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Treatment staff turnover in organizations implementing evidence-based practices: Turnover rates and their association with client outcomes

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Abstract

High staff turnover has been described as a problem for the substance use disorder treatment field. This assertion is based primarily on the assumption that staff turnover adversely impacts treatment delivery and effectiveness. This assumption, however, has not been empirically tested. In this study, we computed annualized rates of turnover for treatment staff (n=249) participating in an evidence-based practice implementation initiative and examined the association between organizational-level rates of staff turnover and client-level outcomes. Annualized rates of staff turnover were 31% for clinicians and 19% for clinical supervisors. Additionally, multilevel analyses did not reveal the expected relationship between staff turnover and poorer client-level outcomes. Rather, organizational-level rates of staff turnover were found to have a significant positive association with two measures of treatment effectiveness: less involvement in illegal activity and lower social risk. Possible explanations for these findings are discussed.

Keywords

substance abuse counselors; clinical supervisors; turnover; retention; workforce

During the past decade, there has been growing interest in and concern about the rates of staff turnover in the substance use disorder (SUD) treatment field (e.g., Eby, Burk, & Maher, 2010; Knudsen, Abraham, Roman, & Studts, 2011; Knudsen, Johnson, & Roman, 2003; McLellan, Carise, & Kleber, 2003; Rothrauff, Abraham, Bride, & Roman, 2011; White & Garner, 2011). As noted by Eby et al. (2010), these concerns have been based primarily on turnover rate calculations that have important limitations (e.g., based on program administrators' estimates of turnover in their organizations). In an effort to provide a more accurate estimate of the average annual rate of staff turnover in this field, Eby et al. conducted a systematic examination of staff turnover among 27 geographically dispersed SUD treatment organizations. Of the 739 clinicians identified at the start of the study, 245 (33%) turned over within the year. Moreover, of the 245 clinicians who left their organizations, the majority (75%) were reported by the organizations to have left for voluntary reasons, which represents an average annual voluntary turnover rate of 25%. Similarly, of the 188 clinical supervisors identified at the start of the study, 44 (23%) turned over within the year. Of the 44 clinical supervisors who left their organizations, the majority

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(61%) left voluntarily, which represents an average annual voluntary turnover rate of 14%. In sum, the results of the study by Eby et al. provide one of the best estimates to date of the average annual rate of SUD treatment staff turnover and suggest that there is cause for concern regarding the stability of this workforce.

Staff turnover is considered to be problematic because it is hypothesized to have numerous associated negative consequences. The most commonly suggested negative consequences of staff turnover are the: a) financial costs associated with recruiting, selecting, and training replacement staff, and b) potential reduction in quality or effectiveness of services being delivered to an organization's customers or clients. Although it is likely that there are financial costs associated with staff turnover, the extent of these financial costs is unclear. Human resource professionals have estimated, however, that depending on skill requirements and level of job responsibilities, the cost to replace each departing staff member is between 93% and 200% of the annual salary allocated to a staff position (Cascio, 2000). Moreover, the financial implications of turnover may be especially profound when implementing evidence-based practices (EBPs), given such practices generally involve greater financial and time commitments due to more extensive training requirements (Aarons, Sommerfeld, Hecht, Silovsky, & Chaffin, 2009; Godley, Garner, Smith, Meyers, & Godley, 2011).

Just as the financial costs associated with the turnover of SUD treatment staff are unclear, we also do not know the impact of SUD clinical staff turnover on treatment implementation or outcomes. That is, despite the widely held assumption that clinical staff turnover negatively impacts the implementation and outcomes of treatment services provided to SUD clients (Knudsen, Ducharme, & Roman, 2006, 2007, 2008; Lamb, Greenlick, & McCarty, 1998; McLellan et al., 2003), we know of no studies that have empirically examined this assumption in the SUD treatment field. Our search of the literature did, however, reveal three studies that have explored staff turnover in relation to treatment implementation or outcome in other healthcare areas (Plomondon et al., 2007; Williams & Potts, 2010; Woltmann et al., 2008). In addition to reporting rates of staff turnover for 42 teams implementing a mental health EBP, Woltmann et al. (2008) found staff turnover to have a significant inverse relationship with treatment fidelity. Plomondon et al. (2007) conducted an organizational-level analyses of 615 managed care organizations and found health plans with higher turnover of primary care providers had significantly lower average member satisfaction ratings and participation in preventative care services. Finally, using data from 3,050 patients who had been treated for chronic pain, Williams and Potts (2010) found higher staff turnover to be significantly associated with poorer client outcomes (e.g., decreased self-efficacy, less distance walked) at the end of treatment.

Addressing important gaps in the extant literature related to turnover of SUD treatment staff, the primary aims of this study were to: a) examine annualized rates of turnover for treatment staff (i.e., clinicians and clinical supervisors) participating in a large EBP implementation initiative, and b) examine the extent to which annualized rates of treatment staff turnover were associated with client outcomes (e.g., initiation, engagement, number of treatment sessions, days of abstinence, involvement in illegal activity). Based on findings in the mental health field that suggest there is a protective effect against staff turnover from EBP implementation accompanied by fidelity monitoring (Aarons et al., 2009), we hypothesized that the average annualized turnover rates observed in our sample would be significantly lower than the average annual turnover rates reported by the Bureau of Labor Statistics (BLS) for the general health care and social assistance industry over the same time period. Additionally, based on findings of the impact of staff turnover on treatment implementation and outcomes reported in other fields (Plomondon et al., 2007; Williams & Potts, 2010; Woltmann et al., 2008), we hypothesized that higher annualized rates of staff turnover

would be significantly associated with poorer client-level treatment implementation and outcomes.

Method

Study context

Data used in this study, which was conducted under the auspices of the appropriate Institutional Review Board, was abstracted from data collected as part of a large-scale EBP dissemination and implementation initiative funded by the Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Treatment (SAMHSA/CSAT). The general goal of this initiative was to improve adolescent substance use treatment by providing multiple community-based treatment organizations with funding so that their clinical staff could learn and implement the Adolescent Community Reinforcement Approach and Assertive Continuing Care (A-CRA/ACC; Godley et al., 2001), which has been shown to be effective in reducing adolescent substance use and substance-related problems (Dennis et al., 2004; Garner et al., 2009; Garner, Godley, Funk, Dennis, & Godley, 2007; Godley, Godley, Dennis, Funk, & Passetti, 2002, 2007; Godley et al., 2010). Each treatment organization received approximately \$900,000 (over a three-year period) and was able to have up to five staff participate in extensive training, feedback, and supervision in the model at no additional cost. The training in A-CRA/ACC included components that have been found effective for training clinicians in EBPs, including a treatment manual, 3.5-day initial workshop, coaching/supervision sessions, and feedback on recorded sessions (Miller, Yahne, Moyers, Martinez, & Pirritano, 2004; Sholomskas et al., 2005). More detailed information about the SAMHSA/CSAT project and training model has been described by Godley and colleagues (2011).

Procedures

Procedurally, this secondary analysis study used staff and client data collected as part of the SAMHSA/CSAT initiative described above. Data related to staff turnover was recorded as part of a contract to Chestnut Health Systems to provide training and technical assistance to each of the 34 treatment organizations participating in the SAMHSA/CSAT project. Client intake and follow-up data was collected by each of the respective treatment organizations participating in the SAMHSA/CSAT-funded initiative.

Sample

Organizations—In October 2006, SAMHSA/CSAT provided funds to 15 treatment organizations, which were then followed by the funding of an additional 19 treatment organizations in October 2007. These 34 licensed treatment organizations were spread across 15 states (regions of the country represented: Northeast [5], Southeast/South Atlantic [8], Midwest [2], Southwest [6], and West [13]). The organizations delivered treatment in the following settings: outpatient (n=13), school-based (n=5), home-based (n=4), residential (n=2), or in a mixture of settings (n=10). All organizations (N=34) were included for examination of staff turnover rates. Analyses examining the relationship between rates of turnover and treatment implementation (n=31) did not include the two organizations providing treatment in residential settings since three of the treatment implementation measures were based on outpatient session attendance. One other treatment organization was not included because it lost its funding early in the project since it was unable to recruit clients. In addition to these three treatment organizations, four more treatment organizations were not included in treatment outcome analyses (n=27) due to having 6-month client follow-up rates of less than 70%, which as noted by Scott (2004), may introduce significant and unpredictable biases in outcome data.

Staff—Between October 2006 and March 2011, 249 treatment staff were employed at one of the 34 treatment organizations participating in this SAMHSA/CSAT initiative. Of these 249 treatment staff, 183 worked as clinicians, 39 worked as clinical supervisors, and 27 worked as both clinicians and clinical supervisors. Given this latter group were both clinicians and clinical supervisors, which were the two groups of interest, these dual-role staff were included as part of each respective clinician and clinical supervisor analyses. Although background information was not systematically collected on all staff participating in the SAMHSA/CSAT initiative, such information was collected from a subset of 121 clinicians (representing 32 (94%) of the 34 treatment organizations) who agreed to participate in a study examining predictors of EBP implementation (Garner, Hunter, Godley, & Godley, 2011). Garner et al. (2011) reported the following characteristics for this sample: average age in years of 35 ($SD = 10.7$), female (73.6%), Master's Degree (57.9%), Bachelor's Degree (34.7%), median years of experience in drug abuse counseling 1.5 years ($SD = 4.9$ years), and currently licensed/certified addictions therapist (16.5%). Ethnic/racial group membership was self-reported, and percentages were as follows: Caucasian (54.5%), African American (18.2%), Asian (2.5%), American Indian/Alaska Native (2.5%), and mixed race or other (22.3%). Overall, 19.7% also reported they were Hispanic or Latino.

Clients—A total of 3,486 clients received one or more A-CRA/ACC treatment sessions across the 31 treatment organizations and were included as part of the treatment implementation analyses. Table 1 provides descriptive statistics for the 3,486 clients included in the treatment implementation analyses, as well as the subset of 3,092 clients included in the treatment outcome analyses. There were no between group differences for these measures.

Measures

Rates of treatment staff turnover—The project start date and project end date were recorded for all clinical staff involved in the SAMHSA/CSAT project. We also coded whether the project end date was due to agency turnover or project turnover. Agency turnover is limited to an individual voluntarily or involuntarily leaving the agency. However, project turnover refers to either an individual voluntarily or involuntarily leaving the agency (i.e., agency turnover) or an individual voluntarily or involuntarily being transferred off of the SAMHSA/CSAT-funded project, but remaining employed at the agency. Thus, our concept of project turnover is consistent with other research (Dalton, 1997), which has noted that transfers are not always easily distinguishable from turnover. Using the project start and end dates, we were able to calculate annualized turnover rates, which take into account the number of days each staff member was employed on the project. Annualized rates of turnover were calculated by dividing the number of turnover events by the total number of days staff were employed on the project and then multiplying this by the unit of observation [(turnover events / days worked on the project) * 365 days]. This method produces annualized rates of staff turnover identical to other established methods (Glebbeeck & Bax, 2004; Shaw, Gupta, & Delery, 2005), which calculate annualized turnover by dividing the number of turnovers by the average number of staff employed during the period and then multiplying this by the appropriate annualization factor [(turnover events / average number of staff employed during observation period) * (365 / days in observation period)].

In addition to calculating the average annualized rates of clinician and clinical supervisor agency turnover rates across the multiple sites for the larger SAMHSA/CSAT project, we calculated the following four organizational-level rates of turnover for each organization: 1) agency turnover of clinicians, 2) project turnover of clinicians, 3) agency turnover of clinical supervisors, and 4) project turnover of clinical supervisors. The average annualized rates of turnover for the SAMHSA/CSAT project were used for making comparisons to the annual

turnover rate reported by the Bureau of Labor Statistics. The four organizational-level rates of turnover were used to examine the relationship between organizational-level rates of treatment staff turnover and client-level outcomes. Because approximately half of the organizations did not have any clinical supervisor turnover, organizational-level rates of clinical supervisor turnover were transformed into three categories. The referent group included those treatment organizations with 0% annualized clinical supervisor turnover. The other two groups were based on a median-split of the remaining treatment organizations' rates of clinical supervisor turnover and were labeled as low clinical supervisor turnover (1% to 34%) and high clinical supervisor turnover (35% or higher), respectively.

Treatment implementation—As part of the SAMHSA/CSAT project, clinicians used the same web-based application (EBTx) that was used to upload therapy session recordings to document the date of each session as well as which treatment procedures were delivered during the session. For this study, four measures of treatment implementation were computed for each client. Definitions for the first two measures were developed by the Washington Circle (WC) group (e.g., Garnick et al., 2002; Garnick, Lee, Horgan, Acevedo, & Washington Circle Public Sector Workgroup, 2009) and included *initiation* (dichotomous yes/no variable indicating if the adolescent received a second treatment session within 14 days of the first treatment session) and *engagement* (dichotomous yes/no variable indicating if the adolescent received two additional treatment sessions within 30 days of initiation). The other two measures included the *number of treatment sessions* delivered to clients and the *A-CRA Exposure Scale* (AES; $\alpha = .80$), which is a count of 20 A-CRA procedures delivered to clients and has been shown to mediate the relationship between treatment retention and outcome (Garner et al., 2009).

Treatment outcome—As part of the SAMHSA/CSAT project, clients were assessed at treatment intake and 6 months post-treatment intake using the Global Appraisal of Individual Needs (GAIN; Dennis, Titus, White, Unsicker, & Hodgkins, 2003), which is a comprehensive biopsychosocial assessment designed to integrate research and clinical assessment into one structured interview. Since clients were receiving treatment for substance use disorders, our primary treatment outcome of interest was *the percentage of days of use* (controlling for days in controlled environments such as jail, prison, or residential treatment). However, we also analyzed five other GAIN measures that have been used to examine the construct validation of various self-reported measures of drug use (Lennox, Dennis, Ives, & White, 2006). These included the GAIN's a) *Substance Problems Scale* (i.e., a count of past-month symptoms of substance abuse, dependence, or substance-induced disorders that is based on DSM-IV; $\alpha = .90$); b) *Social Risk Index* (i.e., a sum of items indicating how many people the respondent hangs out with socially are involved in school, training, illegal activities, substance use, or treatment); c) *Recovery Environment Risk Index* (i.e., an average of items [divided by their range] for the days [during the past 90 days] of alcohol in the home, drug use in the home, fighting, victimization, being homeless, and structured activities that involved substance use and the inverse [90-answer] percent of days going to self-help meetings, and involvement in structured substance-free activities); d) *Illegal Activities Scale* (i.e., an average of items [divided by their range] for the recency of illegal activity, and days [during the past 90 days] of any illegal activity and supporting oneself financially with illegal activity; $\alpha = .64$); and e) *Emotional Problems Scale* (i.e., an average of items [divided by their range] for recency of mental health problems, memory problems, and behavioral problems; the days [during the past 90 days] of being bothered by mental problems, memory problems, and behavioral problems; and the days the problems kept participant from responsibilities; $\alpha = .72$).

Analytic Plan

Differences between the annualized rates of staff turnover reported by the Bureau of Labor Statistics (i.e., the comparison sample) and this study's annualized turnover rates were examined using Cohen's h effect size index (Cohen, 1977), which is used for comparing proportions. Using the conventions provided by Cohen (1977), we considered an absolute difference of .20 or greater to represent a statistically significant difference (i.e., small effect).

Analyses of the relationships between staff turnover and client outcomes were conducted using HLM 6 software (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2004). A series of multilevel regression analyses (Raudenbush & Bryk, 2002) were used to regress client-level outcomes (Level 1) on organizational-level rates of turnover (Level 2), with the intake version of each treatment outcome measure (e.g., days of abstinence, substance problems scale, social risk index) included as a control in each respective model. Conventional $p < .05$ was used to define statistically significant relationships.

Results

Annualized rates of turnover

The annualized *agency* turnover rate was 31% for clinicians and 19% for clinical supervisors. Additionally, the annualized *project* turnover rate was 37% for clinicians and 21% for clinical supervisors. As shown in Figure 1, the annualized agency turnover rate for clinicians in this study was not significantly lower than the average annual rate of total separations for the broader health care and social assistance industry over the same time period ($h = .02$). In contrast, the annualized agency turnover rate for clinical supervisors was significantly lower ($h = -.26$).

Regression of client-level implementation outcomes on organizational-level rates of turnover

Table 2 presents results of the multilevel regression analyses examining the extent to which organizational-level rates of staff turnover were associated with client-level measures of treatment implementation. None of the various organizational-level rates of staff turnover were found to be significantly associated with the four treatment implementation measures examined.

Regression of client-level treatment outcomes on organizational-level rates of turnover

Tables 3a and 3b present results of the multilevel regression analyses examining the extent to which organizational-level rates of staff turnover were associated with client-level measures of treatment outcome. Controlling for intake severity, we did not find a statistically significant relationship between any of the turnover measures and the primary outcome of percent of days of alcohol and other drug use. However, even after controlling for intake severity, we did find four statistically significant relationships. Specifically, higher rates of clinician project turnover were significantly associated with lower client-level social risk. Higher rates of both types (i.e., agency and project) of clinician turnover were significantly associated with lower client-level involvement in illegal activity. Finally, we found that relative to the organizations with no agency turnover of clinical supervisors, those with low rates of clinical supervisor agency turnover had significantly less client-level involvement in illegal activity.

Discussion

In addition to adding to the sparse knowledge about actual rates of staff turnover within the SUD treatment field, this study represents the first known examination of the relationship between turnover of SUD treatment staff and client-level outcomes. We found mixed support for our first study hypothesis. That is, although we found the annualized rates of clinical supervisor organization turnover (19%) to be significantly lower than the average rate of annual staff turnover reported by the Bureau of Labor Statistics for the health care and social assistance industry (30%; Bureau of Labor Statistics, 2011), this was not true for the annualized rate of clinician turnover (31%) observed in our study. It is important to note, however, the similarity of this study's rates of clinician and clinical supervisor turnover to the annual rates of turnover for clinicians (33%) and clinical supervisors (23%) observed by Eby et al. (2010) in their examination of rates of staff turnover among 26 treatment organizations affiliated with the National Institute on Drug Abuse's Clinical Trials Network (CTN) and 1 non-CTN treatment organization.

We did not find support for the hypothesis that higher annualized rates of staff turnover would be significantly associated with poorer client outcomes. In fact, in direct contrast to our hypothesis, we found evidence that higher organizational-level rates of both clinician and clinical supervisor turnover were significantly associated with greater client-level improvements in client-level reports of illegal activity and social risk. Clearly, additional research is needed to better understand these findings. However, they are consistent with Woltmann and colleagues' (2008) qualitative finding that many teams reported staff turnover as having a "primarily positive influence on implementation" (p. 735). That is, 12 teams included as part of Woltmann et al.'s study indicated staff turnover provided an opportunity for "realignment" of the team (e.g., hiring more qualified staff). These findings also are consistent with prior reviews that have acknowledged that turnover may not be limited to negative consequences, but also may have some positive consequences (e.g., Dalton & Todor, 1979; Staw, 1980). For example, in this initiative, clinicians were required to record their therapy sessions for review and if they were not able to demonstrate A-CRA competence after a reasonable time period, they may have been replaced with clinicians who were more willing or able to implement A-CRA with fidelity, therefore resulting in more positive consequences for the project and clients.

In addition to the significant relationship between turnover and outcomes described above, we observed generally weak relationships between organizational-level rates of staff turnover and the majority of client-level outcomes examined. A possible explanation for these weak relationships might be related to the equalizing effects of training staff in an EBP since all staff were trained using the same comprehensive training and ongoing monitoring/coaching approach (Godley et al., 2011). That is, if the training process worked as intended, it would decrease variability associated with the clinician delivering treatment (i.e., therapist effects). Thus, it is possible that the relationship between staff turnover and client outcomes was moderated by consistent measurement of and feedback related to maintaining treatment fidelity and should be examined as part of future research. Indeed, an examination of potential moderators of the turnover rates-organizational performance relationship was one of the concluding recommendations of Shaw's (2011) review of turnover rates and organizational performance.

Limitations

As with all research, the results of this study should be considered in light of its limitations. Given this study was conducted within the context of a highly resourced EBP implementation initiative, it is unknown to what extent the current findings generalize to other treatment settings. Although we had complete turnover data for all clinical staff, we

only had descriptive background data on a subset of individuals that were employed and agreed to participate in a separate study. Additionally, we did not have complete data on the extent to which staff turnover events were voluntary or involuntary. The number of tests conducted increases the likelihood that some findings may be spurious. Thus, additional research is needed to replicate these findings. Client outcome data was based on self-report. Thus, it is possible that the lack of significant findings associated with some of the dependent variables, in part, may have been a result of the use of self-report measures rather than objective verifiable data. Finally, although the current sample of more than 27 treatment organizations and 3,000 clients may be considered large by some standards, these sample sizes are relatively small for organizational-level analyses. Nonetheless, the current study represents the largest known study to date within the SUD treatment field to combine organizational-level staff turnover data with client-level outcome data.

Implications

There are several implications that may be drawn from this study's findings. First, with annualized rates of clinician and clinical supervisor agency turnover of 31% and 19%, respectively, turnover of SUD treatment staff does appear to be an issue of concern. Importantly, however, these findings suggest that the extent to which SUD treatment staff turnover is a concern may have less to do with their impact on service quality and treatment effectiveness than with the financial costs associated with hiring and training replacement staff. Thus, in addition to the need for future research to examine the impact of staff turnover on client outcomes, there also is a need for studies that examine the financial impacts of staff turnover.

A second study implication is that the annual turnover rate of SUD treatment staff appears to be similar to the annual total separation rate for the broader health care and social assistance field. The approximate 30% turnover rate for these jobs is significantly less than the 40% annual total separation rate for all nonfarm jobs reported by the Bureau of Labor Statistics between 2007 and 2010. This is an important finding because it suggests that although rates of staff turnover within the SUD treatment field are not ideal, the rates are not significantly worse than in other industries. Indeed, even when we compare rates of voluntary turnover, the 25% annual voluntary turnover rate reported by Eby et al. (2010), which was based on data collected in 2007, is identical to the 25% annual quit rate reported by the Bureau of Labor Statistics for all nonfarm jobs in the same year.

A third implication of this study is that the relationship between staff turnover and client outcome may vary depending on what type (e.g., clinician vs. clinical supervisor, agency vs. project) of turnover is examined. For example, we found that the direction of the association between staff turnover and client social risk was negative for clinician turnover and positive for clinical supervisor turnover. Similarly, we found that the direction of the association between staff turnover and client initiation was positive for agency turnover and negative for project turnover. Thus, it is important for researchers to clearly define the type(s) of turnover being examined.

Finally, a fourth implication of this study is that the widely held assumption that turnover of SUD treatment staff will adversely impact service delivery and client outcomes is not currently empirically supported. Importantly, while we found some evidence to suggest that higher organizational-level rates of staff turnover were significantly associated with lower client involvement in illegal activity and social risk, we also found that organizational-level rates of staff turnover did not have strong associations with the majority of the client-level measures examined. Thus, we recommend additional research on SUD staff turnover be undertaken to test for replication of these findings, as well as examine consequences of staff turnover in other settings.

General conclusions and next steps

In conclusion, this study provided evidence that a) as in many other fields, there is considerable workforce instability in the SUD treatment field; and b) workforce instability is not necessarily associated with poorer treatment implementation or outcomes for clients. Given this is the first known study to examine the relationship between SUD staff turnover and client outcomes, other examinations of the extent to which organizational-level rates of staff turnover are predictive of client outcomes are clearly needed. Additionally, because researchers have noted that relationships may differ at different levels of analysis (e.g., Robinson, 1950), future research also is needed that more directly examines the association between staff turnover and client outcomes (i.e., examining the extent to which client outcomes differ between clients who had their clinician turnover during the treatment process and clients who did not have their clinician turnover during the treatment process). Finally, rather than focusing solely on the negative consequences of staff turnover, researchers are encouraged to examine possible positive consequences of staff turnover, which as Staw (1980) noted, may include: a) increased performance, b) reduction of entrenched conflict, c) increased mobility and morale, and d) increased innovation and adaptation.

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Figure 1. Comparison of annual clinician and clinical supervisor turnover rates to the overall health care and social assistance industry (2007 – 2010). h = Cohen's effect size index for proportions. h less than $-.20$ or greater than $.20$ is considered statistically significant.

Table 1

Client intake characteristics

	Treatment Process Sample (N=3,486)	Treatment Outcome Sample (N=3,092)
Male	74%	73%
African American	16%	13%
Hispanic	29%	32%
Caucasian	33%	32%
Age	(15.9, 1.42)	(15.9, 1.41)
Single parent household	52%	51%
Juvenile justice involved	67%	65%
Co-occurring mental health disorder	67%	68%
% Days of Alcohol and Other Drug Use	(37%, 36%)	(38%, 36%)
Substance Problems Scale	(13.5, 4.40)	(13.5, 4.45)
Social Risk Index	(2.72, 3.62)	(2.83, 3.70)
Recovery Environment Risk Index	(.25, .08)	(.26, .08)
Illegal Activity Scale	(.10, .11)	(.10, .11)
Emotional Problems Scale	(.26, .20)	(.27, .20)

Note. Values are percents or (mean, SD) for sample.

Table 2
Association between organizational-level staff turnover and client-level treatment implementation

Model	Variable	Initiation (Clients = 3,486)			Engagement (Clients = 3,477)			Number of Sessions (Clients = 3,423)			A-CRA Exposure Scale (Clients = 3,423)		
		B, SE	95% C.I.	Lower, Upper	B, SE	95% C.I.	Lower, Upper	B, SE	95% C.I.	Lower, Upper	B, SE	95% C.I.	Lower, Upper
Clinicians													
Agency Turnover	Constant	1.07, 0.92	0.50, 1.64	-0.01, 0.33	-0.66, 0.64	11.97, 0.95	10.11, 13.83	9.96, 0.53	8.92, 11.00				
	Turnover	0.35, 0.81	-1.24, 1.94	0.31, 0.90	-1.45, 2.07	-0.83, 2.63	-5.98, 4.32	-0.87, 1.47	-3.75, 2.01				
Project Turnover	Constant	1.23, 0.32	0.60, 1.86	0.12, 0.36	-0.59, 0.83	12.38, 1.04	10.34, 14.42	10.12, 0.58	8.98, 11.26				
	Turnover	-0.15, 0.78	-1.68, 1.38	-0.10, 0.90	-1.86, 1.66	-1.80, 2.52	-6.74, 3.14	-1.16, 1.41	-3.92, 1.60				
Clinical Supervisors													
Agency Turnover	Constant (no turnover)	1.11, 0.21	0.70, 1.52	0.07, 0.23	-0.38, 0.52	11.86, 0.69	10.51, 13.21	9.96, 0.37	9.23, 10.69				
	Low Turnover	-0.01, 0.36	-0.72, 0.70	-0.19, 0.40	-0.97, 0.59	-0.42, 1.19	-2.75, 1.91	-0.14, 0.64	-1.39, 1.11				
	High Turnover	0.34, 0.38	-0.40, 1.08	0.26, 0.41	-0.54, 1.06	-0.19, 1.24	-2.62, 2.24	-1.02, 0.67	-2.33, 0.29				
Project Turnover	Constant (no turnover)	1.08, 0.21	0.67, 1.49	0.05, 0.24	-0.42, 0.52	11.81, 0.71	10.42, 13.20	9.93, 0.38	9.19, 10.67				
	Low Turnover	-0.01, 0.36	-0.72, 0.70	-0.17, 0.40	-0.95, 0.61	-0.34, 1.20	-2.69, 2.01	0.02, 0.65	-1.25, 1.29				
	High Turnover	0.40, 0.36	-0.31, 1.11	0.29, 0.40	-0.49, 1.07	-0.05, 1.20	-2.40, 2.30	-0.91, 0.64	-2.16, 0.34				

Note. Low turnover = 1% to 34%; High turnover = 35% or higher. Data for these analyses include 31 organizations (average number of therapists per organization = 6; average number of clinical supervisors per organization = 2). None of the turnover measures were found to be statistically significant ($p < .05$).

Table 3

a. Association between organizational-level turnover rate and improvement in client-level treatment outcomes

Model	Variable	% of Days of Alcohol and Other Drug Use (Clients = 2,396)			Substance Problem Scale (Clients = 2,499)			Social Risk Index (Clients = 2,445)		
		B, SE	Lower, Upper	95% C.I.	B, SE	Lower, Upper	95% C.I.	B, SE	Lower, Upper	95% C.I.
Clinicians										
Agency Turnover	Constant	0.22, 0.03	0.16, 0.28		1.34, 0.21	0.93, 1.75		12.68, 0.33	12.03, 13.33	
	Turnover	-0.03, 0.07	-0.17, 0.11		0.28, 0.57	-0.84, 1.40		-1.51, 0.86	-3.20, 0.18	
	Intake	0.30, 0.03	0.24, 0.36		0.21, 0.03	0.15, 0.27		0.25, 0.03	0.19, 0.31	
	Constant	0.21, 0.03	0.15, 0.27		1.31, 0.23	0.86, 1.76		12.83, 0.34	12.16, 13.50	
Project Turnover	Turnover	-0.02, 0.07	-0.16, 0.12		0.33, 0.55	-0.75, 1.41		-1.73, 0.81	-3.32, -0.14	
	Intake	0.30, 0.03	0.24, 0.36		0.21, 0.03	0.15, 0.27		0.25, 0.03	0.19, 0.31	
Clinical Supervisors										
Agency Turnover	Constant (no turnover)	0.22, 0.02	0.18, 0.26		1.44, 0.15	1.15, 1.73		12.33, 0.24	11.86, 12.80	
	Low Turnover	-0.05, 0.03	-0.11, 0.01		-0.22, 0.26	-0.73, 0.29		-0.71, 0.40	-1.49, 0.07	
	High Turnover	-0.01, 0.03	-0.07, 0.05		0.21, 0.27	-0.32, 0.74		0.18, 0.41	-0.62, 0.98	
	Intake	0.30, 0.03	0.24, 0.36		0.21, 0.03	0.15, 0.27		0.25, 0.03	0.19, 0.31	
Project Turnover	Constant(no turnover)	0.22, 0.02	0.18, 0.26		1.41, 0.16	1.10, 1.72		12.45, 0.28	11.90, 13.00	
	Low Turnover	-0.03, 0.03	-0.09, 0.03		-0.08, 0.27	-0.61, 0.45		-0.82, 0.32	-1.45, -0.19	
	High Turnover	-0.02, 0.03	-0.08, 0.04		0.16, 0.27	-0.37, 0.69		-0.15, 0.37	-0.88, 0.58	
	Intake	0.30, 0.03	0.24, 0.36		0.21, 0.03	0.15, 0.27		0.25, 0.03	0.19, 0.31	

b. Association between organizational-level turnover rate and improvement in client-level treatment outcomes

	Recovery Environment Risk Index (Clients = 2,357)			Illegal Activity Scale (Clients = 2,448)			Emotional Problems Scale (Clients = 2,496)		
	Variable	B, SE	95% C.I. Lower, Upper	B, SE	95% C.I. Lower, Upper	B, SE	95% C.I. Lower, Upper		
<i>Clinicians</i>									
Agency Turnover	Constant	0.23, 0.01	0.21, 0.25	0.10, 0.01	0.08, 0.12	0.20, 0.01	0.18, 0.22		
	Turnover	-0.02, 0.02	-0.06, 0.02	-0.05, 0.02	-0.09, -0.01	-0.05, 0.04	-0.13, 0.03		
	Intake	0.31, 0.02	0.27, 0.35	0.25, 0.03	0.19, 0.31	0.32, 0.02	0.28, 0.36		
Project Turnover	Constant	0.24, 0.01	0.22, 0.26	0.10, 0.01	0.08, 0.12	0.19, 0.02	0.15, 0.23		
	Turnover	-0.02, 0.02	-0.06, 0.02	-0.05, 0.02	-0.09, -0.01	-0.03, 0.04	-0.11, 0.05		
	Intake	0.31, 0.02	0.27, 0.35	0.25, 0.03	0.19, 0.31	0.32, 0.02	0.28, 0.36		
<i>Clinical Supervisors</i>									
Agency Turnover	Constant (no turnover)	0.23, 0.00	0.23, 0.23	0.09, 0.01	0.07, 0.11	0.18, 0.01	0.16, 0.20		
	Low Turnover	-0.01, 0.01	-0.03, 0.01	-0.03, 0.01	-0.05, -0.01	-0.02, 0.02	-0.06, 0.02		
	High Turnover	0.01, 0.01	-0.01, 0.03	0.00, 0.01	-0.02, 0.02	0.00, 0.02	-0.04, 0.04		
Project Turnover	Intake	0.31, 0.02	0.27, 0.35	0.24, 0.03	0.18, 0.30	0.32, 0.02	0.28, 0.36		
	Constant (no turnover)	0.23, 0.01	0.21, 0.25	0.09, 0.01	0.07, 0.11	0.18, 0.01	0.16, 0.20		
	Low Turnover	-0.01, 0.01	-0.03, 0.01	-0.02, 0.01	-0.04, 0.00	-0.01, 0.02	-0.05, 0.03		
Project Turnover	High Turnover	0.00, 0.01	-0.02, 0.02	0.00, 0.01	-0.02, 0.02	0.00, 0.02	-0.04, 0.04		
	Intake	0.31, 0.02	0.27, 0.35	0.24, 0.03	0.18, 0.30	0.32, 0.02	0.28, 0.36		

Note: Intake refers to the intake version of each respective outcome measure. Low turnover = 1% to 34%; High turnover = 35% or higher. Data for these analyses include 27 organizations (average number of therapists per organization = 6; average number of clinical supervisors per organization = 2). All constants and intake covariates were significant ($p < .05$). Turnover variables with $p < .05$ are indicated in bold.