

Relationship Between Clinician-Level Attributes and Implementation Outcomes From The Pathways To Comorbidity Care Training Program

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Abstract

Background

A more nuanced understanding of the interrelationships between clinician-level factors and implementation outcomes may enhance the utility of evidence-based practice implementation strategies. The Pathways to Comorbidity Care (PCC) training program [1] aimed to facilitate integrated management of comorbid drug and alcohol and mental disorders amongst drug and alcohol clinicians. We hypothesised that implementation outcomes would be associated with clinician-level: (i) demographics (gender, education, experience), (ii) attitudes (evidence-based practice, therapist manuals, counselling self-efficacy), and (iii) organisational readiness to change.

Methods

Twenty clinicians participated in the 9-month PCC training program. Attitudes towards evidence-based practices and psychotherapist manuals, self-efficacy, and organisational readiness to change, along with demographics, were measured at baseline. At follow-up, change in *Comorbidity Practice (CoP)* scores related to integrated comorbidity management were obtained using a file audit checklist and categorised into *high* (at least 60% increase in CoP), *medium* or *low* (a decrease of -20% or less in CoP). Clinician-level characteristics were examined across the implementation categories.

Results

There were no significant differences found between implementation groups on sociodemographic variables (p 's > 0.30), attitudes to evidence-based practices, attitudes to therapist manuals, and self-efficacy (p 's > 0.52). The high implementation group demonstrated significantly higher scores on *leadership practices* aspect of organisational readiness to change relative to the low and medium implementation group (($F(2, 16) = 3.63, p = 0.05$; Cohen's $d = .31$) but not on the other subscales (p 's > 0.07).

Conclusions

Confidence that leadership will play a positive role in the implementation process may improve effectiveness of comorbidity training programs for drug and alcohol clinicians. On the other hand, contrary to our hypothesis, counselling self-efficacy, evidence-based practice attitudes, attitudes towards therapist manuals, gender, education and experience were not distinguishing factors.

Background

There is a growing consensus in the literature regarding the role of innovation implementation in improving public healthcare provision [2–7]. These implementation processes are particularly challenging within the human services, where technological innovations are delivered by individuals and organisations operating within complex and multi-level systems of influence [4, 8]. The drug and alcohol treatment setting exemplifies this complexity [9]. While there are many factors that may mediate the process of implementing evidence-based practices (EBPs) in drug and alcohol treatment settings, it is important to consider that the decision to adopt and implement a new EBP lies with the individual clinician [10]. Research into the effects of provider-level characteristics on implementation outcomes within substance use disorder settings is limited [11]. One approach has been to examine the extent to which these factors influence treatment delivery fidelity of evidence-based interventions following implementation efforts.

From a theoretical perspective, social cognitive theories have been widely used to explain health-related behaviours of individuals [12]. Although very little research has applied social cognitive theories to the study of health practitioner behaviour [13], research evaluating EBP implementation in drug and alcohol settings has often been guided by the assumption that clinician factors have an important relationship to implementation fidelity [14]. Clinician factors most frequently measured in such studies include demographics (e.g. gender, age, experience, education, [15–30]), knowledge [22, 28, 30] and attitudes [15, 18, 19, 23, 24, 26]). Organisational change theories such as Rogers' [31] diffusion of innovations theory have also highlighted the importance of clinician perceptions of the capacity of their organisation to support and implement new innovations, and drug and alcohol clinician perceptions of factors related to their organisational context have been evaluated as a possible mediator of implementation fidelity [15].

While clinician demographics have frequently been included in studies investigating factors related to implementation fidelity in drug and alcohol contexts, significant relationships are not often found [14]. Some studies have indicated that higher levels of education are associated with higher fidelity [15], that this distinction is sometimes no longer present following training [25], and that clinicians with lower levels of education can demonstrate greater increases in implementation fidelity following training [16]. Years of experience [32] and gender [20] have also been found to influence implementation fidelity.

Outcomes of studies investigating the relationship between drug and alcohol clinician knowledge and attitudes and implementation fidelity have also been mixed. Findings demonstrating a relationship between clinician knowledge and implementation outcomes have emphasised the importance of increased knowledge and optimism about treatment outcomes [33], and increased knowledge acquisition and retention skills [34]. Findings related to salient attitudes have found that low endorsement of disease belief models [15], higher self-efficacy [19, 35] and an increased belief in the efficacy of the intervention [19] have implications for implementation outcomes. Furthermore, studies have shown that clinicians who are prepared for change and who have positive attitudes to EBP [15, 36–38], and treatment manuals [32] are more likely to implement such practices. On the other hand, evidence suggests that attitudes such as interest, confidence, and commitment to EBPs do not have a strong relationship with treatment fidelity

[18, 39, 40]. Clinician perceptions of the organisational climate comprise a distinct set of beliefs found to influence implementation outcomes in drug and alcohol settings [40, 41].

The Pathways to Comorbidity Care (PCC) project evaluated the implementation of a multi-modal training package designed to improve *Clinician Practice* (identification and treatment), confidence (self-efficacy), knowledge and attitudes to comorbid substance use and mental disorders [42]. We have previously reported that the training package improved the percentage of clinical files demonstrating identification and management of comorbidity, self-efficacy, and attitudes toward screening and monitoring of comorbidity [43]. Barriers and facilitators of the PCC program have also been reported previously [44]. Specific facilitators of the implementation included characteristics of the intervention (credible source, uncomplicated approach, convincing evidence and quality design), a good consideration of patient needs, factors within the organisation (positive learning environment, leadership engagement), and the use of clinical champions. Mixed results were found with regards to clinician characteristics whereby self-efficacy was a strong facilitator, while specific personal beliefs and attitudes were implementation barriers [44].

Given inconsistencies in the existing literature regarding the role of clinician demographics and attitudes in facilitating implementation, in this study we aimed to examine the relationship between clinician characteristics on EBP implementation in the PCC program. We hypothesised that high implementation would be associated with characteristics across three domains: (i) demographics (gender, education, experience), (ii) attitudes (attitudes to evidence-based practice, attitudes to therapist manuals, counselling self-efficacy), and (iii) perceptions of organisational readiness to change.

Methods

Details of this multi-modal training package have been published previously [45].

Recruitment

The study was approved by the Human Ethics Review Committees of the Sydney Local Health District, South Western Sydney Local Health District, Central Coast Local Health District, Hunter New England Research Ethics and Governance Office which covered two participating services, and Mid North Coast Local Health District (X16-0440 & HREC/16/RPAH/624).

Six outpatient and community drug and alcohol services within the NSW Health system in New South Wales, Australia, participated in the Pathways to Comorbidity Care (PCC) project. Three of the six services participated in the PCC training program and the remaining three formed the control group for the study. Findings reported here only pertain to the PCC training group.

In total, 29 eligible clinicians from the PCC training group returned consent forms. Of the 29 participants initially enrolled in the study, 20 completed the study. Clinicians in the PCC condition completed baseline and follow-up assessments, including an interview related to their participation in the training. All sites

provided clinical notes at baseline and follow-up, which were used to assess practice change. Only the baseline assessment and practice change assessment are examined in this study.

Measures

A comprehensive account of assessments has been provided previously [1]. Measures relevant to this study include: the adapted version of the Personnel Data Inventory (an index of demographic and professional information; [41]); the Evidence-Based Practice Attitudes Scale (EBPAS; [46]) which evaluates four aspects of attitude towards evidence based practice (i.e. intuitive appeal, likelihood of adopting if required to, openness to new practices and perceived divergence of practice with evidence-based practice); the Survey of Attitudes to Therapist Manuals (SATM) which addresses experience with treatment manuals, attitudes towards treatment manuals, and beliefs about the content of treatment manuals [47]; the Addiction Counseling Self-Efficacy Scale (ACSES: [48]) which assesses self-efficacy of treating comorbid drug and alcohol and mental health problems; and the Organizational Readiness for Change Assessment Tool (ORCA: [49]) which measures organisational readiness for implementing practice change in healthcare settings. File audits of clinical notes made during the three months prior to baseline and follow-up (10 files per clinician) were evaluated using a checklist for Comorbidity Practice (CoP). This checklist assessed four relevant practice themes for presence and quality: screening, assessment, treatment and referral.

Analysis

Participants were divided into *low*, *medium* and *high* implementers based on the degree of change in CoP between baseline and follow-up. CoP scores were derived from file audits of clinical notes (10 per clinician at each time point), which were evaluated using a checklist of important practice themes (screening and monitoring, assessment, treatment and referral) by one researcher and one clinician (clinical supervisor). Previously studies of the PCC program have evaluated Clinical Practice by determining the percentage of total clinical files demonstrating identification and treatment of comorbidity over a set rate. For the current study, we assessed clinical practice change in greater depth by deriving a *Comorbidity Practice* score from the presence and quality of a checklist of integrated comorbidity management themes in clinical files. For each theme, scores ranged from “0” not present, to “1” evidence of practice theme but lacking subsequent details, to “2” a detailed account of the practice theme. Scores for each clinician and set of files were then discussed and an agreement reached in cases where the scores did not align. A total CoP score was calculated by creating a composite of the four themes.

Low, medium and high categories were derived using binning, and it was determined that a conservative significance level of $p < .01$ would be required between groups to ensure that they were distinct. Following binning, 5 categories were identified. The highest only included one participant and was therefore grouped with category 4. Category 2 and 3 did not differ significantly enough and were also combined. The three categories created through this process (*low*, *medium* and *high*) were distinctly different. The low group included participant with CoP scores that had changed by -20% or less following training, the

high group included participants with CoP scores that had changed by 60% or more following training, and the medium group included participant between these extremes.

Continuous and categorical variables were examined using ANOVAS and Chi square tests respectively to examine differences between high, medium and low implementation groups for baseline CoP scores and across the three domains: demographics (age, sex, education, and professional role); attitudes (evidence-based practice attitudes (EBPAS), attitudes towards therapist manuals (SATM), addiction counselling self-efficacy (ACSES)); and perceptions of organisational readiness to change (organisational readiness to change (ORCA)). Between group differences on these scales were evaluated using effect sizes (Cohen's d) and 95% confidence intervals. Data were analysed using SPSS 28 for Mac OSX.

Results

Sample Characteristics

Implementation change scores were derived from measures of CoP obtained from participants across all 3 PCC sites. The 20 clinicians that participated in the PCC training were grouped according to distinct patterns of change in CoP ($N = 4$ low implementation, $N = 10$ medium implementation, $N = 6$ high implementation). Baseline clinician-level characteristics are displayed in Table 1. The overall mean age was 51.53 ($SD \pm 8.14$) years, 75% were female. Most participants had completed a university degree (60%). The most common professional role was psychologist (45%) and the mean number of years since graduating was 15.46 ($SD \pm 8.88$).

Table 1
Baseline Characteristics of High, Medium and Low Implementers

Variable	High Implementers (n=6)	Medium Implementers (n=10)	Low Implementers (n=4)
Age (m, SD)	51.33 (8.98)	51.00 (8.62)	52.75 (8.22)
Gender (%)			
Male	33.3	11.1	50
Female	66.7	88.9	50
Geographic location (%)			
Metro	50	88	50
Regional	50	12	50
Years since graduating (m, SD)	19.33 (10.50)	15.00 (10.27)	15.00 (5.29)
Highest level of education (%)			
Bachelor's Degree	83.3	55.6	50
Post-graduate Degree	16.7	44.4	50
Occupation (%)			
Psychologist	16.7	55.6	50
Social worker	33.3	-	25
Counsellor	-	22.2	25
Case worker	16.7	11.1	-
Nurse	16.7	11.1	-

Note. Data represent mean \pm SD unless otherwise noted.

Comorbidity Practice implementation scores

CoP scores are presented in Table 2. Across the entire sample, the mean CoP score at baseline was 1.02 ($SD \pm .83$) and 1.25 ($SD \pm .81$) at follow-up, with an overall mean increase of 23% from baseline. There was a 58% increase in assessment of comorbidity at follow-up along with a 35% increase for screening, 18% for treatment and 4% for referral. Differences in baseline CoP scores between the three implementation groups were not significant ($X^2(2, N = 18) = 3.32, p = 0.06$). The high implementation group demonstrated an increase in CoP of 75% following training, compared with 27% for the medium group and a decrease of 22% in the low group.

Table 2
Comorbidity Practice (CoP) scores for High, Medium and Low Implementers

Variable	High (n=6)	Medium (n=10)	Low (n=4)	Total (n=20)
CoP Baseline score				
Screening	.25 (0.22)	.09 (0.06)	.49 (0.42)	.23 (0.26)
Assessment	.11 (0.15)	.05 (0.06)	.31 (0.45)	.12 (0.23)
Treatment	.30 (0.27)	.41 (0.46)	.72 (0.51)	.44 (0.43)
Referral	.31 (0.24)	.13 (0.08)	.32 (0.53)	.23 (0.27)
Total score	.99 (0.76)	.67 (0.42)	1.83 (1.22)	1.02 (.83)
CoP Follow-up score				
Screening	.54 (0.35)	.11 (0.11)	.38 (0.34)	.31 (0.31)
Assessment	.27 (0.25)	.09 (0.12)	.29 (0.37)	.19 (0.23)
Treatment	.55 (0.38)	.46 (0.54)	.60 (0.77)	.52 (0.52)
Referral	.38 (0.25)	.19 (0.11)	.15 (0.17)	.24 (0.19)
Total score	1.73 (0.75)	.85 (0.45)	1.42 (1.18)	1.25 (.81)
CoP Change (%)				
Screening	116.00	2.00	-22.45	34.78
Assessment	145.46	80.00	-6.45	58.33
Treatment	83.33	12.20	-16.67	18.18
Referral	22.58	46.15	-53.13	4.35
Total score	74.75	26.87	-22.40	22.55

Note. Data represent mean \pm SD. CoP scores indicate the degree of detail in CoP themes found in clinical notes. Scores range from 0 to 2. Total CoP score represents the sum of each aspect. CoP Change represents the percentage of change in in CoP scores following training. CoP = Comorbidity Practice. This checklist assessed four relevant practice themes for presence and quality: screening, assessment, treatment and referral.

Clinician-level factors and association with implementation scores

There were no significant differences between high, medium and low implementation groups regarding gender ($X^2(2, N = 19) = 2.38, p = 0.30$), education ($X^2(4, N = 19) = 2.55, p = 0.57$) or occupation ($X^2(5, N =$

19) = 8.14, $p = 0.42$) at baseline. Likewise, no differences were found between high, medium and low implementation groups in age or experience ($F_s < 0.42$). Comparisons between high, medium and low implementation groups on clinician attitudes and perceptions at baseline are presented in Table 3. There were no significant differences between high, medium and low implementation groups on the EBPAS ($F(2, 16) = .22, p = 0.81$), the SATM positive scale ($F(2, 16) = 0.01, p = 0.99$) and negative scale ($F(2, 16) = 0.08, p = 0.92$) or the ACSES ($F(2, 16) = 0.69, p = 0.52$). Although there was also no significant difference between groups on the total ORCA ($F(2, 16) = 2.37, p = 0.13$), or on subscales including *leadership culture* ($F(2, 16) = 3.21, p = 0.07$), *staff culture* ($F(2, 16) = 0.61, p = 0.56$), *measurement* ($F(2, 16) = 1.30, p = 0.30$), *opinion leaders* ($F(2, 16) = 0.40, p = 0.68$) and *resources* ($F(2, 16) = .08, p = 0.92$), there was a significant difference found between groups on the *leadership behaviour* subscale of the ORCA ($F(2, 16) = 3.63, p = 0.05$; Cohen's $d = 0.31$). A Tukey' HSD test for multiple comparisons revealed that *leadership behaviour* was significantly different between high and low implementers ($p = 0.05$, 95% C.I. = -14.03, 0.04). There was no significant difference between high and medium ($p = 0.09$), or medium and low implementation fidelity groups ($p = 0.85$).

Table 3

Effect Size Comparisons of Baseline Psychometric Variables between High, Medium and Low Clinical Practice Implementers

Baseline	High (n=6)	Medium (n=9)	Low (n=4)	Effect size (d), (95% CI)
	Mean (SD)	Mean (SD)	Mean (SD)	
EBPAS total	59.17 (10.05)	58.56 (6.89)	62 (11.02)	.03 (55.41-63.54)
PATM negative	29.67 (6.59)	29.78 (8.80)	30.50 (9.98)	.00 (22.74-36.59)
PATM positive	22.33 (4.23)	23.25 (3.92)	22.25 (7.32)	.01 (20.43-25.02)
ACSES total	117.33 (22.57)	120.56 (18.73)	131.00 (6.33)	.29 (112.98-141.02)
Organisational Readiness to change (context) Total	79.00 (14.93)	79.11 (10.86)	61.75 (19.48)	.23 (68.11-82.73)
Leadership culture	10.00 (6.75)	11.11 (2.26)	6.75 (4.57)	.29 (8.30-17.18)
Staff culture	15.67 (3.62)	15.56 (1.94)	14.00 (2.00)	.07 (14.04-16.49)
Leadership behaviour*	15.00 (3.03)	13.78 (3.70)	8.00 (6.58)	.31 (10.63-15.26)
Measurement	13.00 (3.58)	13.56 (2.24)	9.75 (7.14)	.14 (10.62-14.54)
Opinion leaders	14.17 (3.13)	14.22 (1.86)	13.00 (2.31)	.05 (12.83-15.07)
General resources	11.17 (2.79)	10.89 (4.20)	10.25 (2.63)	.01 (8.24-14.09)

Note. Data represent mean \pm SD. * $p < 0.05$, significant difference between groups, ANOVA. Abbreviations: EBPAS = Evidence-Based Practice Attitudes Scale (min 15 to maximum 75), SATM = the Survey of Attitudes to Therapist Manuals (Negative scale minimum 10 to maximum 50, Positive scale minimum 7 to maximum 35), ACSES = the Addiction Counseling Self-Efficacy Scale (minimum 32 to maximum 160), ORCA = the Organizational Readiness for Change Assessment Tool (minimum 23 to maximum 115).

Discussion

The aim of this study was to evaluate the effects of provider-level characteristics on clinical practice outcomes of the PCC program implementation, which involved clinicians practicing in drug and alcohol outpatient clinics. Contrary to previous findings (e.g. [15, 16, 20, 32]), gender, education, and experience

were not distinguishing factors in this sample. There was also no evidence to suggest that clinician attitudes toward EBP or therapist manuals had any implications for the uptake of the intervention, which contradicts previous conclusions that clinicians who are more open to new EBPs [15, 36–38], and who have positive attitudes towards evidence-based interventions and manuals [32] are more likely to utilise such practices, and adds weight to findings suggesting that commitment to EBPs may not have a strong relationship with implementation outcomes [18, 39, 40]. Likewise, unlike previous findings about the positive role of self-efficacy in improving implementation outcomes [19, 35], self-efficacy was not a distinguishing feature associated with implementation.

Interestingly, there was a relationship between implementation and leadership behaviour. Amongst the various components of ORC that have been cited in the literature as influencing staff adaptation to new innovations (e.g. positive organisational climate [50], valuing innovation, creative and supportive leadership, and staff attributes [51]), findings from this study contribute to evidence in favour of the importance of leadership. Specifically, clinicians who demonstrated the greatest changes in their comorbidity management practices strongly believed that senior leadership in their organisation effectively managed the continuous improvement of patient care, made the responsibilities of leadership and staff clear, actively promoted team cohesiveness and solved clinical care problems, and enhanced communication between relevant clinical services. This information is particularly helpful for developing implementation strategies, which may benefit from a better understanding of how individual clinicians perceive their leaders. These findings also emphasise the importance of engaging leadership when implementing a new EBP in drug and alcohol services, particularly with regards to the challenging area of comorbid drug and alcohol and mental health disorders.

Strengths and Limitations

Firstly, the current findings are limited by the small sample size. However, the broader sample was sourced from diverse geographic locations including a diverse representation of drug and alcohol outpatient clinicians across the Australian public health system. Secondly, the CoP outcome measure was based on the evaluation of clinician files rather than behavioural evaluations of comorbidity practice which may impact on the reliability of the measure. Nevertheless, the study does represent one of few attempts worldwide to evaluate the relationship between clinician-level factors and effectiveness of implementation of comorbidity training in the drug and alcohol field.

Conclusion

These preliminary results suggest that drug and alcohol clinicians' perceptions of their leaders has an influence on the extent to which they implement changes in their clinical practice following training and highlight the importance of engaging leadership in implementation efforts. In a broader sense, these findings challenge the notion that clinicians are largely responsible for barriers to implementation.

List Of Abbreviations

EBP = Evidence-based Practice, ORC = Organisational readiness to change, PCC = Pathways to Comorbidity Care, NSW = New South Wales, EBPAS = Evidence-based Practice Attitudes Scale, SATM = Survey of Attitudes to Therapist Manuals, ORCA = Organizational Readiness to Change Scale, ACSES = Addiction Counseling Self-Efficacy Scale, CP = Comorbidity Practice

Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

Not applicable

Availability of data and materials

Not applicable

Competing interests

The authors declare that they have no competing interests

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Author's contributions

The authors of this study are EL, VG, AB, GU, KW, MT, PH and KM. KM, AB, PH and MT conceptualised, led and designed the main study that this data was derived from. EL conceptualised the paper, led the analysis, interpretation and writing of manuscript. All authors read and approved the final manuscript.

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