

Facing uncertainty - Pilot testing of a palliative prognostic index training with hospital aged care assessment teams

Author

Gerber, Katrin, Bloomer, Melissa J, Hayes, Barbara, Lee, Cik Yin, Lock, Kayla, Bodna, Karen, Yates, Paul

Published

2023

Journal Title

Geriatric Nursing

Version

Version of Record (VoR)

DOI

[10.1016/j.gerinurse.2023.09.014](https://doi.org/10.1016/j.gerinurse.2023.09.014)

Rights statement

© 2023 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC license (<http://creativecommons.org/licenses/by-nc/4.0/>).

Downloaded from

<http://hdl.handle.net/10072/426288>

Griffith Research Online

<https://research-repository.griffith.edu.au>



ELSEVIER

Contents lists available at ScienceDirect

Geriatric Nursing

journal homepage: www.gnjournal.com

Facing uncertainty - Pilot testing of a palliative prognostic index training with hospital aged care assessment teams

Katrin Gerber, PhD^{a,b,c,d,*}, Melissa J. Bloomer, PhD^{e,f,g}, Barbara Hayes, PhD^{h,i},
Cik Yin Lee, PhD^{j,k}, Kayla Lock^{b,l}, Karen Bodna^m, Paul Yates, PhD^{n,1}

^a Melbourne School of Psychological Science, The University of Melbourne, Parkville VIC, 3010 Australia

^b Melbourne Ageing Research Collaboration, National Ageing Research Institute, Parkville VIC, 3052 Australia

^c School of Media and Communication, RMIT, Melbourne VIC, 3000 Australia

^d The Royal Melbourne Hospital, Parkville VIC, 3052 Australia

^e School of Nursing and Midwifery, Griffith University, Nathan QLD, 4111, Australia

^f Intensive Care Unit, Princess Alexandra Hospital, Woolloongabba, QLD 4102, Australia

^g Menzies Health Institute Queensland, Southport 4222 QLD, Australia

^h Cancer Services, Northern Health, Bundoora VIC, 3083 Australia

ⁱ Northern Clinical School, University of Melbourne, Bundoora VIC, 3083 Australia

^j Centre for Medicine Use and Safety, Monash University, Parkville VIC, 3052 Australia

^k Department of Nursing, University of Melbourne, Parkville VIC, 3052 Australia

^l School of Medicine, The University of Melbourne, Parkville VIC, 3010 Australia

^m Community Advisory Group, Melbourne Ageing Research Collaboration, National Ageing Research Institute, Parkville VIC, 3052 Australia

ⁿ Department of Geriatric Medicine, Austin Health, Heidelberg VIC, 3084 Australia



ARTICLE INFO

Article history:

Received 30 June 2023

Received in revised form 15 September 2023

Accepted 15 September 2023

Available online xxx

Keywords:

Aged

Death

Decision making

Dying

End-of-life care

Hospital care

Nursing

Palliative care

Qualitative research methods

Quantitative research methods

recognition of dying

Residential aged care

ABSTRACT

Background: Prognostic avoidance can delay discussions about older hospital patients' life expectancy. This pilot study examined the effects of a prognostic training program on hospital clinicians' knowledge and confidence in identifying older patients at risk of dying.

Methods: Fifty-seven clinicians from aged care assessment teams at two Australian hospitals were introduced to the Palliative Prognostic Index, a 5-item checklist indicating prognoses between 3 and 6 weeks. Mixed-methods training evaluation included pre-post-training surveys and semi-structured interviews, conducted three months post-training.

Results: Clinicians used a combination of experience, knowledge, and intuition as strategies to generate prognoses. Allied health staff relied on intuition more often than medical and nursing staff. Prognostic tools were rarely used. Pre-post-training comparisons showed significant improvements in clinicians' knowledge and confidence in identifying signs of dying, particularly amongst allied health. Follow-up interviews highlighted advantages and challenges of using prognostic tools. Recommendations are made for addressing these.

© 2023 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC license (<http://creativecommons.org/licenses/by-nc/4.0/>)

Background

“How long do I have to live?” is one of the hardest questions for clinicians to answer. Even experienced clinicians tend to overestimate patients' life expectancy^{1–3} or avoid discussing it altogether.⁴ Rapidly changing illness trajectories can make prognostication extremely challenging.^{5,6} Older people may present with multiple

conditions such as chronic disease, frailty and dementia towards the end of life, and their fluctuating trajectory is harder to predict than the clear terminal decline often associated with cancer.^{7,8} An Australian audit of in-hospital deaths identified that for older patients in the emergency department, dying was recognised late, on average only 4–48 h before death.⁹ Late recognition of dying also results in late referral to specialist palliative care, often in the final 24–48 h before death.^{9,10}

In acute and non-acute settings, clinicians working in hospital aged care assessment teams frequently encounter older people at the

*Corresponding author at: Melbourne Ageing Research Collaboration, National Ageing Research Institute, PO Box 2127, Victoria, 3050 Australia.

E-mail address: kgerber.research@gmail.com (K. Gerber).

end of life, with little to no training on how to respond.⁴ These multidisciplinary teams of geriatricians, geriatric medicine trainees, registered nurses, and allied health staff assess the physical, psychological, medical, cultural and social needs of older adults to ensure access to appropriate supports.¹¹ They may also be involved in important care pathway discussions, including whether an older person would benefit from receiving care at home, in non-acute geriatric, rehabilitation or palliative care in-patient units, or in residential aged care.¹² Yet, many clinicians in aged care assessment teams have not received any training in recognising and responding to dying.⁴

As part of a larger study,¹³ we examined experiences, strategies and challenges faced by clinicians working as part of aged care assessment teams in two tertiary metropolitan hospitals.⁴ In-depth interviews highlighted barriers to identifying older patients at risk of dying, including: diffusion of responsibility regarding whose role it was to identify patients at the end of life; lack of feedback about whether prognoses were correct; system pressures to vacate beds, avoidance of end-of-life discussions; and pandemic-related challenges. Underpinning these barriers was a lack of confidence, knowledge, and training in prognostication.⁴

In “The Ostrich Effect”, we argued that many clinicians avoid discussions about life expectancy and the likelihood of dying just like an ostrich buries its head in the sand to avoid danger.⁴ This avoidance is based on predictive uncertainty at the end of life and can lead to a prognostic bystander effect, impacting care planning and patients’ and families’ expectations. Our study also identified that clinicians relied on analytical thinking, intuition, assessments from others, and pattern matching to generate prognoses.⁴ Yet, quantitative evidence about prognostic strategies used by clinicians is limited.

Prognostic tools are an underutilised resource amongst these teams,⁴ even though they have the potential to help clinicians assess life expectancy.^{14–16} For example, the CRISTAL tool,¹⁷ Minimum Data Set Mortality Risk Index,¹⁸ and Advanced Dementia Prognostic Tool¹⁹ were specifically developed for older cohorts, focusing on longer prognoses of 3–12 months. Other tools like the Palliative Prognostic Score²⁰ and Palliative Prognostic Index (PPI)²¹ were originally validated in adult patients with cancer and consider shorter prognoses of 3–6 weeks. For instance, a meta-analysis of 39 studies involving 19,714 patients showed that the PPI predicted survival of less than 3 weeks with a pooled sensitivity of 0.68 and specificity of 0.80.²²

Across several studies, the feasibility of the PPI has been consistently demonstrated. A retrospective file audit¹² demonstrated it was feasible to use PPI with routinely collected hospital data to guide prognostication, thereby supporting clinical decision-making and informing discharge planning in acute settings.¹² Similarly, a systematic review and meta-analysis of 39 studies involving 19,714 patients showed that the PPI was easily scored, did not require invasive tests, and could be used to cross-check clinician-predicted survival.²² Furthermore, the PPI predicted survival of less than 3 weeks with a pooled sensitivity of 0.68 and specificity of 0.80,²² which is particularly useful when clinicians lack confidence in their judgement. Comparing clinicians’ predictions and PPI prognoses in patients with advanced cancer, the PPI was consistently more accurate in predicting 30-day survival than clinicians’ assessments.²³

To help hospital clinicians face predictive uncertainty at the end of life, and support hospital-based aged care assessment teams in identifying older patients at risk of dying, we developed a tailored, interactive training program. This was created based on input from clinicians and researchers from nine organisations, including hospitals, healthcare networks, universities and community representatives. We hypothesised that the training would significantly improve hospital clinicians’ knowledge and confidence in identifying patients at risk of dying. In addition to the pilot testing, we explored the effects of the PPI²¹ on aged care assessment teams’ experiences with the recognition of dying through surveys and interviews.

Design

A mixed-method pilot study was used to evaluate the effects of the training. The team considered multiple potential prognostic tools and chose the PPI²¹ for the training because it was short, did not require in-depth clinical knowledge and the prognostic timeframe of 3–6 weeks was seen as most relevant for care pathway and discharge planning. The PPI is a brief 5-item checklist that asks about patients’ oral intake, presence of oedema, dyspnoea at rest, presence of delirium and the palliative performance scale (see Appendix 1).²⁰ Patients’ overall performance is measured using a scale of 0–100 % where 100 is perfect health and 0 is death. Scores are assigned to each of the five items, creating a total score that offers an indication of patients’ prognosis in three categories: patients at risk of dying in less than 3 weeks, in 3–6 weeks, and more than 6 weeks. Although primarily utilised with cancer patients, it has also been validated in older patients with advanced chronic medical conditions,^{24–26} and in residential aged care²⁶ and community settings.²⁷

Sample, eligibility, and recruitment

Clinicians who worked as part of an aged care assessment team at one of the participating hospitals were eligible to participate in the study. Non-proportional, purposive and snowball sampling were used to identify potential participants and ensure relevant clinical specialists including geriatricians, nurses and allied health were represented. Site contacts, who were part of the project team, shared study flyers advertising the training, the underpinning research and researcher contact details, to facilitate recruitment. To ensure voluntary participation, an opt-in approach was taken, reliant on potential participants indicating their interest in participating, directly via email or telephone.

Procedure

The training involved a 90-minute live, interactive education session led by an experienced geriatrician (PY). This was initially planned to take place face-to-face but was moved online due to COVID-19 restrictions at the time. The training was tailored to the needs of clinicians working as part of hospital aged care assessment teams. Clinicians from two hospitals in Melbourne, Australia were invited. The training began by discussing the importance of timely identification of signs of dying in older hospital patients, the challenges to this, and why dying is often recognised late.

The concept of prognostic tools was introduced, and then the PPI was presented in detail, explaining each of the 5-items before applying it to several case examples. This provided opportunity for participants to use the PPI and talk about the calculated scores. Subsequent training focused on next steps for clinicians to consider if a patient was identified by the PPI as at risk of dying. Topics included conversations with the treating team, patients and families about symptom management, patient values, beliefs and goals of care, advance care planning, palliative care referral, end-of-life wishes including preferences for place of care, and family support needs. Open discussion and questions were encouraged during the training to make it interactive and engaging.

Training was evaluated using online pre-post-training surveys and follow-up interviews three months later. Interviews were conducted online, via telephone, or in-person in a location chosen by the participant, e.g. a hospital office.

Data collection

The pre-post training surveys included multiple-choice and open-ended questions and were collected online via an anonymous

Qualtrics link presented at the beginning of the training (Appendix 2). The pre-training survey outlined participant and consent information, ten demographic questions, 12 questions about their experiences, knowledge, confidence, and strategies to identify patients at risk of dying, and their experiences with and attitude towards prognostic tools. Examples of central concepts were provided in the survey questions, where needed, to guide comprehension (e.g., 'Intuition - I have a feeling that the patient might be dying soon', Appendix 2).

Participants completed a post-training survey enabling direct comparisons of individual responses without the need for ID codes. The post-training survey included nine questions addressing participants' knowledge and confidence to identify signs of dying and their recollection of the training content, and seven questions assessing training quality. After the training, participants were asked to use the PPI and their training insights and implement these in their clinical practice.

To explore participants' experiences of using the PPI, we conducted semi-structured follow-up interviews after three months. To ensure participants could share their views freely, interviews were conducted by an independent psychological scientist with expertise in end-of-life research (KG) who was not part of the training. Participants provided written consent before the interview and received an \$80 gift card to compensate for their participation. Interviews followed a semi-structured guide (Appendix 3) and after collecting demographic information, interviews began by asking what they remembered about the training and their experiences with the PPI over the last three months. Participants were asked if the training had affected their work and what steps could be taken to further support their role in identifying older patients near the end of life.

Data analysis

Survey responses were downloaded from Qualtrics to IBM SPSS Statistics for data analysis. Survey responses where more than 50 % of data were missing, such as those who stopped after the initial demographic questions were excluded. Surveys where more than 50 % of data was present were included. Quantitative survey data were analysed using descriptive statistics. Wilcoxon Signed-Ranks Test was used to compare mean rank changes in participants' knowledge and confidence before and after the training. Kruskal Wallis H Test was used to compare any knowledge and confidence differences between disciplines. Dunn's procedure with Bonferroni correction for multiple comparisons was used for post-hoc pairwise analyses.

Interviews were audio-recorded, transcribed and de-identified before being analysed using QSR International's NVivo. Qualitative description underpinned this study.²⁸ An initial coding framework was developed based on the interview questions and discussions within the research team. To enhance reliability and validity, multiple researchers were involved in independently coding the data. Using the processes proposed by Braun and Clarke^{29,30} two researchers (KG, BH) coded a subsample of interviews independently to map and expand the coding frame. Draft codes were compared and refined, and coding differences were resolved through discussions until consensus was reached. The coding frame was subsequently applied to the remaining transcripts by two researchers (KG, KL).³¹

Ethics

The study was approved by a health service Human Research Ethics Committee (ID: HREC/59,677/Austin-2019), with additional ethical and governance approvals received from a second health service and research institute.

Table 1
Characteristics of survey participants.

Variable	Mean (SD)	Range	N	%
Age (years)	42 (10)	28–63		
Sex				
Female			45	90 %
Male			4	8 %
Other			1	2 %
Highest qualification				
University qualification			47	94 %
Diploma/Certificate			3	6 %
Time in their occupation (years)	15 (12)	1–42		
Time at site (years)	9 (8)	0–27		
Country of healthcare training				
Australia			44	88 %
Outside of Australia			6	12 %
Employment Status				
Full-time			31	62 %
Part-time			19	38 %
Discipline				
Medical			23	46 %
Nursing			15	30 %
Allied Health			10	20 %
Unspecified			2	4 %

Results

Survey sample

Overall, 57 participants took part in the training and the survey, but seven were excluded due to >50 % missing data. For the 50 participants whose data was included, their average was 42 years, the majority were female, held a university degree and had an average of 15 years of experience (Table 1).

Pre-training survey results

Before the training, participants reported feeling "fairly confident" in their ability to recognise signs of dying (*Mdn* = 3, *IQR* = 2–3), despite having only "a little bit of knowledge" of identifying those signs (*Mdn* = 2, *IQR* = 2–3).

Over 91 % (43/47) of participants employed multiple strategies to identify signs of dying, with the majority (57 %, 27/47) using a combination of intuition, knowledge and experience. Almost 57 % (26/46) reported relying on experience as their main strategy for recognition of dying, 22 % (10/46) used their knowledge, and 17 % (8/46) relied on their intuition. Only 17 % (8/46) reported using prognostic tools as a strategy to identify signs of dying (8/46), with one participant reporting that this was their main strategy. This indicates that recognition of dying was mostly an experience-driven task and prognostic tools played a limited role in prognostication. The disciplines represented in the assessment teams also differed significantly in the strategy they used (χ^2 (12, *N* = 46) = 28.4, *p* < .01), with 33 % of allied health staff relying on intuition as their main strategy compared to 18 % of medical staff and 8 % of nursing staff. In contrast, 31 % of nursing staff and 23 % of medical staff used knowledge as their main strategy in comparison to only 11 % of allied health staff. Experience was still the most frequently reported main strategy in recognition of dying across the disciplines (Fig. 1).

Despite the limited exposure to and use of prognostic tools, when asked about their attitudes, most participants "somewhat agreed" that prognostic tools were important, accurate in predicting life expectancy and useful to identify signs of dying (*Mdn* = 3, *IQR* 3–4). When presented with a list of assessment tools, many recalled being familiar with some of them, such as the Barthel Index (67 %, 31/46)

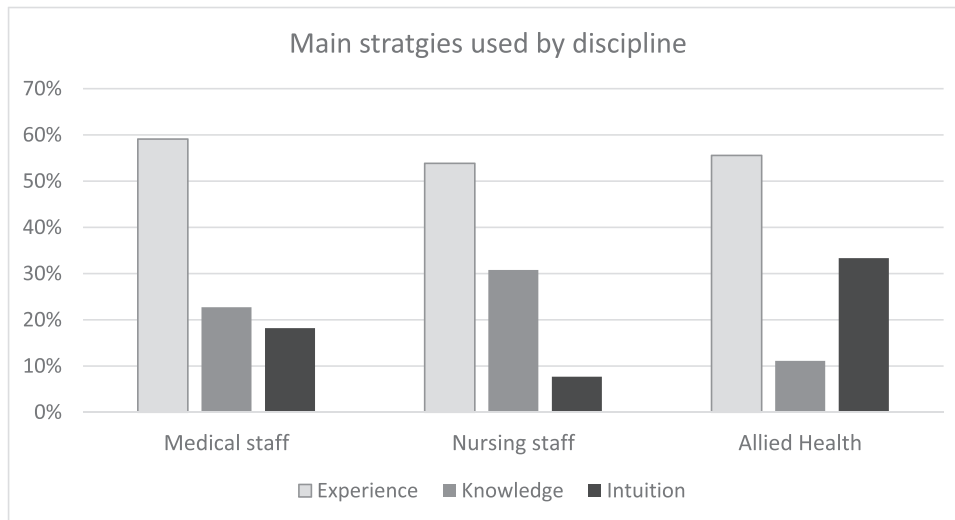


Fig. 1. Main strategies reported by medical, nursing and allied health staff in recognising signs of dying.

and Karnofski Performance Scale (43 %, 20/46). Only 30 % (13/44) of participants had heard of the PPI and 7 % (3/44) had used it.

A large majority, 89 % (41/46), reported not knowing any of the PPI categories. With limited explicit knowledge of the PPI indicators, when asked to list any signs that a patient might be at risk of dying, many recorded clinical markers that aligned with the PPI. Overall, 58 % (24/41) noted reduced oral intake and 61 % (25/41) identified changes in breathing, yet only 14 % (6/41) explicitly mentioned dyspnoea. Whilst 24 % (12/41) considered confusion or changes in consciousness, only 17 % (7/41) specifically identified delirium as a potential sign of dying.

Pre-post training comparison

As hypothesised, the training led to improvements in participants' outcome measures (Fig. 2). Wilcoxon Signed-Ranks Test showed a significant increase in the median post-training ranks for participants' knowledge ($Z = -4.56, p < .001$) and confidence in identifying signs of dying ($Z = -3.74, p < .001$). Additionally, 74 % (34/46) reported feeling more confident after the training. Kruskal Wallis H test was used to compare the differences in self-reported knowledge and confidence between medical, nursing and allied health participants.

Before the training, there were significant differences in staff's self-reported knowledge [$H(2) = 6.17, p < .05$] and confidence in recognition of dying [$H(2) = 8.01, p < .05$]. Medical staff reported significantly higher knowledge ($p < .05$) and confidence ($p < .05$) in recognising patients at risk of dying than allied health. After the training, there were no more significant differences in knowledge and confidence between the disciplines ($p > .05$).

In addition to these self-reports, there were also objective knowledge changes. After the training, 87 % (40/43) were able to list at least four of the five PPI signs of dying, compared to 7 % (3/41) before. There were no negative training effects.

There were also improvements in attitudes toward prognostic tools. Wilcoxon Signed-Ranks Test showed a significant improvement in the attitude that prognostic tools are important for doctors ($Z = -2.14, p = .033$) and a marginally significant improvement in the attitude that prognostic tools are accurate ($Z = -1.90, p = .058$). There was no significant change in the attitude that prognostic tools are important for nurses ($Z = -1.90, p = .285$) and that prognostic tools are useful ($Z = -1.00, p = .317$).

Free-text entries at the end of the survey showed that the training was extremely well received. Overall, 98 % (45/46) liked the training, all (100 %, 46/46) perceived the trainer as knowledgeable and 95 %

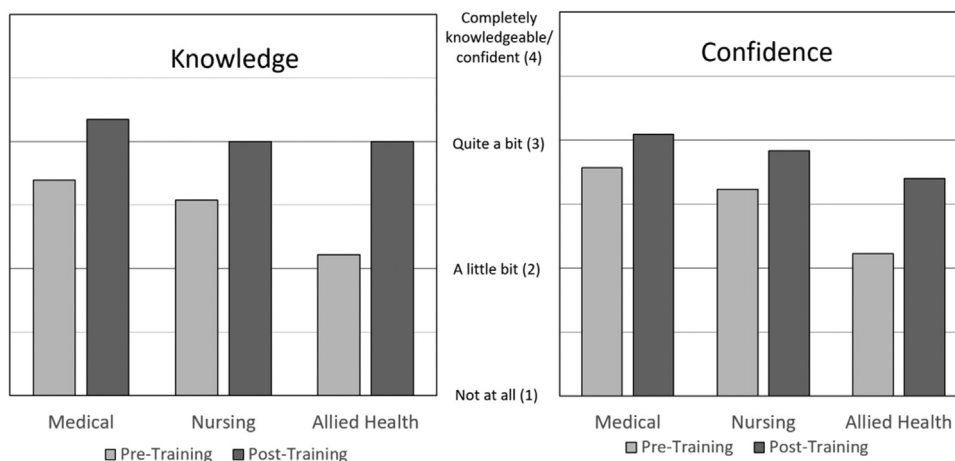


Fig. 2. Self-rated knowledge and confidence of medical, nursing and allied health staff immediately before and after the training.

Table 2
Characteristics of interview participants.

Variable	Mean (SD)	Range	N	%
Age (years)	45 (13)	31–66		
Sex				
Female			10	91 %
Male			1	9 %
Time in their occupation (years)	20 (14)	6–43		
Time in aged care assessment team (years)	5 (6)	0–20		
Discipline				
Medical			5	45 %
Nursing			5	45 %
Allied Health			1	9 %

(44/46) felt the information they received was relevant for their work. Further, 98 % (44/46) rated the training content as practical and felt confident to apply the training to their work. Finally, 96 % (43/45) reported that it was likely that they would recommend the PPI to a colleague.

Follow-up interviews

To examine clinicians' experiences with using the PPI in their practice, we conducted 11 follow-up interviews three months after the training, lasting an average of 51 min (range 35–71 min). Participants included five medical, five nurse and one allied health staff. Most interview participants were female, had 20 years of clinical experience and worked in aged care assessment teams for 5 years (Table 2).

All interview participants had used the PPI several times over the three months, mostly as a once-off assessment of a patient of concern, but some used it multiple times on the same patient to track changes. Interview analysis revealed three main themes regarding advantages and challenges in using the PPI in practice and recommendations on how to overcome these challenges (Fig. 3).

Advantages of the PPI. Participants highlighted that the 5-item PPI was clearly structured, quick and easy to use, and did not increase workload, which was seen as important in busy hospital settings. It was often used when clinicians felt unsure of the prognosis.

It was more of a structured way of predicting death and dying, particularly in patients that you weren't sure what their trajectory would be ... to help guide decisions or discussions around a patient's trajectory. (Participant 10, doctor)

The tool was seen as useful in initiating end-of-life discussions with colleagues and treating teams.

A few of my colleagues did that index on someone and went back and questioned the treating team. ... "Is this really in the person's best interest?" ... It allows you to open the discussion. (Participant 2, nurse)

The PPI triggered prognostic discussions and led to end-of-life conversations with patients and families, but participants felt it was up to geriatricians or the treating team to initiate these discussions.

Her oral intake had dropped off, and she was still very delirious and wasn't really engaging with staff, and so we used [the tool] to say: Well, do we think she's dying? ... It did prompt a discussion with the son to say, "Your mum is not doing as well as we would like, and there's the potential that she may deteriorate and die in the next few weeks..." And that just helped set some realistic expectations ... which was helpful. (Participant 10, doctor)

The training and introduction to the PPI sparked peer-teaching and mentoring, with those who participated in training reporting teaching others. Local champions emerged at each site, encouraging others to PPI in their practice. Two participants also reported commencing file audits to trial the PPI.

Participants described how the PPI training and subsequent use drew attention to under-recognised end-of-life symptoms like delirium, which was under-acknowledged as a potential sign of dying before (17 %, 7/41), compared to immediately after training (95 %, 41/43). Participants also reported longer-term improvements in their knowledge and confidence regarding recognition of dying, even three months after the training.

I feel like it's augmented my arsenal ... and improved my mindfulness (Participant 1, doctor)

It just gives me more confidence in what I'm assessing ... in determining the management and that it's the correct path to be taking ... It's an objective tool and it just helps with the choices ... It did guide my decision-making and I was more confident in the decisions that I was making ... For me, having something objective to work with was very valuable. (Participant 2, nurse)

I feel confident knowing that there is a tool there if I'm getting stuck. So, it's something in my back pocket that I can use if I'm not sure. (Participant 11, doctor)

Others described how the PPI helped them go beyond their intuition or gut feeling, and to be empowered in engaging in end-of-life discussions. Hence, they will continue using it in the future.

It might be a good way to have evidence for some of the things that you recognise but you don't know how to explain. (Participant 4, nurse)

It's helped put an actual tool to the clinical judgements that you're making but can't define ... you can say okay, they have this and that and that comes up as this number. I found it really helped thinking I'm not making it up in my head. The tool that backs it up ... It's very helpful to have evidence to back up what you see. (Participant 4, nurse)

Challenges with the PPI. Several challenges were raised by participants. Identifying the presence or absence of delirium was seen as particularly difficult, yet important because it heavily influenced the overall PPI score. Similarly, others suggested that the quality of their assessment depended on how much time they had with the patient and their family.

Sometimes it's very difficult to differentiate between behaviour due to delirium from an acute illness, and a terminal delirium ... I guess assessing delirium is probably the hardest part. That's the one that requires some clinical experience. (Participant 1, doctor)

Similar to delirium, other symptoms like oedema were seen as being on a spectrum rather than a binary 'present-absent' category, which raised the question of how noticeable a symptom needs to be to be rated as 'present' in the PPI. This could turn the assessment from an objective to a subjective one.

A lot of older people just have slight oedema from dependency and so for me, I just think, "Oh, is this oedema just enough?" And so, as I'm feeling up the legs, if it's more getting up towards the knee, I would then rate it as oedema, as opposed to what probably is just ankle oedema, I don't rate it. I don't know if that's correct or not. (Participant 2, nurse)

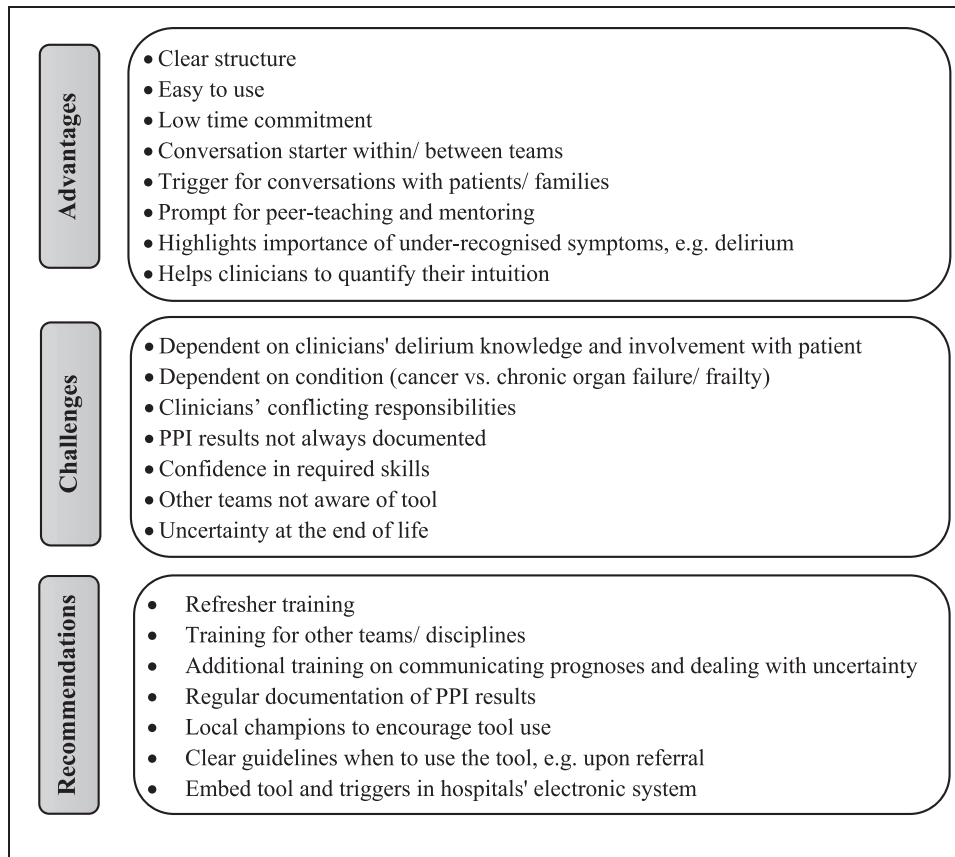


Fig. 3. Overview of discussed advantages, challenges and recommendations for PPI use.

Participants also highlighted that the accuracy of the PPI may be condition-dependant as some felt that the tool was more suitable for patients with cancer with a clear terminal decline compared to patients with chronic organ failure or frailty.

A lady in her 80s who had about four months of functional and cognitive decline, and she came into hospital... But she'd developed delirium just before she arrived... She looked very sick, and ... I thought she was going to die then. And then she didn't die... She looked like she was gradually declining, and I was having lots of these discussions with her family. It was helpful for me to crystallise that although she's been fluctuating, the overall course is probably towards end of life. (Participant 11, doctor)

The majority of the ones I've filled in, the scoring is at least six. And I don't think all of those people have a prognosis of less than two weeks... I think that for oncology patients, it would have been much more accurate. (Participant 5, doctor)

Since it was not mandatory to use the tool, many team members simply forgot or did not use it. This was particularly the case when the tool was not electronically available and clinicians hence had to complete it on their phone, as a paper version or in their mind and then manually record the PPI scores in the medical record. Some felt that other clinicians would not understand the PPI score, so they needed to also document an interpretation of the score and associated prognosis. This was perceived as laborious, contributing to paperwork fatigue and time pressure. Others were hesitant to document PPI scores for fear of being wrong.

I would never write it down because I suppose I've seen the reverse situation, when you've said to a family, "I think your mum's got a week to live" and she's still alive three months later. I've seen the trouble and angst that can cause, so I tend to never ever commit to a timeframe when I'm talking to patients, or when I'm writing in the notes. (Participant 5, doctor)

Some confidence issues remained after the training, especially amongst allied health, who sometimes felt they needed a medical or nursing background to assess patients' signs of dying.

We had a social worker that was feeling more confident. She used it at least once. But the others I think, the occupational therapists, they don't really feel that they have the skills to use it... Whereas nurses, it's part of your thing, looking at skin, oedema, it's more of a second nature kind of a thing. You just automatically look. (Participant 3, nurse)

Many highlighted that other teams should also be trained in using the PPI. This was seen as particularly relevant for treating clinicians and palliative care teams who could use the PPI before sending patients to the aged care assessment team, ensuring that their referrals were appropriate and discussing the prognosis with patients and families.

I think all the medical teams have to do this [tool] because... they have to understand if that patient's life span is going to be three weeks or greater than six weeks or more. They're supposed to be having those conversations with families and patients to say, "Look, we don't think mum or dad has got long to live" (Participant 7, nurse)

Ultimately, participants discussed that when assessing signs of dying, some uncertainty always remained as prognostication was described as an “*artform or imprecise science*” (Participant 1, doctor).

Uncertainty is part of the process and definition of dying. It's okay if you think the patient is dying and then they improve . . . death is not linear. This tool could be helpful in supporting the overall picture. So, you think someone's going to die, and then the next day they seem more chatty and eating and everything, but their PPI score is high. . . It gives you an idea that the overall process might still be tending towards the end of life. (Participant 11, doctor)

Recommendations to address prognostic challenges. Clinicians suggested further training in using the PPI could be helpful for participants, others who join the team and other specialties, such as palliative care and oncology to help them understand medical record entries about PPI scores and potentially use the tool as well. Participants also suggested that future training could include how to communicate prognoses to patients and families and how to deal with uncertainty at the end of life.

I would [want to] . . . make sure that we explain that it is to support communication and decision-making . . . about 'this is a possibility', so we can recognise when things are happening. (Participant 11, doctor)

Other suggestions included strategies to encourage regular use and documentation of prognoses and the results of prognostic tools. Involving local champions was suggested as a way of engaging and prompting others in PPI assessment. They also suggested that prognostic tool scores and their interpretation must be clearly documented in patients' files to support team communication and track changes over time. There was also a need for clear guidance on when and how often to use the tool, e.g., upon referral, when changes are noticed or before discharge.

Somehow a trigger needs to be done in our electronic system just to make sure that we're actually completing it on a regular basis or completing it for the right people. (Participant 6, allied health)

As with this example, it was also suggested that this process could be supported by integrating prognostic tools into the electronic patient management system so that automated triggers could be used to prompt tool completion, calculate the score and track score changes over time.

Discussion

The aim of this study was to examine the effects of the PPI²¹ on hospital clinicians' knowledge and confidence in identifying patients at risk of dying. Previous research has demonstrated that prognostic avoidance and uncertainty about whose role it is to recognise and respond to signs of dying turns clinicians into passive bystanders.^{4,32} Thus, recognition of dying needs to be seen as part of hospital clinicians' role and scope, particularly if we are to reduce “The Ostrich Effect”,⁴ where no one takes responsibility. While clinicians in aged care assessment teams may have good general knowledge of most signs of dying, the findings in this study suggest this did not necessarily translate into confidence with prognostication. Previous research with aged care assessment teams showed that recognition of dying was often experience-driven, involving analysis of clinical indicators and assessments from others, with prognostic tools an underutilised resource.⁴ This study provides additional evidence that in the

absence of prognostic tools, clinicians relied on their experience, knowledge and intuition as prognostic strategies.

The PPI training provided in this study helped clinicians to quantify their intuition, underpinning conversations around life expectancy and end-of-life care, with immediate and significant improvements in clinicians' knowledge and confidence and enhanced communication. Given that previous research indicates that collaboration between clinicians allows for the various insights from different specialties to be pooled,⁴ embedding the PPI as a standard component of clinical practice would be ideal. Being able to cross-check clinicians' assessment and PPI scoring, especially when clinicians lack confidence in their judgement,²² would further consolidate learning and enhance collaboration in the provision of end-of-life care.³³ In addition, senior nurses, clinicians or care coordinators intuitively led by example, promoting and encouraging others to use the PPI in their assessment, likely contributing to sustained practice change.

However, changes to practice, and sustaining change over time is likely only possible with high-level organisational commitment, supported by policy and flexible systems. With the increasing use of electronic medical record systems,³⁴ embedding the PPI and setting up automated triggers to encourage PPI assessment may assist to promote goals of care discussions and palliative care referral.³⁵

Strengths and limitations

This study provides comprehensive evidence to support the use of the PPI and other prognostic tools to guide care planning decisions of older people in hospital. Providing evidence for the sustainability of the PPI intervention, findings were strengthened by longitudinal follow-up data three months post-training.

Whilst the training and follow-up interviews were initially planned face-to-face, COVID-19 restrictions necessitated online delivery. Despite the need for change, online learning is in many cases as effective as in-person training,^{36,37} and it may even be a preferred option due the convenience of digital access. Online survey completion also means that participants may have looked up answers to survey questions, potentially conflating their reported knowledge of signs of dying. Given the survey was anonymous however, the motivation to cheat was likely minimised. Implementation of the PPI tool and participant recruitment was complicated by widespread disruption to the provision of care due to COVID-19, and limited the amount of time for post-training implementation and interviews. Furthermore, whilst most participants were female, reflecting the gender distribution in these aged care assessment teams, it is possible that the findings reported here do not reflect other aged care assessment teams.

After the training, teams were encouraged to use the PPI tool as often as possible and appropriate in their setting, but the exact frequency of use was not reported. Future research could explore whether the frequency of using a prognostic tool is associated with increased staff knowledge and confidence. Since the aim of the study was to identify the training effects rather than accuracy of the PPI, the results suggest the PPI may lead to increased opportunities for referral to palliative care and increased discussions with patients and families. Future research could also focus particularly on allied health staff who had the lowest levels of knowledge and confidence in identifying signs of dying before the training and who benefited most.

In the follow-up interviews, participants openly discussed the advantages, challenges, and experiences with using the PPI as a prognostic tool in their clinical practice. However, a response bias must be considered. Team members who had not used the PPI after the training or had negative experiences with it may have been less likely to volunteer for the interviews. While interviewees reported that the training had a long-lasting effect on their knowledge and confidence

regarding recognition of dying even three months later, it is not possible to directly compare these qualitative findings with the quantitative measures collected immediately before and after the training. Future studies could consider quantitative follow-up surveys across several time points to assess the long-term effects in more detail.

Conclusion

Hospital clinicians who work as part of aged care assessment teams and especially allied health staff need to be supported in identifying early signs of deterioration and dying to help treating teams in end-of-life care and discharge planning. Prognostic tools like the PPI can help quantify clinicians' intuitive assessments and thereby improve their confidence in engaging in end-of-life conversations with colleagues, patients, and families. Yet, prognostication is based on probabilities and therefore not black or white. Hence, some uncertainty remains.

To help clinical teams face this uncertainty, we need to address the prognostic avoidance and death as a taboo topic that still exists, even in hospital settings. This needs to include communication skills training for engaging with prognostic uncertainty. When clinicians are hesitant to talk about dying, they may want to ask themselves what they think is worse: Telling patients and their families that they might be at risk of dying, and then they don't? Or not telling them and then they do?

Funding

This study was funded by the Melbourne Ageing Research Collaboration and Victorian Private Geriatric Hospitals Limited.

Ethics

The study was approved by the Human Research Ethics Committee of Austin Health, Melbourne, Australia (ID: HREC/59677/Austin-2019). Research governance approval was obtained from Western Health and the National Ageing Research Institute.

Declaration of Competing Interest

The authors declare there is no conflict of interest.

Supplementary materials

Supplementary material associated with this article can be found in the online version at [doi:10.1016/j.gerinurse.2023.09.014](https://doi.org/10.1016/j.gerinurse.2023.09.014).

References

- Gramling R, Gajary-Coots E, et al. Palliative care clinician overestimation of survival in advanced cancer: disparities and association with end-of-life care. *J Pain Symp Manage*. 2019;57:233–240.
- Cheon S, Agarwal A, et al. The accuracy of clinicians' predictions of survival in advanced cancer: a review. *Annals Palliat Med*. 2016;5:22–29.
- Glare P, Virik K, et al. A systematic review of physicians' survival predictions in terminally ill cancer patients. *BMJ*. 2003;327:195–201.
- Gerber K, Hayes B, Bloomer M, et al. The ostrich approach – Prognostic avoidance, strategies and barriers to assessing older hospital patients' risk of dying. *Geriatr Nurs*. 2022;46:105–111.
- Christakis NA, Smith JL, et al. Extent and determinants of error in doctors' prognoses in terminally ill patients: prospective cohort study. *BMJ*. 2000;320:469–473.
- Button E, Chan RJ, et al. A systematic review of prognostic factors at the end of life for people with a hematological malignancy. *BMC Cancer*. 2017;17:213.
- Morin L, Wastesson JW, et al. How many older adults receive drugs of questionable clinical benefit near the end of life? A cohort study. *Palliat Med*. 2019;33:1080–1090.
- Ambiàs-Novellas J, Murray SA, et al. Frailty degree and illness trajectories in older people towards the end-of-life: a prospective observational study. *BMJ Open*. 2021;11: e042645.
- Mitchell I, Lacey J, et al. Understanding end-of-life care in Australian hospitals. *Aust Health Rev*. 2021;45:540–547.
- Bloomer MJ, Botti M, et al. End-of-life care for older people in subacute care: a retrospective clinical audit. *Collegian*. 2019;26:22–27.
- Services Australia. Assessment for Aged Care, www.servicesaustralia.gov.au/organisations/health-professionals/services/assessment-aged-care 2020, Accessed 1 May 2023.
- Gerber K, Tuer Z, et al. Who makes it out alive?—Predicting survival to discharge of hospital patients referred to residential aged care. *Collegian*. 2021;28:431–437.
- Melbourne Ageing Research Collaboration. *READY - Recognising Patients at Risk of Dying*. 2020. <https://www.nari.net.au/recognising-patients-at-risk-of-dying>. Accessed 12 January 2022.
- Yourman LC, Lee SJ, et al. Prognostic Indices for older adults: a systematic review. *JAMA*. 2012;307:182–192.
- Brown MA, Sampson EL, et al. Prognostic indicators of 6-month mortality in elderly people with advanced dementia: a systematic review. *Palliat Med*. 2013;27:389–400.
- Pobar I, Job M, et al. Prognostic tools for survival prediction in advanced cancer patients: a systematic review. *J Med Imag Radiat Oncol*. 2021;65:806–816.
- Cardona M, Lewis ET, et al. Predictive validity of the CriSTAL tool for short-term mortality in older people presenting at Emergency Departments: a prospective study. *Europ Geriatr Med*. 2018;9:891–901. 2018/12/24.
- Porock D, Parker Oliver D, et al. Predicting death in the nursing home: development and validation of the 6-month minimum data set mortality risk index. *The J Gerontol Series A*. 2005;60:491–498.
- Mitchell SL, Miller SC, et al. The advanced dementia prognostic tool: a risk score to estimate survival in nursing home residents with advanced dementia. *J Pain Symp Manage*. 2010;40:639–651.
- Maltoni M, Nanni O, et al. Successful validation of the palliative prognostic score in terminally ill cancer patients. *J Pain Symp Manage*. 1999;17:240–247.
- Morita T, Tsunoda J, et al. The Palliative Prognostic Index: a scoring system for survival prediction of terminally ill cancer patients. *Support Care Cancer*. 1999;7:128–133.
- Yong SQ, Porock D, et al. Performance of the Palliative Prognostic Index for cancer patients: a systematic review and meta-analysis. *Palliat Med*. 2023;0.
- Farinholt P, Park M, et al. A comparison of the accuracy of clinician prediction of survival versus the Palliative Prognostic Index. *J Pain Symp Manage*. 2018;55:792–797.
- Affizal S, Yap YL, et al. Palliative Prognostic Index as a predictor of mortality among geriatric patients with advanced chronic medical conditions. *Med J Malaysia*. 2022;77:468–473.
- Nieto Martín MD, Bernabeu Wittel M, et al. Adaptation of the Palliative Prognostic Index in patients with advanced medical conditions. *Rev Clin Esp*. 2013;213:323–329.
- Esteban-Burgos AA, El Mansouri-Yachou J, et al. Prognostic models associated with 6-month survival of patients admitted to nursing homes. *Gerontology*. 2019;65:40–44.
- Belanger E, Tetrault D, et al. Accuracy and usefulness of the Palliative Prognostic Index in a community setting. *Int J Palliat Nurs*. 2015;21:602–605.
- Kim H, Sefcik JS, et al. Characteristics of qualitative descriptive studies: a systematic review. *Res Nurs Health*. 2017;40:23–42.
- Braun V, Clarke V. Using thematic analysis in psychology. *Qualitat Res Psychol*. 2006;3:77–101.
- Braun V, Clarke V. Conceptual and design thinking for thematic analysis. *Qualitat Psychol*. 2022;9:3–26.
- Church SP, Dunn M, et al. Benefits to qualitative data quality with multiple coders: two case studies in multi-coder data analysis. *J Rural Soc Sci*. 2019;34:2.
- Bloomer MJ, Endacott R, et al. The 'dis-ease' of dying: challenges in nursing care of the dying in the acute hospital setting. A qualitative observational study. *Palliat Med*. 2013;27:757–764.
- Victorian State Government Department of Health. *Victoria's End of Life and Palliative Care Framework*. Department of Health; 2022.
- Campanella P, Lovato E, et al. The impact of electronic health records on healthcare quality: a systematic review and meta-analysis. *Eur J Public Health*. 2016;26:60–64.
- Wegier P, Koo E, et al. mHOMR: a feasibility study of an automated system for identifying inpatients having an elevated risk of 1-year mortality. *BMJ Qual Saf*. 2019;28:971–979.
- Pei L, Wu H. Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta-analysis. *Medical Educat Online*. 2019;24: 1666538.
- Davis J, Chryssafidou E, et al. Computer-based teaching is as good as face to face lecture-based teaching of evidence based medicine: a randomised controlled trial. *BMC Med Educ*. 2007;7:1–6.