Validation of a scale for rating the process of delivery of psycho-social treatments for alcohol dependence and misuse: the UKATT Process Rating Scale (PRS).

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Summary

The development and validation of a manual based method for monitoring and rating the process of the delivery of psychosocial treatments of alcohol dependence and misuse is described. Tests of the validity and reliability of the UKATT Process Rating Scale (PRS) show that it is able to detect the two treatments for which it was designed and to discriminate between them.

Introduction

Why it is important to measure treatment fidelity

The requirement to monitor the delivery of psychological and social treatment underlies clinical governance of routine clinical practice, supervision and psychotherapy research. For all these purposes it is necessary to quantify and assess the quality of treatment delivery. Treatment integrity or fidelity checks provide the means to examine the extent to which treatments are delivered and the quality of such delivery (Moncher and Prinz 1991). Interpretation of the findings in both effectiveness and efficacy trials in psychotherapy research requires measurement of treatment implementation (Waltz *et al*. 1993). Variations in competence can be identified and potential treatment effects more accurately attributed. For example, where there are no treatment fidelity checks, treatment effects could be wrongly attributed to the treatments themselves rather than a difference in therapist competence. Equally the potential emergence of a treatment effect may be masked by variations in the extent and quality of the delivery of treatment. Null findings could be ascribed to treatment adherence problems such as similarity of elements in different therapies (Carroll & Nuro 1996) or overlap in treatments that were delivered to different groups (Kazdin 1994).

Therapeutic outcomes can be influenced by participant characteristics, treatment delivery, qualities of the therapist and the interaction between therapist and client. If inferences are to be drawn from effectiveness studies, these factors need to be measured and their influence calculated. This approach forms the basis of the 'technology model' of psychotherapy research design, described by Waskow (1984) and Carroll *et al.* (1994), which aims to replicate the rigour employed in randomised controlled drug trials: therapy is specified in terms of dose delivered, active and 'inert' ingredients and the conditions of administration.

Procedures to safeguard treatment fidelity and measure treatment delivered have not always been adopted as standard procedure in psychotherapy outcome research (Moncher & Prinz, 1991). However, the issue was given serious consideration in the National Institute of Mental Health Treatment of Depression Collaborative Research Program (TDCRP) (Elkin *et al*. 1985; 1989; Hill *et al*. 1992), providing the impetus for subsequent measurement of treatment fidelity in psychotherapy research in general, and specifically in the addiction field (e.g. Carroll *et al*. 1998a; Barber *et al.* 1996; 2004). The TDCRP utilised a comprehensive manual to record adherence to treatment for depression: the Collaborative Study Psychotherapy Rating Scale (Hill *et al.* 1992). Raters in this study were non-expert in the therapeutic modalities assessed, but did have a professional background in clinical psychotherapy.

Measuring treatment fidelity in psychotherapeutic treatment of addiction

Waltz *et al.* (1993) elaborated the method of measuring treatment integrity by identifying two central concepts – adherence and competence. Adherence is described as the extent to which a therapist used the recommended intervention and competence refers to the skills demonstrated by the therapist in their implementation of the intervention. These investigators recommended that both be measured in order to account for treatment integrity.

The National Institute on Drug Abuse (NIDA) Collaborative Cocaine Treatment Study trial (Crits-Christoph *et al.* 1999) compared four different psychosocial interventions for the treatment of cocaine dependence using the technology model to specify the treatment and its delivery, adding measures of therapists' competence as well as protocol adherence in delivering treatment. Three different rating scales were

used by raters who were experts in one of the treatments delivered: the Cognitive Therapy Adherence/Competence Scale (Barber *et al.* 2003), based on the previously validated Cognitive Therapy Scale (Young & Beck 1980), the Adherence/Competence Scale for Individual Drug Counselling for Cocaine Dependence (Barber *et al.* 1996) and the Adherence/Competence Scale for Supportive Expressive Dynamic Therapy for Cocaine Dependence (Barber et al. 1997). Each rater listened to a portion of two randomly selected audiotapes of sessions from each client, and also rated a smaller number of tapes from the therapy conditions in which they were not considered expert, using the rating scale in which they were expert. The measurement of treatment delivered in this trial successfully discriminated between treatment conditions and demonstrated that therapists adhered to their prescribed therapy. However different types of therapies were, in the main, rated with different rating scales by different raters, rendering comparisons of interventions difficult; rater bias in terms of knowledge and expectations of the therapy rated cannot be ruled out.

Project MATCH (Project MATCH Research Group 1997) used a similar rating system to that utilised by the TDCRP depression study. The MATCH Tape Rating Scale (MTRS) (Carroll *et al.* 1998b) was utilised to assess trial treatment protocol adherence and differentiation between the treatment conditions. Likert type scales were used to measure delivery of the unique active ingredients of the therapies examined. The MTRS successfully discriminated between the three treatments that were compared in the trial (Carroll *et al.* 1998b). Competence in therapist delivery of treatment was assessed using a non-treatment specific measure of general therapist skill, rather than a measure of competence in the specific ingredients of each therapy. The same pool of raters, who were blind to treatment type, rated all sessions.

Refinement of the MTRS resulted in development of the Yale Adherence and Competence Scale (YACS), a system for rating therapist adherence and competence in delivering psychological treatment for substance misuse disorders (Carroll *et al*. 2000). This scale was similarly based upon the principles of the technology model (Waskow 1984; Carroll & Rounsaville 1990). The rating system is a general psychotherapy rating scale, designed so that it could be easily adapted for other types of psychotherapy for addictions. It encompasses four dimensions designed to ensure

content validity of a measure of treatment fidelity (Bond *et al*. 2000; Carroll *et al.* 2000; Calsyn 2000). Thus the scale includes items that refer to ingredients of the therapy and therapist behaviours that are 1) unique and essential 2) essential but not unique 3) acceptable but neither unique nor essential and 4) proscribed within the therapeutic framework. It is proposed that raters, non-expert in individual treatment types, are able to rate competence based on detailed descriptions giving examples of individual therapeutic behaviours.

An instrument designed to rate a specific therapy, namely Motivational Interviewing, the Motivational Interviewing Skill Code (MISC) (Miller & Mount 2001) measures adherence but not competence. A psycholinguistic code for measuring changes in client speech expected to occur with effective Motivational Interviewing is used in conjunction with it. Raters are required to listen to an audiotape of a therapy session three times: the first time the rater makes global ratings about therapeutic factors relating to the clinician, the client and the clinician-client interaction. The second time the rater codes each client and therapist utterance in terms of motivational interviewing factors. The third time the rater measures the proportion of time that the client and the clinician speak. Seventy five per cent of global ratings items demonstrated fair, good or excellent reliability, however items measuring individual therapist and client behaviours ranged from poor to excellent, with only 44% of items yielding intra-class correlations indicating good to excellent reliability (Moyers *et al*. 2003). The question of raters being blinded to treatment type or expert in the treatment is inconsequential in the use of the MISC as it only measures one type of treatment.

A less time consuming method was described by Strang and McCambridge (2004) who utilised a short therapist self-report measure of what occurred in a session, completed in writing immediately post session. The measure took approximately two minutes to complete and included categorical and five-point scale ratings. Although this method is time efficient, the potential unreliability of therapist self-report throws into question its validity. Miller & Mount (2003) found that therapists were likely to report greater increases in motivational interviewing skills following a Motivational Interviewing training programme, than other observers who rated therapy sessions using the MISC. In a study investigating the effectiveness of psychotherapy and

pharmacotherapy for cocaine users, Carroll *et al*. (1998a) similarly found a lack of concordance between therapist and observer ratings of session content when using a session checklist immediately post-session.

The purpose of the present study was to develop and validate a manual based method of rating treatment fidelity, capable of rating frequency and quality of the delivery of treatment components, treatment manual adherence, therapeutic style and discriminability between different treatments. The UK Alcohol Treatment Trial Process Rating Scale (UKATT-PRS) was designed to measure adherence to protocols and competence in the delivery of manualised therapies. A rating scale, designed to be time-efficient, to allow all sessions to be rated by the same rater, to be readily adaptable to use with a range of therapeutic approaches to substance misuse treatment and appropriate for use in a UK context was developed.

Ratings of the frequency and quality of delivery of treatment can assist in interpretation of treatment effects in a number of ways: in clinical trials where effectiveness is measured, treatment process ratings form the basis for attributing outcomes to treatment received and for investigating which components of the treatment contribute to such effectiveness; they can form the basis for matching therapist attributes with competence and can also be used for assessing competence to practice and in routine supervision of practice.

Method

Scale and manual development and piloting

The MATCH Tape Rating Scale (MTRS) (Carroll *et al.* 1998b), designed to rate the delivery of three individually based psycho-social treatments, Motivational Enhancement Therapy, Cognitive Behavioural Coping Skills and Twelve Step Facilitation Therapy, was used as the basis for developing the UK Alcohol Treatment Trial Process Rating Scale (UKATT-PRS). The new scale was designed to rate the frequency and quality of the delivery of a UK version of Motivational Enhancement Therapy (MET) (Miller *et al.* 1995) and a new treatment, Social Behaviour and Network Therapy (SBNT) (Copello *et al*. 2002), compared for effectiveness in the UK Alcohol Treatment Trial (UKATT 2001) and chosen for UKATT on the strength of their evidence base (or the evidence base of their component parts), for their

distinctiveness (the former being a treatment targeting individual, internal motivation and the latter targeting the social environment in which drinking and change occur) and for their acceptability for routine clinical practice.

The principles of Motivational Enhancement Therapy require the therapist to elicit client concerns about drinking, to heighten ambivalence and to direct the client towards a decision to cut down or stop drinking. In Social Behaviour and Network Therapy the therapist aims to identify and work with a social network supportive of positive change; eight structured sessions focus on topics ranging from communication and coping skills in the network, to relapse prevention plans and alternative activities to drinking.

Fifty-two therapists from three treatment centres in the UK successfully completed training in one of the two manualised treatments to which they had been randomly assigned. Their practice was video-recorded and supervised throughout the trial. The videos were stored anonymously at the trial training centre where they were available for the purpose of independent blind rating.

To generate rating scale items, essential active ingredients (both unique and common) of each treatment were identified from treatment manuals in discussion with the authors of these manuals. Active ingredients included style and content specific to each treatment. The items were then re-examined to ensure they covered all treatment components, and that they were balanced between the treatments.

These items were combined into a twenty-six item scale, divided into three sections. The first section contained 6 items measuring session management, the second section contained 13 items measuring specific tasks and the third contained 7 items measuring therapist style (see Appendix 1). These twenty-six items were rated on two 5-point scales, one measuring the extent to which the item was performed (frequency), the other measuring how well the therapist performed the item (quality). The scale measuring frequency was anchored at 0 - *Not at all* and 4 - *Extensively* with intermediate labels of *A little, Somewhat* and *Considerably*. The scale measuring quality was anchored at 0 - *Not at all well* and 4 - *Very well* with unlabelled intermediate points. A checklist of specific session topics was attached (example

items include *Feedback of test results* and *Relapse prevention plan* - see Table 11) and there was a preliminary factual question referring to numbers present at the session.

Items were specified in a manual. For each item, a definition, a description of the characteristics of high and low ratings for frequency and quality and examples of therapist dialogue illustrating these were provided. The manual also included general guidance on differentiating the frequency and quality of therapist behaviours, on avoiding common pitfalls relating to possible rater bias and on the method for note-taking during the session.

Sampling

Video recordings of two psychosocial treatments of alcohol misuse and dependence delivered in the UK Alcohol Treatment Trial (UKATT) were available for the purpose of developing and validating the rating scale. One video per client (where available) was sampled for process rating. The sample of over 400 video tapes was stratified by treatment (MET, SBNT), session number (1-3 for MET, 1-8 for SBNT) and centre (South Wales, Leeds, West Midlands) (see Table 1). Replacement sampling was used when a video was subsequently found to be unrateable, in order to retain the balance between treatments, session numbers and centres.

Table 1
Selection of videotapes by treatment and treatment session

	Number available		Number selected	
Session	**MET n**	**SBNT n**	**MET n (%)**	**SBNT n (%)**
No videos	106	104		
1	316	212	92 (36%)	44 (23%)
2	254	157	84 (32%)	21 (11%)
3	160	142	83 (32%)	23 (12%)
4		119		21 (11%)
5		102		22 (11%)
6		82		20 (10%)
7		66		22 (11%)
8		54		20 (10%)

There was a target of 50 videos to be sampled for double rating and of these 25 would be triple rated. Videos were randomly selected throughout the trial for double and triple rating by a further two independent raters. This ensured inclusion of ratings

throughout the entire treatment phase of the trial and ensured balance by treatment, session number and centre.

Rater training and supervision

An independent rater, referred to hereafter as the primary rater, blind to the types of therapy being rated, was trained in the use of the manual and supervised throughout the study to enhance consistency over time. Initial training involved rating six video recordings of treatment sessions and calibration of these ratings through discussion with two supervisors. Further, all these videos were rated a second time by the primary rater and supervisors, and ratings compared over time. Inter-rater agreement was reached when the primary rater's scores were at least adjacent to the supervisors' scores for all items in all six videos. The primary rater then commenced rating the sample of videos selected for the study. Calibration meetings were held every 3 weeks throughout the rating period to prevent rater drift. Between 15 and 20 videos were rated by the primary rater between calibration meetings and two of these were randomly selected for blind supervisor rating and discussion.

Not all the video recordings were of an equal quality, due to the fact that the recordings took place in a variety of settings, using different equipment and relying upon the ability of the therapist to operate the recording equipment. A number of criteria for determining the rateability of video recordings were therefore agreed at the outset. Videos were deemed unrateable if there was no sound, or insufficiently good sound to make out the content of the dialogue. If the recording obviously cut out before the end of the session, or cut in after the beginning of the session, a note was made to take account of the possibility this might bias subsequent analysis.

Analysis

Validity

Treatment specific items were analysed separately to examine the validity of the scale for measuring the delivery of the two treatments. Four summary scores were created: MET_f (the mean of the frequency scores for MET items): MET_q (the mean of the quality scores for MET items where frequency ratings were >0); $SBNT_f$ (the mean of the frequency scores for SBNT items) and $SBNT_q$ (the mean of the quality scores for SBNT items where frequency ratings >0).

The ability of the scale to discriminate the two treatments was investigated by comparing individual item scores and frequency summary scores for each treatment. A t-test was used to compare the mean item scores and the mean frequency summary scores between SBNT and MET. It was hypothesised that MET items and MET summary scores would be high for MET sessions and low for SBNT sessions and vice versa for SBNT items and frequency summary scores.

Concurrent validity was examined by analysis of variance comparing manual derived quality summary scores for the two treatments with global ratings of individual therapist's skills (low/medium/high) given by the treatment specific supervisors.

Reliability

Cronbach's alpha was calculated to assess the internal consistency of the four summary scores. Principal components analysis was conducted to determine the factor structure of the scale. If certain items were shown to be redundant they could be removed from the scale.

The inter-rater reliability of the scale was examined using comparisons between the primary rater and two others, giving independent ratings for a sample of the videos. Agreement was recorded if either the same score or adjacent scores were given to a scale item by both raters. The percentage agreement was calculated for each item to determine the degree of agreement between the primary rater and double raters. For the four summary scores, the average of the two raters' scores was plotted against difference in their score (Bland & Altman 1986) to make pairwise comparisons between raters. This illustrates graphically whether the summary scores are rated consistently, how well the raters agree on average and what the limits of agreement are. The plot shows the line of mean difference which indicates whether one rater consistently rates higher (or lower) than the other, and the spread of data points about the line of mean difference which illustrates the variability in agreement between the raters.

Analysis of learning curves was not undertaken due to insufficient numbers of therapists having a large number of clients and due to the high degree of variability in outcomes between clients, which could mask individual therapist patterns over time.

Additional data analysis

The session management frequency and quality scores were individually and collectively compared across treatments to assess their ability to identify non-treatment specific components of good practice in treatment delivery. Reliability of session management items was assessed by comparing frequency scores from the primary and two independent raters.

A checklist of main and characteristic activities for each treatment was compiled. This session content could be used to confirm the nature of the treatment given during a session and for comparison between treatments in line with the randomised treatment assignment.

Results

Five hundred and sixty-four of 774 (73%) clients had at least one video; 337/443 (76%) were for MET; 227/331 (69%) were for SBNT. Four hundred and fifty-two clients had a rateable video: 259 were for MET and 193 were for SBNT. One hundred and twelve clients had at least one unrateable video - a total of 160 videos were unrateable: 101 for MET and 59 for SBNT.

Validity

Table 2 shows mean frequency scores for treatment specific items for both treatments. Although some of the treatment specific items have low mean frequency scores, there is a significant difference between their frequency ratings in each of the treatments and in each case the rating is higher for the treatment for which the item was designed.

Table 2
Mean frequency ratings for treatment specific items by treatment type (standard deviation in parentheses).

	Treatment			
Manual items	*MET n=259* Mean frequency score (SD)	*SBNT n=193* Mean frequency score (SD)	Mean Difference	CI for the mean difference
MET items				
Feedback	1.64 (1.81)	.02 (0.14)	1.62	1.40-1.84
Eliciting client concerns about drinking	1.66 (1.58)	.10 (0.39)	1.56	1.36-1.76
Eliciting self efficacy for change	.41 (0.78)	.09 (0.34)	0.31	0.19-0.43
Commitment to drinking goal	2.26 (1.10)	1.21 (1.20)	0.65	0.43-0.87
Ambivalence	.51 (0.80)	.04 (0.31)	0.47	0.37-0.58
Creating conflict	.18 (0.48)	.12 (0.19)	0.16	0.09-0.22
Eliciting commitment to change drinking	.30 (0.59)	.04 (0.22)	0.27	0.19-0.35
Eliciting optimism for change	1.64 (1.40)	.16 (0.48)	1.47	1.29-1.66
Reflective listening	2.89 (0.85)	1.46 (0.83)	1.43	1.28-1.59
Exploration of feelings	1.11 (0.97)	.45 (0.69)	0.67	0.52-0.83
Empathy	1.97 (0.99)	1.24 (0.91)	0.72	0.54-0.90
SBNT items				
Homework	.19 (0.47)	.97 (1.20)	-0.80	-0.98- -0.62
Alternative activities to drinking	.37 (0.77)	.93 (1.22)	-0.56	-0.76- -0.36
Social support for change – general	.03 (0.20)	1.25 (1.08)	-1.23	-1.38- -1.07
Identify sources of support for change	.24 (0.59)	1.31(1.54)	-1.07	-1.30- -0.84
Involvement of others in behaviour change	.42 (0.75)	2.40 (1.20)	-1.99	-2.18- -1.80
Therapist as task oriented	.86 (1.15)	2.55 (1.35)	-1.70	-1.94- -1.46
Therapist as an active agent for change	.05 (0.27)	.32 (0.76)	-0.27	-0.38- -0.16
Collaboration	.04 (0.26)	.45 (0.65)	-0.42	-0.52- -0.32
Interpersonal focus	1.53 (1.0)	2.56 (1.52)	-1.06	-1.29- -0.82

- Values range from not at all (0) to extensively (4).
- All item differences between the two treatments significant with $p<.05$

SBNT and MET frequency summary scores by treatment group are represented in Figures 1 and 2. Mean scores for frequency of MET items were significantly higher in MET than in SBNT (MET mean = 1.32; SBNT mean = 0.47; CI for the difference = 0.79 to 0.91). Mean scores for frequency of SBNT items were significantly higher in SBNT than in MET (SBNT mean = 1.42; MET mean = 0.42; CI for the difference = -1.08 to - 0.93).

Figure 1
Mean and 95%CI for SBNT frequency summary by randomised group
2 sample t-test; p<0.001

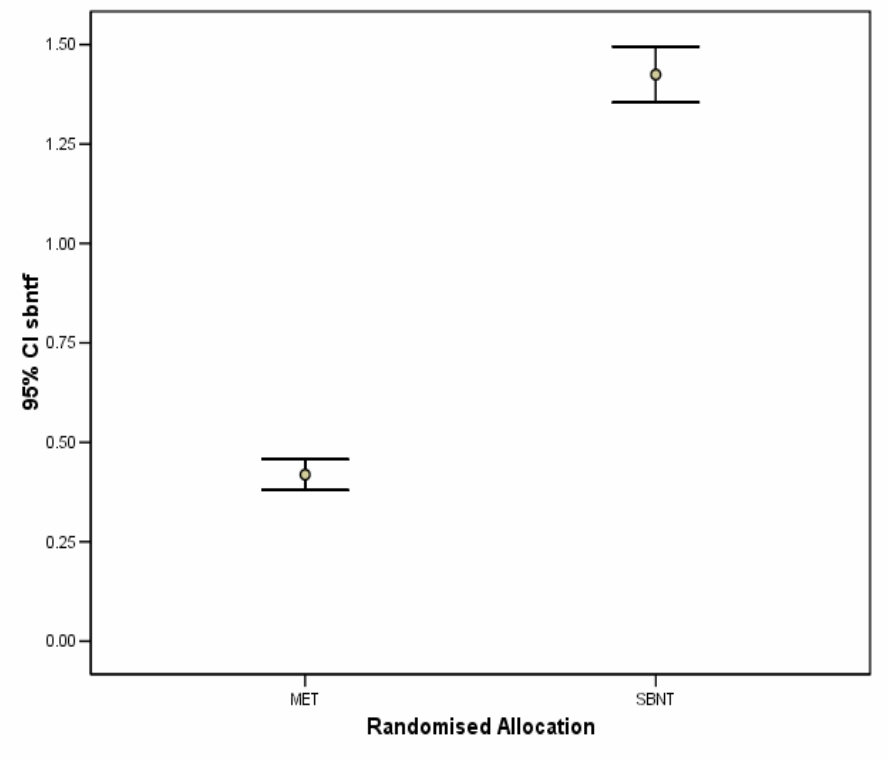
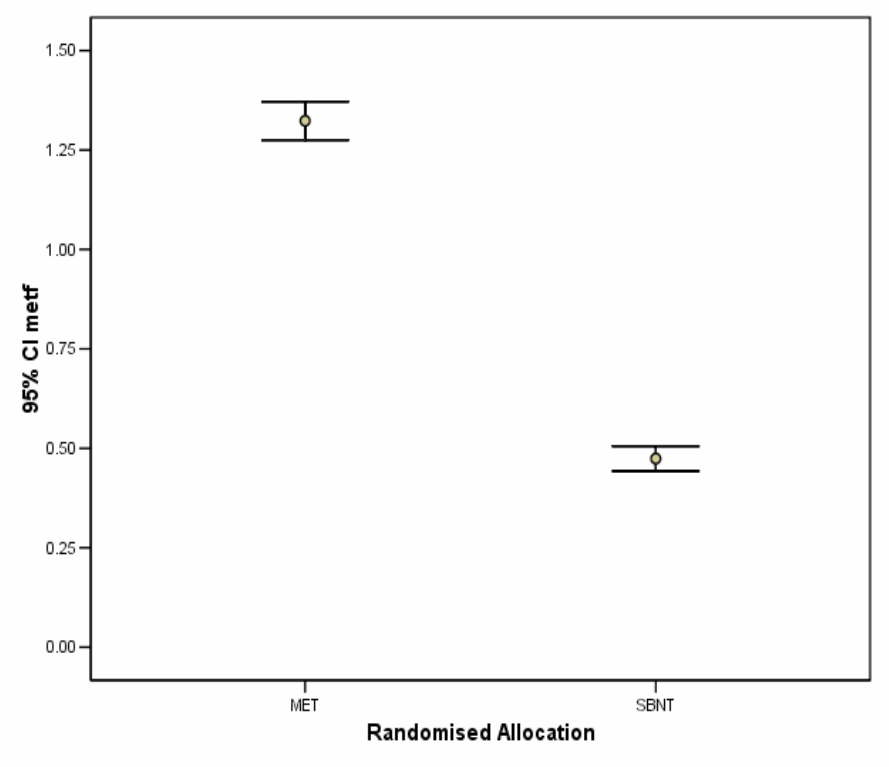


Figure 2
Mean and 95%CI for MET frequency summary by randomised group
2 sample t-test; p<0.001



Comparison of quality scores for individual items by treatment type were conducted on those individual items for which there were sufficient data. As quality scores were only given if the item was given a frequency rating of 1 or more (that is, if the item was rated as having occurred) some items had very low numbers of quality ratings particularly for the treatment to which those items were not attributed. Items with ten or more quality ratings were included in the analysis. Six items had insufficient data for analysis (feedback, ambivalence, creating conflict, eliciting commitment to change drinking, social support for change and collaboration). T-tests were conducted on the fourteen items with sufficient data. Four of the seven MET items showed a significantly higher quality score for MET than for SBNT. Six of the seven SBNT items had significantly higher ratings of quality for SBNT than for MET (see Table 3).

Where a treatment specific item was given a frequency rating, it was also given a quality rating. Figures 3 and 4 represent SBNT and MET quality summary scores by randomised group. Where SBNT quality ratings are given, quality is rated significantly higher in SBNT treatment than in MET treatment (SBNT mean = 2.31; MET mean 1.94; CI for the difference = -0.51 to -0.23). Where MET quality ratings are given, they are higher in MET treatment than in SBNT treatment (MET mean = 2.47; SBNT mean 2.35; CI for the difference = 0.01 to 0.24).

Table 3
Quality ratings for individual items by treatment assignment

Manual items	*Treatment*					
	MET		*SBNT*			
MET items	n	Mean quality score (SD)	n	Mean quality score (SD)	Difference between means	CI for the difference
Feedback	132	2.95 (1.06)	4	1.25 (0.96)	1.70[2]	0.64 – 2.75
Elicit client concerns	162	2.61 (1.04)	15	1.67 (1.35)	0.94[1]	0.38 – 1.51
Elicit self efficacy	70	1.96 (1.08)	17	1.47 (0.87)	0.49[4]	-0.76 – 1.05
Commitment to drinking goal	244	2.49 (1.14)	154	2.28 (1.17)	0.21[4]	-0.25 – 0.442
Ambivalence	89	2.22 (0.96)	4	2.00 (1.41)	0.23[4]	-0.77 – 1.22
Create conflict	36	2.22 (0.99)	3	1.67 (0.58)	0.56[4]	-0.63 – 1.74
Elicit commitment to change	60	2.23 (1.16)	6	2.00 (0.63)	0.23[4]	-0.44 – 0.91
Elicit optimism for change	181	2.39 (1.15)	25	2.00 (1.12)	0.40[4]	-0.90 – 0.87
Reflective listening	255	2.89 (0.62)	165	2.74 (0.84)	0.15[4]	0.01 – 0.30
Exploration of feelings	181	1.98 (0.81)	64	1.75 (0.76)	0.23[3]	0.00 – 0.46
Empathy	241	2.53 (0.82)	150	2.43 (0.96)	0.10[4]	-0.09 – 0.29
SBNT items						
Homework	43	1.44 (1.03)	100	2.32 (1.05)	-0.88[1]	-1.25 – -0.50
Alternative activities	59	1.47 (0.82)	93	1.91 (0.98)	-0.44[2]	-0.74 – -0.14
Social support-general	7	1.43 (1.13)	135	2.06 (0.92)	-0.63[4]	-1.34 – 0.08
Identify sources of support	45	1.51 (0.66)	101	2.55 (1.12)	-1.04[1]	-1.34 – -0.75
Involvement of others	73	1.19 (0.72)	178	2.22 (1.02)	-1.03[1]	-1.26 – -0.81
Therapist task oriented	115	2.03 (0.90)	172	2.49 (0.99)	-0.45[1]	-0.68 – -0.23
Therapist active agent	10	2.00 (1.05)	38	2.18 (1.18)	-0.18[4]	-1.00 – 0.63
Collaboration	7	1.43 (0.53)	74	1.93 (0.78)	-0.50[4]	-1.01 – 0.00
Interpersonal focus	214	2.17 (0.86)	171	2.82 (1.10)	-0.65[1]	-0.85 – -0.45

Values range from not at all (0) to extensively (4).
[1] p<.001
[2] p<.005
[3] p<.05
[4] ns

Figure 3
Mean and 95%CI for SBNT quality summary by randomised group
2 sample t-test; p<0.001

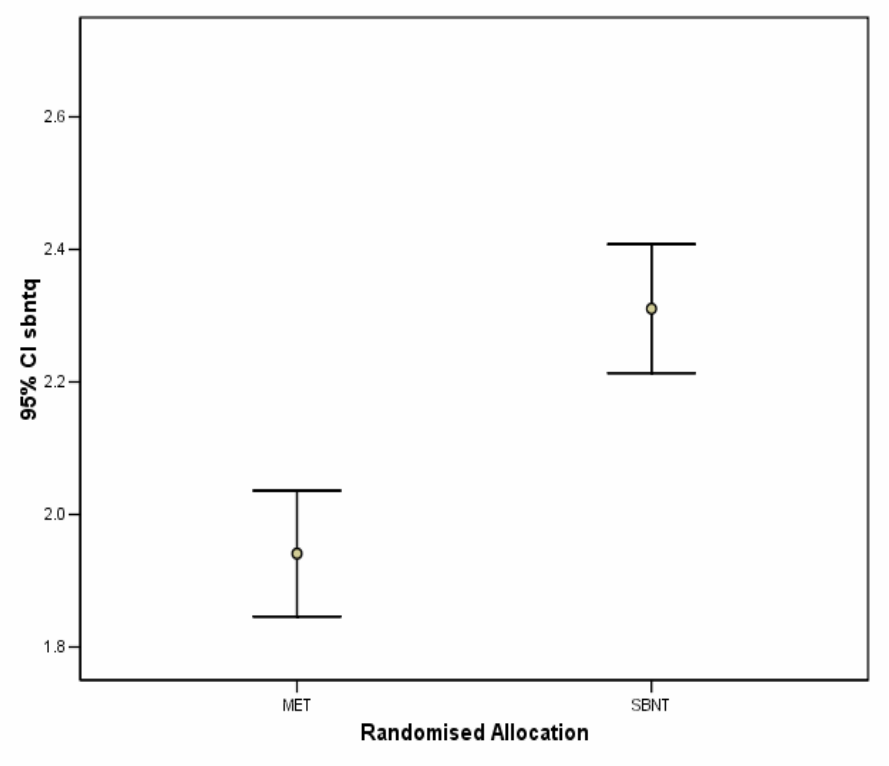
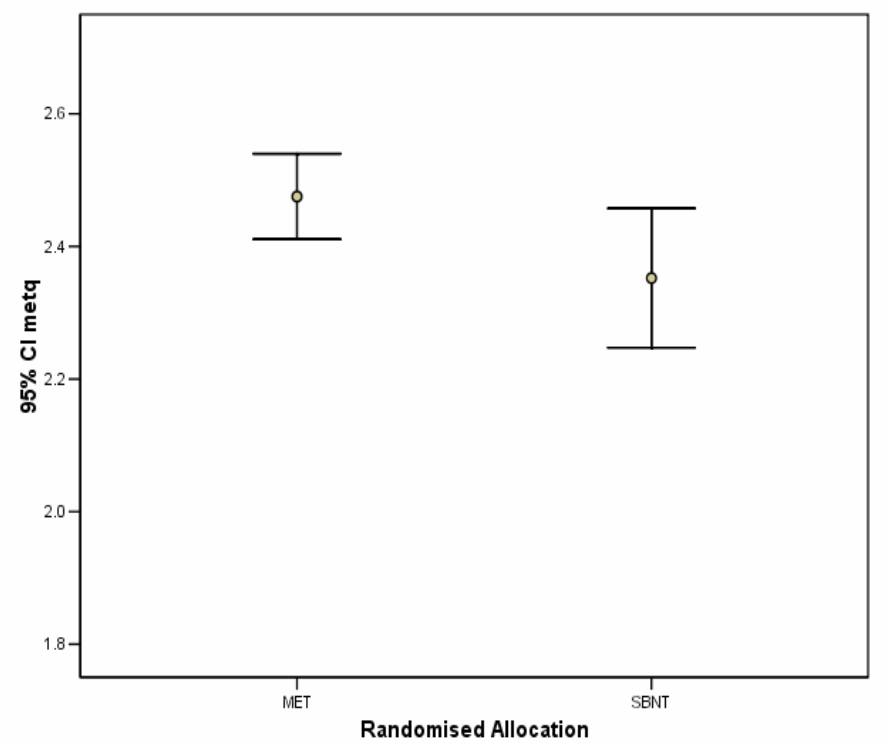


Figure 4
Mean and 95% CI for MET quality summary by randomised group
2 sample t-test; p=0.04



Concurrent validity

Global ratings of quality of therapists' treatment delivery were provided in three categories (high, medium and low quality) by the two treatment specific supervisors and compared with quality summary ratings made by the primary rater. The magnitude of ratings between the primary rater and the supervisors showed concurrence in that rater derived scores were highest for those in the supervisors' high category and lowest in the supervisors' low category. Analysis of variance revealed an overall significant difference between summary ratings for therapists in each of the allocated categories of high, medium and low quality given by the treatment specific supervisors (see Table 4).

Table 4

Quality summary scores against supervisors' ratings

Supervisor's rating		SBNT videos - quality summary	MET videos - quality summary
Low	Mean (SD)	2.09 (0.63)	2.20 (0.53)
	N	36	46
Medium	Mean (SD)	2.11 (0.69)	2.53 (0.47)
	N	72	105
High	Mean (SD)	2.56 (0.63)	2.55 (0.53)
	N	85	107
ANOVA	p-value	<0.001	<0.001

Reliability

Item analysis was conducted separately for frequency of MET items and for frequency of SBNT items producing Cronbach's Alpha of .71 for MET items and .76 for SBNT items. Item-total correlations are given in Table 5 and Table 6.

Table 5
Item analysis statistics for frequency of MET items (coefficient alpha .71)

MET items	Corrected item-total correlation	Cronbach's Alpha if item deleted
Feedback	.46	.68
Eliciting client concerns about drinking	.59	.65
Eliciting self efficacy for change	.24	.71
Commitment to drinking goal	.19	.72
Ambivalence	.35	.70
Creating conflict	.20	.71
Eliciting commitment to change drinking	.25	.71
Eliciting optimism for change	.33	.70
Reflective listening	.63	.65
Exploration of feelings	.42	.69
Empathy	.37	.69

Table 6
Item analysis statistics for frequency of SBNT items
(coefficient alpha .76)

SBNT items	Corrected item-total correlation	Cronbach's Alpha if item deleted
Homework	.48	.73
Alternative activities to drinking	.31	.76
Social support for change – general	.60	.72
Identify sources of support for change	.39	.75
Involvement of others in behaviour change	.70	.69
Therapist as task oriented	.62	.70
Therapist as an active agent for change	.24	.76
Collaboration	.38	.75
Interpersonal focus	.33	.76

Results of the Principal Components Analysis are shown in Table 7. A single factor with an eigen value of 5.13 accounting for 25% of the variance emerged. All treatment components had a loading greater than .29 on this factor with the exception of creating conflict, eliciting self-efficacy and commitment to goal. MET items all had positive loadings and SBNT items all had negative loadings suggesting that the more MET was practised, the less SBNT was practised.

Table 7
Principal Components Analysis: frequency of task and style items

Frequency of task and style items	Component 1
Homework	-.533
Feedback	.646
Alternative activities	-.397
Elicit client concern	.707
Social support - given	-.665
Elicit self-efficacy	.254
Involvement of others	-.798
Commitment to goal	.164
Sources of support	-.495
Ambivalence	.448
Creating conflict	.229
Commitment to change	.294
Eliciting optimism	.500
Task oriented	-.725
Active agent for change	-.292
Reflective listening	.674
Collaboration	-.453
Interpersonal focus	-.370
Exploration of feelings	.461
Empathy	.375

Extraction Method: Principal Component Analysis.

Inter-rater reliability was measured by comparing independent ratings of frequency and quality given by two further researchers with those of the primary rater. Table 8 shows the number of videos rated by each of the two independent raters and the proportion and percentage agreement (measured by identical or adjacent ratings on the Likert scale) with the primary rater. The third column of Table 8 shows the proportion and percentage agreement with the primary rater by one or other of the independent raters when maximum agreement is selected.

Table 8
Double Rating: Number (%) of agreements with primary rater

	Double Rater 1	Double Rater 2	Double Rater 1 or 2
Frequency: homework	58 / 64 (87%)	58 / 66 (88%)	70 / 73 (96%)
Quality: homework	9 / 11 (82%)	15 / 18 (83%)	20 / 20 (100%)
Frequency: feedback	60 / 63 (95%)	62 / 66 (94%)	72 / 74 (97%)
Quality: feedback	12 / 14 (86%)	11 / 13 (85%)	13 / 14 (93%)
Frequency: alternative activities	56 / 63 (89%)	58 / 66 (88%)	69 / 74 (93%)
Quality: alternative activities	11 / 16 (69%)	11 / 16 (69%)	11 / 16 (69%)
Frequency: elicit client concern	49 / 64 (77%)	57 / 66 (82%)	70 / 73 (96%)
Quality: elicit client concern	16 / 21 (76%)	20 / 25 (80%)	24 / 26 (92%)
Frequency: social support – general	53 / 64 (83%)	58 / 66 (88%)	63 / 72 (88%)
Quality: social support – general	17 / 20 (85%)	18 / 21 (86%)	23 / 26 (89%)
Frequency: elicit self-efficacy	46 / 64 (72%)	58 / 66 (88%)	72 / 76 (95%)
Quality: self-efficacy	14 / 16 (88%)	14 / 16 (88%)	14 / 16 (88%)
Frequency: involvement of others	51 / 64 (80%)	51 / 66 (77%)	63 / 69 (91%)
Quality: involvement of others	22 / 28 (79%)	22 / 28 (79%)	22 / 28 (79%)
Frequency: commitment to goal	45 / 64 (70%)	50 / 66 (76%)	63 / 68 (93%)
Quality: commitment to goal	42 / 53 (79%)	37 / 47 (79%)	55 / 57 (97%)
Frequency: sources of support	50 / 64 (78%)	55 / 66 (83%)	68 / 74 (94%)
Quality: sources of support	20 / 25 (80%)	18 / 22 (82%)	27 / 29 (93%)
Frequency: ambivalence	57 / 64 (89%)	61 / 66 (92%)	73 / 75 (97%)
Quality: ambivalence	7 / 8 (87%)	4 / 8 (50%)	9 / 10 (90%)
Frequency: creating conflict	51 / 64 (80%)	51 / 64 (80%)	51 / 64 (80%)
Quality: creating conflict	1 / 2 (50%)	2 / 3 (67%)	2/ 3 (67%)
Frequency: commitment to change	40 / 64 (62%)	59 / 66 (89%)	69 / 74 (93%)
Quality: commitment to change	9 / 13 (69%)	9 / 13 (69%)	9 / 13 (69%)
Frequency: eliciting optimism	39 / 64 (61%)	55 / 66 (83%)	66 / 72 (92%)
Quality: eliciting optimism	23 / 30 (77%)	19 / 24 (79%)	29 / 31 (94%)
Frequency: task oriented	51 / 64 (80%)	49 / 66 (74%)	64 / 68 (94%)
Quality: task oriented	16 / 21 (76%)	16 / 21 (76%)	16 / 21 (70%)
Frequency: active agent for change	61 / 64 (95%)	65 / 66 (98%)	75 / 75 (100%)
Quality: active agent for change	1 / 1 (100%)	2 / 2 (100%)	2 / 2 (100%)
Frequency: reflective listening	50 / 64 (78%)	51 / 66 (77%)	69 / 73 (95%)
Quality: reflective listening	50 / 52 (96%)	48 / 54 (89%)	62 / 62 (100%)
Frequency: collaboration	60 / 64 (94%)	60 / 64 (94%)	60 / 64 (94%)
Quality: collaboration	3 / 4 (75%)	3 / 4 (75%)	3 / 4 (100%)
Frequency: interpersonal focus	44 / 63 (70%)	43 / 63 (70%)	44 / 63 (70%)
Quality: interpersonal focus	31 / 40 (77%)	37 / 45 (82%)	45 / 50 (94%)
Frequency: exploration of feelings	44 / 64 (69%)	44 / 64 (69%)	44 / 64 (69%)
Quality: exploration of feelings	20 / 27 (74%)	25 / 30 (83%)	33 / 34 (97%)
Frequency: empathy	45 / 63 (71%)	45 / 63 (71%)	45 / 63 (71%)
Quality: empathy	36 / 43 (84%)	33 / 40 (82%)	50 / 51 (98%)

Rater 1 & 2: 57 videos
Rater 1 alone: 10 videos
Rater 2 alone: 10 videos

Per cent agreement for individual items is relatively high, whereas there is much more variability in agreement between raters when summary scores for frequency are compared (see Figures 5 to 8). Figure 5 which displays agreement between the primary rater and double rater 1 shows more disagreement than the other figures. A positive difference indicates double rater scores higher than primary rater; a negative difference indicates double rater scores lower than primary rater. So in Figure 5 with a mean difference of -0.58 for the average agreement on the MET frequency summary score, when the primary rater gives higher ratings, double rater 1 gives lower ratings overall.

Figure 5
Bland & Altman Plot – MET frequency summary scores:
Primary rater compared to double rater 1 (a positive difference indicates double rater scores higher than primary rater; a negative difference indicates double rater scores lower than primary rater)

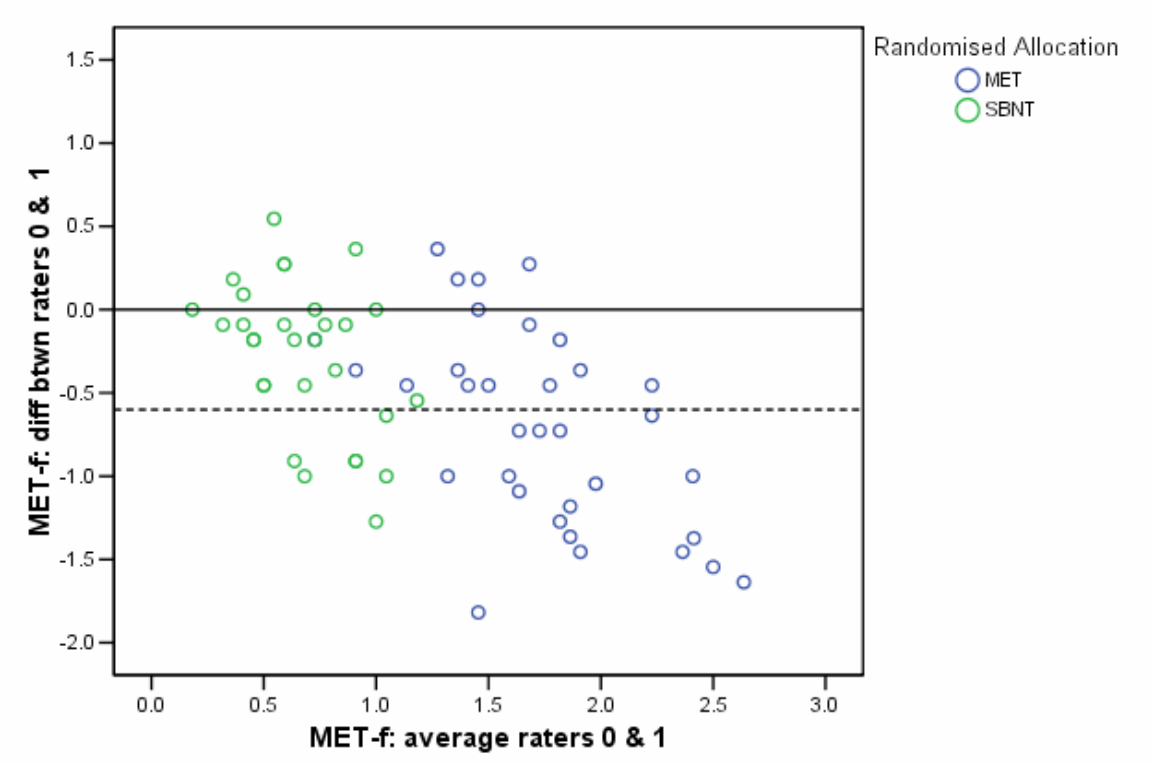


Figure 6
Bland & Altman Plot – MET frequency summary scores: initial rater compared to double rater 2

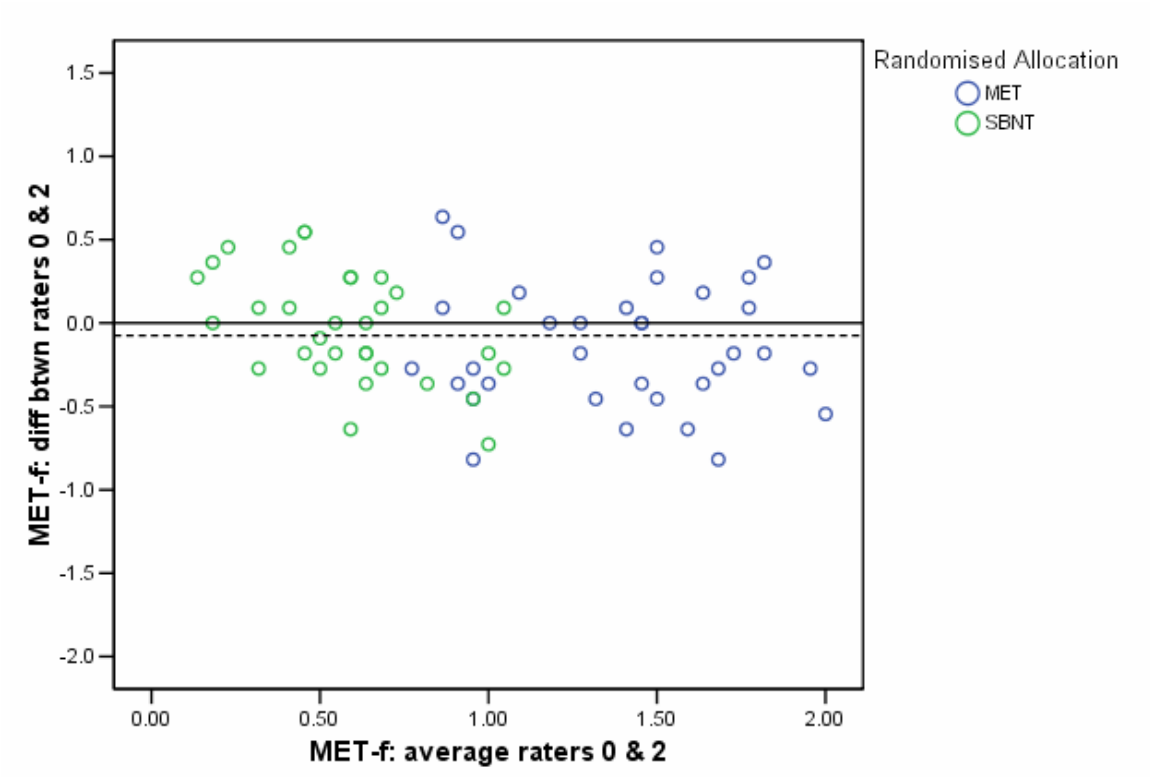


Figure 7
Bland & Altman plot – SBNT frequency summary scores: Initial rater compared to double rater 1

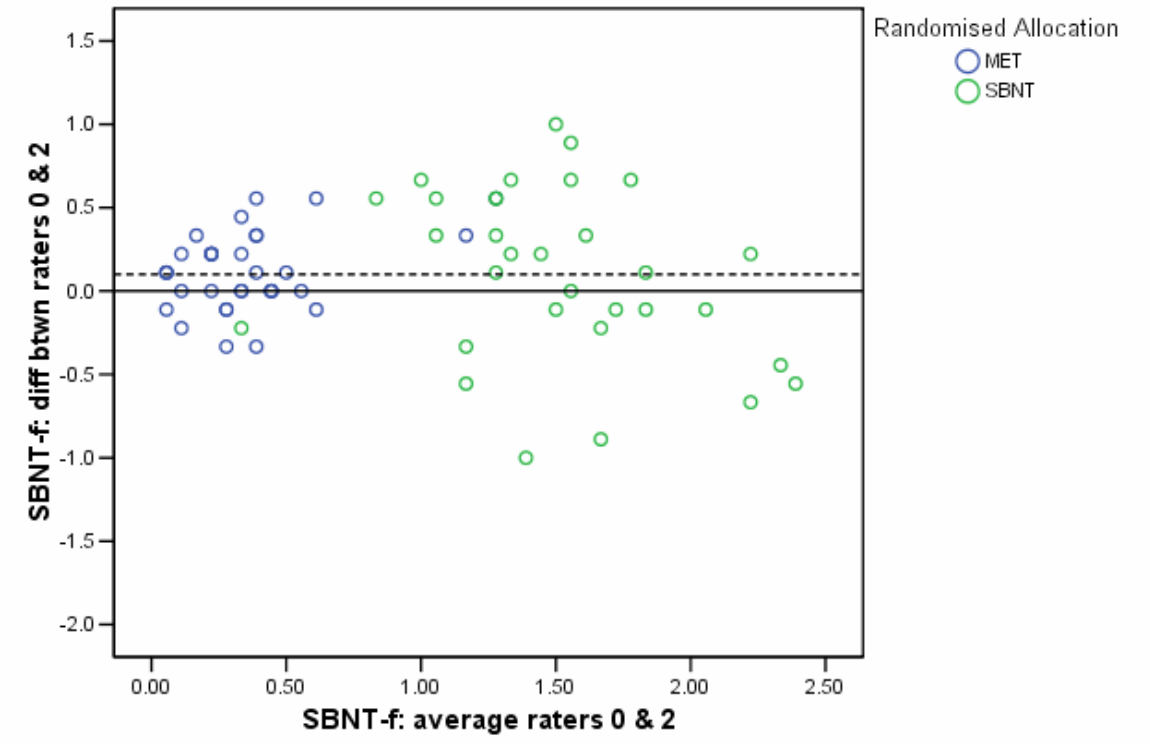
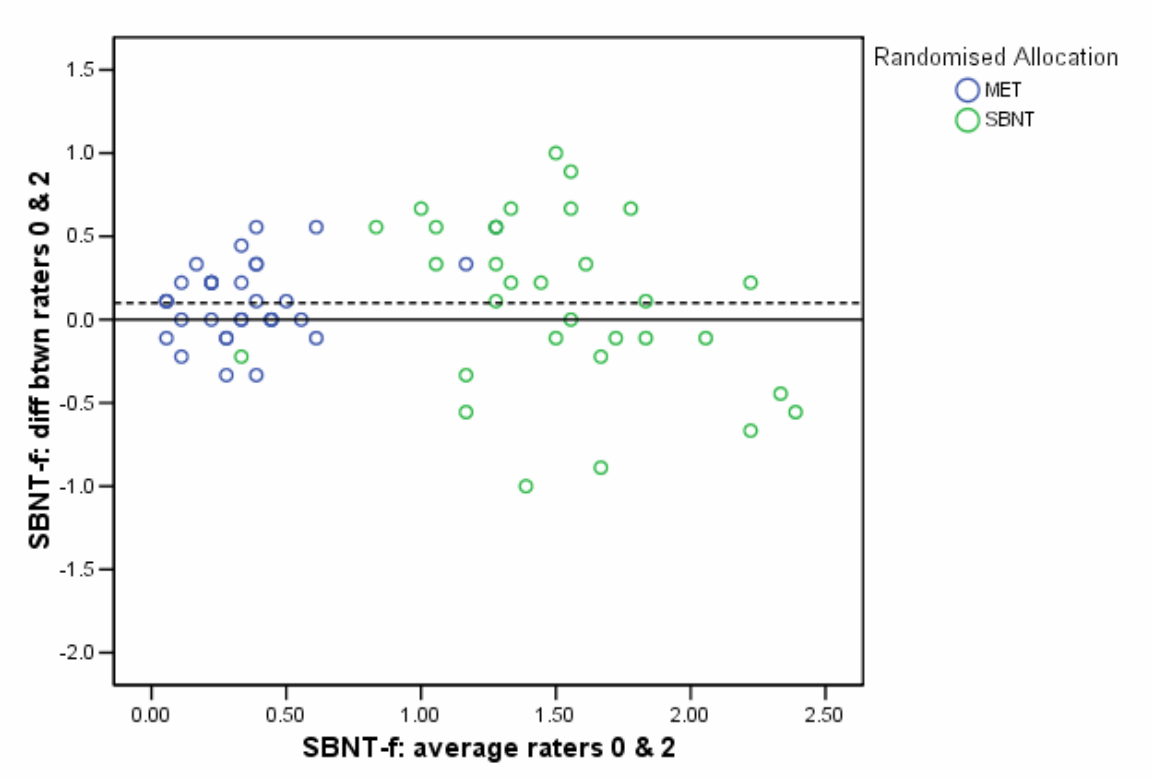


Figure 8
Bland & Altman plot – SBNT frequency summary scores:
Initial rater compared to double rater 2



Session management items

A comparison of the mean frequency scores for the six session management items revealed a significant difference between the scores for each therapy when rated by the primary rater, with the exception of frequency scores for the item "review inter-session change". Frequency ratings were significantly higher for Motivational Enhancement Therapy on four items: maintaining the structure of the session, setting the agenda for the session, maintaining a focus on the drinking problem, giving an end of session summary and for Social Behaviour and Network Therapy on one item, describing the philosophy of the treatment (see Table 9).

Table 9
Comparison of mean frequency scores for session management items for the two treatments

	MET n= 258	SBNT n =193	p
Maintaining structure[a]	2.51	1.92	<0.001
Agenda setting	1.21	0.64	<0.001
Philosophy of treatment	0.80	1.48	<0.001
Review inter session change	2.02	2.06	ns
Consistency of problem focus	3.28	2.85	<0.001
End of session summary	1.73	0.76	<0.001

[a]**=SBNT251 MET 191**

In order to investigate the inter-rater reliability of the instrument with reference to the session management items, the % agreement between the primary rater and the second and third rater was calculated. These percentages are shown in Table 10. Agreement for frequency ratings for end of session summary is low; agreement for the other end of session management items is much higher.

Table 10
Double Rating: Number (%) of agreements with primary rater

	Double Rater 1	Double Rater 2	Double Rater 1 or 2
Frequency: maintaining structure	52 / 64 (81%)	49 / 60 (82%)	61 / 67 (91%)
Quality: maintaining structure	42 / 54 (78%)	64 / 61 (89%)	63 / 65 (97%)
Frequency: agenda setting	44 / 64 (69%)	58 / 65 (89%)	71 / 73 (97%)
Quality: agenda setting	35 / 39 (90%)	33 / 37 (89%)	45 / 45 (100%)
Frequency: philosophy of treatment	54 / 65 (81%)	56 / 66 (85%)	68 / 71 (96%)
Quality: philosophy of treatment	28 / 32 (87%)	26 / 32 (81%)	36 / 37 (97%)
Frequency: review inter session	49 / 65 (75%)	51 / 66 (77%)	66 / 71 (93%)
Quality: review inter session	41 / 50 (82%)	39 / 53 (74%)	54 / 59 (92%)
Frequency: consistency of problem	43 / 65 (66%)	52 / 66 (79%)	64 / 70 (91%)
Quality: consistency of problem	39 / 54 (72%)	47 / 64 (73%)	57 /64 (89%)
Frequency: end of session	24 / 65 (37%)	24 / 66 (36%)	34 / 62 (55%)
Quality: end of session	24 / 38 (63%)	26 / 41 (63%)	33 / 40 (83%)

The frequency of session content items and comparison of their presentation in the two treatments are shown in Table 11. There was a fairly low level of reporting of the session topics, especially for action planning, advice giving, alcohol education and employment. These four topics were also as likely to be given in one treatment as they were in the other.

Table 11
The frequency of session content topics and a comparison of their presentation between treatments MET sessions n=258; SBNT sessions n=193. (More than one item of session content could be checked per session).

Session Content	Frequency in MET	Frequency in SBNT	p<
MET			
Feedback	110	1	0.001
Change plan worksheet	37	0	0.001
Action plan	11	5	ns
SBNT			
Communication skills	0	27	0.001
Coping skills	0	19	0.001
Social support	23	167	0.001
Relapse prevention	0	31	0.001
Alcohol education	12	11	ns
Pleasurable activities	17	44	0.001
Employment	12	13	ns
Giving advice	14	15	ns

Discussion

The scale developed for process rating the delivery of MET and SBNT in the UK Alcohol Treatment Trial is able accurately to detect components of each of the treatments and to discriminate between them. The scale detected that the randomised treatment was delivered as planned in those sessions included in this study and that characteristics of the other treatment were either missing or were delivered infrequently. The summary ratings for each treatment are indicative of the ability of the scale to discriminate the two treatments. Further, all treatment-specific items in the UKATT-PRS showed significant differences between the two treatments indicating that the scale is able both to discriminate the treatments generally and to detect the delivery of all specific components of the content and style of the two treatments that are included in the scale.

Relatively low frequency ratings were found for four of the MET items (self-efficacy for change, commitment to change, creating conflict and ambivalence) and four of the SBNT items (active agent for change, collaboration, homework and alternative activities to drinking). There are a number of possible explanations for these low ratings. It is possible that the therapists who were trained and supervised in the two treatments performed some aspects of these treatments infrequently. That is, the scale did detect these aspects of the two treatments when they occurred but they did not occur very frequently. Alternatively it is possible that the therapists performed these components of the two treatments but the scale did not accurately measure the performance of these items. Reliability analysis enables us to determine which explanation is more likely. If the three raters (the main rater and the two independent raters) were readily able to reach agreement about the frequency with which an item occurred across a number of sessions then we can assume that the item in the scale was clearly specified and functional. This would lead us to question the level of performance of the specific item by therapists in the trial. If the item had lower reliability between raters and was recorded as occurring infrequently, then it is possible that the item has not been specified sufficiently to enable an accurate measure of the extent to which the component of the treatment was delivered in therapeutic sessions.

The data presented in Table 4 show that seven of the eight items with low frequency scores have high levels of agreement between the primary rater and the two independent raters (lowest % agreement: self-efficacy for change: 72%; creating conflict: 80%, ambivalence: 89%, active agent for change: 95%, collaboration: 94%, homework: 87%, alternative activities to drinking: 89%). One of the items shows a lower level of agreement between the primary rater and double rater 1 (commitment to change drinking: 62%) though a good level of agreement with double rater 2 (89%). It is possible that the item ‘commitment to change drinking’ may need tighter specification in the manual for the UKATT-PRS. However, the data above point to the possibility that other items with low frequency scores are likely to have been detected by the UKATT-PRS when they occurred but the delivery of these items in the sessions included in this study was infrequent.

The scale is better able to detect SBNT than MET on the grounds of quality ratings. Six out of seven SBNT items were found to have significantly higher quality ratings in SBNT than in MET treatment, but only four out of seven MET items were found to have significantly higher quality ratings in MET than in SBNT. It is possible either that the manual guidance given for rating quality is better able to detect quality of SBNT delivery than MET delivery or that the treatments have a different number of components which are both essential and unique to that treatment. For example, SBNT is likely to contain more essential items that are also unique than does MET; the latter more established treatment was designed to incorporate basic principles of a widely used evidence based effective counselling style, namely motivational interviewing. Its characteristic style of delivery is therefore more likely to be practised across different treatment types.

To assess the validity of the scale in measuring the quality of delivery, summary quality scores were compared with global ratings of the quality of therapists' practice provided by the treatment supervisors. Supervisors' ratings were general ratings of performance of therapists across the whole of the treatment trial and the primary ratings were derived from observation of individual sessions. The comparison suggests that the UKATT-PRS is able to measure the quality of therapists' delivery of the two treatments.

Internal consistency analysis of the scale, based upon analysis of frequency ratings of individual items in the two parts of the scale, suggests the possible deletion or redesign of specific items. The item "Commitment to drinking goal" showed low corrected item total correlation (.19) with other MET items; it is worth noting that although this item was performed frequently in MET, it was also performed in SBNT and is therefore deemed unreliable in detecting MET or in discriminating the treatments. The items "Eliciting self efficacy for change", "Creating conflict" and "Eliciting commitment to change drinking" also have low corrected item total correlations but Cronbach's alpha is not raised by their deletion. There remains a question about their removal from the scale or a clearer specification in the manual.

One item in the SBNT component of the scale has a low corrected item total reliability, namely "Therapist as active agent for change" (.24) and Cronbach's alpha

is not raised by its deletion. This item describes a component thought to be definitive of the nature of SBNT (Copello *et al*. 2002) but in fact performed infrequently by therapists in this study. Given this, re-specification of the item in the treatment manual might merit consideration.

Principal components analysis produced a main factor (labelled UKATT treatment) accounting for 25% of the variance, with positive loadings for MET items with the exception of creating conflict, eliciting self efficacy and commitment to goal (these items are deemed suitable for rejection or modification) and negative loadings for all SBNT items, supporting the evidence that therapists delivered either MET or SBNT.

Measurement of agreement between the three independent raters for individual items is relatively high and agreement is comparable for MET and SBNT sessions. Agreement between independent raters is equally high for frequency and quality ratings. This suggests that the scale is a reliable measure of components of the two treatments. Agreement between the three raters for summary scores is much more variable.

The session management part of the scale did not work as predicted. It was hypothesised that these items would not discriminate between the treatments and in the event only one of them showed no significant differences between scores for each of the treatments. Comparison of scores of the three independent raters suggests that these items can be measured reliably with the exception of end of session summary. Discussion between the raters revealed that the primary rater had adhered to a stricter definition of the timing of the end of the session summary than the two independent raters. Examination of the treatment manuals and training protocols reveals that aspects of session management were not similarly prescribed in each of the treatments. Greater and more specific emphasis was given to some of these components in the MET treatment manual compared to the SBNT treatment manual, probably accounting for the significant differences in frequency ratings. Reviewing inter session change was integral to the protocols of both treatments.

Of the eleven session content items contained in the checklist, seven showed differences between MET and SBNT consistent with treatment specification. Four

items do not discriminate between treatments. The session content checklist was devised as a method of verifying the content of the session. In the event only seven items were able to do this in a meaningful way.

The overall sample for this kind of study was large and involved a minimum of 452 hours viewing of video recordings with additional time for rating and supplementary administration. Nonetheless there was a question about potential bias in the study sample: video recordings were available for only 73% of the study clients where the design aimed for 100% video recording of sessions. Of those sampled on the basis of one video from each client, 160 were unrateable, with 101 of these being for MET and 59 for SBNT. Some therapists might be less well represented in this sample and more videos were unrateable in one of the treatments (MET) than the other (SBNT).

Conclusion

The UKATT-PRS is a valid and reliable method of rating the delivery of two psychosocial treatments for alcohol problems and dependence. It is likely to be able to be adapted for the purpose of rating the delivery of other psycho-social treatments applying the same principles used in its development. It can therefore form the basis of measuring performance and treatment fidelity in clinical trials, in treatment audit and in routine supervision of practice.

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Appendix 1

Manual items

Session management
Maintaining Structure
Agenda Setting
Explanation of Philosophy of Treatment or Treatment Session
Reviewing Inter - Session Change
Consistency of Problem Focus
End of Session Summary
Specific tasks
Homework
Drinking – Feedback/Negative Consequences
Alternative Activities to Drinking
Eliciting Client Concerns about Drinking
Social Support for Change - General
Eliciting Self-efficacy for Change
Involvement of Others in Behaviour Change
Commitment to Drinking Goal
Identify Sources of Support for Change
Ambivalence
Creating Conflict
Eliciting Commitment to Change Drinking
Eliciting Optimism for Change
Therapist style
Therapist as Task Oriented
Therapist as Active Agent for Change
Reflective listening
Collaboration
Interpersonal focus
Exploration of feelings
Empathy