







The Overdose Response with Take Home Naloxone (ORTHN) project: Evaluation of health worker training, attitudes and perceptions

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Abstract

Introduction. Naloxone is a life-saving medication that reverses opioid overdose; naloxone can be provided on a ‘take-home’ basis so naloxone can be administered outside of the health-care setting. The Overdose Response and Take Home Naloxone (ORTHN) project established a model of care for take-home naloxone (THN) interventions across alcohol and other drug and harm reduction services in NSW, Australia. This paper evaluates the staff training and credentialing program, and examines staff attitudes and perspectives regarding the provision of THN interventions in these settings. **Methods.** Staff across seven services were trained through a ‘train-the-trainer’ credentialing model to deliver ORTHN, including naloxone supply. Staff were surveyed regarding their experience, attitudes and knowledge on THN prior to and after training, and after 6 months. At the 6 months follow up, staff were asked about the interventions they provided, barriers and enablers to uptake, and opinions regarding future rollout. **Results.** A total of 204 staff were trained and credentialed to provide the ORTHN intervention. Most (60%) were nurses, followed by needle syringe program workers and allied health/counsellors (32%). Linear and logistic regression analyses indicated that the training program was associated with significant improvements in staff knowledge and attitudes towards overdose and THN; however, only attitudinal improvements were maintained over time. There were high rates of staff satisfaction with the ORTHN intervention and training. **Discussion/Conclusions.** The ORTHN program is ‘fit for purpose’ for broad implementation in these settings. A number of potential barriers (e.g. time, medication and staffing costs) and enablers (e.g. peer engagement, regulatory framework for naloxone supply) in implementing THN interventions were identified. [Monds LA, Bravo M, Mills L, Malcolm A, Gilliver R, Wood W, Harrod ME, Read P, Nielsen S, Dietze PM, Lenton S, Bleeker AM, Lintzeris N. The Overdose Response with Take Home Naloxone (ORTHN) project: Evaluation of health worker training, attitudes and perceptions. *Drug Alcohol Rev* 2022;41:1085–1094]

Key words: naloxone, overdose, health worker, opioid, train the trainer.

Introduction

Opioid overdose rates continue to increase in Australia and worldwide [1,2]. Naloxone, an opioid antagonist

that quickly reverses overdose, is recommended as a lifesaving medication that can be provided on a ‘take-home’ basis for people at risk of overdose [3]. Take-home naloxone programs involve education around

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overdose recognition and response, and then supply of naloxone to the participant to take with them to use in the future in the case of a potential overdose.

To implement this recommendation, many health services have initiated staff and/or peer worker training programs so that workers can provide THN for people at risk of overdose and their carers. Multiple studies have demonstrated that health and peer workers can provide these interventions, leading to a significant increase in the uptake of THN in those regions [e.g. 4–9]. However, few studies have investigated the impact of training on staff knowledge and attitudes towards providing THN. This is important to ensure the quality of provision of THN and the sustainability of such programs.

One potential challenge relates to high staff turnover rates in health services, meaning training needs are ongoing. One approach that may address this issue is the ‘train the trainer’ model [10]. Train the trainer programs prevent the need to rely on external (and costly) training each time new staff require training. For example, Scotland has had a national naloxone program since 2010 [11]. The program included funding for THN kits (with pre-filled syringes), guidelines for delivering interventions and a ‘train-the-trainer’ model whereby key trainers were enabled to train other staff in how to provide THN interventions to eligible clients [see also, 12]. Dahlem *et al.* [13] implemented a train-the-trainer model for their THN program in the USA across a range of services including non-government organisations, mental health and public health departments. Over 15 months, 143 people were trained. At 6 months follow up, despite a low response rate ($n = 22$), 64% of the trainers had trained others in THN intervention provision, with 77 naloxone kits distributed. A limitation raised by the study authors was that fidelity of the training was not assessed; nor was the competence of the new trainees assessed in terms of their knowledge, confidence or ability to provide THN interventions. These issues are important for ensuring high-quality training.

In addition, staff concerns, beliefs and attitudes can be a barrier to THN program implementation. For example, studies of health worker perceptions of THN have demonstrated that while staff are supportive, concerns exist regarding insufficient time, knowledge and skills to provide THN, alongside the concern that THN will not address underlying substance use, and even that providing THN may encourage risky substance use and reduce treatment seeking [14–19]. Empirical evidence that THN contributes to such negative outcomes is lacking; thus, specifically addressing this lack of evidence in training may improve staff attitudes towards provision of THN [19].

Until recently few health services in Australia have implemented THN programs [see 8, for a review].

Accordingly, a project to increase uptake of THN occurred across multiple alcohol and other drug (AOD) and harm reduction services in New South Wales (NSW), Australia. A brief THN intervention (10–30 min) was developed (referred to hereafter as the ORTHN, Overdose Response with THN, intervention) and implemented across participating sites [see 9, for more details about the development of the intervention]. The ORTHN intervention included both staff training and client education. Staff were trained and credentialed to provide the client education and naloxone without the need for involvement of medical practitioners or pharmacists. Client education addressed overdose risk factors, signs of overdose and how to respond to overdose, and clients were supplied with THN (pre-filled syringes). Over 600 ORTHN interventions were provided to clients during the study, with results demonstrating improved client attitudes towards THN and no significant increase in substance use following the brief intervention, with overdose reversals reported by 9.5% of participants in the 3 months after receiving the ORTHN intervention; see [9] for further information about the client intervention/education program.

A trained and skilled workforce is important to ensure THN programs are delivered appropriately, however, few studies have evaluated the impact of staff THN training on staff knowledge, attitudes and perceptions. This article describes the ORTHN staff training and credentialing framework, the impact of training on staff knowledge and attitudes regarding THN, and staff perspectives regarding future implementation. Specifically, the evaluation examined the provision of ORTHN interventions by staff (approximately 6 months following training), including:

1. changes in staff attitudes and beliefs towards THN;
2. assessment of staff competence in delivering ORTHN (including knowledge of overdose signs, risks and responses);
3. staff satisfaction with the training and credentialing process;
4. barriers and enablers in delivering THN interventions;
5. estimating the cost of delivering THN, based on the staffing and medication costs of the ORTHN procedure.

Methods

Design

A mixed-methods prospective longitudinal design was employed in which the clinical procedures, regulatory frameworks and training programs for ORTHN were

developed, implemented and evaluated. The project occurred from 2017 to 2018, across seven AOD treatment and harm reduction services (needle syringe programs and a supervised injecting facility in metropolitan, and non-metropolitan settings in NSW, Australia).

Evaluation of impacts of training on staff involved administration of questionnaires addressing knowledge, attitudes and practices regarding THN interventions at three-time points: immediately before training (pre-training questionnaire); immediately after training (post-training questionnaire); and at research follow up at the end of the ORTHN intervention study period (usually 6 months after training workshops; range 3–12 months). The research follow up examined staff perspectives regarding the provision of the ORTHN intervention, the training and credentialing process, and barriers and enablers to ongoing THN provision.

Participants

Overall, 204 staff were trained and credentialed to provide the ORTHN intervention during the 12 month study period, and consented to participate in the evaluation (see Table S1, Supporting Information, for demographic details).

The ORTHN training and credentialing framework

An authorised protocol was obtained from the NSW Health Chief Health Officer to allow ORTHN intervention and naloxone provision by health workers alongside doctors and pharmacists, with a structured training and credentialing process. The ORTHN Education and Credentialing Framework (summarised in Table S2) identified the necessary training, conditions, competencies and assessment criteria required for a health worker to become credentialed to provide ORTHN interventions, including the supply of naloxone.

The ORTHN staff training program was designed to be delivered to either small groups (up to 20 staff) or to individual staff. The training was designed to be routinely delivered in 60–90 min, and included written resources, slides (with trainer's notes) and embedded videos demonstrating the delivery of the ORTHN brief interventions with clients, and how consumers should respond to a suspected overdose, including naloxone administration.

A 'train the trainer' model was developed, in which each organisation identified 2–5 staff to be trained in delivering ORTHN training and credentialing for their

workforce. The 'train-the-trainer' program was delivered in approximately 2–2.5 h: 60 min for training staff to deliver the clinical intervention, 30 min on how to assess the competency of trainees, and up to 60 min for 'train the trainer aspects' (i.e. how to organise and deliver the ORTHN staff training program in their services).

Materials

Evaluation of staff training and credentialing program.

Knowledge and attitudes regarding responding to overdoses and the role of THN were assessed using modified versions of the Opioid Overdose Knowledge Scale and the Opioid Overdose Attitudes Scale [20], better suited to brief assessment of knowledge and attitudes in a brief intervention context and with staff (see Supporting Information).

Staff perspectives on future models of THN interventions.

Staff perceptions regarding the ORTHN intervention delivered in this project, and how THN interventions and staff training programs should be delivered in the future, were assessed at the 6 months follow-up staff research interviews. Questions included Likert scale responses (0 = strongly disagree to 4 = strongly agree) to enablers of THN uptake (e.g. to what extent do you agree that the following are important for increasing uptake of THN at your service: rescheduling, cost of naloxone, support of service leaders), barriers to THN uptake (e.g. here are a list of concerns staff may have about providing THN, please indicate the extent to which you identify with: extra workload, may increase substance use in clients, etc.). Staff were asked to rate their satisfaction with the ORTHN clinical intervention, as well as the training and credentialing program, using a Visual Analogue Scale (0 = completely dissatisfied, 100 = completely satisfied), opinions on the length of the training (too short, about right, too long), preferred format of future training (e.g. face to face, online) and preference for naloxone costs to the client (with options ranging from 'no charge' to 'more than \$40).

Estimating the cost of THN intervention. This was estimated by including the cost of medication (naloxone formulation used cost approximately [AUD] \$50 per THN kit) and staffing costs (time in delivering an 'average' THN intervention at an average staffing cost of \$50 per hour). The staffing time to deliver the average THN intervention was asked in the 6 months follow-up research interview.

Procedure

Prior to training, staff completed the pre-training questionnaire. This was completed online via RedCap, or in person with a paper version. Immediately following training, as part of the credentialing process, staff were asked to complete the knowledge questions again and ORTHN specific questions (e.g. exclusion criteria for providing naloxone such as pregnancy or hypersensitivity to naloxone) using a paper form. Several items were designated as ‘must get correct’ (termed here ‘Essential’ items) to pass the credentialing process (alongside the role play). Approximately 6 months later all trained staff were sent an online follow up survey link which assessed knowledge and attitudes, as well as whether any ORTHN interventions had been provided and any benefits/barriers. Opinions regarding the ORTHN procedures and training and credentialing process were also sought at this time. All study procedures were approved by NSW Health Human Research Ethics Committee.

Statistical analyses

Descriptive statistics were examined for differences in data collected at baseline and follow-up research interviews. Among those completing follow up, changes in continuous measures at baseline, post-training and follow up were analysed using repeated-measures analysis of variance. To test change in odds of endorsing the attitude statements (via the Opioid Overdose Attitudes Scale) over the three-time points we used logistic mixed-effects model for repeated measures regression. In these models time, a three-level, categorical, within-subjects variable (pre-ORTHN vs. post-ORTHN vs. follow up) was the only fixed factor, with participant ID the random factor. Comparisons of odds of endorsing the statement were tested for each of the three pairwise combinations within the time variable. *P*-values were corrected for type-1 error using the Benjamini–Hochberg procedure. Regression coefficients were population-averaged rather than cluster specific [21]. The 95% confidence intervals for the odds ratios were obtained from taking the 95% intervals of 10 000 bootstrapped samples.

Results

Characteristics of staff credentialed to provide ORTHN interventions

Two hundred and four staff were credentialed to provide ORTHN interventions (including the train-the-trainers)

under the clinical protocol. As shown in Figure 1, prior to beginning the ORTHN intervention, 204 participants completed the pre-training questionnaire. Immediately following the completion of the ORTHN intervention, 175 participants completed the post-training questionnaire. Approximately 6–9 months after completing the post-training questionnaire, 82 participants completed the follow-up questionnaire (response rate of 40%). Due to an earlier version of the baseline survey missing a question, and some difficulties matching participant answers, there were lower sample sizes for some measures (indicated below).

Of those who completed the pre-training survey, most credentialed staff were nurses (73/121, 60%), with allied health and needle syringe program workers together accounting for 32%. Most staff (63%) had not been previously trained in delivering THN interventions—and almost all of those who had been previously trained worked in two particular services (South East Sydney Local Health District and Uniting Medically Supervised Injecting Centre). The largest proportion of staff was from opiate treatment programs (62/150, 41.3%) followed by AOD withdrawal treatment settings (25/150, 16.7%), with needle syringe/outreach programs comprising 8.7%. The majority of staff (63.0%) had never delivered a THN intervention to a client previously, and few (15/119, 12.6%) had delivered THN interventions on five or more occasions. Most staff (61%) had attended an overdose previously, and 34% had previously administered naloxone (in a health service setting). See Table S1 for more information. Analysis by type of staff (AOD worker, NSP worker or ‘other’) indicated no significant differences in knowledge or attitudes in subsequent analyses.

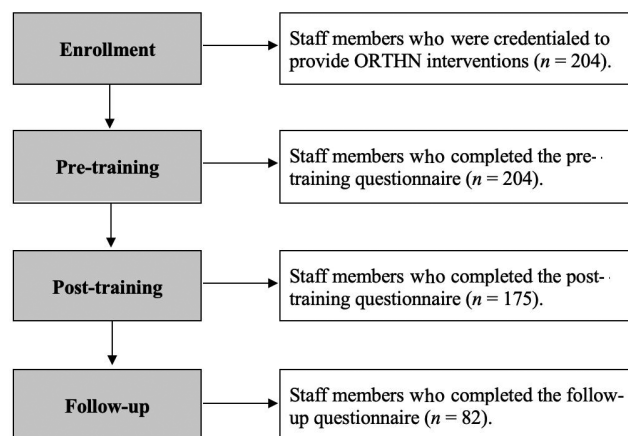


Figure 1. Flowchart of staff member participation in the ORTHN intervention, and the number of staff who completed the study questionnaire at three-time points (pre-training, post-training and follow up).

Knowledge and attitudes of staff regarding overdose and THN programs

Table 1 shows the composite scores regarding overdose knowledge (overdose risks, signs, responses, naloxone and ‘essential’ scores) and repeated measures data for the participants completing the pre-, post- and follow-up questionnaires. There were significant knowledge improvements post-training, but this was not consistently retained at the follow up (as indicated by significant quadratic contrasts). There was also a decline in knowledge from post-training to follow up for the ‘essential’ questions; although the follow-up scores were still higher than at baseline. See Table S4 comparing knowledge at each time point.

For six of the nine attitude statements taken from the Opioid Overdose Attitudes Scale there were significant increases from pre- to post-training and from pre-training to follow up in odds of endorsement (Figure 2a-f and Table S5, for odds ratios, confidence intervals and *P*-value associated with each analysis).

These were statements expressing confidence in knowledge of naloxone administration and about how to advise clients about use of naloxone (Figure 2a-d; ‘I have a working knowledge of how to prevent and manage an opioid overdose’; ‘I can appropriately advise clients about opioid overdose prevention and management’; ‘I have a working knowledge of how to use naloxone in an opioid overdose’; ‘I can appropriately advise clients about using naloxone in an opioid overdose’) a statement expressing respondents’ opinions about their service’s responsibility to provide clients with naloxone (Figure 2e: ‘My service has the responsibility to provide clients with the option of naloxone to manage opioid overdose’), and a statement concerning the appropriateness of discussing overdose prevention with clients (Figure 2f: ‘My clients believe that it is appropriate for me to talk to them about overdose prevention and management’). All attitude statements were endorsed by more than 93% of respondents at both post-training and follow up (see Figure 2 and Table S5) and hence there were no significant changes

Table 1. Staff knowledge (opioid overdose knowledge scale) towards overdose and take-home naloxone over three-time points (pre-training, post-training and follow up)

	Pre-training (total correct score mean ± SD)	Post-training (total correct score mean ± SD)	Follow up (total correct score mean ± SD)	Repeated measures across the three-time points
Overdose risk knowledge score/7; <i>N</i> = 78	6.46 ± 1.03	6.87 ± 0.47	6.34 ± 1.77	Overall $F(2,154) = 4.30$, $P = 0.02$ Quadratic contrast $F(1,77) = 12.63$, $P = 0.001$
Overdose signs knowledge score/7; <i>N</i> = 78	5.43 ± 0.83	5.73 ± 0.68	5.37 ± 1.31	Overall $F(2,154) = 3.88$, $P = 0.02$ Quadratic contrast $F(1,77) = 8.87$, $P = 0.004$
Overdose response total score/12; <i>N</i> = 52	11.21 ± 1.19	11.89 ± 0.32	11.71 ± 0.78	Overall $F(2,102) = 9.63$, $P < 0.001$ Linear contrast $F(1,51) = 7.45$, $P = 0.009$ Quadratic contrast $F(1,51) = 13.88$, $P < 0.001$
Naloxone knowledge total score/4; <i>N</i> = 68	3.28 ± 0.88	3.90 ± 0.31	3.74 ± 0.51	Overall $F(2,134) = 20.60$, $P < 0.001$ Linear contrast $F(1,67) = 15.56$, $P < 0.001$ Quadratic contrast $F(1,67) = 30.86$, $P < 0.001$
Essential knowledge score/9; <i>N</i> = 52	8.45 ± 1.12	8.89 ± 0.32	8.75 ± 0.62	Overall $F(2,104) = 5.37$, $P = 0.006$ Linear contrast $F(1,52) = 4.91$, $P = 0.031$ Quadratic contrast $F(1,52) = 5.85$, $P = 0.019$

in odds of endorsement from post-training to follow up for any of the attitude statements. There were also no significant differences identified regarding type of staff ('AOD worker', 'NSP worker' or 'other'). The statements that showed no significant increase in odds of endorsement were those that already had high levels of endorsement at baseline (Figure 2g-i). For full details of these analyses see Table S4.

Staff perceptions regarding ORTHN interventions and program

Identifying barriers and enablers of THN uptake. Staff responses to perceived barriers and enablers to THN interventions were asked immediately before training, and again at the follow-up period. At both time points, respectively, the five priority issues identified by staff were 'Training of workers' (97%, 98%), 'Support of service leaders' (92%, 97%), 'Standing order to allow supply of naloxone without a doctor or pharmacist' (92%, 97%), 'Guidelines on how to provide THN' (91%, 96%) and consumer /peer worker advocacy (90%, 97%). Other factors such as cost to the service (77%) or client (84%), or down-scheduling (75%) were less important to staff.

Staff identified a number of concerns regarding THN interventions in their setting—most notably 'insufficient time and increased workload for staff' (identified by 52% at follow up). Some staff also identified concerns such as cost of the medication (22%), clients being uncomfortable talking about their substance use (19%), or that THN 'does not address the cause of overdose' (18%), and 'concerned it may increase other OD risks such as not calling an ambulance' (15%). These perceptions did not change over the course of the study period. Despite these concerns, very few staff identified these factors to be outright impediments to delivering ORTHN interventions. Furthermore, there was endorsement by the vast majority of staff of the potential benefits of THN programs, including 'Save lives' (96%), 'Empowers clients to address overdose' (96%), 'Increases engagement with your service' (90%) and 'Improves relationship with your clients' (92%).

Delivering the ORTHN interventions. Most responders to the follow-up questionnaire indicated they provided ORTHN intervention during the study period (78/99, 78.8%), whereas (21/99, 21.2%) indicated they had not. Of those who responded ($n = 67$), they estimated providing a mean \pm SD of 8.7 ± 9.2 ORTHN interventions each during the study period (median = 6, range 1–50).

Staff were asked to rate overall satisfaction with the ORTHN clinical intervention in its current form,

using a Visual Analogue Scale (0 = completely dissatisfied, 100 = completely satisfied), with a mean \pm SD response of 83 ± 15 , median = 85, range 20–100.

Staff perceptions on the ORTHN training and credentialing program. Staff were asked to rate their satisfaction with the ORTHN training and credentialing program in its current form, using a Visual Analogue Scale (0 = completely dissatisfied, 100 = completely satisfied). The mean \pm SD response ($n = 101$) was 83 ± 17 , median = 87, range 30–100. Almost all staff (99/104, 97.1%) either 'Strongly agreed' or 'Agreed' that the ORTHN training 'equipped me with enough knowledge and skills to deliver ORTHN to my clients', while only two of 104 were 'Uncertain'.

Staff responses regarding the need for each of the ORTHN credentialing criteria indicated strong endorsement for the existing credentialing criteria. Specifically, staff either agreed or strongly agreed that: training should be mandatory prior to being allowed to deliver THN (95/104, 91.3%); past experience delivering brief interventions with this client population (73/103, 71%) and a current certificate in adult basic life support (75/104, 72.1%) should be existing competencies; and that appropriate knowledge, skills and attitudes should be assessed prior to receiving credentialing to deliver ORTHN (87/104, 83.7%).

Cost of delivering ORTHN interventions

We can estimate the average of cost of delivering THN interventions in established services as the sum of the cost of the naloxone, and the cost of staff time to deliver the intervention. In Australia at the time of the study, naloxone formulations cost approximately \$(AUD)50 per unit, while we can estimate staff costs at approximately \$(AUD)25 per intervention—calculated as 30 min of staff time earning approximately \$50 per hour (based on average earnings for nurses, allied health and NSP workers at the time of the study, and the median response provided by staff as to how long it took them to provide ORTHN to clients; range was <10 min to >30 min).

Discussion

The ORTHN project developed, implemented and evaluated a clinical intervention for a THN intervention suited to clients attending services such as AOD treatment, needle and syringe programs and related health-care services (e.g. supervised injecting facilities). A 'train-the-trainer' model was adopted to ensure

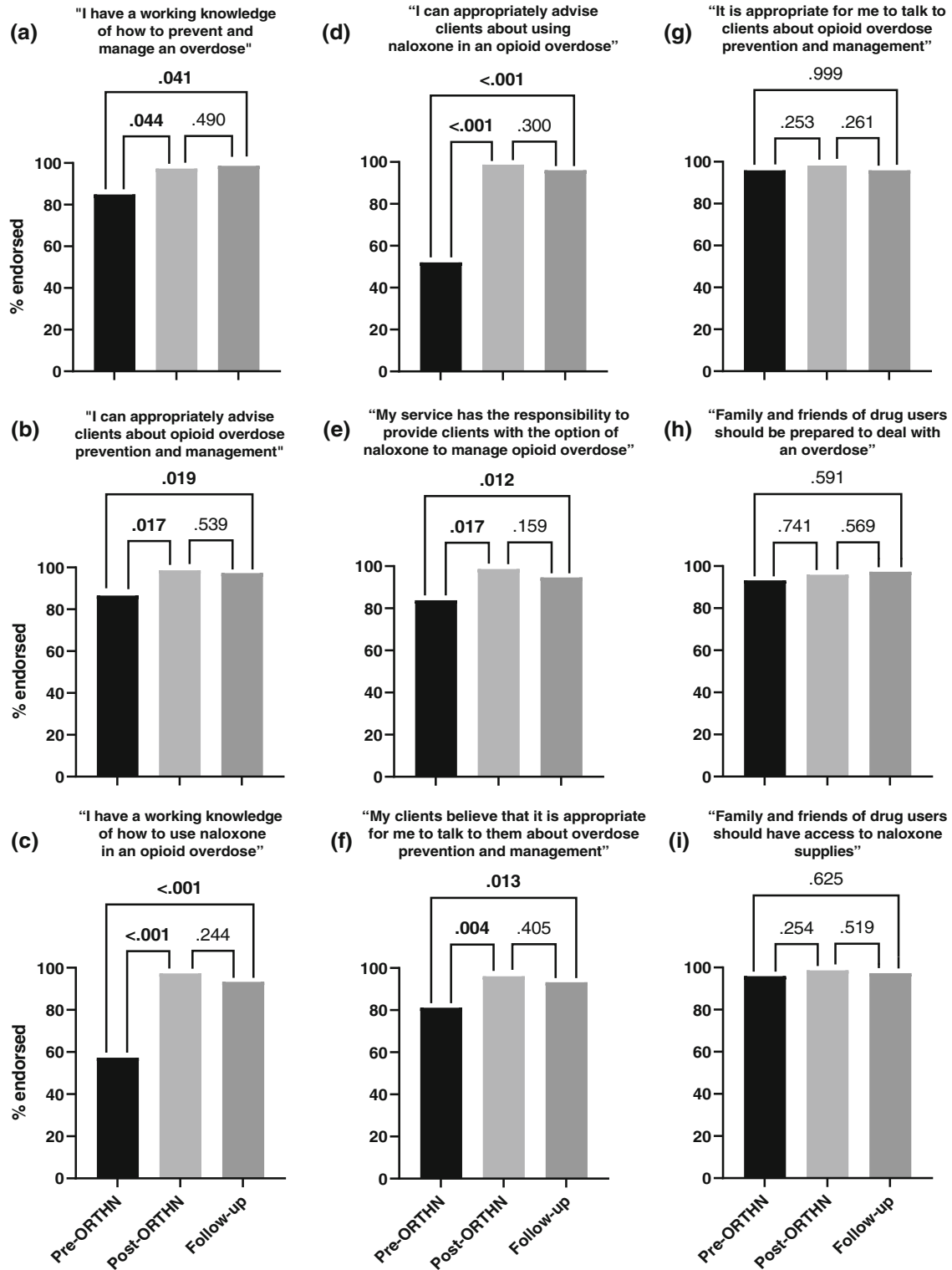


Figure 2. Comparison of staff attitudes (proportion agree/strongly agree) before, immediately after training and at follow up (modified opioid overdose attitudes scale responses).

widespread uptake of the intervention by staff, and the credentialing process allowed a broader range of health workers to be eligible to supply the medication. In this

article, we examined staff attitudes and perspectives on the ORTHN intervention and its delivery and detail how many positive elements of the program were

identified, including high levels of endorsement for the effectiveness of THN (e.g. 'saves lives' and 'empowers clients'), and staff in these settings were overwhelmingly supportive in providing THN interventions.

Our findings are particularly relevant for some of the settings—such as needle syringe programs where supply of medications (and related need for clinical documentation) has not typically previously occurred. Despite responses close to ceiling at baseline, the training significantly enhanced staff knowledge and attitudes, with high levels of trainee satisfaction. These improvements are in line with other studies where knowledge and attitude improvements were observed after staff training [12]. Although some/all of the knowledge enhancements were not retained over time, it should be noted that baseline knowledge levels were very high, and remained high at 6 months, although there was some reduction in knowledge at follow up. Importantly, the mean scores for the domains of 'overdose response', 'naloxone knowledge' and 'essential knowledge' scores did not deteriorate markedly at follow up. Nevertheless, these findings suggest access to refresher training may be important for some staff. The sustained attitude improvements are important for continued uptake of the program. In previous research, while intentions and confidence to provide THN in future have been collected [12], our study adds to the literature by demonstrating a high rate of follow through of intentions: specifically, at follow up 79% of staff had provided at least one THN during that time period. We believe that the high provision rates are related not only to sustained positive attitudes, but also the rigorous training and credentialing program ensuring staff had the appropriate skills to provide THN.

The training and credentialing program for health workers was also evaluated by staff as being appropriate to its aims—with high levels of endorsement for the credentialing criteria, and for the training program itself. In line with limited previous research in this area, key concerns and barriers to uptake included insufficient time and workload, as well as concerns about whether THN may increase other risks (e.g. not calling an ambulance) and that it does not adequately address the broader patterns of substance use [14–17]. Although many of these potential barriers were addressed during the staff training, further attention may be required on these issues in future training initiatives, particularly in health settings less focussed in working with this client population (e.g. hospital emergency departments, general practice, or community pharmacy settings).

A further concern highlighted in the current study included the perception that a small minority of staff indicating that they believed some clients would be uncomfortable discussing their substance use and some

potential overdose risks. This finding suggests further education of staff on how to raise overdose prevention with clients, including addressing the perception that clients will not be receptive and highlighting the evidence that suggests people trained do not engage in riskier substance use [9]. An additional concern raised by some workers related to medication costs to the service and consumer, an issue that needs to be resolved by policy makers seeking to implement THN.

Another issue to be addressed is appropriately prioritising and resourcing staff to deliver THN interventions. Staff identified most THN interventions took 10–30 min to deliver, which may be a barrier in settings with pressing workforce demands (e.g. hospital emergency departments) or where staff are otherwise not reimbursed for delivering such interventions (e.g. community pharmacies). Coffin and Sullivan [22] have previously estimated that one death is prevented for every 227 naloxone kits distributed (95% confidence interval 71–716). At an average cost of approximately \$AUD75 per THN intervention, our study suggests a cost of \$17 025 (95% confidence interval \$5325–\$53 700) to prevent a death from overdose with THN, representing a very cost-effective approach to reducing mortality, even when factoring in time for health-care professionals to deliver the intervention.

This study is not without limitations. Sample sizes varied depending on questions due to some questionnaire design and follow-up limitations, which may have impacted the power to detect significant effects for some measures and may have introduced some bias into the results. Another potential for biased answers may be through staff who did not want to say their true attitudes about providing naloxone or their thoughts on the training; however, hopefully the anonymity of the survey was able to reduce this bias potential somewhat.

It is also possible that staff type/service (e.g. AOD staff and harm reduction staff) had different attitudes and prior experiences with naloxone and general perceptions about substance use, leading to different reactions to this training program. Therefore, in future research, it would be useful to further explore how staff in different roles and at different services perceive the training. In addition, we do not have an objective report of staff practices post-training, only a self-report of numbers of THN interventions provided. Future studies seeking to replicate this project should consider comparing subjective and objective reports of staff practice.

Conclusion

In conclusion, the results of the evaluation demonstrated that the current ORTHN training and

credentialing program increased staff knowledge and changed staff attitudes, with high levels of staff satisfaction, and a favourable cost profile. Important enablers identified by staff included the role of training, guidelines and the ability to supply naloxone without the need to involve medical practitioners or pharmacists. Remaining barriers around staffing workloads, medication costs and addressing staff concerns regarding the potential for increased risk behaviours should be considered in future THN program development.

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Conflict of Interest

The authors have no conflicts of interest.

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's website:

Appendix S1: Staff follow up survey.

Table S1. Staff demographics (pre-training survey).

Table S2. Summary of Overdose Response with Take Home Naloxone (ORTHN) staff credentialing process.

Table S3. Overdose Response with Take Home Naloxone checklist and record of supply.

Table S4. 'Paired' samples of staff knowledge (Opioid Overdose Knowledge Scale) towards overdose and

take-home naloxone over three-time points (pre-training, post-training and follow up).

Table S5. Staff attitudes (Opioid Overdose Attitudes Scale) towards overdose and THN over three-time points (pre-training, post-training and follow up).