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ORIGINAL RESEARCH

Evaluation of a pathway to address take own leave events for First Nations peoples presenting for emergency care: The Deadly RED project

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Abstract

Objective: The 'Deadly RED' project primarily aimed to improve culturally competent care to reduce the number of First Nations patients presenting to a Queensland ED who 'Take own leave' (TOL). The secondary aim was to evaluate the implementation project.

Methods: A pre/post-test quasi experimental study design using mixed methods was co-designed with adherence to Indigenous research considerations. Quantitative analysis of First Nations presentations before and after Deadly RED implementation was performed using SPSS. Qualitative analysis of transcribed research yarns in NVIVO was coded and themed for analysis. Staff experiences and perspectives were collated using electronically distributed surveys and process audits were performed.

Results: A total of 1096 First Nations presentations June to August 2021 and 1167 in the matched 2022 post-implementation period were analysed. Significantly more patients were recorded as TOL post-implementation (13.0% pre *vs* 21.3% post) and representations rates were unchanged. Forty-six staff surveyed identified improvements in all parameters including cultural appropriateness and quality of care. Qualitative analysis of 85 research yarns revealed themes migrated to increasingly acceptable, accessible, and usable care. Notably, 45% of the First Nation's patients recorded as TOL self-reported that their treatment was complete. The study was feasible as 80% of packs distributed and 73% follow-up screening after TOL.

Conclusions: The Deadly RED evaluation revealed significant discrepancies in the reported data points of TOL and the 'story' of the First Nations persons experience of appropriate and completed care. Staff awareness and cultural capability improved significantly, and yarning allowed knowledge translation and improvements in communication which contributed to a better healthcare experience for First Nations patients attending our ED.

Key findings

- TOL events increased but this was challenged by the qualitative data which told a different story of the events.
- Deadly RED project increased staff cultural capability and improved wholistic care.
- Yarning and Indigenous research methodology enhanced engagement and understanding.

Key words: *take own leave, first nations, emergency access, culturally competent care, yarning.*

Introduction

EDs around Australia are facing rising pressures in delivering healthcare to patients with increasingly complex medical and psychosocial needs. This issue is further compounded by prevalent access block and overcrowding.[1] Patients are consequently waiting longer, resulting in increased rate of those choosing to 'take own leave' (TOL).[2] This overarching term describes patients that 'did not wait' (DNW) or 'left after treatment commenced' (LATC) and defines a major public health concern.[3]

In Australia, Aboriginal and Torres Strait Islander patients (hereby respectfully referred to as First Nations people) are overrepresented in patients that TOL in EDs across all geographical jurisdictions compared to the

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general population. Identifying as a First Nations person is the most significant contributing factor to a patient's TOL risk,and rates of DNW and LATC are higher for First Nations patients (6.82% and 2.81%) compared to 'all patient presentations' (4.12% *vs* 1.17%%).[4] Despite multiple government campaigns[5,6] and significant health spending this number is increasing, providing indirect evidence of unmet needs and poorer health outcomes.[7]

Several strategies have been proposed to reduce the number of First Nations patients who TOL based on the understanding of contributing factors.[8] These include improving cultural competency of healthcare workers, continuous consultation and engagement with local elders, better culturally sensitive communication with patients and providing a culturally safe environment.[9-12] Enhancement of the First Nations healthcare workforce in the form of Indigenous Health Liaison Officers (IHLOs) and thus support for their training and retention must be prioritised.[13] Additionally, lack of focus on cultural connection and holistic care is a leading cause of failures of previous strategies to 'Close the Gap'.[14]

Recognising these factors, the IHLO and ED team co-designed an improvement project titled 'Deadly RED'. Deadly in Aboriginal English is something that is good or desirable[15] and RED referred to Redcliffe which is the location for the metropolitan ED that was the study site. Following local stakeholder engagement and literature review, our aim was to increase treatment completion rates, improve engagement with hospital staff and IHLOs, and reduce representations of First Nations patients. This project aligns with the vision of the *National Aboriginal and Torres Strait Islander Health Plan 2021–2031* whereby First Nations people 'enjoy long, healthy lives that are centred in culture, with access to services that are prevention-focused, culturally safe and responsive, equitable and free of racism'.[16]

Methods

The Deadly RED implementation project comprised three parts. Firstly, improving identification and engagement of First Nations patients by fostering connections and providing information packs after triage to all First Nation's patients who identified. Secondly, improving identification processes for patients who TOL and providing timely, clinically and culturally appropriate follow up within 48–72 h facilitated through a new regularly generated list of First Nation's patients and their disposition (including TOL). The follow up was performed either by an emergency specialist, a nurse practitioner or the Aboriginal and Torres Strait Islander nurse navigator and a shared secure excel spreadsheet documented follow-up actions. Finally, increasing options for accessing culturally appropriate care through linkages to available community services. The Deadly RED pathway was communicated to staff through local champions using existing communication pathways and also within the three 4-h cultural capability training sessions that were run with 75 ED staff from mixed specialties. Indigenous research principles of respect, relationships, advocacy, reciprocity, time and gratitude guided the study protocol.[17,18] A participatory action research (PAR) approach[19] allowed process improvements to occur concurrently in response to feedback and stakeholder workshops.

The primary outcome was reducing TOL rates for First Nations patients presenting through culturally competent care with secondary aims to evaluate the Deadly RED pathway.

The study population was all patients who identified themselves at the point of triage as being Aboriginal and/or Torres Strait Islander. The pre-intervention period was defined as June 2021 to August 2021 and the post-intervention period was defined as June 2022 to August 2022. The study was evaluated using a pre-test/post-test quasi-experimental design with a mixed methods approach using the Donabedian evaluation framework.[20] The outcomes of feasibility, acceptability, usability and effectiveness of the Deadly RED intervention were evaluated with a mixture of quantitative and qualitative methods.

Quantitative methods

Data were analysed using SPSS version 28.0 (IBM Corp., Armonk, NY, USA). Categorical variables were summarised as frequency and percentage. Continuous variables were summarised as mean and standard deviation (SD) or median and interquartile range (IQR) if not normally distributed. A linear mixed model with random intercept (for patient) adjusting for Australian Triage Scale (ATS) was used to examine both ED LOS and Time to be seen by clinician. Both variables were log transformed prior to analysis and back transformed for reporting with 95% confidence intervals. Two-sided P values less than 0.05 were considered significant. Staff surveys were developed by modifying a survey from a prior study to the cultural context and utilising a 5-point Likert score and free text responses. These were distributed pre and post to evaluate acceptability and effectiveness of (see Appendix S1 for questions). All Likert scales were collapsed into agree (agree, strongly agree) and disagree (neither agree or disagree, disagree, strongly disagree). Process measures of adherence to the Deadly RED process were audited as a measure of usability and feasibility and treatment completion and representation for a matched period pre and post the implementation as a surrogate measure of effectiveness.

Qualitative methods

The Qualitative data were collected through the use of Research Yarns[21] conducted through private phone interviews by an Identified Research Assistant purposefully recruited for the project. Yarning or storytelling is a core conversational method for First nation Australian peoples and structuring the research interview questions as a conversational yarn allows enhanced engagement and understanding and sharing of experiences valuable for data collection. Verbal consent was gained prior to each research yarn. The yarns were de-identified, transcribed verbatim and imported into NVIVO software for coding. The initial script was identical pre and post for the core yarning questions and then additional questions specific to the targeted areas within the Deadly RED pathways including follow up and communication about needing to leave were added in the post yarns (see Appendix S2 for research yarns script). A convenience sample of patients were collected from ED Information system (EDIS) presentation data and interviews conducted with those that answered the phone and consented to continue. A particular focus was given to those patients who TOL. Initial dataset familiarisation was conducted with complete read-through of the transcripts as two unique sets multiple times. The data set familiarisation was spaced by a few months to allow focus and clarity on the datasets independently. Initial classification of the yarns according to disposition (admitted, discharged, LATC and DNW) and age (child <16 years, adult or elder [specified as >50 years old]) were designated. Transcripts were coded by a single coder and cross checked with multiple electronic and paper passes ensuring coding completeness. Code names were clarified and modified to form distinct concepts. Codes were then brought to a yarning circle with the Deadly RED research team for generation of distinct themes in relation to the research questions around how feasible (accessible), acceptable and usable the care was from the perspective of the First Nations persons' experience pre- and post-pathway implementation. Frequent codes were noted around some themes and deductive analysis of the codes allowed latent meaning to be presented as they related to the research question.

Ethics

The Deadly RED project was approved by the Metro North Human Ethics committee (HREC/2021/QPCH/78821). Ethical guidelines for research with Aboriginal and Torres Strait Islander peoples was specifically referred and adhered to throughout the research process. Patients who identified as Aboriginal and Torres Strait Islander at the point of registration were given a Consent to Contact form.

Results

Primary outcome

There were 2263 ED presentations by 1788 First Nations patients during the study period. During the pre-implementation period there were 1096 ED presentations by 852 patients and during the post-implementation phase there were 1167 ED presentations by 936 patients. The mean age of patients was 28 (SD 20) with 53.0% being female, as shown in Table 1. There were no differences in age, sex or mode of arrival between study periods however there were differences in diagnosis and ATS. General medical diagnoses were most the common (51.3% pre *vs* 54.4% post) followed by injuries (28.7% pre *vs* 26.1% post) and diagnoses requiring surgery (12.4% pre *vs* 9.6% post). There were significantly more patients being triaged to four to five during the pre-intervention period compared to the post-intervention period (42.5% pre *vs* 36.5% post).

Only 2.7% patients pre and 7.5% post were recorded as seeing an IHLO. During the post implementation period patients took longer to been seen by a clinician even after adjusting for differences in ATS. ATS and diagnosis were found to be collinear and there was missing data from the did not wait patients in for the diagnosis variable so only ATS was examined in models. Significantly more patients TOL during the post-implementation period (13.0% pre *vs* 21.3% post) see Table 2. Patients who did not complete treatment were more likely to do so if they were younger or had been triaged at lower urgency levels. ED length of stay was longer during the post-implementation phase even after adjusting for differences in ATS. Readmission rates were similar between periods and the number of readmissions per patient did not differ between groups.

Compared to the 'all patient cohort' of ED presentations, the First Nation's patients remained 1.8 times more likely to TOL both pre and post the study period and while both groups increased TOL rates, the increase in TOL rates post for First Nations patients were higher (8.3% increase *vs* 4.9% in same period) (Table 3). Readmission rates were similar between periods and the number of readmissions per patient did not differ between groups.

Secondary outcome

There were 50 respondents pre-implementation and 46 respondents post-implementation. Over 50% of respondents were nursing staff and 28.1% were medical (see Table 4). The perception that the level of care was safe and appropriately comprehensive did not significantly change following the intervention (60.0% pre *vs* 73.9% post, $P = 0.15$). There was significant perceived improvement in referral pathways, culturally appropriate care, information given to patients and allowance for individual and social factors. While respondents perceived significant inroads being made for referral pathways and follow-up care of did not wait or left after treatment patients', agreement was just 37.0% and 43.9%, respectively, post-implementation.

A process audit of the Deadly RED pathway was performed. Approximately 40% of patients had documented information packs given to them, although only 15% of the 1000 packs were left over at the end of the trial suggesting that many more were handed out than accounted for.

Of 248 TOL events post implementation, 181(73%) had documented follow-up screening. Fifty phone calls were completed and 45 attempted with no answer. This was approximated at about 5 min per patient follow up equating to 2.5 clinician hours a week on average. Most patients were clinically improved or had seen alternative health providers in the community. Seven patients were advised to return to ED for ongoing care including one admission to ICU. One patient was called every day for 5 days as their presentation was deemed high risk. Upon eventual

TABLE 1. *First nations patient characteristics pre- and post-implementation of the Deadly RED Safe Home process*

Patient characteristics	Overall ($n = 2263$), n (%)	Pre ($n = 1096$), n (%)	Post ($n = 1167$), n (%)	P-value
Number of unique patients	1788	852	936	
Age† ($n = 1788$), mean (SD)	28 (20)	28 (21)	28 (21)	1.00
Age ($n = 1788$)				0.20
<1	84 (4.7)	30 (3.5)	54 (5.8)	
1–5	216 (12.1)	116 (13.6)	100 (10.7)	
6–15	304 (17.0)	142 (16.7)	162 (17.3)	
16–25	319 (17.8)	154 (18.1)	165 (17.6)	
26–35	291 (16.3)	133 (15.6)	158 (16.9)	
36–45	195 (10.9)	93 (10.9)	102 (10.9)	
46–55	188 (10.8)	91 (10.7)	97 (10.4)	
56–65	96 (5.4)	53 (6.2)	43 (4.6)	
66–75	61 (3.4)	27 (3.2)	34 (3.6)	
76+	34 (1.9)	13 (1.5)	21 (2.2)	
Sex ($n = 1788$)				0.87
Female	948 (53.0)	448 (52.6)	500 (53.4)	
Male	838 (46.9)	403 (47.3)	435 (46.5)	
Unknown	2 (0.1)	1 (0.1)	1 (0.1)	
Mode of arrival				0.60
Walk-in	1532 (67.7)	755 (68.9)	777 (66.6)	
Ambulance	685 (30.3)	319 (29.1)	366 (31.4)	
Police	43 (1.9)	20 (1.8)	23 (2.0)	
Other	3 (0.1)	2 (0.2)	1 (0.1)	
Diagnosis‡ ($n = 1927$)				0.033
General medical	1018 (52.8)	495 (51.3)	523 (54.4)	
Injury	528 (27.4)	277 (28.7)	251 (26.1)	
Surgical	212 (11.0)	120 (12.4)	92 (9.6)	
Mental health	81 (4.2)	37 (3.8)	44 (4.6)	
Obstetrics and gynaecology	62 (3.2)	29 (3.0)	33 (3.4)	
Drug and/or alcohol related	26 (1.3)	7 (0.7)	19 (2.0)	
Australian Triage Scale				0.014
1–2	298 (13.2)	137 (12.5)	161 (13.8)	
3	1073 (47.4)	493 (45.0)	580 (49.7)	
4–5	892 (39.4)	466 (42.5)	426 (36.5)	

†Age at first presentation. ‡Excluded patients that did not wait or left after treatment commenced.

contact, the patient was very grateful for the care when they returned to ED.

A total of 35 yarns pre and 50 post were completed and transcribed for analysis. Two incomplete interview transcripts were excluded from the post file set. The data sets were well matched both pre and post though the post-yarns had increased children and an over-representation of patients who TOL (LATC and DNW).

As an overall observation, the themes of the Yarns prior to the Deadly RED implementation were skewed more towards a negative experience i.e. not accessible, acceptable, or usable when

TABLE 2. *First nations' patient treatment pre- and post-implementation of the Deadly RED Safe Home process*

Treatment	Overall ($n = 2263$), n (%)	Pre ($n = 1096$), n (%)	Post ($n = 1167$), n (%)	P-value
Consult request for IHLO recorded	117 (5.2)	30 (2.7)	87 (7.5)	<0.001
Time to be seen by clinician† ($n = 2209$), minutes, median (IQR)	91 (39–161)	75 (32–135)	112 (49–190)	<0.001
Adjusted time to be seen by clinician§, minutes, geometric mean (95% CI)		38 (36–41)	55 (52–58)	<0.001
Departure status				
Discharged	1220 (53.9)	615 (56.1)	605 (51.8)	0.042
Admitted	345 (15.2)	179 (16.3)	166 (14.2)	0.16
Left after treatment commenced	337 (14.9)	135 (12.3)	202 (17.3)	<0.001
ED short stay	279 (12.3)	147 (13.4)	132 (11.3)	0.13
Did not wait	54 (2.4)	8 (0.7)	46 (3.9)	<0.001
Transferred	26 (1.1)	11 (1.0)	15 (1.3)	0.53
Died in ED	2 (0.1)	1 (0.1)	1 (0.1)	1.00
Take own leave (DNW + LATC)	391 (17.3)	143 (13.0)	248 (21.3)	<0.001
By age group				
<1 ($n = 105$)	10 (9.5)	2 (5.1)	8 (12.1)	0.32
1–5 ($n = 266$)	56 (23.0)	19 (14.9)	37 (32.2)	0.003
6–15 ($n = 341$)	67 (19.6)	25 (15.3)	42 (23.6)	0.055
16–25 ($n = 395$)	75 (19.0)	26 (13.5)	49 (24.3)	0.006
26–35 ($n = 360$)	71 (19.7)	21 (13.5)	50 (24.4)	0.010
36–45 ($n = 284$)	48 (16.9)	24 (15.0)	24 (19.4)	0.33
46–55 ($n = 260$)	38 (14.6)	14 (11.3)	24 (17.6)	0.15
56–65 ($n = 127$)	16 (12.6)	8 (11.9)	8 (13.3)	0.81
66–75 ($n = 82$)	5 (6.1)	1 (2.7)	4 (8.9)	0.37
75+ ($n = 43$)	1 (2.3)	0 (0.0)	1 (3.7)	1.00
By ATS				
1 to 2 ($n = 298$)	9 (3.0)	3 (2.2)	6 (3.7)	0.51
3 ($n = 1073$)	191 (17.8)	62 (12.6)	129 (22.2)	<0.001
4 to 5 ($n = 892$)	191 (21.4)	78 (16.7)	113 (26.5)	<0.001
ED LOS‡ ($n = 2261$), minutes, median (IQR)	217 (140–318)	200 (130–280)	238 (149–364)	<0.001
Adjusted ED LOS§ ($n = 2261$), minutes, geometric mean (95% CI)		193 (184–202)	226 (217–236)	<0.001
ED LOS for patients who died ($n = 2$), minutes, mean (SD)	438 (91)	502	373	
ED LOS 4 h or less‡ ($n = 2261$)	1324 (58.6)	734 (67.0)	590 (50.6)	<0.001
Patients with more than 1 admission ($n = 1788$)	300 (16.8)	143 (16.8)	157 (16.8)	1.00
Number of readmissions per patient ($n = 300$), median (IQR)	2 (2–3)	2 (2–3)	2 (2–3)	0.13
Readmission within 3 days of previous admission ($n = 475$)	183 (38.5)	95 (38.9)	88 (38.1)	0.85

†Excludes patients who did not wait. ‡Excluding patients who died. §Linear mixed affects model adjusting for ATS (reference group: 4–5).

TABLE 3. *Comparison of take own leave (TOL) between First Nations patients and all patient cohort across the two study periods*

Disposition first nation's patients	Overall (n = 2263), n (%)	Pre (n = 1096), n (%)	Post (n = 1167), n (%)	P-value
Departure status				
Left after treatment commenced (LATC)	337 (14.9)	135 (12.3)	202 (17.3)	<0.001
Did not wait (DNW)	54 (2.4)	8 (0.7)	46 (3.9)	<0.001
TOL (DNW + LATC)	391 (17.3)	143 (13.0)	248 (21.3)	<0.001
ATS levels				
3 (n = 1073)	191 (17.8)	62 (12.6)	129 (22.2)	<0.001
4–5 (n = 892)	191 (21.4)	78 (16.7)	113 (26.5)	<0.001
Disposition all patient cohort	**Overall (n = 34 341), n (%)**	**Pre (n = 16 802), n (%)**	**Post (n = 17 539), n (%)**	**P-value**
Departure status				
LATC	1747 (5.1)	519 (3.1)	1228 (7.0)	<0.001
DNW	1573 (4.6)	690 (4.1)	883 (5.0)	<0.001
TOL (DNW + LATC)	3320 (9.7)	1209 (7.2)	2111 (12.1)	<0.001

TABLE 4. *Staff demographics and perceptions pre- and post-implementation of Deadly RED (see Appendix S1 for full survey questions)*

Questions	Overall (n = 96), n (%)	Pre (n = 50), n (%)	Post (n = 46), n (%)	P-value
Professional role				0.98
Nursing staff	55 (57.3)	29 (58.0)	26 (56.5)	
Medical staff	27 (28.1)	13 (26.0)	14 (30.4)	
Administration/other	9 (9.4)	5 (10.0)	4 (8.7)	
Indigenous liaison or cultural capacity officer	5 (5.2)	3 (6.0)	2 (4.3)	
Years at Redcliffe (n = 46)				NA
0–12 months	NA	NA	10 (21.7)	
1–5 years	NA	NA	15 (32.6)	
5+ years	NA	NA	21 (45.7)	
Level of care is safe and appropriately comprehensive (agree)	64 (66.7)	30 (60.0)	34 (73.9)	0.15
Referral pathways are effective (n = 95, agree)	53 (55.8)	22 (44.0)	31 (68.9)	0.015
Care is culturally appropriate (agree)	48 (50.0)	18 (36.0)	30 (65.2)	0.004
Information given is acceptable (agree)	43 (45.3)	15 (30.6)	28 (60.9)	0.003
Allowances for individual and social factors (agree)	35 (36.5)	8 (16.0)	27 (58.7)	<0.001
Follow-up care is appropriate in the setting of 'did not wait' or 'left after treatment commenced' (agree)	29 (30.2)	9 (18.0)	20 (43.9)	0.007
ED processes make it likely to complete treatment (agree)	25 (26.0)	8 (16.0)	17 (37.0)	0.019

TABLE 5. *Qualitative themes from pre- and post-Deadly RED yarns*

Themes	Pre-Deadly RED	Post-Deadly RED
Accessibility (feasibility)	Poor • Staff pressures limiting care • COVID challenges • Poor wait times • Not empowering patients • Not listening Good • Listening to the patient • Respect for patient • Positive views of healthcare professionals	Poor • Poor waiting times • Poor holistic care Good • Acknowledging family linkages • Positive views of healthcare professionals • Care during traumatic event
Acceptability	Poor • Poor Staff engagement • Inadequate pain management • Communication issues ‘not fixed’ • Staff not able to meet needs because of pressure Good • Listening to the patient	Poor • Long waiting times Good • Listening to the patient
Usability of care	Poor: • COVID making things harder • Staff can’t meet needs because of pressure • Discharge processes hard to follow Good • Good waiting times • Holistic care	Poor • Long waiting times • Poor environment in the waiting room Good • Transport availability • Basic needs met, for example food, water • Communication with family • Good waiting times

compared to the post-implementation interviews (see Appendix S3 for a Word cloud of these themes). In both sets, the patients who TOL reported a ‘worse’ experience and less accessible, acceptable and usable care.

The themes were compared pre- and post-implementation and are presented in Table 5. The prominent themes across all areas pre where the impact of COVID and waiting times and staff pressures which resulted in poorer care and confusing processes. Care was unacceptable if there was ‘inadequate pain management’. Post-implementation, most themes were not prominent although ‘poor waiting times’ continued to impair access, acceptability and usability. This was clear from the transcript quotes including ‘Felt like I could have dealt with it at home as no-one seemed to be in a rush’ and ‘I was there for an urgent thing but I didn’t want to stay because they had a lot going on so I wanted to rest in my own bed’.

Positive themes pre- and post-implementation indicated care was more accessible and acceptable if the patients were listened to. Care was more ‘usable’ during short wait times but also when basic needs were met. This included providing food, water and reassurance. Assistance with transport and communication with family allowed tolerance of long wait times and made the experience ‘usable’. As one elder said ‘just them coming to have a yarn, that would be really good’.

Post-implementation yarns had added questions regarding early discharge and follow up and yielded themes of ‘patients comfortable informing staff they needed to leave’ and appreciation of follow-up ‘shows that they care’ if they TOL. From these responses it became apparent that the number of patients who advised of the need to leave was contradictory to the recorded disposition for the patients’ file. Eight of the 18 patients (45%) who had been logged as TOL were satisfied their treatment had been completed when they left ED.

Discussion

The present study complements the current body of knowledge and provides useful insights into the patient experience for Fist Nations patients presenting for ED care. The primary outcome of reducing TOL events for First Nation’s patients was not achieved. The primary reason for this appeared to be both due to an increase in presentations and slight increase in acuity and in overall wait time including both the additional 15 min per patient to be seen by a doctor and the ED length of stay (EDLOS) increase of 20% per patient between the two study periods. Wait time is known to be a major factor in TOL from other studies.[2] When examining the two time periods, the workflow changes including reduced treatment spaces due to infection concerns and increased waiting room offloads of higher acuity patients secondary to the arrival of COVID19 in our metropolitan ED made the internal processing of patients more complex and increased the wait time and numbers of waiting room patients between the two time periods. However, despite this increase in the number of First Nation's TOL events, analysis of the qualitative data revealed a very different narrative behind the results with almost half of the of patients who were recorded in EDIS as TOL reporting in their research yarn that they considered their treatment complete. The accuracy of recording of the IHLO consult was also challenged as 50% said they had seen an IHLO (*vs* 7.5% reported). Our 'western' interpretation of care completion only after being seen by the doctor is challenged by these results as we discovered, from the transcripts of the yarns, that patients whose care was met by these other providers and were logged as a TOL event in fact left satisfied because they required nothing further. This concept was reinforced by the findings of the follow-up calls where no further clinical care was needed or required for most patients and representation rates were constant across both study periods.

The general themes for both staff and patient perceptions showed significant positive improvements post-Deadly RED implementation which focused on early engagement and demystifying ED processes leading to an overall improvement across accessibility, acceptability, and usability of care. Early engagement from nursing or IHLO staff providing reassurance and options for care has been presumed to explain the differences between the qualitative *versus* the quantitative data. This finding is supported by the literature outlining the need for holistic care and rapport with staff to enable quality care.[13]The overall evaluation of the Deadly RED pathway showed that the process was accessible, usable and generally acceptable in enhancing the quality of care for our First Nations patients.

The biggest achievements of the Deadly RED implementation were gains in cultural awareness in staff and cultural safety within the ED. Exponential improvements in the quality of care provided and meaningful translation of perspectives to allow a deeper understanding from both sides of the consumer and staff equation have been possible. Cultural capability training is required for all health professionals and needs to be prioritised within educational and health institutions to maintain this.

The present study has many limitations. It was undertaken at one outer metropolitan hospital, so generalisability is limited. Pre-/post-study designs can be impacted by internal validity and extraneous factors and our study suffered from the significant impact of the increase in EDLOS, acuity and processing times of the COVID19 pandemic which confounded our results between the pre- and post-period. The study design of a PAR allowed continual modifications according to learnings which made it difficult to compare the influence of the intervention accurately. Strengths of the study include the co-design methodology and First Nation's strong representation on the research team.

Conclusion

First Nations patients experience in ED improved with the implementation of the Deadly RED pathway and the pathway was found to be feasible, acceptable and usable. Although TOL traditionally considered to reflect patient experience worsened during this time and the implementation and results were confounded by the arrival of the COVID19 pandemic between the pre- and post-periods, the qualitative analysis suggests that the quality and cultural capability of ED care improved. These findings challenge health organisations to look beyond the numbers when attempting to address health challenges particularly in relation to inequalities affecting First Nation patients. The Deadly Red pathway demonstrated significant benefit to staff through tacit learnings from the project and study design. To provide culturally appropriate, effective and meaningful emergency care to First Nations patients, we need to delve deeper into the stories and lives of these patients using a grass roots approach through early engagement and holistic care within ED.

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Author contributions

MD works at both Sunshine Coast University Hospital in Emergency and the Redcliffe Hospital for the progression of the Deadly RED project. EH was the Cultural Capability officer at Redcliffe Hospital and is now the Health Equity Research Project Officer with the Metro North Research Unit and is a proud Yuru man. MC is an RN in emergency at Redcliffe Hospital and is a proud Wakka Wakka woman.

Competing interests

None declared.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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Supporting information

Additional supporting information may be found in the online version of this article at the publisher's web site:

Appendix S1. Staff Survey questions (Questions 1–8 in both pre and post and 9–12 only in post-survey).
Appendix S2. Research Yarn script.
Appendix S3. Word cloud of themes from pre-implementation interviews.