



Comparative Effectiveness of Integrated Peer Support and Clinical Staffing Models for Community-Based Residential Mental Health Rehabilitation: A Prospective Observational Study

Stephen Parker^{1,2,3,5} · U. Arnautovska¹ · N. Korman^{1,2} · M. Harris⁴ · F. Dark^{1,2}

Received: 13 June 2022 / Accepted: 22 August 2022 / Published online: 3 September 2022
© The Author(s) 2022

Abstract

This observational study compared the outcomes of consumers receiving community-based residential mental health rehabilitation support in Australia under a clinical staffing model and an integrated staffing model where Peer Support Workers are the majority component of the staffing profile. Reliable and clinically significant (RCS) change between admission and discharge in functional and clinical assessment measures were compared for consumers receiving care under the clinical (n = 52) and integrated (n = 93) staffing models. Covariate analyses examined the impact of known confounders on the outcomes of the staffing model groups. No statistically significant differences in RCS improvement were identified between the staffing models. However, logistic regression modelling showed that consumers admitted under the integrated staffing model were more likely to experience reliable improvement in general psychiatric symptoms and social functioning. The findings support the clinical and integrated staffing models achieving at least equivalent outcomes for community-based residential rehabilitation services consumers.

Keywords Schizophrenia · Rehabilitation · Residential services · Peer support · Staffing model

Introduction

Contemporary community-based mental health residential rehabilitation services combine medium-to-long term accommodation with intensive rehabilitation and psychosocial support (Parker et al., 2019a, 2019b, 2019c). These services provide transitional residential rehabilitation (TRR) to people experiencing severe and persistent mental illness to enable them to live more independently in the community.

Most people accessing these services are diagnosed with schizophrenia and have complex care needs (Dalton-Locke et al., 2020; Parker et al., 2019a, 2019b, 2019c). Providing intensive support over an extended duration in a residential setting incurs high costs per episode of care (Parker et al., 2020). Despite the costs associated with these services, there have been limited comparative studies to establish their effectiveness (Dalton-Locke et al., 2020; Parker et al., 2019a, 2019b, 2019c), and TRR service capacity has expanded considerably in Australia over the last decade (Karan et al., 2022).

Australian TRR-type services have been adapted based on changing policy agendas and local service priorities. For example, services have generally shifted from a focus on providing a permanent residence to transitional support (Gerrand et al., 2007), increasingly emphasize recovery-oriented practice (McKenna et al., 2016), and are exploring novel staffing configurations with reduced emphasis on clinical roles (Karan et al., 2022; Parker et al., 2016; Saraf & Newton, 2017). Including staff with a lived experience of mental illness (Peer Support Workers, PSWs) in traditional clinical mental health services is increasingly encouraged in Australia (Saraf & Newton, 2017; State of Victoria, 2021).

✉ Stephen Parker
Stephen.parker@uq.edu.au

¹ School of Medicine, The University of Queensland, Brisbane, Australia

² Metro South Addiction and Mental Health Services, Woolloongabba, Australia

³ Metro North Addiction and Mental Health Service, Chermshire, Australia

⁴ School of Public Health, The University of Queensland, Brisbane, Australia

⁵ The Prince Charles Hospital, Chermshire, QLD 4032, Australia

One such approach is the 'integrated staffing model' (Karan et al., 2022). Under this model, PSWs, rather than mental health nurses, represent the majority staffing component and draw on their personal recovery experiences to support consumers. The integrated staffing model was not intended to alter the principles and objectives of TRR care (Parker et al., 2016).

While there has been strong advocacy for the benefits of incorporating PSW roles in mental health services, the supporting evidence is mainly qualitative, with largely equivocal findings emerging from quantitative studies (Lloyd-Evans et al., 2014; O'Connor et al., 2017). Furthermore, there are concerns about how efforts to integrate paid PSWs within routine mental health care might undermine the value derived from 'real-world interactions between people supporting each other with their emotional distress' (p342) (Gillard, 2019).

Qualitative research conducted at TRR units trialing the integrated staffing model found that consumers and staff held positive expectations of this approach (Meurk, Parker, Newman, & Dark, 2018; Parker et al., 2018, 2019a, 2019b, 2019c). Furthermore, 12–18 months following service entry, consumers supported under this staffing approach emphasized the value of PSW availability (Parker et al., 2021). A recent cross-sectional study in Queensland found that the integrated staffing model was associated with lower levels of restrictive practice, pharmacological treatment, and greater staff-rated consumer engagement than the clinical staffing model (Karan et al., 2022). The authors of this study emphasized the need for findings to be interpreted with caution as no inferences could be drawn as to whether the differential treatment was appropriate or preferable. No available research compares care outcomes between the integrated and clinical staffing models. Despite the limited quantitative evidence, the integrated staffing model was identified as 'show[ing] promise in supporting recovery-oriented practice and maximizing consumer choice and control' (p37) in a report commissioned by the 2020 Victorian Royal Commission into Mental Health (Harvey & Brophy, 2020). Before the broader dissemination of such an approach, it is critical to demonstrate that a substantial reduction in clinical staff within TRR services to accommodate PSW availability does not degrade the clinical and functional outcomes achieved.

Aims

This study considers whether clinical and functional outcomes differ between consumers admitted to community rehabilitation units operating the integrated and clinical staffing models. Given that the integrated staffing model was not intended to alter the core function of the service, we hypothesized that significant differences in outcomes between the staffing approaches would not emerge (Parker

et al., 2016). However, if differences are present, this would affect the optimal staffing approach for future services.

Methods

Data were collected as part of a mixed-methods evaluation of the comparative effectiveness of integrated and clinical staffing models for Community Care Units (CCUs; ethics approval HREC/14/QPAH/62) (Parker et al., 2016). A prospective observational design was used due to the ethical and clinical inappropriateness of randomized site allocation or waitlist control. Focusing on 'comparative effectiveness' followed the assumption of clinical equipoise at the policy level. Individualized change rather than group-level comparisons were chosen based on advocacy for this approach (Trauer, 2010) and its increasing use in similar contexts (Barbato et al., 2007; Gonda et al., 2012; Maxwell, Tsoutsoulis, Menon Tarur Padinjareveettil, Zivkovic, & Rogers, 2019; Murugesan et al., 2007). The ISPOR Task Force Report for comparative effectiveness research (Berger et al., 2012) and STROBE statement (von Elm et al., 2007) guided study reporting. Publications based on related data are available, including cohort description (Parker et al., 2019a, 2019b, 2019c), modelling predictors of unplanned discharge (Arnautovska et al., 2021), and qualitative research of stakeholder perspectives (Meurk et al., 2018; Parker et al., 2018, 2019, 2021).

Study Context

CCUs are the dominant community-based TRR service-type operated by public mental health services in Australia. These units provide living skills development and community integration support to consumers residing in independent living units (in a cluster housing configuration) over 6-to-24-months. Staff support is available 24-h a day.

This study considered data from consumers admitted across three CCUs in Queensland over 3-years (12/2014-to-12/2017). One site operated the clinical staffing model, and two operated the integrated staffing model. Under the clinical staffing model, nursing staff reflect most staff roles; there are also senior allied health practitioners and medical staff. Under the integrated staffing model, PSWs reflect the majority team component (> 50%), with a reduction in the number of nursing roles. PSW staff have their own leadership structure and draw on their lived recovery experience to support consumers and guide clinical staff toward recovery-oriented practices. There is no specified interventional framework for PSWs at the CCUs. However, a qualitative study provides a rich description of what PSWs perceived their roles to be, emphasizing self-disclosure and connection through 'shared engagement in everyday activities... providing authentic opportunities to support residents deal

with their experiences and fears... [building] relationships and trust... [and] reducing shame and isolation' (p5) (Wyder et al., 2020).

Participants

Consumers were admitted to the CCU closest to their most-recent principal residence and were included in the cohort if they provided consent and stayed beyond the assessment period (6-weeks, $n = 145/161$). Ninety-one percent and 89% of eligible clinical and integrated staffing model site consumers consented. Recruitment exceeded the target to achieve >80% power to detect a 15% difference in the Health of the Nation Outcome Scales (HoNOS) (Wing et al., 1998) set for the parent evaluation ($n \geq 100$) that was based on the treatment change observed in an Australian community residential step-up/down service (Siskind et al., 2013).

Data Collection and Measures

Unblinded trained multi-disciplinary team members completed an assessment battery on admission and discharge. Diagnostic and demographic information was collected at admission, and treatment-related variables were collected at admission and discharge (see Table 1). Based on the literature, a range of known confounders relevant to understanding rehabilitation outcomes were available in our data set (see Supplementary Materials 1).

The assessment battery included measures relevant to the real-world planning of rehabilitation care (Parker et al., 2016). These covered: functioning and disability (HoNOS, Social Functioning Scale (SFS) (Birchwood et al., 1990), Allen's Cognitive Levels (ACL) (Velligan et al., 1998), and Life Skills Profile-16 (LSP-16) (Rosen et al., 2001); clinical symptoms [Brief Psychiatric Rating Scale (BPRS-18) (Flemenbaum & Zimmermann, 1973), Scale for the Assessment of Negative Symptoms (SANS) (Andreasen, 1982), and Alcohol Use Disorders Identification Test (AUDIT) (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001)]; and, wellbeing/recovery (Mental Health Inventory (MHI-38) (Veit & Ware, 1983) and the Stages of Recovery Instrument (STORI-30) (Andresen et al., 2013). Measures were selected based on the availability of data to support their reliability and validity, as well as pragmatic considerations relevant to the service context (Parker et al., 2016).

Defining Reliable and Clinically Significant Change

Difference scores (admission-discharge) and subsequent analyses were conducted on measures with >50% of paired data. Where relevant, scores were transformed so that positive differences reflected improvement on all measures.

The reliable change index (RCI) was calculated using the Christensen and Mendoza formula (Christensen & Mendoza, 1986). The clinical significance of an individual discharge score was operationalized based on three cut-off methods (N. S. Jacobson & Truax, 1991): [Cut-off 1] More than 2 *SDs* from the dysfunctional population mean (i.e., cohort mean at admission); [Cut-off 2] Within 2 *SDs* of the functional population mean (i.e., normative data); and [Cut-off 3] Closer to the functional population mean than the dysfunctional population mean.

Normative data for Cut-offs 2 and 3 for HoNOS and LSP-16 came from a study of Australian individuals with a psychotic disorder accessing mental health services who had experienced at least one inpatient or emergency department admission within five years but none within six months ($n = 114$) (Maxwell et al., 2019). For BPRS-18 and SANS, normative data came from a study of community-dwelling individuals with clinically stable 'chronic schizophrenia' without admissions in the previous six months ($n = 120$) (Baynes et al., 2000). Relevant functional population data was not identifiable for the other measures; thus, only Cut-off 1 could be applied. Where skewed data limited the ability to interpret RCS based on Cut-off 1 meaningfully, RCS improvement was not considered (N. Jacobson et al., 1988).

Reliable and clinically significant (RCS) change was assumed where the change between admission and discharge score exceeded the RCI *and* crossed a clinical significance threshold (i.e., RCS improvement or RCS deterioration).

Analysis

Analyses were completed in IBM SPSS Statistics Version 27 (SPSS, 2017). Comparability of the three sites was supported by examining measures at admission using the Kruskal–Wallis test (Supplementary Materials 2). Data from integrated staffing model sites were merged for subsequent analyses.

Individual difference scores were categorized as 'reliable improvement' or 'no reliable improvement' (i.e., stable/deterioration) based on the RCI. The RCS improvement cut-off producing the largest proportion of improved consumers (Gonda et al., 2012) was used to categorize scores into 'improvement' and 'no improvement' for RCS change. Outcomes for the staffing model groups were compared using Chi-Square/Fisher's Exact tests, with effect size estimated using Cramer's V (Kim, 2017).

The impact of known confounders on the relationship between staffing model and reliable improvement was explored using binomial logistic regression modelling (see Supplementary Materials 1). Modelling was not undertaken for RCS improvement due to the low event rates. Independent variables (IVs) additional to the 'Integrated staffing model' entered in the final models were

Table 1 Features of the study sites, including characteristics of the clinical and integrated staffing models. Adapted from Parker et al. (2016)(Parker et al., 2016)

		Site 1	Site 2	Site 3
Staffing ^a	Model	Clinical	Integrated	Integrated
	Total FTE staff	21.6	24.5	18.4
	Total FTE peer-support staff	0.6	16	10.4
	Total FTE clinical staff	19.5	7.5	7
	FTE staff: Consumer ratio	1.08	1.23	1.15
	Peer support staff: Clinical staff ratio	.003	2.13	1.49
Location	Distance from state capital (km)	4.2	30.9	21.2
	Relative Socio-economic Disadvantage (2013) ^b	90	83	46
Referring district	Population	588,475	143,628	287,517
	Acute inpatient services	Yes	Yes	Yes
	Inpatient rehabilitation beds	No	Yes	No
	Community mental services	Yes	Yes	Yes
	Transitional housing team	Yes	No	No
	Community-based rehabilitation team	Yes	No	Yes
Philosophy of care	Mental health homelessness outreach team	Yes	No	Yes
	Recovery-oriented	Yes	Yes	Yes
	Strengths-based	Yes	Yes	Yes
	Designated rehabilitation focus	Yes	Yes	Yes
	Voluntary engagement in rehabilitation ^c	Yes	Yes	Yes
	Individualized care planning	Yes	Yes	Yes
Built environment	Transitional support	Yes	Yes	Yes
	Operational commencement	2012	2014	2014
	Maximum occupancy (consumers)	20	20	16
	Self-contained independent living units	20	20	15
	Disabled access units	1/20	1/20	1/15
Treatment/support	Shared recreation and leisure facilities	Yes	Yes	Yes
	Evidence based therapeutic group programmes ^d	Yes	Yes	Yes
	Individual psychotherapy support ^e	Yes	Yes	Yes
	Living skills support and development	Yes	Yes	Yes
	Peer support interventions and availability ^f	Limited	Prominent	Prominent
	Structured leisure and physical activities	Yes	Yes	Yes

^aStaffing profile as at 12/2014 (operational commencement of Sites 2 & 3), FTE=Full Time Equivalent staff

^bLocal Government Area (LGA) percentile rank of Relative Socio-economic Disadvantage in comparison to all other LGAs in Australia, higher number reflects lower levels of disadvantage (scale 0–100)

^cInvoluntary consumers are accepted, but with an explicit emphasis on voluntary engagement with available rehabilitation activities

^dGroup therapies include: CBT for Psychosis, Cognitive Remediation, and Social Cognition and Interaction Training

^eIndividual therapies include: Cognitive Behavior Therapy (CBT) and Motivational Interviewing

^fDetailed illustration of the nature of peer support work in practice at the integrated staffing model units is available in Wyder et al. (2021) (Wyder et al., 2020)

rationalized based on a threshold of $p < 0.200$ (Mickey & Greenland, 1989). All IVs were entered simultaneously. Where time-related covariates were included, interactions with staffing model were explored. Events-to-IVs ratios in the final models exceeded the acceptable minimum threshold (5:1) in assessing confounders (Vittinghoff & McCulloch, 2007).

Results

The sample included 145 consumers aged 18–59 years ($M = 31.4$, $SD = 9.0$, see Table 2). The median duration of CCU care was 303-days. Although there were no differences in the frequency of involuntary treatment on

Table 2 Characteristics of consumers by staffing model

	Clinical (n = 53)	Integrated (n = 92)	Total N = 145	Test statistic	p
Demographics	–	–	–	–	–
Age at admission (\bar{x} , years)	31.1 (8.7)	31.6 (9.2)	31.3 (9.0)	$t_{(143)} = -0.318$	0.751
Male sex	66.0%	78.3%	73.8%	$\chi^2_{(1)} = 0.120$	0.079
Australian born	86.8%	84.8%	85.5%	$\chi^2_{(1)} = 0.811$	0.472
Unemployment ^a	83.0%	90.2%	87.6%	$\chi^2_{(1)} = 1.603$	0.206
≤ 10-years formal education ^b	47.2%	59.8%	54.5%	U = 2133.500	0.212
Accommodation (most recent) ^c	–	–	–	Fisher's Exact	0.156
Living with family	59.8%	59.8%	58.6%	–	–
Income source ^d	–	–	–	Fisher's Exact	0.104
Disability support pension	67.9%	54.3%	59.3%	–	–
Primary diagnosis	–	–	–	–	–
F20-29.x Schizophrenia spectrum	71.7%	80.4%	77.2%	$\chi^2_{(1)} = 1.460$	0.227
Secondary diagnoses/issues	–	–	–	–	–
Substance use	37.7%	48.9%	44.8%	$\chi^2_{(1)} = 1.699$	0.192
Physical health issue ^e	22.6%	25.0%	24.1%	$\chi^2_{(1)} = 0.841$	0.457
Referral and treatment	–	–	–	–	–
Community-based referral ^f	56.6%	63.0%	60.7%	$\chi^2_{(1)} = 0.585$	0.445
Mean duration of CCU care (days) ^g	402.5	329.6	356.3	U = 2295.000	0.557
Involuntary treatment ^h on admission	52.8%	43.5%	46.9%	$\chi^2_{(1)} = .1.181$	0.277
Involuntary treatment at discharge	47.17%	30.43%	36.55%	$\chi^2_{(1)} = .4.061$	0.044
More restrictive status	3.77%	2.17%	2.76%	Exact ⁱ	0.609
No change in status	86.79%	82.61%	84.14%	–	–
Less restrictive status	9.43%	15.22%	13.10%	–	–

^aUnemployment excludes any form of paid or unpaid form of employment but includes volunteering.

^bOrdinal variable based on increasing levels of education with four categories (primary school, Year 10, Year 12, Tertiary), Mann-Whitney U test was applied. Tertiary education includes any vocational training regardless of completion.

^cSix accommodation categories were considered: Living with family, Supported housing, Private rental, No fixed address, Other.

^dIncome source considered across three categories: Disability Support Pension, Other benefits (e.g. sickness benefits), Paid employment.

^eBased on HoNOS item 5a ratings >2 being classified as a 'significant physical health issue'.

^fCommunity-based referral compared to combined acute (35.2%) and sub-acute (4.1%) inpatient referral source.

^gRange of CCU care (days) is 43-1361 (total), 43-1361 (clinical model), and 50-953 (integrated model).

^hInvoluntary treatment includes both Involuntary Treatment Orders/Treatment Authorities and Forensic Orders

ⁱComparing 'more restrictive status', 'no change in status', and 'less restrictive status' categories between the integrated and clinical staffing model groups for all participants, Exact = p=.609.

admission between the two staffing models, consumers under the integrated staffing model were more frequently voluntary at the time of discharge ($\chi^2_{(1)} = 4.061$, $p = 0.044$). Paired admission and discharge data were available for > 50% of consumers on all measures except ACL and STORI-30 (Table 2).

Most consumers showed reliable improvement on SANS (72.5%), MHI Index (64.0%), SFS (55.6%), LSP-16 (51.1%), and HoNOS (50.4%, see Table 3 and Fig. 1). Approximately half the consumers showed reliable improvement on

BPRS-18 (47.8%). Using the RCS improvement criterion, gains occurred most frequently on the symptomatic measures (SANS, 37.4%; BPRS-18, 27.3%), and almost a quarter of participants improved on HoNOS (24.8%). Few consumers met the RCS improvement criterion on SFS (9.6%), MHI Index (2.2%), and LSP-16 (2.1%).

In unadjusted analyses, only BPRS-18 scores differed between the two staffing models. A higher proportion of consumers admitted under the integrated staffing approach were reliably improved compared to the clinical staffing

Table 3 Admission and discharge total scores on measures within the assessment battery where paired data was available for > 50% of participants (N = 145)

	n	Admission			Discharge		
		Mean (SD)	Median	Range	Mean (SD)	Median	Range
Functioning & disability							
HoNOS Total ^a	141	10.3 (6.0)	9	0–26	9.8 (5.6)	9	0–31
<i>Clinical staffing</i>	52	9.1 (6.2)	7	0–25	9.2 (5.2)	9.5	0–23
<i>Integrated staffing</i>	89	11.1 (5.9)	10	0–22	10.1 (5.9)	9	0–31
LSP-16 Total ^a	142	12.2 (6.1)	12	0–33	12.0 (6.1)	12	0–30
<i>Clinical staffing</i>	53	10.7 (5.7)	10	0–23	12.3 (6.0)	12	0–30
<i>Integrated staffing</i>	89	13.2 (6.2)	13	3–33	11.8 (6.1)	11	2–28
SFS Total (n = 81) ^b	81	102.0 (7.5)	102.3	86–122	109.8 (7.6)	109.7	92–127
<i>Clinical staffing</i>	30	106.1 (7.7)	105.1	91–122	111.8 (8.7)	112.4	93–127
<i>Integrated staffing</i>	51	99.6 (6.3)	98.7	86–114	108.7 (6.8)	108.9	92–122
Symptoms							
BPRS-18 Total ^a	92	39.0 (9.7)	39.5	22–78	31.67 (8.1)	30.5	18–61
<i>Clinical staffing</i>	39	37.4 (8.7)	39	23–55	30.9 (7.9)	31	20–57
<i>Integrated staffing</i>	53	40.3 (10.3)	41	22–78	32.2 (8.2)	30	18–61
SANS Total ^a	91	47.6 (18.6)	49	4–82	33.6 (16.6)	33	1–76
<i>Clinical staffing</i>	34	39.8 (18.3)	36.5	4–76	28.7 (17.1)	24	1–66
<i>Integrated staffing</i>	57	52.3 (17.3)	53	14–82	36.6 (15.7)	37	4–76
Substance use							
AUDIT Total ^a	78	6.4 (8.1)	3	0–32	5.4 (6.6)	3	0–28
<i>Clinical staffing</i>	27	4.5 (6.8)	2	0–22	3.2 (4.8)	1	0–23
<i>Integrated staffing</i>	51	7.4 (8.6)	3	0–32	6.5 (7.2)	3	0–28
Psychological well-being							
MHI Index ^b	135	55% (18.9)	56.9%	5–100%	62.6% (18.7)	68.1%	6–99%
<i>Clinical staffing</i>	48	57.6% (17.1)	56.9%	21–100%	66.1% (18.0)	68.1%	14–98%
<i>Integrated staffing</i>	87	54.8% (19.9)	56.9%	5–95%	65.6% (19.1)	68.1%	6–99%

^aHigher scores equate to higher levels of symptoms or impairment

^bLower score equate to higher levels of symptoms or impairment

approach (60.4% vs. 30.8%, OR 3.43, CI 1.43–8.22, Cramer's V 0.293). No group differences were statistically significant when the stricter RCS improvement criteria were applied.

Covariate analyses are detailed in Table 4. The increased likelihood of reliable improvement in BPRS-18 scores among consumers in the integrated staffing approach (Exp(B) = 2.726, CI = 0.994–7.480, p = 0.051) was attributable in part to baseline differences in HoNOS Total (Exp(B) = 1.090, CI = 1.009–1.177, p = 0.029) and education level (Exp(B) = 0.454, CI = 0.248–0.830, p = 0.010). After adjusting for confounders, consumers in the integrated staffing model also had higher odds of reliable improvement in SFS (Exp(B) = 3.218, CI = 1.122–9.229, p = 0.030). Additionally, analyses indicated the likelihood of RCI improvement was lower for consumers admitted later in the cohort for HoNOS (Exp(B) = 0.635, CI = 0.407–0.989, p = 0.045) and SANS (Exp(B) = 0.440, CI = 0.232–0.835, p = 0.012) Table 5 Table 4.

Discussion

This study considered whether consumers receiving TRR support under integrated and clinical staffing models achieve equivalent functional and clinical outcomes at discharge. Regardless of staffing model, most consumers (50.4%–72.5%) showed reliable improvements in negative psychotic symptoms (SANS), psychological wellbeing and distress (MHI-38), social functioning (SFS), disability (LSP-16), and mental health and social functioning (HoNOS). The unadjusted odds of reliable improvement were equivalent between the staffing model groups on all measures, except in general psychiatric symptoms (BPRS-18, favoring those in the integrated staffing model). No significant differences emerged in the likelihood of RCS improvement between the staffing model groups. Covariate analyses suggested that consumers admitted under the integrated staffing model were more likely to experience reliable improvement than in the clinical staffing model on

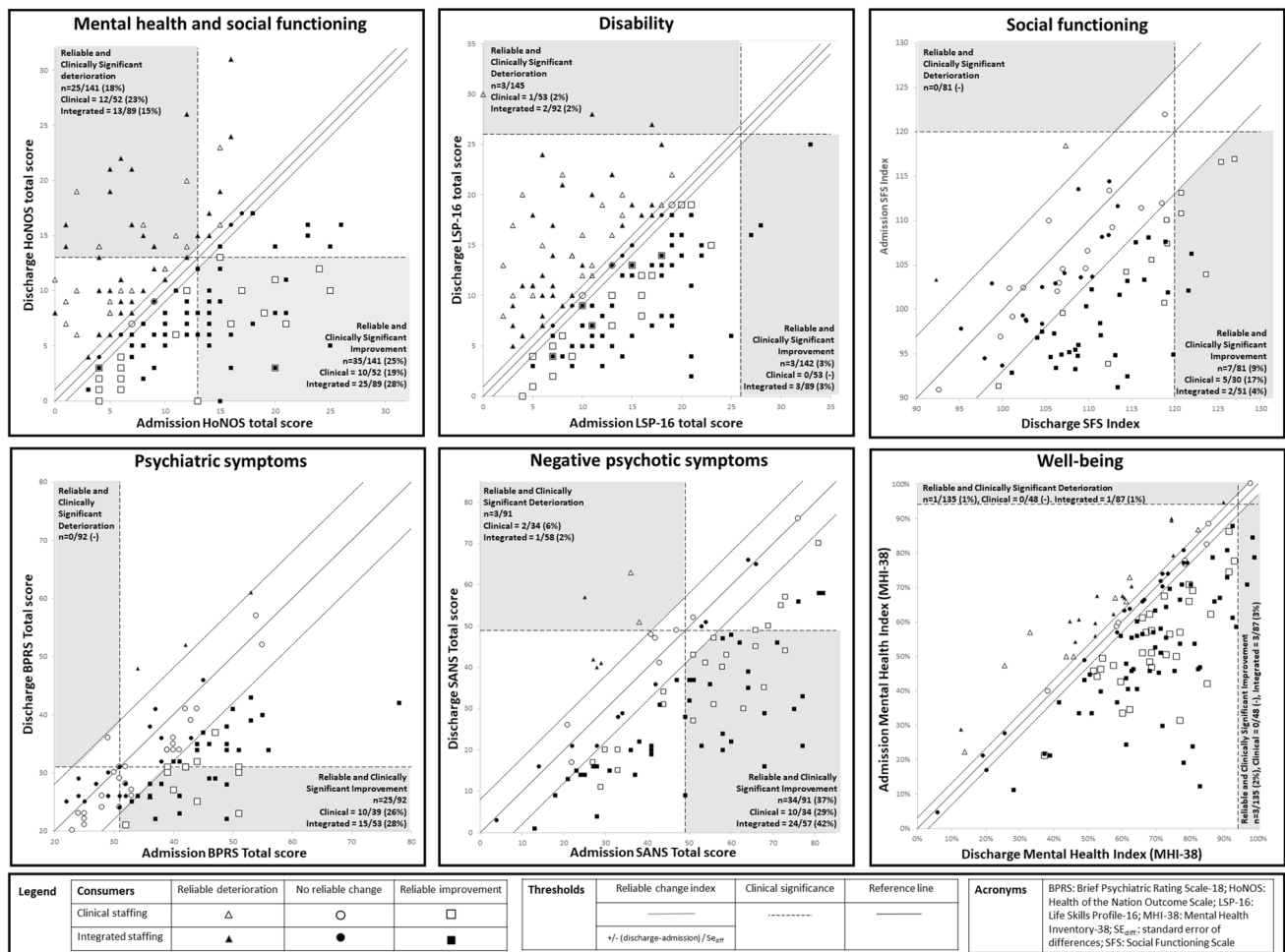


Figure. 1 Plot of admission and discharge assessment scores for measures where reliable and clinically Significant change was calculable (deterioration / no change / improvement)

two outcomes (BPRS-18 and SFS). Additional predictors of reliable improvement on the BPRS-18 were having a primary diagnosis of schizophrenia, higher HoNOS total score on admission, and lower levels of education. Additional predictors of reliable improvement in SFS emerging through the covariate analyses were the presence of comorbid substance use, involuntary mental health act status, and lower LSP-16 total scores on admission.

The gains in clinical and functional outcomes are consistent with the literature supporting the positive impact of mental health rehabilitation (Chan et al., 2021; Dalton-Locke et al., 2020). Unlike a recent retrospective cohort study that included only clinical staffing model sites (Parker et al., 2020), reliable improvements in disability occurred for most consumers. However, our study focused on admission-discharge outcomes rather than pre-admission and post-discharge. Our results also compare favorably to a recent Australian inpatient rehabilitation cohort study (Maxwell et al., 2019), with higher frequencies of reliable improvement in

HoNOS and LSP. However, the comparability of these outcomes is limited by our mean length of admission being over three times longer.

The absence of marked differences between the integrated and clinical staffing configurations is consistent with the quantitative literature considering PSWs as care providers in Australian (O'Donnell et al., 1999) and international (Pitt et al., 2013) clinical services. Our findings indicate that the integrated staffing model achieved at least equivalent outcomes and that consumers under this model were more likely to have their involuntary treatment revoked prior to discharge. These findings provide reassurance that reduced restrictive and pharmacologically focused treatment at CCUs under the integrated staffing model (Karan et al., 2022) is not associated with inferior clinical and functional outcomes. Additionally, our findings add weight to the relevance of considering consumer preferences in terms of their emphasis on the value of the availability of PSWs under an integrated staffing model (Parker et al., 2021).

Table 4 Comparison of reliable and clinically significant improvement in outcome variables where > 50% of paired admission-to-discharge data was available

	Cut-off	Clinical n(%)	Integrated n(%)	Total n(%)	Test	Cramer's V ^c	p
Reliable improvement based on the Reliable Change Index (RCI) ^a							
Functioning & disability							
HoNOS Total (n = 142)	-1	21(40.4)	50(56.2)	71(50.4)	$\chi^2_{(1)} = 3.276$	0.152	0.070
LSP-16 Total (n = 142)	-1	24(45.3)	50(56.2)	74(52.1)	$\chi^2_{(1)} = 1.581$	0.106	0.209
SFS Total (n = 81)	+7	13(43.3)	32(62.7)	45(55.6)	$\chi^2_{(1)} = 2.883$	0.189	0.090
Symptoms							
BPRS-18 Total (n = 91)	-8	12(30.8)	32(60.4)	44(47.8)	$\chi^2_{(1)} = 7.893$	0.293	0.005
SANS Total (n = 91)	-8	24(70.6)	42(73.7)	66(72.5)	$\chi^2_{(1)} = 0.102$	0.034	0.749
Substance use							
AUDIT Total (n = 78)	-2	9(33.3)	18(35.3)	27(34.6)	$\chi^2_{(1)} = 0.030$	0.020	0.863
Psychological well-being							
MHI Index (n = 135)	+7	32(65.3)	55(63.2)	87(64.0)	$\chi^2_{(1)} = 0.025$	0.014	0.875
Reliable and Clinically Significant (RCS) improvement							
Functioning and disability							
HoNOS Total (n = 142) ^a	13	10 (19.2)	25 (28.1)	35 (24.8)	$\chi^2_{(1)} = 1.380$	0.099	0.240
LSP-16 Total (n = 142) ^a	26	—(—)	3(3.4)	3 (2.1)	Fisher's Exact	—	0.293
SFS Total (n = 81)	120	5 (16.7)	2 (3.9)	7 (8.6)	Fisher's Exact	—	0.095
Symptoms							
BPRS Total (n = 91) ^a	31	10 (25.6)	15 (28.3)	25 (27.2)	$\chi^2_{(1)} = .080$	0.030	0.777
SANS Total (n = 91) ^a	49	10 (30.3)	24 (41.4)	34 (37.4)	$\chi^2_{(1)} = 1.103$	0.110	0.293
Psychological well-being							
MHI Index (n = 135) ^b	94.1%	0 (0.0)	3 (3.4)	3 (2.2)	Fisher's Exact	—	0.552

^aNormative population for the calculation of 'Cut-off 2' for HoNOS total and LSP-16 total was obtained from a study by Maxwell et al. (2018), and for the calculation of cut-off 3 for BPRS total, SANS total, and all SANS subscales from a study by Baynes et al. (2000)

^bFor the MHI, only RCS 'Cut-off 1' was calculable, the raw score cut off (215) is equivalent to a MHI percentage score of 94.1%. No RCS cut-off was able to be calculated for the AUDIT

^cEffect size interpretation for Cramer's V for chi-squared test with df = 1: 0.10 = small, 0.30 = medium, 0.50 = large

M mean; SD standard deviation; RCI reliable Change index; RCS reliable and clinically significant; HoNOS health of the nation outcome scales; SFS social functioning scale; LSP-16: life skills profile; BPRS-18: brief psychiatric rating scale; SANS scale for the assessment of negative symptoms; AUDIT alcohol use disorders identification test; MHI: mental health index

Limitations

A key limitation is the absence of process evaluation to identify treatment differences between the approaches. Additionally, inter-rater reliability data was unavailable, and a later admission date was associated with a lower likelihood of reliable improvement on HoNOS and SANS, suggesting possible impacts of processes and staff changes. Unmeasured and unknown confounders may have also impacted the results. For example, service-level factors that impact organizational performance were not considered, such as staffing turnover, shortages, and burnout (Coates & Howe, 2015).

Outcomes were considered without correcting for multiple comparisons, increasing the risk of Type 1 error. The nature of the planned analyses meant that applying such

corrections would have limited the ability to draw meaningful conclusions due to inflation of the Type 2 error risk (Armstrong, 2014). Another important consideration is limitations in statistical power to detect small differences between the staffing models. This is a particularly relevant consideration for the outcomes with higher levels of missing data (AUDIT, BPRS, SANS, and SFS). Given this, our findings should be interpreted cautiously.

Unavailability of paired admission data occurred more frequently for consumers who had experienced unplanned discharge. This means the findings may be biased toward consumers who are more likely to have favorable outcomes. Additionally, high rates of missing data prevented comparing the personal recovery measure (STORI-30), an outcome highly relevant to the service focus.

Table 5 Results of covariate analysis using logistic regression to identify predictors of reliable improvement

Outcome ^a	Covariate(s) with p-value < 0.200 ^{b,c,d}	Exp(B)	95% CI	p-value	
AUDIT	Primary diagnosis of Schizophrenia	.515	0.191–1.392	0.191	
	Comorbid substance use disorder	2.220	0.829–5.940	0.112	
BPRS	Integrated staffing model	2.726	0.994–7.480	0.051	
	Education level	.454	0.248–0.830	0.010	
	Primary diagnosis of Schizophrenia	2.184	0.804–5.933	0.125	
HoNOS	HoNOS total	1.090	1.009–1.177	0.029	
	Admission date (years from study commencement)	.635	0.407–0.989	0.045	
	CCU length of stay	1.692	0.922–3.106	0.090	
	Integrated staffing model	1.984	0.802–4.911	0.138	
	Male gender	2.707	0.989–7.408	0.052	
	Primary diagnosis of Schizophrenia	.364	0.148–0.900	0.029	
	Comorbid substance use disorder	.477	0.205–1.111	0.086	
	HoNOS Total score	1.249	1.144–1.365	0.000	
	LSP-16	HoNOS Item 1 – Aggression	.642	0.386–1.068	0.088
		Life Skills Profile Total	1.212	1.122–1.309	0.000
MHI	Length of CCU stay	2.152	1.163–3.984	0.015	
	HoNOS Item 1 – Aggression	1.475	0.864–2.519	0.155	
SANS	Admission date (years from study commencement)	.440	0.232–0.835	0.012	
	Education level	2.579	1.253–5.310	0.010	
SFS	Integrated staffing model	3.218	1.122–9.229	0.030	
	Comorbid substance use disorder	2.232	0.813–6.123	0.119	
	LSP-16 Total score	.946	0.869–1.030	0.198	
	Involuntary mental health act status	2.462	0.913–6.636	0.075	

^aReliable improvement based on whether the difference between admission and discharge scores exceeded the calculated Reliable Change Index threshold

^bApart from the time-based variables ('Years between study commencement and admission' and 'Length of stay') all covariates are based on information at the time of admission

^cSelection of covariates in addition to 'Integrated staffing model' was based on initial screening to identify available known confounders whose p-value was < .200. Covariates in the final models in were: Audit=Primary diagnosis F20.x, & Comorbid substance use); BPRS (Education level, Primary diagnosis F20.x, Comorbid substance use, & HoNOS Total score); HoNOS (Admission date, CCU length of stay, Gender, Primary diagnosis F20.x, Comorbid substance use, & HoNOS total score); LSP-16 (HoNOS Item 1 – Aggression, & LSP-16 total score); MHI (CCU length of stay, Gender, HoNOS Item 1 – Aggression, & HoNOS Item 5 – Physical); SANS (Admission date, & Education level); SFS (Comorbid substance use, LSP-16 total score, & Involuntary MHA status)

^dInteractions with staffing model were considered for any outcome where time-based covariates ('Years between study commencement and admission' and 'Length of stay') had a p-value of < .200 in the final model. None of these interactions were included in the final models

Conclusions

Reliable improvements in symptoms and functioning generally occurred between admission to and discharge from community-based residential rehabilitation. Furthermore, most consumers demonstrated clinically significant improvements in negative psychotic symptoms and disability. Under the integrated and clinical staffing models, consumers had at least equivalent clinical and functional outcomes. In the context of other emerging research, our findings further emphasise the promising nature of the integrated approach as an alternative to traditional clinical staffing models. More research in other contexts will enhance the ability for future

decisions about mental health rehabilitation services staffing to be evidence-informed.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s10597-022-01023-8>.

Acknowledgements We acknowledge the participants who were willing to share their personal information for this study and the unit staff who participated in the data collection process. In addition, Dr Carla Meurk, Dr Ellie Newman, Prof. Dan Siskind, and Prof. Harvey Whitford all made substantial contributions to the parent study protocol from which this work has been derived. Dr Gemma McKeon assisted with proofreading the manuscript.

Funding Open Access funding enabled and organized by CAUL and its Member Institutions. No specific funding was obtained in support of this research.

Data Availability Any further release of data would be subject to application and approval from the relevant ethics committee and data custodians under the provisions of the Public Health Act (Queensland) 2005.

Declarations

Conflict of interest FD, NK, and SP are employees of the public mental health service where the study was conducted.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

- Andreasen, N. C. (1982). Negative symptoms in schizophrenia. *Definition and Reliability. Arch Gen Psychiatry*, 39(7), 784–788. <https://doi.org/10.1001/archpsyc.1982.04290070020005>
- Andresen, R., Caputi, P., & Oades, L. (2013). Development of a short measure of psychological recovery in serious mental illness: The STORI-30. *Australasian Psychiatry*, 21(3), 267–270. <https://doi.org/10.1177/1039856213476352>
- Armstrong, R. A. (2014). When to use the Bonferroni correction. *Ophthalmic and Physiological Optics*, 34(5), 502–508.
- Arnautovska, U., McKeon, G., Dark, F., Siskind, D., Harris, M., & Parker, S. (2021). Predictors of unplanned discharge from community-based residential mental health rehabilitation for people affected by severe and persistent mental illness. *Journal of Mental Health*, 30(4), 500–508. <https://doi.org/10.1080/09638237.2020.1755025>
- Babor, T. F., Higgins-Biddle, J., Saunders, J., & Monteiro, M. (2001). The alcohol use disorders identification test: Guidelines for use in. *World Health Organization. Recuperado de* <https://apps.who.int/iris/handle/10665/67205>.
- Barbato, A., Agnetti, G., D'Avanzo, B., Frova, M., Guerrini, A., & Tettamanti, M. (2007). Outcome of community-based rehabilitation program for people with mental illness who are considered difficult to treat. *Journal of Rehabilitation Research and Development*, 44(6), 775–783. <https://doi.org/10.1682/jrrd.2007.02.0041>
- Baynes, D., Mulholland, C., Cooper, S. J., Montgomery, R. C., MacFlynn, G., Lynch, G., & King, D. J. (2000). Depressive symptoms in stable chronic schizophrenia: Prevalence and relationship to psychopathology and treatment. *Schizophrenia Research*, 45(1–2), 47–56. [https://doi.org/10.1016/S0920-9964\(99\)00205-4](https://doi.org/10.1016/S0920-9964(99)00205-4)
- Berger, M. L., Dreyer, N., Anderson, F., Towse, A., Sedrakyan, A., & Normand, S. L. (2012). Prospective observational studies to assess comparative effectiveness: The ISPOR good research practices task force report. *Value Health*, 15(2), 217–230. <https://doi.org/10.1016/j.jval.2011.12.010>
- Birchwood, M., Smith, J., Cochrane, R., Wetton, S., & Copestake, S. (1990). The social functioning scale the development and validation of a new scale of social adjustment for use in family intervention programmes with schizophrenic patients. *The British Journal of Psychiatry*, 157(6), 853–859.
- Chan, K. P. K., Kathryn, K., Igoumenou, A., & Killaspy, H. (2021). Predictors of successful move-on to more independent accommodation amongst users of the community mental health rehabilitation team: A prospective cohort study in inner London. *Social Psychiatry and Psychiatric Epidemiology*, 56(1), 75–84. <https://doi.org/10.1007/s00127-020-01910-z>
- Christensen, L., & Mendoza, J. L. (1986). A method of assessing change in a single subject: An alteration of the RC index. *Behavior Therapy*, 17(3), 305–308. [https://doi.org/10.1016/S0005-7894\(86\)80060-0](https://doi.org/10.1016/S0005-7894(86)80060-0)
- Coates, D., & Howe, D. (2015). Combatting staff burnout in mental health: Key managerial and leadership tasks that are fundamental to staff wellbeing and retention. *Asia Pacific Journal of Health Management*, 10(2), 24–32.
- Commonwealth of Australia. (2013, 18/07/2013). 2033.0.55.001 - Census of population and Housing: Socio-economic indexes for areas (SEIFA), Australia, 2011. Retrieved from <http://www.abs.gov.au/ausstats/abs@.nsf/DetailsPage/2033.0.55.0012011?OpenDocument>
- Dalton-Locke, C., Marston, L., McPherson, P., & Killaspy, H. (2020). The Effectiveness of mental health rehabilitation services: A systematic review and narrative synthesis. *Front Psychiatry*, 11(1501), 607933. <https://doi.org/10.3389/fpsy.2020.607933>
- Flemenbaum, A., & Zimmermann, R. L. (1973). Inter- and intra-rater reliability of the brief psychiatric rating scale. *Psychological Reports*, 32(3), 783–792. <https://doi.org/10.2466/pr0.1973.33.3.783>
- Gerrard, V., Bloch, S., Smith, J., Goding, M., & Castle, D. (2007). Reforming mental health care in Victoria: A decade later. *Australasian Psychiatry*, 15(3), 181–184. <https://doi.org/10.1080/10398560701310874>
- Gillard, S. (2019). Peer support in mental health services: Where is the research taking us, and do we want to go there? *Journal of Mental Health*, 28(4), 341–344. <https://doi.org/10.1080/09638237.2019.1608935>
- Gonda, T., Deane, F. P., & Murugesan, G. (2012). Predicting clinically significant change in an inpatient program for people with severe mental illness. *Australian and New Zealand Journal of Psychiatry*, 46(7), 651–658. <https://doi.org/10.1177/0004867412445527>
- Harvey, C., & Brophy, L. (2020). *Models of Care for Victorians living with Severe and Persistent Mental Illness and Complex Multi-agency Needs: Literature Review and Key Reform Considerations. Final Report, Commissioned by. The Royal Commission into Victoria's Mental Health System.* Retrieved from
- Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, 59(1), 12–19. <https://doi.org/10.1037//0022-006x.59.1.12>
- Jacobson, N., Wilson, L., & Tupper, C. (1988). The clinical significance of treatment gains resulting from exposure-based interventions for agoraphobia: A reanalysis of outcome data. *Behavior Therapy*, 19(4), 539–554.
- Karan, N., Parker, S., Jones, D., & Stedman, T. (2022). Cross-sectional comparison of treatment provided under the clinical, integrated, and partnership staffing models for community-based residential mental health rehabilitation. *Community Mental Health Journal*, 58(5), 907–916. <https://doi.org/10.1007/s10597-021-00898-3>

- Kim, H. Y. (2017). Statistical notes for clinical researchers: Chi-squared test and Fisher's exact test. *Restor Dent Endod*, 42(2), 152–155. <https://doi.org/10.5395/rde.2017.42.2.152>
- Lloyd-Evans, B., Mayo-Wilson, E., Harrison, B., Istead, H., Brown, E., Pilling, S., & Kendall, T. (2014). A systematic review and meta-analysis of randomised controlled trials of peer support for people with severe mental illness. *BMC Psychiatry*, 14(1), 39. <https://doi.org/10.1186/1471-244X-14-39>
- Maxwell, A., Tsoutsoulis, K., Padinjareveetil, M. T., & A., Zivkovic, F., & Rogers, J. M. (2019). Longitudinal analysis of statistical and clinically significant psychosocial change following mental health rehabilitation. *Disability and Rehabilitation*, 41(24), 2927–2939. <https://doi.org/10.1080/09638288.2018.1482505>
- McKenna, B., Oakes, J., Fourniotis, N., Toomey, N., & Furness, T. (2016). Recovery-oriented mental health practice in a community care unit: An exploratory study. *Journal of Forensic Nursing*, 12(4), 167–175. <https://doi.org/10.1097/JFN.0000000000000127>
- Meurk, C., Parker, S., Newman, E., & Dark, F. (2018). *Staff expectations of an integrated model of residential rehabilitation for people with severe and persisting mental illness: A pragmatic grounded theory analysis*. Unpublished manuscript. University of Queensland. Brisbane, Australia.
- Mickey, R. M., & Greenland, S. (1989). The impact of confounder selection criteria on effect estimation. *American Journal of Epidemiology*, 129(1), 125–137. <https://doi.org/10.1093/oxfordjournals.aje.a115101>
- Murugesan, G., Jeffrey, R., Amey, C. G., Deane, F. P., Kelly, B., & Stain, H. (2007). Inpatient psychosocial rehabilitation in rural NSW: Assessment of clinically significant change for people with severe mental illness. *Australian and New Zealand Journal of Psychiatry*, 41(4), 343–350. <https://doi.org/10.1080/00048670701213260>
- O'Connor, N., Clark, S., & Ryan, C. J. (2017). A substantial peer-worker workforce in a psychiatric service will improve patient outcomes - the case against. *Australasian Psychiatry*, 25(5), 445–447. <https://doi.org/10.1177/1039856217700777>
- O'Donnell, M., Parker, G., Proberts, M., Matthews, R., Fisher, D., Johnson, B., & Hadzi-Pavlovic, D. (1999). A study of client-focused case management and consumer advocacy: The community and consumer service project. *Australian and New Zealand Journal of Psychiatry*, 33(5), 684–693. <https://doi.org/10.1080/j.1440-1614.1999.00629.x>
- Parker, S., Dark, F., Newman, E., Korman, N., Meurk, C., Siskind, D., & Harris, M. (2016). Longitudinal comparative evaluation of the equivalence of an integrated peer-support and clinical staffing model for residential mental health rehabilitation: A mixed methods protocol incorporating multiple stakeholder perspectives. *BMC Psychiatry*, 16(2), 179. <https://doi.org/10.1186/s12888-016-0882-x>
- Parker, S., Meurk, C., Newman, E., Fletcher, C., Swinson, I., & Dark, F. (2018). Understanding consumers' initial expectations of community-based residential mental health rehabilitation in the context of past experiences of care: A mixed-methods pragmatic grounded theory analysis. *International Journal of Mental Health Nursing*, 27(6), 1650–1660. <https://doi.org/10.1111/inm.12461>
- Parker, S., Dark, F., Newman, E., Hanley, D., McKinlay, W., & Meurk, C. (2019). Consumers' understanding and expectations of a community-based recovery-oriented mental health rehabilitation unit: A pragmatic grounded theory analysis. *Epidemiology Psychiatric Sciences*, 28(4), 408–417. <https://doi.org/10.1017/S2045796017000749>
- Parker, S., Hopkins, G., Siskind, D., Harris, M., McKeon, G., Dark, F., & Whiteford, H. (2019b). A systematic review of service models and evidence relating to the clinically operated community-based residential mental health rehabilitation for adults with severe and persisting mental illness in Australia. *BMC Psychiatry*, 19(1), 55. <https://doi.org/10.1186/s12888-019-2019-5>
- Parker, S., Siskind, D., Hermens, D. F., Dark, F., McKeon, G., Korman, N., & Whiteford, H. (2019c). A Comprehensive cohort description and statistical grouping of community-based residential rehabilitation service users in Australia. *Front Psychiatry*, 10(798), 798. <https://doi.org/10.3389/fpsy.2019.00798>
- Parker, S., Arnautovska, U., Siskind, D., Dark, F., McKeon, G., Korman, N., & Harris, M. (2020). Community-care unit model of residential mental health rehabilitation services in Queensland, Australia: Predicting outcomes of consumers 1-year post discharge. *Epidemiology Psychiatric Sciences*, 29, e109. <https://doi.org/10.1017/S2045796020000207>
- Parker, S., Wyder, M., Pommeranz, M., Newman, E., Meurk, C., & Dark, F. (2021). Consumer experiences of community-based residential mental health rehabilitation for severe and persistent mental illness: A pragmatic grounded theory analysis. *International Journal of Mental Health Nursing*, 30(3), 733–746. <https://doi.org/10.1111/inm.12842>
- Pitt, V. J., Lowe, D., Pricor, M., Hetrick, S., Ryan, R., Berends, L., & Hill, S. (2013). A systematic review of consumer-providers' effects on client outcomes in statutory mental health services: The evidence and the path beyond. *Journal of the Society for Social Work and Research*, 4(4), 333–356.
- Rosen, A., Trauer, T., Hadzi-Pavlovic, D., & Parker, G. (2001). Development of a brief form of the life skills profile: The LSP-20. *Australian and New Zealand Journal of Psychiatry*, 35(5), 677–683. <https://doi.org/10.1080/0004867010060518>
- Saraf, S., & Newton, R. (2017). Care or recovery? *Redefining Residential Rehabilitation*. *Australas Psychiatry*, 25(2), 161–163. <https://doi.org/10.1177/1039856216671662>
- Siskind, D., Harris, M., Kisely, S., Brogan, J., Pirkis, J., Crompton, D., & Whiteford, H. (2013). A retrospective quasi-experimental study of a community crisis house for patients with severe and persistent mental illness. *Australian and New Zealand Journal of Psychiatry*, 47(7), 667–675. <https://doi.org/10.1177/0004867413484369>
- SPSS, I. (2017). IBM SPSS 25.0 for Windows [Computer software]. In: Author Chicago, IL.
- State of Victoria. (2021). *Royal Commission into Victoria's Mental Health System, Final Report, Summary and recommendations, Parl Paper No. 202, Session 2018–21*. Retrieved from Victoria, Australia: https://finalreport.rcvmhs.vic.gov.au/wp-content/uploads/2021/02/RCVMHS_FinalReport_ExecSummary_Accessible.pdf
- Trauer, T. (2010). *Outcome measurement in mental health theory and practice*. Cambridge University Press.
- Veit, C. T., & Ware, J. E., Jr. (1983). The structure of psychological distress and well-being in general populations. *Journal of Consulting and Clinical Psychology*, 51(5), 730–742. <https://doi.org/10.1037/0022-006x.51.5.730>
- Velligan, D. I., Bow-Thomas, C. C., Mahurin, R., Miller, A., Dassori, A., & Erdely, F. (1998). Concurrent and predictive validity of the allen cognitive levels assessment. *Psychiatry Research*, 80(3), 287–298. [https://doi.org/10.1016/s0165-1781\(98\)00078-x](https://doi.org/10.1016/s0165-1781(98)00078-x)
- Vittinghoff, E., & McCulloch, C. E. (2007). Relaxing the rule of ten events per variable in logistic and Cox regression. *American Journal of Epidemiology*, 165(6), 710–718. <https://doi.org/10.1093/aje/kwk052>
- von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gotsche, P. C., Vandenbroucke, J. P., & Initiative, S. (2007). Strengthening the reporting of observational studies in epidemiology (STROBE) statement: Guidelines for reporting observational studies. *BMJ*, 335(7624), 806–808. <https://doi.org/10.1136/bmj.39335.541782.AD>
- Wing, J. K., Beevor, A. S., Curtis, R. H., Park, S. B., Hadden, S., & Burns, A. (1998). Health of the nation outcome scales (HoNOS).

Research and Development. Br J Psychiatry, 172(1), 11–18.

<https://doi.org/10.1192/bjp.172.1.11>

Wyder, M., Roennfeldt, H., Parker, S., Vilic, G., McCann, K., Ehrlich, C., & Dark, F. L. (2020). Diary of a Mental health peer worker: Findings from a diary study into the role of peer work in a clinical mental health setting. *Front Psychiatry, 11*, 587656. <https://doi.org/10.3389/fpsy.2020.587656>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.