

Process evaluation of the Custody Based Intensive Treatment (CUBIT) program for sex offenders: Within-treatment change

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Aim

This study aimed to examine the intermediate outcomes of participation in the Custody Based Intensive Treatment (CUBIT) program in treating dynamic risk factors that are expected to have an influence on offenders' likelihood of sexual reoffending.

Methods

The sample included sex offenders who had participated in CUBIT over the lifespan of the program, and had completed psychometric measures administered before and after treatment (total N = 637). Within-treatment change was assessed at the group level as well as at the individual level using calculations of clinically significant change.

Results

On average CUBIT participants showed significant change over treatment on most of the assessed measures. Results of clinically significant change analyses indicated that most offenders reported being in the normative ranges of functioning on various measures prior to treatment. Of those offenders who reported dysfunction on a given measure at pre-treatment, half (53.5%) showed clinically significant change on that measure over treatment on average. Subgroup analyses indicated that child sex offenders were more likely to report dysfunction prior to treatment than adult sex offenders, although rates of significant change among offenders who reported dysfunction were similar across these groups.

Conclusion

The results of this study suggest that participation in CUBIT is associated with substantial self-reported change across multiple domains of dynamic risk for sexual reoffending on average. Further research is needed to isolate the observed patterns of change to the causal impacts of CUBIT, and to establish the predictive validity of such intermediate measures to sexual reoffending outcomes.

INTRODUCTION

Identification and assessment of dynamic risk factors are critical components of offender treatment. Dynamic risk factors are those cognitive, personality-based, situational and behavioural variables that have been empirically shown to have a causal relationship with likelihood of reoffending and are amenable to change. The Risk Needs Responsivity (RNR) model (Bonta & Andrews, 2017) emphasises interventions that reduce the severity of dynamic risk factors or criminogenic needs (needs principle), while tailoring intensity to the offender's likelihood of reoffending (risk principle) and delivery to individual characteristics that may influence responsiveness (responsivity principle). In this regard, assessment of an offender's dynamic risk factors can inform their treatment targets prior to participation, in addition to their progress and outstanding case management needs over the course of treatment.

Dynamic risk factors for sexual reoffending have undergone extensive study in recent decades, and a number of relevant variables have been identified (e.g. Hanson & Morton-Bourgon, 2004; Mann et al., 2010). Dynamic risk factors for sex offenders have been clustered into four broad domains including: offence supportive attitudes, which are beliefs that condone sexual behaviour with children or coercive sexual activity towards women, in addition to general antisocial attitudes; sexual interests, which can involve paraphilic sexual preferences and preoccupation with sex; socioaffective functioning, including lack of intimacy with adults, loneliness and deficits in emotion and self-esteem; and self-regulation, which relates to difficulties with impulsivity, dysfunctional coping and poor emotional control (Beech, 1998; Thornton, 2002; see also Allan et al., 2007; Barnett et al., 2012; Wakeling et al., 2013).

The relationship between dynamic risk factors and the needs principle is also important from a program evaluation perspective because it articulates the mechanisms of change in treatment, or how treatment has an influence on reoffending outcomes (e.g. Howard & van Doorn, 2018; Kazdin, 2007; Kroner & Yessine, 2013). In the case of a sex offender program such as CUBIT, for example, it may be expected that treatment will effect a change in an offender's dynamic risk factors, which in turn reduces their likelihood of sexual reoffending. In accordance with this program logic, the effects of treatment on ultimate reoffending outcomes may therefore be estimated by assessing evidence of change in risk factors over the course of treatment. Evaluation of treatment outcomes via intermediate effects on risk factors has been suggested for sex offender programs in particular, considering the low rates of sexual reoffending and other methodological constraints to robust impact evaluation of such programs on recidivism (e.g. Banse et al., 2013; Beggs, 2010; Friendship et al., 2003; Wakeling & Barnett, 2014).

Most dynamic risk factors for sexual reoffending cannot be directly observed, and are therefore assessed using self-report psychometric measures. While there is some scepticism that offenders would give accurate self-reports about their risk factors (e.g. Tierney & McCabe, 2001), a number of studies have found that offenders can provide self-report assessments of dynamic risk factors that have predictive validity for reoffending outcomes. For example, a meta-analysis by Walters (2006) showed that discrete self-report measures have correlations with reoffending that are of comparable effect sizes to that of clinician scored risk assessments, on the proviso that the measure assesses conceptually relevant domains of dynamic risk. Other studies have similarly shown that self-report assessments of offence-specific risk factors can have significant, albeit often modest, predictive validity for sexual reoffending (e.g. Barnett et al., 2012; Helmus et al.,

2013; Mann et al., 2010; Wakeling et al., 2011; van den Berg et al., 2018).

It follows that assessment of within-treatment change in dynamic risk factors has typically involved administering psychometric measures to offenders at multiple stages during their participation, most commonly at the beginning and end of treatment. A number of studies have examined change in sex offenders' psychometric scores before and after treatment, with indications that they tend to report significant improvement in various dynamic risk factors over the course of treatment on average (see Nunes et al., 2011, for a review). Best practice methods of statistically measuring change over treatment continue to be a source of debate, however (e.g. Yang et al., 2017). In particular it has been argued that average change in scores before and after treatment at the group level may give inadequate information about dynamics of change over treatment and how they correspond with outcomes for a given offender (Banse et al., 2013; Nunes et al., 2011). More recent studies have applied statistical approaches that assess change among sex offenders at the individual level, such as clinically significant change (Barnett et al., 2013; Nunes et al., 2014; Wakeling et al., 2013). This method categorises individual outcomes according to whether they showed change that was both statistically reliable and reflects movement from dysfunctional to functional ranges of scores (e.g. Jacobson et al., 1984; 1986).

The Current Study

The aim of this study is to evaluate associations between sex offenders' completion of the CUBIT program and their within-treatment change on dynamic risk factors for likelihood of sexual reoffending. To achieve this we examined change in scores for a number of self-report measures that are routinely administered to CUBIT participants before and after treatment, and reflect established domains of risk and treatment targets for the program. Within-treatment change was assessed

using multiple methods, including average change at the group level, and individual classification into categories of clinically significant change.

In recognition of the heterogeneity of sex offenders and how this may affect their treatment needs and response to intervention, this study also examined compared and contrasted offenders' psychometric scores and patterns of change for those with child or adult sex offences.

The current study is part of a planned series of process evaluation projects examining the CUBIT suite of programs for sex offenders implemented by Corrective Services New South Wales (CSNSW). Previous research in this series has examined factors associated with program uptake and completion (Howard, 2016) and effects of changes to treatment delivery on participation outcomes (Howard, Neto, & Galouzis, 2018).

The objectives of this process evaluation series are to inform continuing improvement to best practice and provide context to a parallel outcome evaluation of CUBIT conducted by the NSW Bureau of Crime Statistics and Research (BOCSAR: Halstead, 2016). Results of the outcome evaluation indicated that participation in CUBIT was associated with a significant reduction in risk of general reoffending relative to controls. However, treatment effects on sexual reoffending were inconclusive as a result of low base rates of recidivism and other methodological constraints to the power of analyses (Halstead, 2016).

Research questions for this study included the following:

- Do sex offenders show significant change in assessed risk factors over treatment on average? Which factors do and do not show within-treatment change?
- What is the level of need or dysfunction in assessed risk factors among CUBIT participants prior to treatment?

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- To what extent do individual offenders show clinically significant change over treatment?
 - Does the prevalence of pre-treatment need and patterns of within-treatment change differ between adult and child sex offenders?

METHODS

Sample

The total sample for this study was 637 adult male offenders who had commenced CUBIT between 1999 and the data collection census date of April 2015. CUBIT is a residential group program for men who have offended against children or adults and have been assessed as having moderate to high risk and needs for sexual reoffending (for further description of the CUBIT program see Howard, 2016; Howard et al., 2018; Ware & Bright, 2008).

Offenders were included in the study if they had validly completed psychometric assessments at the pre-treatment and / or the post-treatment stages of participation in CUBIT. This included 542 offenders who completed treatment and 95 offenders who failed to complete the program. Given the variation in rates of administration of the various psychometric measures before and after treatment, analyses in this study were often conducted on differing numbers of offenders. Sample numbers for individual analyses are given in the Results section where appropriate.

Among the offenders in this sample, the average (mean) age at treatment entry was 40.93 years (range 18–81 years). For offenders with available information on Indigenous status ($n = 628$), 20.5% identified as being of Aboriginal or Torres Strait Islander background. Type of index sex offence was evenly distributed between offences against adult (44.8%) and child (51.5%) victims, whereas the

remainder had index sex offences against both adults and children (3.7%).

Consistent with eligibility criteria and the high intensity of the CUBIT program, two thirds of offenders were categorised as having moderate-high to high risk of sexual reoffending as assessed by the Static-99R (Hanson & Thornton, 2000; Helmus, Thornton, Hanson, & Babchishin, 2012). Average (mean) continuous score on the Static-99R was 4.21 (range -3 - 11).

Measures

The majority of measures used in this study were obtained from the battery of psychometric assessments that are routinely administered to offenders before and after participation in CUBIT by therapeutic staff. These assessments were aggregated into a database spanning the lifespan of CUBIT operations for the purposes of research and evaluation. Other variables of interest were obtained from the CSNSW Offender Integrated Management System (OIMS) operational database, and the CUBIT programs referral database.

A description of each of the psychometric measures considered in this study is provided below. Further information on reliability and normative statistics for the measures is also given in the section on calculations of clinically significant change and Table 1.

Bumby Rape Scale (BRS). The BRS (Bumby, 1996) was designed to measure offence supportive cognitions of men who sexually assault women. The measure consists of 36 items, each of which are scored on a 4 point Likert scale (1 = strongly disagree; 4 = strongly agree) to give a total score ranging between 36 and 144. A single factor total score is calculated to indicate the overall severity of offence supportive cognitions about sexual assault of women. At pre-treatment the internal consistency of the BRS was high at $\alpha = .96$.

Bumby Molest Scale (BMS). The BMS (Bumby, 1996) was developed as a companion measure to the BRS and measures offence supportive beliefs about sexual assault of children. The measure comprises 38 items which are scored on a 4 point Likert scale (1 = strongly disagree; 4 = strongly agree) to give scores ranging between 38 and 152. The BMS derives a single total score factor that indexes severity of cognitions supporting child sexual assault. The BMS showed excellent internal reliability in this sample at $\alpha = .96$.

Coping Inventory for Stressful Situations (CISS). The CISS (Endler & Parker, 1990) is a 48 item self-report measure that assesses the extent to which individuals tend to apply different styles of coping in difficult, upsetting or stressful situations. Following an established typology for styles of coping (e.g. Cook & Heppner, 1997), the CISS measures three correlated factors including task oriented coping (CISS - Task: 15 items), social / emotionally oriented coping (CISS - Emotion: 16 items) and avoidant coping (CISS - Avoidance: 16 items). The Avoidance scale can be interpreted in reference to two subordinate factors of Distraction and Social Diversion; for the purposes of this study we assessed the superordinate Avoidance factor only. All items are scored on a 5 point Likert scale to indicate how respondents apply various coping activities (1 = not at all; 5 = very much). At pre-treatment, offenders in this study returned alphas of .93 for the CISS - Task factor, .88 for the CISS - Emotion factor and .86 for the CISS - Avoidance factor.

Coping Using Sex Inventory (CUSI). The CUSI (Cortoni & Marshall, 2001) is a 16 item self-report measure that assesses the degree to which sex is used to deal with stressful situations. The total score ranges between 16 and 80 and can be interpreted as an index of the extent to which the respondent uses sex-related activities such as fantasies, masturbation, use of pornography and sexual behaviour as coping strategies. Items are

also clustered into three thematic domains relating to consensual sex (CUSI - Consensual: 5 items), rape (CUSI - Rape: 6 items) and child sexual abuse (CUSI - Molest: 4 items). Frequency of activities are rated on a 5 point Likert scale (1 = not at all; 5 = very much). Internal consistencies for the Total and Consensual, Rape and Molest factors in this study were .85, .85, .83 and .89 respectively.

UCLA Loneliness Scale (UCLA LS). Offenders were administered Version 3 of the UCLA Loneliness Scale (Russell, 1996; Russell, Peplau, & Cutrona, 1980), which consists of 20 statements that reflect how lonely respondents describe their current experience. This single factor measure is scored on a 4 point Likert scale (1 = never; 4 = often) to give a total index of emotional loneliness. The measure is evenly weighted between positively worded and negatively worded items; positively worded items are reverse coded prior to calculating scores so that higher total scores are indicative of greater loneliness. The internal reliability of the UCLA Loneliness Scale was high in the current sample at $\alpha = .90$.

Miller Social Intimacy Scale (Miller SIS). The Miller SIS (Miller & Lefcourt, 1982) is a 17 item self-report scale that assesses the maximum level of intimacy currently experienced by the respondent. Respondents rate items about the perceived frequency of closeness, support and affection in reference to their closest current intimate relationship on 10 point Likert scale (1 = not much / very rarely; 10 = a great deal / almost always). Overall level of intimacy is scored with a range between 17 and 170. The Miller SIS had high internal consistency in the sample ($\alpha = .93$).

Social Self-Esteem Inventory (SSEI). The SSEI (Lawson, Marshall, & McGrath, 1979) was designed to assess respondents' self-esteem in social situations in particular. It consists of 30 items on which respondents rate their agreement with statements on 6 point Likert scales (1 = completely unlike me; 6 = exactly like me) to give a total factor

score ranging between 6 and 180. Half of the items are negatively worded (indicating lower social self-esteem) and are reverse coded so that higher total scores indicate increasing social self-esteem. Offenders in this sample showed internal reliability on SSEI items of .95 at pre-treatment.

Wilson Sex Fantasy Questionnaire (WSFQ). The WSFQ (Wilson, 1978) is a 40 item self-report measure that assesses four categories of sexual fantasies: Intimate (e.g. kissing passionately), Exploratory

(e.g. group sex), Impersonal (e.g. sex with strangers), and Sadomasochistic (e.g. coercive sex) fantasies. The frequency of fantasies for each of the categories are assessed over 10 5 point Likert scale items (1 = never, 5 = regularly). The superordinate total or summed score may be interpreted as an index of overall frequency of sexual fantasy. For the current study, internal reliability alphas were .86 for Intimate, .76 for Exploratory, .74 for Impersonal, and .82 for Sadomasochistic factors, and .93 for the WSFQ Total score.

Table 1. Normative data for non-offender samples and reliability statistics for psychometric measures included in the study, used in clinically significant change calculations.

Measure	Source	Functional mean (SD)	Reliability statistic	Functional threshold
BRS	Bumby (1996); Nunes et al. (2014)	63.69 (13.54)	.86	76.94
BMS	Bumby (1996); Nunes et al. (2014)	49.97 (10.12)	.84	60.09
CISS	Endler & Parker (1990)			
Task		58.86 (9.95)	.73	48.61
Emotion		39.21 (11.54)	.68	48.80
Avoidance		38.10 (9.59)	.55	47.69
CUSI	Cortoni & Marshall (2001); Marshall et al. (2003)			
Consensual		14.8 (5.33)	.85	20.13
Rape		6.7 (1.96)	.83	8.66
Molest		4.0 (0)	.89	4.00
Total		27.4 (7.44)	.85	34.84
UCLA Loneliness	Russell et al. (1980)	41.88 (10.22)	.73	52.10
Miller SIS	Miller & Lefcourt (1982)	137.8 (21.48)	.96	116.32
SSEI	Lawson et al. (1979)	132.0 (21.0)	.88	111.00
WSFQ	Baumgartner et al. (2002); Plaud & Bigwood (1997)			
Intimate		31.7 (9.3)	.92	41.00
Exploratory		14.3 (7.9)	.86	22.20
Impersonal		11.7 (6.8)	.83	18.50
Sadomasochistic		6.8 (5.7)	.86	10.60
Total		62.6 (23.9)	.95	86.50

Note that where functional threshold > functional mean, higher scores on the measure are indicative of greater dysfunction. Where functional threshold < functional mean, lower scores are indicative of greater dysfunction.

Data analysis

Missing data

Data on relevant variables were missing for a number of participants. In particular, over the period of measurement not all offenders were administered the full battery of psychometric measures represented in this study and not all offenders completed each of the administered measures validly. In addition, the previously unstructured approach to collating psychometric data as part of program participation resulted in loss of assessments for a number of offenders.

Considering this study's focus on psychometric properties and outcomes of measures we adopted a conservative approach to missing data. In the event that measures had formal procedures to manage otherwise valid response sets with minor missing data, these procedures were adopted. Otherwise responses with missing data on the scale of interest were excluded on a listwise basis from analyses. Among offenders who commenced treatment ($n = 637$), rates of valid completion of pre-treatment measures ranged between 71.8% and 89.2%. For offenders who completed treatment ($n = 542$), valid completion rates at post-treatment ranged from 69.2% to 84.6%.

Within-treatment change

Average within-treatment change at the group level was assessed by conducting paired sample t -tests on the simple difference between pre-treatment and post-treatment scores. This analysis provides a simple index of whether the average difference between scores at pre-treatment and post-treatment was statistically significant across the sample.

Tests of simple differences provide limited information about intermediate outcomes of treatment, primarily because they assess average change at the group level and do not indicate how

many or what proportion of offenders achieved a significant degree of change. In addition it is not possible to assess whether individual change is clinically significant or reflects a shift from dysfunctional status to functional status over the course of treatment. To address these factors we also calculated individual within-treatment change using categories of clinically significant change.

Clinically significant change analysis first requires calculation of a threshold at which scores can be defined as functional or dysfunctional (Jacobson et al., 1984; 1986). Considering that sex offenders are a heterogeneous population and would not all be expected to be dysfunctional on domains assessed in this study, it was not possible to use means from the sample as an index of the functional threshold. As a result we used data on non-offender samples to represent functional norms. The threshold was then calculated as the functional sample mean plus 1 SD (if higher scores represent greater dysfunction) or minus 1 SD (if lower scores represent greater dysfunction: see Nunes et al., 2014; Wakeling et al., 2013). Normative data from non-offender samples were largely obtained from psychometric development and other validation studies of the measures¹. See Table 1 for a list of sources of non-offender normative data and relevant statistics.

To assess whether an offender's change on a measure was statistically significant, we calculated the reliable change index (RCI: Jacobson et al., 1984; 1986; Jacobson & Truax, 1991). The RCI calculates simple change scores as a function of error statistics to test whether the difference between two measurements is significant. Categories of clinically significant change were then derived by combining RCI outcomes with placement of post-treatment scores relative to the functional threshold. Offenders were classified as *recovered* on

¹ An exception is that no studies were found that reported reliability statistics for the subordinate factors of the CUSI. As such it was necessary to apply internal consistency alphas derived from the current study sample at pre-treatment when calculating the reliable change index.

a measure if their post-treatment score was in the functional range of scores and showed reliable change. Offenders were classified as *improved* if they showed reliable change although their post-treatment score remained in the dysfunctional range. Offenders were classed as *unchanged* if they did not show reliable change. Lastly, offenders were classed as *deteriorated* if they showed reliable change over treatment but in a direction to indicate more severe dysfunction.

It is noted that conceptualisations of clinically significant change assume that all individuals are dysfunctional prior to treatment (Jacobson et al., 1984), and methods of categorisation do not account for individuals who are functional on the measure of interest at pre-treatment. As a result we only applied categories of change to offenders who report dysfunctional pre-treatment scores. Offenders in the functional ranges at pre-treatment were classified as *already functional* and the extent of their change over treatment was not assessed using this method (see Nunes et al., 2014).

RESULTS

Average within-treatment change

Available sample sizes and descriptive statistics for each of the measures at pre-treatment and post-treatment are given in Table 2. It can be seen that as expected, offender scores at pre-treatment tended to be higher than those observed at post-treatment for most measures. In particular, scores on measures of dynamic risk associated with offence supportive attitudes (BRS; BMS), sexual self-regulation (CUSI scales), sexual interests (WSFQ scales) and loneliness (UCLA LS) all showed declines at post-treatment compared to pre-treatment.

A small number of exceptions were observed, in that task oriented coping (CISS – Task) and avoidant coping (CISS – Avoidance) as well as social self-

esteem (SSEI) and social intimacy (Miller SIS) all tended towards increases or improvement between pre-treatment and post-treatment.

Average change between pre-treatment and post-treatment was assessed using a series of paired sample t-tests. As shown in Table 2, average within-treatment change across the total sample was statistically significant for all measures with the exception of the Miller SIS and the WSFQ – Intimate scale. Effect sizes for average change were calculated using the formula for Cohen's d (Cohen, 1992), adjusted for the correlation between repeated measures as outlined by Morris and Deshon (2002). By convention, effect sizes of up to .2 are small, up to .5 are moderate and up to .8 are large (Cohen, 1992). For the total sample effect sizes of the differences tended to be in the moderate range. Effect sizes in the large range were detected in relation to reductions in attitudes towards rape (BRS) and in loneliness (UCLA LS) as well as increases in social self-esteem (SSEI).

Functional status at pre-treatment

As previously mentioned, for an individual to achieve clinically significant change it is necessary that they firstly exhibit dysfunction in the factor of interest prior to participating. In the case of sex offender programs, this means offenders are assumed to have a degree of dysfunction (relative to non sex offender populations) on the domains of dynamic risk that are addressed over the course of treatment. In this regard calculation of clinically significant change categories can provide information about the extent and prevalence with which the treatment cohort presents need in relation to target risk factors.

Proportions of offenders who scored in the functional ranges for each of the measures at pre-treatment are represented in blue on Figure 1. It can be seen that for most measures the majority of offenders in the sample gave scores that indicated they were in the functional range prior to treatment

(mean = 78.9%). Rates of reporting in the functional range at pre-treatment were particularly high for the BRS (90.3%), the CUSI Consensual factor (93.1%), and the WSFQ Intimate (98.6%) and Exploratory (90.5%) factors. Relatively low rates of reporting in the functional range were observed for the CISS Emotion (50.2%) and Avoidance (47%) factors as well as the Sadomasochistic factor of the WSFQ (59.2%).

Clinically significant change

A second component of clinically significant change is that individual offenders are classed as recovered over treatment, or show improvement in scores that

is both statistically significant and represents a shift into functional ranges. For those offenders who were dysfunctional at pre-treatment, categorisations of their within-treatment change as recovered, improved, unchanged or deteriorated are also given in Figure 1. As a function of the total sample, rates of recovery ranged between 1.1% and 18.8% with an average (mean) of 9.0%. The highest rates of recovery were observed for the BMS (18.8%), the SSEI (16.2%) and the CISS - Emotion factor (15.7%), whereas relatively few offenders were classed as recovered for WSFQ scales such as the Intimate (1.1%), Sadomasochistic (2.8%) and Exploratory (3.1%) factors.

Table 2. Descriptive statistics for each of the measures at pre-treatment and post-treatment, in addition to analyses of average differences in scores between assessments.

Measure	Pre-treatment		Post-treatment		Simple Differences	
	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>t</i>	<i>d</i>
BRS	494	56.38 (15.23)	435	46.31 (12.28)	14.04***	0.75
BMS	470	54.77 (16.43)	408	46.98 (11.58)	9.94***	0.58
CISS - Task	484	55.00 (11.44)	396	60.38 (10.32)	-7.62***	-0.47
CISS - Emotion	455	48.31 (11.54)	375	41.62 (12.94)	10.84***	0.53
CISS - Avoidance	487	47.70 (11.31)	399	51.18 (11.50)	-4.50***	-0.31
CUSI - Consensual	556	12.00 (5.33)	452	10.56 (4.95)	4.43***	0.26
CUSI - Rape	560	6.96 (2.59)	459	6.52 (2.27)	3.91***	0.14
CUSI - Molest	568	5.08 (2.68)	457	4.51 (1.65)	4.94***	0.23
CUSI - Total	545	25.91 (8.69)	448	23.07 (7.21)	6.33***	0.34
UCLA Loneliness	510	42.93 (10.17)	427	35.74 (8.76)	14.85***	0.79
Miller SIS	538	130.56 (27.15)	432	131.45 (25.35)	-1.55	-0.03
SSEI	523	122.78 (29.41)	437	137.90 (26.67)	-11.56***	-0.68
WSFQ - Intimate	513	25.09 (7.52)	443	24.27 (8.04)	1.64	0.12
WSFQ - Exploratory	472	15.63 (5.16)	432	14.23 (4.28)	5.21***	0.34
WSFQ - Impersonal	503	15.59 (4.91)	438	14.13 (4.16)	6.17***	0.33
WSFQ - Sadomasochistic	513	11.94 (3.69)	446	11.05 (2.47)	5.08***	0.28
WSFQ - Total	458	67.67 (18.18)	415	63.49 (16.00)	3.91***	0.27

p* < .05; *p* < .01 ****p* < .001

Similar proportions of offenders who were dysfunctional at pre-treatment were classed as unchanged at post-treatment (mean = 9.9%; range 0–47%). The largest proportions of offenders in the total sample were classed as unchanged in the CISS Avoidance (47.7%) and Emotion (33.5%) factors as well as the Sadomasochistic factor of the WSFQ (14.9%). No offenders were classed as unchanged on the Miller SIS, the SSEI and the Task factor of the CISS. Across all of the measures, only marginal proportions of offenders were classed in the improved (mean = 1.6%; range = 0–7.3%) and deteriorated (mean = 0.5%; range 0–2.6%) categories of clinically significant change.

It should be noted that rates of clinically significant change in the total sample were restricted by the high proportions of offenders who returned scores in the functional range at pre-treatment. That is, most offenders in the sample were not able to demonstrate recovery because they were already functional. While Figure 1 was presented to reflect the distribution of all offenders in the interests of brevity, it is also important to examine treatment effects in terms of rates of recovery among those offenders who actually showed evidence of dysfunction at pre-treatment and were therefore amenable to functional change.

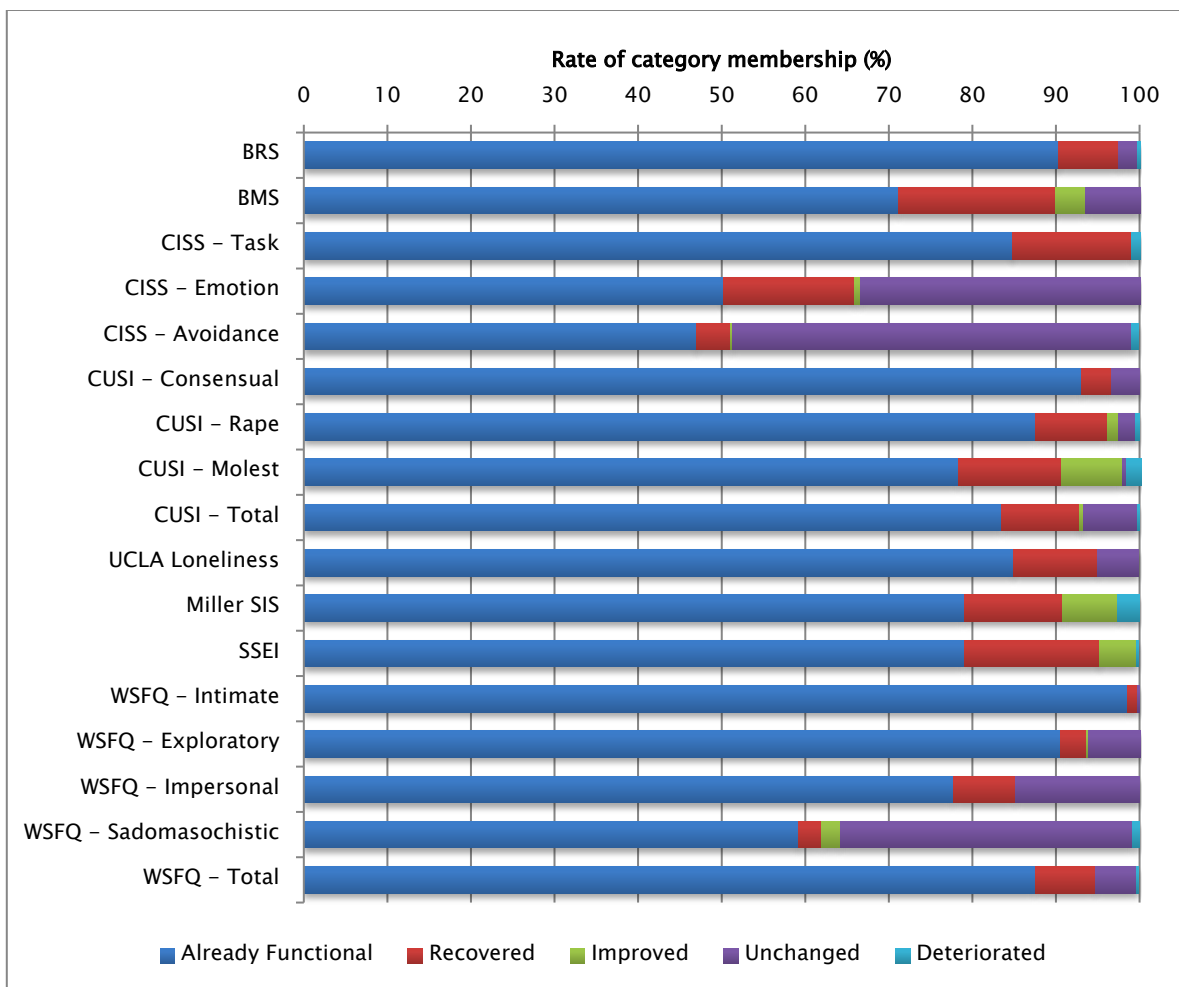


Figure 1. Distribution of clinically significant change categories for the total sample. The Already Functional category (blue) represents offenders who reported functional scores at pre-treatment; the remainder of categories represent treatment change outcomes for offenders who reported dysfunctional scores at pre-treatment.

Among the offenders who had dysfunctional scores at pre-treatment (mean = 21.1%; range 1.4 - 52.9%), an average of 53.5% exhibited clinically significant change that warranted classification in the recovered category (range 7.5 - 92.8%). Particularly high rates of within-treatment recovery among dysfunctional offenders were observed for the CISS - Task factor (92.8%), the WSFQ - Intimate factor (78.5%), the SSEI (77.5%) and the BRS (73.4%). The lowest rates of recovery among dysfunctional offenders were shown for the WSFQ - Sado-masochistic factor (6.8%) and the Avoidance factor of the CISS (7.5%).

Comparisons of adult and child sex offenders

The following section compares pre-treatment needs and extent of within-treatment change for child and adult sex offenders. Some of the assessed factors have greater specificity to particular categories of sexual reoffending than others. For example, it may be expected that individuals who offend against children would exhibit greater need in relation to sexual fantasies about children compared to individuals who offend against adults. This will then contribute to within-sample variance in how different groups of sex offenders exhibit change over the course of treatment. An examination of pre-treatment risk factors and within-treatment change between child and adult sex offenders may also inform differential treatment needs for target offender cohorts.

For the purposes of this section we report the results of comparisons between offenders with index adult (n = 239) or child sex offences (n = 275) only, and those with offences against both victim groups (n = 20) or unknown victim characteristics (n = 103) were excluded from.

Table 3 shows average pre-treatment scores as well as the results of independent samples t-tests comparing adult and child sex offenders for each of the measures. On average, child sex offenders

indicated greater dysfunction than adult sex offenders for the majority of measures. Child sex offenders tended to report higher pre-treatment scores in relation to sexual fantasies, coping using sex (with the exception of the CUSI Consensual factor), and offence supportive attitudes for both child molestation and rape. These offenders also tended towards lower general social functioning and adaptive coping compared to adult sex offenders.

Independent samples t-tests showed that at pre-treatment, child sex offenders reported significantly higher scores on the BMS, the CUSI Molest and Total factors, the UCLA Loneliness Scale, and the WSFQ Exploratory and Impersonal factors compared to adult sex offenders. Conversely, child sex offenders also reported significantly lower scores on the Miller SIS and the SSEI. An examination of Cohen's d statistics indicated large effect sizes in relation to differences on the BMS and CUSI Molest scale, as well as social self-esteem as assessed by the SSEI.

Consistent with results for the total sample, both child and adult sex offenders showed significant change at the group level between pre-treatment and post-treatment on most measures. Child sex offenders showed change in the expected functional direction on all measures with the exception of the CUSI Consent factor ($t = .71$; $p = .47$), the SIS ($t = -.75$; $p = .45$) and the WSFQ Intimate factor ($t = .60$; $p = .54$; all other t 's > 2.5 ; p 's $< .01$).

Similarly, adult sex offenders showed significant improvement on measures other than the CUSI Rape ($t = 1.67$; $p = .09$) and Molest factors ($t = -.82$; $p = .41$), in addition to the SIS total score ($t = -.60$; $p = .55$) and the Intimate factor of the WSFQ ($t = 1.16$; $p = .25$; all other t 's > 2.2 ; p 's $< .05$).

Subsequent analyses were conducted to examine differences in functional status at pre-treatment and categories of clinically significant change for child sex offenders and adult sex offenders. The prevalence of categories of clinically significant change for each group is shown in the top (adult

sex offenders) and bottom (child sex offenders) panels of Figure 2. A clear pattern to emerge was that adult sex offenders were more likely to report being in functional ranges at pre-treatment compared to child sex offenders. On average across the measures, 84.4% of adult sex offenders were functional at pre-treatment (range = 41.5 - 98.6%). By comparison, an average of 76% of child sex offenders reported being functional at pre-treatment (range = 48.3 - 98.3%).

Consistent with differences in the proportions of offenders who reported dysfunction at pre-treatment across the two groups, adult sex offenders showed an overall lower prevalence of clinically significant change compared to child sex offenders. The proportion of all adult sex offenders in the recovered category ranged between 0.7% for

the WSFQ Intimate factor to 14.8% for the CISS Emotion factor (mean = 5.8%). The proportion of all child sex offenders in the recovered category ranged between 1.7% for the WSFQ Intimate factor to 26.8% for the BMS, with a mean of 11%.

Despite the observed differences in overall distribution of change categories, adult and child sex offenders showed similar rates of recovery among those offenders who were dysfunctional at pre-treatment and therefore amenable to clinically significant change. Of the dysfunctional adult sex offenders, more than half were classed as recovered at post-treatment across measures on average (mean = 57.8%; range = 5.2 - 100%). Of the dysfunctional child sex offenders, an average of 54.9% were categorised as recovered after treatment (range = 8.9 - 100%).

Table 3. Descriptive statistics and results of comparisons of pre-treatment scores on each of the measures between child sex offenders and adult sex offenders.

Measure	Adult sex offenders		Child sex offenders		Simple differences	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>d</i>
BRS	54.14	14.03	57.07	15.74	-1.94	-.19
BMS	46.35	10.78	60.04	17.11	-9.40***	-.98
CISS - Task	55.98	11.19	54.85	11.64	.97	.09
CISS - Emotion	47.36	11.33	48.61	11.08	-1.05	-.11
CISS - Avoidance	48.84	11.82	47.31	10.78	1.31	.13
CUSI - Consensual	11.91	5.50	11.74	5.20	.33	.03
CUSI - Rape	6.74	2.27	6.89	2.53	-.65	-.06
CUSI - Molest	4.04	.40	5.85	3.47	-8.05***	-.93
CUSI - Total	24.61	7.32	26.23	9.60	-1.98*	-.19
UCLA Loneliness	39.80	9.56	44.67	10.23	-4.92***	-.49
Miller SIS	134.13	24.41	127.44	28.53	2.61**	.25
SSEI	132.95	26.02	115.39	29.27	6.47***	.63
WSFQ - Intimate	24.64	7.45	24.86	7.82	-.30	-.02
WSFQ - Exploratory	14.92	4.68	15.96	5.37	-2.06*	-.21
WSFQ - Impersonal	14.73	4.22	15.95	5.37	-2.59*	-.25
WSFQ - Sadosomachistic	11.60	3.42	12.06	3.88	-1.28	-.12
WSFQ - Total	65.51	17.15	67.88	19.08	-1.28	-.13

p* < .05; *p* < .01; ****p* < .001

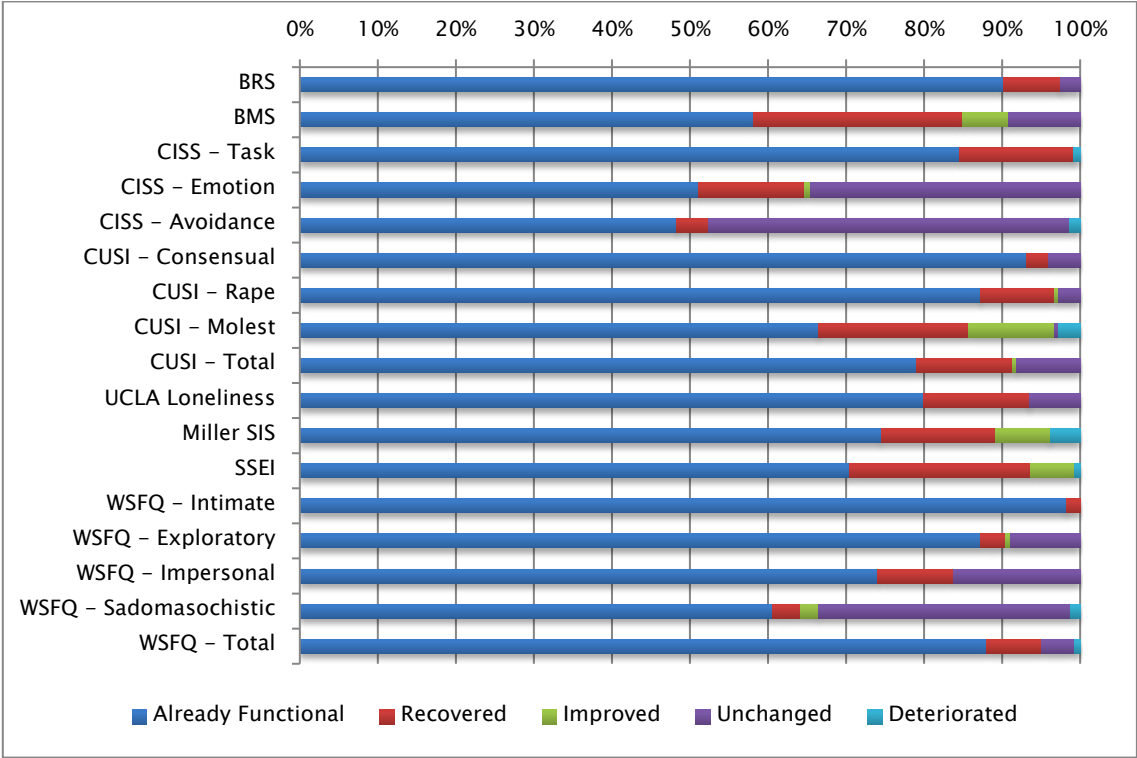
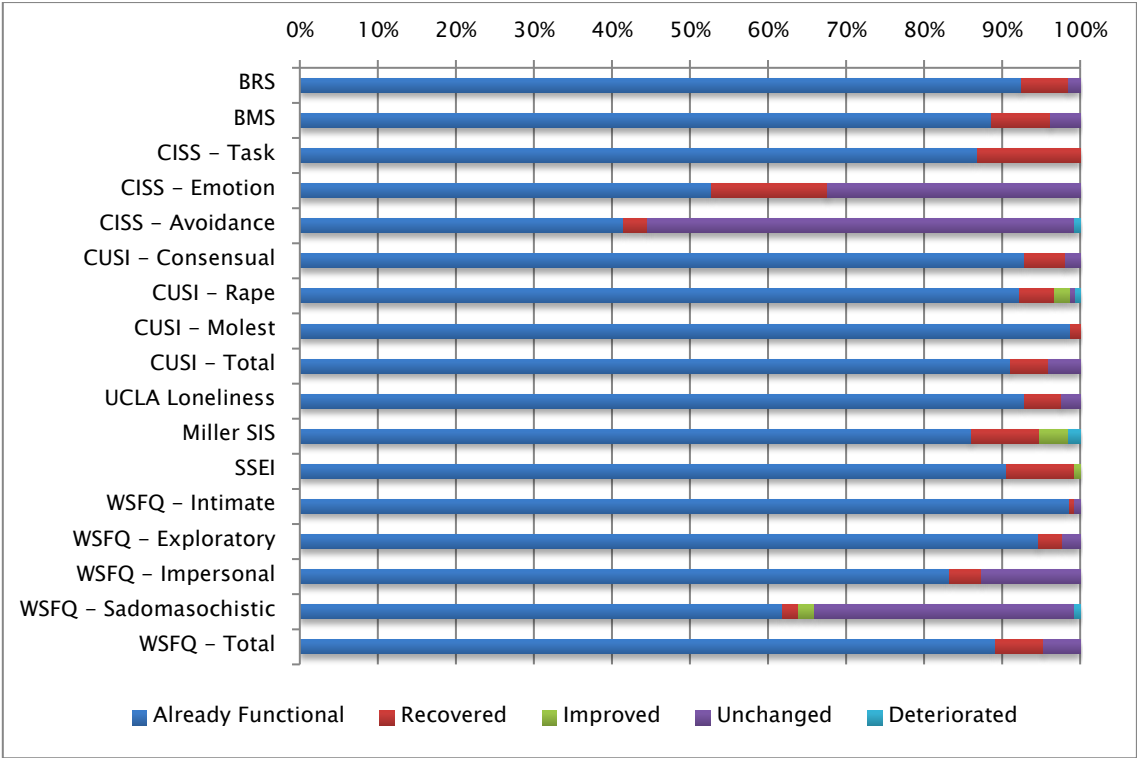


Figure 2. Distribution of clinically significant change categories for adult sex offenders (top) and child sex offenders (bottom). The Already Functional category (blue) represents offenders who reported functional scores at pre-treatment; the remainder of categories represent treatment change outcomes for offenders who reported dysfunctional scores at pre-treatment.

DISCUSSION

Indicators of within-treatment change have utility from a program evaluation perspective because they assess the extent to which treatment achieves change in dynamic risk factors that in turn have an influence on the individual's future likelihood of reoffending (e.g. Beggs, 2010; Kroner & Yessine, 2013; Kazdin, 2007; Wakeling & Barnett, 2014). The aim of this study was to examine dynamics of within-treatment change among sex offenders who have participated in the CUBIT program.

Average change

At the group level, offenders' self-reported scores changed significantly on average on most measures between pre-treatment and post-treatment. The magnitude of change was in the small to moderate ranges of effect sizes on average, which is consistent with previous studies of within-treatment change among sex offenders (e.g. Beggs & Grace, 2011; Nunes et al., 2011; 2014; Olver, Kingston, et al., 2014; Olver, Nicholaichuk, et al., 2014).

Significant change was in the expected direction of improvement for all measures with the exception of the CISS Avoidance factor, so that offenders were observed to show increases in avoidant coping over treatment on average. While sex offenders tend to exhibit elevated avoidant coping (Cortoni, Anderson, & Looman, 1999), there are indications that avoidance is not necessarily a uniformly maladaptive coping strategy (e.g. Holahan et al., 1996). Participation in CUBIT may promote adoption of relatively functional forms of avoidant coping, such as mobilisation of social networks as a diversion strategy, as opposed to chronic attempts at thought suppression or avoidance of potentially prosocial activities and settings. It is also possible that variation in treatment effects on avoidant coping may reflect conceptual shifts from a relapse

prevention orientation to one more aligned with the Good Lives Model over the lifespan of the program (e.g. Ward & Stewart, 2003).

Across the total sample, only the Miller SIS and the WSFQ Intimate measures did not show significant change on average. One interpretation is that improvement of intimacy in existing significant relationships and the frequency of intimate sexual fantasies are not clear or successful treatment targets of CUBIT. In this regard the results may highlight tensions in the goals of sex offender interventions relating to intimate sexual fantasies, whereby treatment aims to address risk factors associated with sexual preoccupation while simultaneously promoting the expression of normative sexual interests and behaviours. Alternatively, it is noted that the Miller SIS assesses relatively stable factors associated with established relationships that may not be amenable to extensive change over the course of treatment while offenders are housed in custody.

Individual needs and significance of change

More complex patterns emerged when considering the results of clinically significant change calculations. A primary trend in the results was that on most measures the majority of offenders (mean = 78.9%) reported pre-treatment scores that were in the functional range. This indicates that only around one in five of participating offenders presented with dysfunction in an assessed dynamic risk factor of interest on average, and were therefore able to exhibit clinically significant change over treatment.

Low rates of self-reported dysfunction at pre-treatment have been observed in other studies (e.g. Nunes et al., 2011; Smallbone & McHugh, 2010). Consistent with this, sex offenders tend to show relatively small differences in self-reported dynamic risk factors compared to those who have not offended sexually (Sewell & Nunes, 2009, cited in

Nunes et al., 2014), which has implications for calculating distinctions between functional and dysfunctional thresholds.

Taken at face value, there is the implication that many of the dynamic risk factors represented by measures in this study are not relevant to most offenders who participate in CUBIT. Sex offenders are a heterogeneous population with differing characteristics and needs, which is expected to contribute to substantial variation in pre-treatment scores. Base rates of sexual reoffending are also low on average, which may be a reflection of the rarity of relevant needs in offender samples.

However, considering the prevalence of pre-treatment functional status among this high risk, high needs custodial cohort of sex offenders, there remains the possibility that assessment of pre-treatment needs in this sample was confounded by under-reporting or other response biases. Response bias has been highlighted as a source of error in offender self-reports (Holden et al., 1992; Tierney & McCabe, 2001; but see also Loza et al., 2007; Mills et al., 2003; Mills & Kroner, 2005; 2006), and threats to validity may be particularly pronounced for sex offenders where various risk- and offence-related factors are often associated with severe social stigma (Tierney & McCabe, 2001). These effects may be further complicated by changes in context-specific motivations for response bias at pre-treatment and at post-treatment (Hanson & Wallace-Capretta, 2000; Howard & van Doorn, 2018; Juarez & Howard, 2018; 2021).

The high rate of offenders who were already functional at pre-treatment limited subsequent analysis of categories of change over treatment. However, on average around half (53.5%) of offenders who were in the dysfunctional range on a given measure at pre-treatment were classified as recovered after treatment, or showed change in scores that was statistically significant and represented a shift from dysfunctional to functional

ranges. Recovery rates among offenders who were dysfunctional at pre-treatment suggest that treatment had more pronounced effects in improving social self-esteem and task oriented coping, and in reducing antisocial attitudes about rape and the frequency of intimate sexual fantasies. Rates of recovery were again low for avoidant coping as well as sexual fantasies with sadomasochistic themes. The latter result may be attributable to the very low reporting and variance in sadomasochistic fantasies among non sex offenders, in that the normative sample approached floor effects for scores on this factor of the WSFQ (Plaud & Bigwood, 1997).

Needs profiles and change among adult and child sex offenders

Additional analyses indicated that offenders with index child sex offences reported more severe scores at pre-treatment, and were more likely to be in dysfunctional ranges at pre-treatment, compared to those with index adult sex offences. Child sex offenders showed higher needs not only in relation to offence supportive attitudes and coping using sexual activity towards children, but also in relation to overall tendencies to cope using sex, loneliness, self-esteem, intimate relationships, and impersonal and exploratory sexual fantasies.

One interpretation of the results is that child sex offenders had higher risk and needs compared to adult sex offenders on average. However, child sex offenders in the sample had lower assessed risk on the Static-99R ($M = 3.58$; $SD = 2.62$) compared to adult sex offenders ($M = 4.83$; $SD = 1.90$). Previous studies have also indicated that adult sex offenders tend to be at higher risk of reoffending on average (e.g. Hanson & Bussiere, 1998).

Another potential contributing factor relates to differences in perceptions and reporting of needs between the groups. Child sex offenders exhibit less versatility in their offending behaviours (e.g. Harris et al., 2009) and may be more likely to

perceive their offending in relation to sexual pathology and associated psychosocial difficulties compared to adult sex offenders. Given their greater versatility in offending, areas of dysfunction for adult sex offenders may be better represented by measures of dynamic risk for general reoffending as opposed to sexual reoffending. It is noted that previous studies of mixed groups of sex offenders have reported predictive validity for indices of anger and aggression (e.g. Olver, Kingston et al., 2014; Olver, Nicholaichuk et al., 2014), which may be more applicable to risk of adult compared to child sex offending. A related consideration is that child sex offenders in this sample may have been less likely to minimise or otherwise bias their reports of dynamic risk factors compared to adult sex offenders. Previous research has been inconsistent in this regard, with some studies indicating that child sex offenders are more likely to engage in impression management and others showing limited differences between groups (for a review see Tan & Grace, 2008).

A potential implication of the observed between-group differences is that child sex offenders may be more likely to engage in treatment that is oriented towards addressing dynamic risk factors for sexual reoffending in particular, compared to adult sex offenders. Consistent with this, adult sex offenders have been found to be more likely to refuse treatment in sex offender programs (Howard, 2016). However, it is noted that engagement factors such as motivation for treatment appear to have limited impact on treatment effect among sex offenders who actually enter and complete programs (e.g. Watson et al., 2018). A related observation is that in this study, both child and adult sex offenders who reported dysfunction at pre-treatment showed similar rates of recovery across the assessed factors on average (57.8% and 54.9% respectively).

Limitations

A number of limitations of this study should be noted. First, we were unable to compare within-treatment change among CUBIT participants to an equivalent comparison group who completed repeat assessments in the absence of treatment. As a result it is not possible to attribute change in scores to the effects of attending CUBIT, as opposed to spontaneous change over time.

In addition, while the sample of sex offenders included in this study was relatively large, statistical power was impacted by high rates of measure non-completion and the exclusion of responses with missing data from analyses. Issues with low statistical power were likely to have been pronounced when examining subgroups of child and adult sex offenders. It would be beneficial for routine psychometric assessment procedures with offenders to incorporate probing processes for missing data, particularly when that data is suspected to be missing not at random.

Another limitation is that psychometric measures were administered under therapeutic rather than research conditions. As such it was not possible to standardise administrations or develop protocols that optimise valid responding. Offenders' perceptions of the consequences of their responses may have an influence on their self-reports, and it is likely that they would experience more complex motivations to moderate disclosures of risk when measures are administered as part of treatment than for research purposes. While there is some evidence that offenders give similar self-reports under therapeutic or research conditions (e.g. Loza et al., 2007), it is unclear whether this would be the case in the context of both pre-treatment and post-treatment administrations. There is a need for program administrators to consider such influences when developing procedures for administering psychometric batteries to sex offenders, as well as additional research to identify best practice conditions that minimise response bias.

Relatedly, a significant limitation of this study is that it did not assess whether psychometric measures were risk relevant, or had predictive validity for sexual reoffending. Previous reviews have indicated that some constructs represented by measures in this study, such as self-esteem and loneliness, have little empirical support as risk factors for sexual reoffending (Mann et al., 2010). Alternatively, measures may purport to assess established risk factors but have limited validity. For example, research has found that the Bumby scales have poor predictive accuracy for sexual reoffending (Nunes et al., 2014), despite evidence for the risk relevance of offence supportive attitudes (Helmus et al., 2013). A growing body of literature has also indicated that even for valid measures, change in scores over treatment may not reflect change in the offender's likelihood of reoffending (for reviews see Banse et al., 2013; Serin et al., 2014; Wakeling & Barnett, 2014), potentially as a result of differing influences of response bias across pre-treatment and post-treatment contexts (Juarez & Howard, 2018). In the absence of evidence for the predictive validity of measures, and change in those measures over time, it is not possible to conclude that the patterns of change observed in this study convey meaningful information about the effect of CUBIT in generating therapeutic gains that have a causal impact on likelihood of recidivism.

Conclusion

The results of this study showed that on average, participants of the CUBIT program for sex offenders showed significant within-treatment change on various measures of domains of dynamic risk including sexual interests, offence supportive attitudes, socioaffective functioning and self-regulation. The direction of change tended to be consistent with expected effects of treatment in improving functioning or ameliorating risk factors. Clinically significant change analyses also indicated positive intermediate effects of CUBIT, with around

half of offenders who returned dysfunctional scores on a given measure at pre-treatment being classed as recovered on that measure after treatment, on average.

Notwithstanding these results, the majority of offenders reported being in normative ranges of functioning on measures prior to engaging in treatment. This suggests that most CUBIT participants may not present severe deficits in risk factors that are the common treatment targets of sex offender programs, which raises interesting implications about the benefits of such programs in treating significant dysfunction or pathology relating to sex offending risk, as compared to supporting relatively functional individuals towards implementing prosocial change.

However, there is also the potential that these and other results observed in the current study were influenced by offenders' response biases when completing self-report measures. There is a need for further research to establish the predictive validity of measures of dynamic risk factors for sexual reoffending, and change in those measures over time, to support an understanding of the intermediate effects of treatment for CUBIT participants and how these are associated with sexual recidivism outcomes.

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