless it's really concerned with particular patients, or feel we need to monitor, but if we do it for everybody the work load is very high and some of the nurses won't be happy participating. They are already pre-occupied and may say, "Oh! It's not our responsibility". [N15]

Sub theme 2B: Awareness and training deficits

Lack of awareness about formal adherence assessment tools was **described by the majority of** participants.

I don't know any formal [assessment tools]. I've never heard about any official ones, I think it would be interesting to read about. [P4]

However, to address this barrier **by providing** training and education related to adherence assessments **was detailed by several participants:**

Nursing staff lacks necessary training and skills. I think definitely, there is room for improvement in relation to educating the nurses about medication on dialysis or all kidney failure patients. [N17]

The above **exemplar highlighted** gaps in training in conducting adherence assessments.

Sub theme 2C: Concerns about practicality/suitability of adherence tools

Participants identified several limitations of formal assessment that would compromise identification of nonadherent behavior. One perceived limitation is that of practicality and reliability of using validated questionnaires or objective pill counting:

It's not quite possible, it's not that easy to measure and absolutely quantify [adherence]. The only way you could do is you physically watch the patient for a week, you know, taking all their dosage. I don't think it's possible. [P1]

Some participants felt that measuring adherence might label a patient as being nonadherent.

I think it's good to get a general measure of adherence within patients, but I do sometimes find questionnaires label patients as being nonadherent and it's sort of taken as quite a nasty term. [P5]

3. Patient-level

Sub theme 3A: Communication of assessment

Participants reported the need to set expectations to ensure effective assessment of medication adherence because patients may perceive their privacy being invaded and would not participate:

It would depend on how it is presented, if it wouldn't be presented in a right way there would be patients who would become upset about why we are asking that question, and patients feeling of having their privacy invaded puts a lot of significant barriers of trust at the nurses. [N11]

However, if the patients knew about the benefits, and what to expect of the assessment process, they would be aware and respond to the assessment:

I think most of the patients would be happy to answer the questions definitely, if they see the benefit from it, that we care about the medicine they are taking. [N12]

Sub theme 3B: Patient participation

Participants described factors that deterred patients from undertaking adherence assessment activities. These included treatment fatigue from dialysis, patient activation (i.e. patient's motivation and perceived ability to contribute to their health management), and language

barriers especially with non-English speakers that would prevent patients from conveying their health-related issues to the [clinicians](#).

Medical people oversee them and they have so many appointments, and if you ask them if they have any worries they will just say “no”. A lot of them, even if you offer review they go, “No everything is fine, I *actually don't need to see you.*” [P1]

People do have free will. Even though we are trying to do the best to our patients, they still can go, *'I can't be bothered'*. *Then you have to go that point, well that's your decision not anybody elses.* [P2]

We had quite a few issues in our unit based on different cultural groups. We do have quite a few non-English speaking patients; basically they speak English but not enough to understand. [N11]

Sub theme 3C: Trust

Participants described trust and mistrust, and its impact on conducting a medication adherence assessment:

It's sad, I think some of them have mistrust about what we tell them, they don't trust that we are telling them the right thing or the truth about the medication what they require. [N6]

They don't look at the nursing expertise, they also don't listen to suggestions [about taking medications] and, they say the doctors said do this way and they won't take on board with the nursing, also the lack of confidence in the nursing that we would know what they are talking about. [N18]

Patients feel that they are going to be judged. That, they should by now know this information, why they are asking this pointless question, causing time wasting. [P3]

Participants perceived that patients would prefer to share their concerns with renal clinicians whom they trusted, had rapport, and did not feel judged regarding their adherence.

B. Strategies for improving adherence assessment

Three sub themes related to improving adherence assessment were identified. A summary of considerations to improve adherence assessment is highlighted in Table 2.

Sub theme 1: Formalization of assessment process

Participants commonly commented on the need to formalize the adherence assessment in the haemodialysis setting, to facilitate other renal clinicians to perform adherence assessments as part of routine care:

I think it might be good [to formalize assessment] because everybody then is following the same process. Staff know what to look for and what to ask. If you got a tool that it will prompt them to ask questions or prompt them to follow up on certain things. [N18]

Sub theme 2: Integration of assessment process and tools into routine care

Participants described integrating an adherence checklist into their medication treatment sheets.

We could possibly have on a care plan a medication check and tick the boxes after conversation with the patients. Not so much the questionnaire, but just the prompt to have that conversation with the patients. [N14]

Well, our daily treatment sheet has, we already have some checklist we go through, sort of might be a simplest just adding up [adherence checklist], having any issues with your tablets... [N8]

Sub theme 3: Multidisciplinary support

Successful assessment of patient adherence was thought to be more likely to follow multidisciplinary support. Participants highlighted the need to collaborate with medical and nursing staff in order to provide a consistent message to the patients regarding adherence assessment and promotion activities.

I think we need to be involved in multidisciplinary approach, so we have support from our colleagues, so everybody is on the same page and support its initiatives and therefore the patients get *the consistent message that it's not just the pharmacists hounding them, but it's actually got value and purpose behind it.* [P3]

You need pharmacy input and you need medical staff input, and you need to have a clinician champion who is at the absolute top of *the chain.* *You can't do this from a nursing perspectives [alone], we can't do it as pharmacists [alone].* [P2]

Participants also expressed a need to liaise with interpreters for non-English speaking patients, or indigenous liaison staff in the case of indigenous or Aboriginal patients to support in their medication management:

We use interpreters where necessary, if they are the patients with different languages.
[P1]

We wait for their carers or family to come in who speak their language and we interpret via them. [P3]

For the indigenous, we have support from the Aboriginal liaison staff, so they can talk to her and help in medication management. [N12]

Discussion

This study explored specialist renal pharmacists' and nurses' perspectives on the challenges in assessing medication adherence and ways adherence assessment practices could be improved in haemodialysis settings. This study offers a number of insights into the organizational, professional, and patient-level factors that may influence adherence assessment activities. In addition, this study confirms the findings of other studies, which recommend formalization and integration of the adherence assessment process into routine practice, and highlights the importance of multidisciplinary support required for a successful assessment of medication-taking behavior. Organizational and professional barriers identified from this study such as resource prioritization in workplaces, time availability, and awareness and training deficits among health professionals corroborated findings from other studies (Dayer, Dunn, Pace, & Flowers, 2016; Zolnierek & DiMatteo, 2009; Mangan, Powers, & Lengel, 2013; Roberts, Benrimoj, Chen, Williams, & Aslani, 2006; Salgado, Moles, Benrimoj, & Fernandez-Llimos, 2012). This study reiterates concerns surrounding practicality and suitability of adherence assessment, which has been extensively studied medication adherence (Burnier et al., 2015; Ghimire et al., 2015; Nguyen, La Caze, & Cottrell, 2014; Osterberg & Blaschke, 2005).

This study revealed that patients would prefer sharing their concerns with clinicians whom they trust and not feel judged, consequently leading to good patient-clinician partnerships. Relationships between patient-clinician would influence assessment process and can have a significant impact on medication-taking behavior (Rifkin et al., 2010). While clinicians may have good intentions to assess adherence, if they fail to set expectations and

identify benefits of assessing adherence, patients may turn hostile towards the assessor and withdraw participation. Thus, communication can be **critical to** patient-**clinician** relationships. Having good patient-clinician communication can improve adherence, as supported by a meta-analysis (Zolnierek & DiMatteo, 2009). Communication can also be a key to patient activation, which involves providing necessary knowledge, skills and motivation to improve a patient's ability to self-care and maintain their health (Hibbard et al., 2004). Patients have been found to follow recommended advice when they are in the higher stages of activation (Hibbard, Mahoney, Stock, & Tusler, 2007). A recent systematic review has also highlighted that increased patient activation scores are associated with decreased hospitalization and emergency room utilization in chronically ill patients, though the relationship **to** medication adherence was inconclusive (Kinney, Lemon, Person, Pagoto, & Saczynski, 2015). Future research should explore the relationship between patient activation and its impact on medication adherence in patients with ESKD who are undergoing haemodialysis.

Our participants reported the desirability of formalizing adherence assessment. Patients **may feel that their privacy was less at risk** when inquired about their medication-taking behavior and would rather make themselves available for assessment. **Most** participants proposed integrating an adherence checklist into routine care. Renal clinicians can utilize any of the validated questionnaires available in the literature that non-judgementally asks about their medication adherence for example, *"I know it must be difficult to take all your medications regularly. How often do you miss taking them?"* Alternatively, patients may be asked about a particular medication, *"How often do you not take medication X?"* (Brown & Bussell, 2011; Magid & Ho, 2016). These questions may open up discussions pertaining to medication-related issues. **Previous studies found** that disclosure of nonadherence through interviews and questionnaires have represented patient's medication-taking behavior (Choo et al., 1999; Magid & Ho, 2016; Wagner et al., 2001). However, it should be understood that self-reported

measures, though inexpensive and easy to use, come with limitations such as recall bias and social desirability responses (Lehmann et al., 2014). Moreover, accompanying challenges from organizational and professional levels while incorporating **adherence** assessment need to be carefully considered. Due to the interplay between workload and time, dialysis staff may seek to prioritize their tasks, which would diminish staff compliance towards the adherence **assessment**. More dedicated **clinicians** may be required to carry out adherence assessment and promotion **strategies**. However, organizations may have **competing** priorities for allocation of resources that may discourage implementation and/or sustainability of such programs (Mangan et al., 2013; Roberts et al., 2006; Salgado et al., 2012). Further research is warranted to assess the feasibility and cost-effectiveness of implementing such programs in haemodialysis settings.

Table 2 provides practical **strategies** to facilitate a routine assessment **which may lead to better** adherence in haemodialysis settings. One of the key **findings** was medication **reconciliation and review** on a regular basis. The medication reconciliation process confirms the accuracy of medication record with the patients/caregiver, whereas medication review involves in-depth analysis of the medication regimen including appropriateness of therapy, dosing, and monitoring of side effects and efficacy of the treatment (Patricia & Foote, 2016). As patients undergoing haemodialysis see **multiple** prescribers, **have** frequent hospital admissions, and are on multiple medications; this increases the risk for medication record discrepancies (MRDs) and medication-related problems (MRPs). On an average, 3.1 MRDs and 0.5 MRPs per patient has been observed in **the** haemodialysis **population** (Patricia & Foote, 2016). Thus, conducting regular medication reconciliation **and review** by a dedicated clinician may facilitate early detection and intervention of **MRPs** in patients on haemodialysis.

Other **findings were** to verify objective evidence while assessing adherence, for example, by calling the patient's local pharmacy, checking refill history, or reviewing blood levels **of** certain **medications** such as phosphate binders. Pharmacy refill data can be a means

to identify [intervals](#) between medication refills and help initiate patient dialogues for exploring medication-related issues. However, this method may only be effective within the closed pharmacy system, and does not necessarily provide direct evidence of medication administration by the patients (Magid & Ho, 2016). In such cases, objective assessment may be carried out in conjunction with subjective methods like patient interviews or using self-reported questionnaires.

[Multidisciplinary support](#) for adherence assessment also emerged as a prominent theme. Renal clinicians from disciplines such as medicine, pharmacy and nursing can work together and liaise with the interpreters or social workers for assessment [of multiple variables which impact on medication adherence](#). Creating an opportunity for active patient involvement during therapeutic consultations with [clinicians](#) improves patient adherence to treatment (Zolnierek & DiMatteo, 2009). Practice implications also extends to current renal clinicians by providing trainings [in the](#) skills necessary to assess and promote adherence. In addition, haemodialysis settings may [require the](#) upgrade [of the](#) infrastructure by having a private space or interview room [to](#) safeguard patients' privacy. [The recommendations arising from the findings](#) will help inform the design and testing of a new model of care that incorporates adherence assessment into routine [care](#) for early identification of nonadherence in patients undergoing haemodialysis.

Study limitations

As individual practices may vary between haemodialysis settings, the views expressed may not be generalizable to [settings](#) with considerable differences. Also, the renal pharmacists' viewpoints from the Australian context may differ from other countries where pharmacists do not have specialised clinical roles. Further studies should be conducted to evaluate the

applicability of our findings to wider populations. Nevertheless, given the diverse sample of renal clinicians with varied years of experience, this study captures potential barriers and recommends strategies for improving adherence assessment. Furthermore, the use of a recognised data analysis method (Braun and Clark, 2006) ensures the rigor of the study. In addition, the conduct and reporting of this research (Tong et al., 2007) facilitates dependability auditing (Krefting, 1991), if required.

Conclusions

The barriers to assessing adherence were identified at organizational, professional, and patient levels. Current adherence assessment could be improved through formalization and integration of the adherence assessment into dialysis unit policy/procedures, and overcoming existing barriers by appointing dedicated and trained clinicians for conducting adherence assessment and promotion activities in haemodialysis settings. Most importantly, renal clinicians should opt for patient engagement where possible, frequently instigate dialogue, and remain vigilant in identifying patients' concerns related to medication that may help to resolve the significant issue of medication nonadherence in patients on haemodialysis.

Relevance to clinical practice

The findings from this qualitative study highlight the challenges faced by renal nurses and pharmacists in assessing adherence, and suggests some practical strategies which adherence assessment could be improved. These findings could encourage renal clinicians to actively participate in adherence assessment and promotion activities, and help ensure patients on haemodialysis benefit from their therapies.

Acknowledgements

We thank all [the](#) renal nurses and pharmacists for their participation in this study. Sincere gratitude goes to Division of Pharmacy, University of Tasmania for providing gift vouchers for the participants.

Conflicts of interest

The authors declare that they have no conflicts of interest.

Funding

None.

Contributions

Conception and study design: SG, RLC, and STRZ; Data acquisition: SG, RLC, and STRZ; Data analysis/ interpretation: SG, KL, MDJ, RLC, STRZ; Manuscript preparation: SG

References

- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qual Res Psychol*, 3(2), 77-101. doi:10.1191/1478088706qp063oa
- Brown, M. T., & Bussell, J. K. (2011). Medication adherence: WHO cares? *Mayo Clin Proc*, 86(4), 304-314. doi:10.4065/mcp.2010.0575
- Burnier, M., Pruijm, M., Wuerzner, G., & Santschi, V. (2015). Drug adherence in chronic kidney diseases and dialysis. *Nephrol Dial Transplant*, 30(1), 39-44. doi:10.1093/ndt/gfu015
- Chan, K. E., Thadhani, R. I., & Maddux, F. W. (2014). Adherence Barriers to Chronic Dialysis in the United States. *J Am Soc Nephrol*, 25(11), 2642.
- Choo, P. W., Rand, C. S., Inui, T. S., Lee, M. L., Cain, E., Cordeiro-Breault, M., . . . Platt, R. (1999). Validation of patient reports, automated pharmacy records, and pill counts with electronic monitoring of adherence to antihypertensive therapy. *Med Care*, 37(9), 846-857.
- Dayer, L., Dunn, E., Pace, A., & Flowers, S. (2016). Pharmacists' perceived knowledge of and confidence in dispensing oral antineoplastic agents. *J Am Pharm Assoc (2003)*, 56(2), 141-144.e142. doi:10.1016/j.japh.2016.02.009
- Denhaerynck, K., Manhaeve, D., Dobbels, F., Garzoni, D., Nolte, C., & De Geest, S. (2007). Prevalence and consequences of nonadherence to hemodialysis regimens. *Am J Crit Care*, 16(3), 222-235; quiz 236.
- Ghimire, S., Banks, C., Jose, M. D., Castelino, R. L., & Zaidi, S. T. R. (2017). Renal pharmacists' perceptions and current practices of assessing medication adherence in dialysis patients. *Int J Clin Pharm*. doi:10.1007/s11096-017-0574-8
- Ghimire, S., Banks, C., Jose, M. D., Castelino, R. L., & Zaidi, S. T. R. (2018). Medication adherence assessment practices in dialysis settings: A survey of renal nurses' perceptions. *J Clin Nurs*. doi:10.1111/jocn.14642
- Ghimire, S., Castelino, R. L., Jose, M. D., & Zaidi, S. T. R. (2017). Medication adherence perspectives in haemodialysis patients: A qualitative study. *BMC Nephrology*, 18(1), 167. doi:10.1186/s12882-017-0583-9
- Ghimire, S., Castelino, R. L., Lioufas, N. M., Peterson, G. M., & Zaidi, S. T. (2015). Nonadherence to Medication Therapy in Haemodialysis Patients: A Systematic Review. *PLoS One*, 10(12), e0144119. doi:10.1371/journal.pone.0144119
- Group, T. F. T. (2010). In-Center Hemodialysis Six Times per Week versus Three Times per Week. *N Engl J Med*, 363(24), 2287-2300. doi:10.1056/NEJMoa1001593
- Zolnierek, K. B., & DiMatteo, M. R. (2009). Physician communication and patient adherence to treatment: A meta-analysis. *Medical care*, 47(8), 826-834. doi:10.1097/MLR.0b013e31819a5acc
- Hibbard, J. H., Mahoney, E. R., Stock, R., & Tusler, M. (2007). Do increases in patient activation result in improved self-management behaviors? *Health Serv Res*, 42(4), 1443-1463. doi:10.1111/j.1475-6773.2006.00669.x
- Hibbard, J. H., Stockard, J., Mahoney, E. R., & Tusler, M. (2004). Development of the patient activation measure (PAM): Conceptualizing and measuring activation in patients and consumers. *Health Serv Res*, 39(4 Pt 1), 1005-1026. doi:10.1111/j.1475-6773.2004.00269.x
- Iuga, A. O., & McGuire, M. J. (2014). Adherence and health care costs. *Risk Manag Healthc Policy*, 7, 35-44. doi:10.2147/RMHP.S19801
- Kinney, R. L., Lemon, S. C., Person, S. D., Pagoto, S. L., & Saczynski, J. S. (2015). The association between patient activation and medication adherence, hospitalization, and emergency room utilization in patients with chronic illnesses: A systematic review. *Patient Educ Couns*, 98(5), 545-552. doi:10.1016/j.pec.2015.02.005
- Krefting, L. (1991). Rigor in qualitative research: The assessment of trustworthiness. *Am J Occup Ther*, 45(3), 214-222.

- Lehmann, A., Aslani, P., Ahmed, R., Celio, J., Gauchet, A., Bedouch, P., . . . Schneider, M. P. (2014). Assessing medication adherence: Options to consider. *Int J Clin Pharm*, 36(1), 55-69. doi:10.1007/s11096-013-9865-x
- Lemstra, M., Nwankwo, C., Bird, Y., & Moraros, J. (2018). Primary nonadherence to chronic disease medications: A meta-analysis. *Patient Prefer Adherence*, 12, 721-731. doi:10.2147/PPA.S161151
- Magid, K., & Ho, P. M. (2016). The 7th vital sign: Why we should care about medication adherence. Available at: <http://www.acc.org/latest-in-cardiology/articles/2016/06/30/06/42/the-7th-vital-sign> Accessed on July 7, 2017.
- Mangan, M. N., Powers, M. F., & Lengel, A. J. (2013). Student pharmacists' perceptions of barriers to medication adherence counseling. *J Pharm Pract*, 26(4), 376-381. doi:10.1177/0897190012466896
- Manley, H. J., Cannella, C. A., Bailie, G. R., & St Peter, W. L. (2005). Medication-related problems in ambulatory hemodialysis patients: A pooled analysis. *Am J Kidney Dis*, 46(4), 669-680. doi:10.1053/j.ajkd.2005.07.001
- Martin, L. R., Williams, S. L., Haskard, K. B., & DiMatteo, M. R. (2005). The challenge of patient adherence. *Ther Clin Risk Manag*, 1(3), 189-199.
- Nguyen, T. M., La Caze, A., & Cottrell, N. (2014). What are validated self-report adherence scales really measuring?: A systematic review. *Br J Clin Pharmacol*, 77(3), 427-445. doi:10.1111/bcp.12194
- Osterberg, L., & Blaschke, T. (2005). Adherence to medication. *N Engl J Med*, 353(5), 487-497. doi:10.1056/NEJMra050100
- Patricia, N. J., & Foote, E. F. (2016). A pharmacy-based medication reconciliation and review program in hemodialysis patients: A prospective study. *Pharmacy Practice*, 14(3), 785. doi:10.18549/PharmPract.2016.03.785
- Rifkin, D. E., Laws, M. B., Rao, M., Balakrishnan, V. S., Sarnak, M. J., & Wilson, I. B. (2010). Medication adherence behavior and priorities among older adults with CKD: A semistructured interview study. *Am J Kidney Dis*, 56(3), 439-446. doi:10.1053/j.ajkd.2010.04.021
- Roberts, A. S., Benrimoj, S. I., Chen, T. F., Williams, K. A., & Aslani, P. (2006). Implementing cognitive services in community pharmacy: A review of facilitators used in practice change. *Int J Pharm Pract*, 14(3), 163-170. doi:10.1211/ijpp.14.3.0002
- Salgado, T. M., Moles, R., Benrimoj, S. I., & Fernandez-Llimos, F. (2012). Exploring the role of renal pharmacists in outpatient dialysis centres: A qualitative study. *Int J Clin Pharm*, 34(4), 569-578. doi:10.1007/s11096-012-9645-z
- Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *Int J Qual Health Care*, 19(6), 349-357. doi:10.1093/intqhc/mzm042
- Wagner, J. H., Justice, A. C., Chesney, M., Sinclair, G., Weissman, S., & Rodriguez-Barradas, M. (2001). Patient- and provider-reported adherence: Toward a clinically useful approach to measuring antiretroviral adherence. *J Clin Epidemiol*, 54 Suppl 1, S91-98.

What does this paper contribute to the wider global clinical community?

- This study provides an insight into the often less explored aspect of patient adherence that is the role of clinicians, such as renal nurses and pharmacists, in assessing and promoting adherence, their challenges to assess adherence during routine care, and identifying ways by which some of those challenges could be mitigated to ensure patients benefit from their therapies.
- Various challenges were identified at organizational, professional and patient levels that could hinder adherence assessment.
- Some of the recommended strategies to improve adherence assessment in haemodialysis settings includes, formalization and integration of assessment processes/tools into routine care, and use of multidisciplinary support to assess and promote adherence.

Table 1. Demographics of participants (n = 18)

Characteristics	Category	Value
Age, Years		44 (25-60)
	20-30	3 (16.7)
	31-40	4 (22.2)
	41-50	8 (44.4)
	≥ 51	3 (16.7)
Gender		
	Male	5 (27.8)
	Female	13 (72.2)
Level of education		
	Diploma	2 (11.1)
	Bachelors	7 (38.9)
	Graduate Certificate	8 (44.4)
	Masters	1 (5.6)
Designation		
	Renal Pharmacist	6 (33.3)
	Registered Nurse	9 (50.0)
	Nurse Unit Manager	3 (16.7)
Experience in renal unit, Years		11.5 (1-27)
	1-10	8 (44.4)
	11-20	9 (50.0)
	≥ 21	1 (5.6)
Dialysis unit location		
	Metropolitan	12 (66.7)
	Rural	6 (33.3)

Note: Values expressed as number (percentage) or median (lower-upper limits of range).

Table 2. Considerations for improving adherence assessment practices

- **Formalization of the adherence assessment process**
 - Formalize the process in hospital policy/procedures
- **Integration of the adherence assessment process and tools into routine care**
 - Integrate adherence checklist into treatment sheet
- **Multidisciplinary support**
 - Partner with doctor and nursing staff
 - Liaising with interpreters and communication facilitators (e.g. formal/professional interpreters, informal/family interpreters, liaison with indigenous/aboriginal co-operatives)
- **Other specific activities**
 - Organize scheduled sessions for medication reviews (e.g. monthly review and reconciliation of medicines, patient report card review for blood levels)
 - Verification of objective evidence (e.g. direct observation of medicines, physical assessment, calling patient's local pharmacy, refill history, observing side effects of therapy)
 - Assess subjectively through patient communication (e.g. discussing patient concerns about medicines, non-judgemental questioning, maintaining good rapport and trusting relationships, being a good listener)

Figure Legend

Figure 1. Barriers to assessing medication adherence in patients undergoing haemodialysis

Supplementary material

Appendix 1. Interview guide

Appendix 2. Barriers to assessing medication adherence in patients undergoing haemodialysis

Appendix 3. Considerations to improve adherence assessment in haemodialysis settings