

A Service Evaluation of PTSD Resolution Client Outcome Data



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Table of contents

Executive summary	3
Introduction.....	4
The work of PTSD Resolution.....	4
Outcome measure: the CORE-10.....	4
Service evaluations and the use of UK IAPT services as a comparison group	5
Aims and contents of this report	6
Section 1: Demographics of and service usage by PTSD Resolution clients.....	7
Reception of therapy by demographics	8
Demographic and other factors predicting treatment completion.....	10
Service usage.....	11
Section 2: Analysis of CORE-10 outcomes.....	14
Outcomes: recovery and reliable change	14
Outcome measures by demographic covariates	15
Prior treatment.....	18
Distress	20
Change in CORE-10 over treatment	22
Section 3: Findings and Recommendations.....	24
Findings	24
Administrative recommendations	25
Recommendations for further study	26
Summary	27
Key findings	27
Key limitations	27
Appendix 1: Defining the dataset.....	29
Data inclusions and exclusions	29
Preparation of covariate data	29
CORE-10 measures	32
Appendix 2: Statistical methods	33
Appendix 3: Follow-up measures	34
Appendix 4: Justifying the quadratic model.....	35
By session	35
By time.....	36
References.....	38

Executive summary

PTSD Resolution is a charity which provides, free at the point of contact, Human Givens Therapy (HGT) through a Practice Research Network of over 200 practitioners. The HGT therapists offer counselling interventions for a range of individuals including the UK armed forces community. This report comprises an analysis of 504 PTSD Resolution clients referred between April 2014 and February 2016. The report provides information on the demographic characteristics of those receiving treatment as well as analysis of a range of self-report measures of mental health symptoms gathered during client's contact with PTSD Resolution.

We found that PTSD Resolution clients were broadly representative of the Service population from which they are drawn as regards sex and ethnic diversity. At the point of presentation, PTSD Resolution clients almost universally reported a high burden of mental health symptoms. There was no evidence, however, that the severity of symptoms at presentation in any way affected how service users subsequently responded to treatment.

Treatment outcomes are comparable to those provided by primary care therapy services in England (Improving Access to Psychological Therapies (IAPT)). The effect of treatment appeared to be independent of spontaneous remission over time. However the strength of this conclusion is limited by the strong correlation between time and treatment sessions and also because we could not account for other possible causes of remission such as other treatment accessed concurrently. The service evaluation also identified that some groups did not respond as well as others, notably the unemployed, those living alone, and those on mental health medication.

As with other outpatient mental health service evaluations, attrition was problematic. However, we did not identify that any specific risk factors for dropout from treatment other than unemployment.

In summary, this service evaluation found that a substantial proportion of people who present to PTSD Resolution, at a time that they were experiencing a substantial burden of mental health symptoms, improved over the course of treatment. There was tentative indicative evidence that the improvement in mental health did not appear to be related to spontaneous recovery. However, whilst these data are suggestive that the HGT treatment provided by PTSD Resolution therapists led to an improvement in service user's mental health, the available data was not able to clarify whether there may have been other causes of improvement. It is wholly possible that, unmeasured factors, such as changes in social or occupational roles or the impact of any other treatment, may have accounted for some or all of the measured improvement. We suggest that further research and/or evaluation is conducted to clarify the reasons for the measured improvement.

Introduction

The work of PTSD Resolution

PTSD Resolution is a registered charity¹ offering free counselling to UK Armed Forces-related patients (including reservists and dependents) using a Human Givens Therapy (HGT) approach (Griffin and Tyrrell 2004). PTSD Resolution delivers its services through a Practice Research Network² which includes over 200 HGT practitioners. Veterans who access their services can do so without the need for a referral. PTSD Resolution aims to provide up to six one-to-one, one-hour HGT sessions focused on treating mental health problems associated with military trauma – not specifically Post Traumatic Stress Disorder (PTSD). Clients may have more than six sessions if they require.

The Human Givens Institute Practice Research Network (HGIPRN) was piloted for 12 months. The results of this evaluation found that, as measured by CORE-10 scores, 54.6% of clients showed reliable recovery (Andrews, Twigg et al. 2011). However, that pilot was not representative of the PTSD Resolution setting and sample demographics; piloting was done within a general medical practice in a suburban area of Luton, via referral to HGT therapists from general practitioners and nurse practitioners. Current PTSD Resolution practice is to accept clients without referral. Furthermore, within the pilot the majority of service users were female whilst the vast majority of military veterans are male. Lastly, the pilot was performed in a general primary care setting rather than within the general Armed Forces Community.

In order to better understand the impact of PTSD Resolution therapists providing treatment for Armed Forces Community clients, a service evaluation was commissioned of data from clients referred to their therapists between April 2014 and February 2016.

Outcome measure: the CORE-10

PTSD Resolution therapists ask clients to complete a brief mental health measure the CORE-10 (Barkham, Bewick et al. 2013). The CORE-10 has been used for routine assessment of therapies in secondary mental healthcare to evaluate mental health, during all types of session. The CORE-10 measures outcomes and progress of clients' therapy and is a ten-item short measure derived from the 34-item Clinical Outcomes in Routine Evaluation – Outcome Measure (CORE-OM) (Barkham, Mellor-Clark et al. 2006). Studies have shown that CORE-OM is highly correlated with the Clinical Interview Schedule – Revised ($r=0.77$) (Lewis, Pelosi et al. 1992; Connell, Barkham et al. 2007)³, and it shows good test-retest reliability and validity against numerous other instruments (Evans, Connell et al. 2002). CORE-10 yields sensitivity and specificity values of 0.92 and 0.72 respectively for depression at a cut-off score of 13, and a clinical cut-off score for general psychological distress of 11 with a reliable

¹ Registered with the UK Charity Commission, registration no. 1133188.

² A collaboration of practicing service providers, who provide their work settings for the generation of practice-based knowledge.

³ A “gold standard” diagnostic tool, using a structure interview designed for clinically experienced interviewers to identify mental health disorders in all settings, and used widely including in such keystone research activities as the British National Psychiatric Morbidity Survey.

change (Jacobson and Truax 1991) index of 6; the kappa value of agreement⁴ between category assignment at this cut-off was 0.77, and the CORE-10 shows similar agreement with other measures as the CORE-OM (Barkham, Bewick et al. 2013). A five-year repeat of the original pilot found 71.0% of participants showed reliable improvement, and 50.6% of participants demonstrated both reliable change and recovery (Andrews, Wislocki et al. 2013).

Service evaluations and the use of UK IAPT services as a comparison group

PTSD Resolution provides services to veterans who present with mental health difficulties. As yet the HGT approach used by PTSD Resolution counsellors has not been assessed within a robust clinical trial which would have some patients receiving HGT and others (a control group) receiving either no therapy or a suitable comparison therapeutic modality (e.g. cognitive behavioural therapy (CBT)). Robust clinical trials also require random allocation of patients to the intervention or control group. These sorts of trials are called randomised controlled trials (RCTs).

Service evaluations measure the potential impact of a particular intervention on a group of service users utilising the data that is routinely collected by those delivering the treatment. Service evaluations are not clinical trials but do nonetheless provide a useful source of information about whether people presenting to a clinical service are improving or not. Many NHS services, which provide a range of evidence-based interventions⁵, regularly evaluate their outcomes. One such NHS service is The Improving Access to Psychological Therapies (IAPT) initiative, which was instituted to facilitate access to NICE (National Institute for Health and Care Excellence) - recommended treatments for depression and anxiety disorders in primary care (i.e. outside of specialist mental health settings). Several evaluative reports have been produced from IAPT services as they rolled out across England which have included details on service use and recovery rates. As the data used in this service evaluation was administratively-collected, by a service which did not include any untreated personnel (i.e. no waiting list data), we considered that a comparison to IAPT data was appropriate.

However, there are significant limitations to this comparison, the greatest of which is the difference in outcome tools used; IAPT services primarily measure outcomes using the Patient Health Questionnaire, 9-item version (PHQ-9) (Kroenke, Spitzer et al. 2001) and General Anxiety Disorder questionnaire (GAD-7) (Spitzer, Kroenke et al. 2006), as well as other instruments more oriented to social and general wellbeing such as the Work and Social Adjustment Scale (W&SAS) (Mundt, Marks et al. 2002).

The IAPT data demonstrate that, according to the measures used, recovery rates (i.e. those who could be classed as having a mental health problem at the beginning of treatment but not by the end) of 37-45% (Glover, Webb et al. 2010; Department of

⁴ Cohen's kappa coefficient measures agreement between parties, and is more robust than a simple percentage of agreement as it takes into account the proportion of agreement which could have occurred by chance

⁵ The NHS and other public health and social care services rely on the guidance from National Institute for Health and Care Excellence (NICE) in order to make evidence-based treatment recommendations

Health 2012; Gyani, Shafran et al. 2013)⁶, with recovery rates among those completing treatment reaching 45%. Recovery rates reported by IAPT services have increased year-on-year (Department of Health 2012) with over 60% completing treatment by March 2012 (Department of Health 2012), and for those completing treatment, 56% of cases recovered (Glover, Webb et al. 2010). “Reliable improvement”⁷ (Jacobson and Truax 1991) was found in 43.6-77.1% of those who were cases at the beginning of treatment (average 63.7%; note that IAPT deal with a wide range of disorders, giving rise to high variation), with “reliable recovery” (i.e. both remission from the presenting complaint and reliable improvement) in 23.9-56.5% of initial cases, averaging 40.3% (Gyani, Shafran et al. 2013).

Service evaluation reports on IAPT services show that 36% terminated treatment with IAPT after only one contact (Glover, Webb et al. 2010). Patients who received more therapy sessions were more likely to recover (Gyani, Shafran et al. 2013). IAPT demographic data, comparable to the data analysed in this service evaluation, shows that 87% of the IAPT service users are White British and 54% are full or part-time employed.

Aims and contents of this report

This report utilises the data collected by PTSD Resolution in order to:

1. Determine the demographic distribution of their clients
2. Examine patterns of use of therapy and causes of attrition (i.e. unplanned leaving of therapy)
3. Investigate the consequences of prior treatment and distress felt by clients
4. Evaluate the service in terms of initial, final, and change over treatment of outcome scores
5. Investigate how symptoms change over the course of therapy and over time, with a view to distinguishing the effects of these factors

⁶ Note that this report uses IAPT figures based on peer-reviewed papers and multi-year reports. The most up-to-date information is found in IAPT monthly reports, but are not used here, partly due to month-to-month variation. For reference, the most recent report at the time of writing (February 2016) gives a 6.4 mean number of attended treatment appointments, 63.9% of those completing treatment showing reliable improvement, 48.4% of initial cases having recovered, and 46.4% of initial cases showing reliable recovery.

⁷ I.e. using statistically-derived indication of clinically significant change, whereby a Reliable Change Index for a client is considered (by calculating pre-test and post-test scores and dividing by the standard error of the difference) and compared to a defined cutoff score to discriminate recovered, improved, unchanged and deteriorated cases

Section 1: Demographics of and service usage by PTSD Resolution clients

Descriptions and explanations of the dataset, cleaning and categorisation of variables (including level of missing data), and methods used are found in Appendices 1 and 2; please refer to them for further explanations and any clarifications of the following analyses. Table 1 shows the demographic distribution of the whole PTSD Resolution closed cases database (irrespective of whether they engaged in treatment), consisting 504 clients after exclusions (see Appendix 1).

Factor	Category	Number⁸	Percentage
Sex	Male	439	89.2
	Female	53	10.8
Age (years)	19-24	13	2.8
	25-34	120	25.4
	35-44	146	30.9
	45-54	130	27.5
	55+	63	13.4
Employment	Employed	207	45.0
	Not seeking work	78	17.0
	Long-term sick	109	23.7
	Seeking work	66	14.4
Relationship status	Married	120	37.2
	Cohabiting/committed relationship	76	23.5
	Casual relationship/single	127	39.3
Accommodation	Partner	248	51.2
	Family	45	9.3
	Non-family	12	2.5
	Alone	150	31.0
	No fixed abode	20	4.1
	Prison	9	1.9
Dependants	0 ⁹	229	45.4
	1	87	17.3
	2	100	19.8
	3	59	11.7
	4	20	4.0
	5-9	9	1.8
Pharmaceutical use¹⁰	None	155	33.5
	Anti-depressant	144	31.1
	Other	164	35.4

Table 1 Overall demographics of PTSD resolution clients

⁸ Numbers do not sum to 504 due to missing data in covariates (see Appendix 1)

⁹ 229 of 504 records are listed as having 0 dependents. As all other covariates include at least some missing data, it must be assumed that at least some of these 229 are, in fact, missing rather than 0, but this cannot be determined from the data available

¹⁰ Note that “pharmaceutical use” is not a demographic factor, but included here and throughout for convenience

We determined that 10.8% of the PTSD Resolution sample were female; although lower than the general population (see above), this is broadly in line with the distribution in the Armed Forces; 10.1% of current UK Regulars are female (Ministry of Defence 2015), and 11% of the veteran population were female in 2014 (Ministry of Defence 2016), and for comparison 8.1% were female in 2001 (around the average time of leaving for this sample) (Ministry of Defence 2001). Mean age was 42 years, and around two-thirds were taking some form of medication. 45% were employed; this is somewhat lower than 54% employment rate in the IAPT sample, and substantially lower than employment levels in the veteran population in general (75%) (Ministry of Defence 2016). Over half were living with their partner, but a substantial proportion was living alone (31.0%). Only a minority (37.2%) were married; this is substantially lower than the veteran population in general (64%) (Ministry of Defence 2016).

Due to considerable missing data, it was not possible to utilise the field ‘time since leaving the services’ in the analysis of factors affecting mental health. However, for information, the mean time since leaving the services until referral to PTSD Resolution was 14.5 years (median value 12 years)¹¹. The distribution is shown in Figure 1; as can be seen, there is a large proportion seeking help within a few years of leaving service; however help-seeking appears to continue to occur moderately frequently until 30 years post-service.

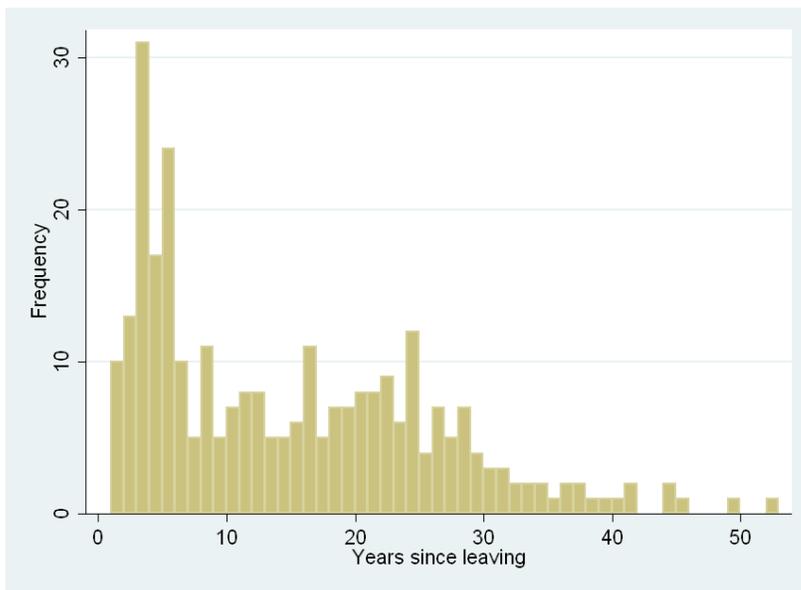


Figure 1 Distribution of years since leaving

Reception of therapy by demographics

Similar to IAPT services, not all who enter the programme receive therapy. Within the PTSD Resolution sample, 84.5% attended more than one session¹², compared with 64% of IAPT users who terminate treatment after only a single contact (Glover, Webb

¹¹ The lower median indicates that the mean is being skewed by a small number with exceptionally long periods before seeking help.

¹² Includes those sessions listed as assessment, therapy, or completion, as any of these may contain at least some treatment, but not screening or follow-up sessions.

et al. 2010); note that these are not directly comparable due to differences in types and definitions of contacts. Table 2 evaluates demographic differences in service usage in terms of whether or not the individual attended any sessions of therapy. A p-value of less than 0.05 implies that there is a statistical difference between categories (marked with *) (see Appendix 2 for a more detailed explanation); thus we can see that receiving therapy varies with employment status, with those in employment being most likely to receive therapy. This is the only recorded demographic variable which has a significant effect on whether or not an individual receives at least some therapy. Note that interpretation is limited because this analysis does not discriminate between those who have no therapy sessions because they were not referred to further treatment and those who did not attend booked therapy sessions.

<i>Factor</i>	<i>Category</i>	<i>Number receiving/not receiving therapy</i>	<i>%</i>	<i>χ^2 value</i>	<i>p-value</i>
Sex	Male	369/70	84.1	0.026	0.87
	Female	45/8	84.9		
Age	19-24	12/1	92.3	3.699	0.45
	25-34	103/17	85.8		
	35-44	127/19	87.0		
	45-54	109/21	83.9		
	55+	49/14	77.8		
Employment	Employed	192/15	92.8	21.112	<0.01*
	Not seeking work	53/18	74.7		
	Long-term sick	88/21	80.7		
	Seeking work	50/16	75.8		
Relationship status	Married	104/16	86.7	2.564	0.28
	Cohabiting/committed relationship	65/11	85.5		
	Casual relationship/single	101/26	79.5		
Accommodation	Partner	216/32	87.1	7.736	0.17
	Family	38/7	84.4		
	Non-family	11/1	91.7		
	Alone	119/31	79.3		
	No fixed abode	15/5	75.0		
	Prison	9/0	100		
Dependants	0	188/41	82.1	2.955	0.71
	1	79/12	86.8		
	2	88/12	88.0		
	3	49/10	83.1		
	4	18/2	90.0		
	5-9	4/1	80.0		
Pharmaceutical use	None	133/22	85.8	0.437	0.80
	Anti-depressant	120/24	83.3		
	Other	137/27	83.5		

Table 2 Demographic differences between treated and untreated groups

* p-value < 0.05, and hence statistically significant variation between groups

Demographic and other factors predicting treatment completion

Of those who did receive therapy, many did not pursue it to planned completion. IAPT services observed 60-66% treatment completion (Department of Health 2012); we found that 64.7% of PTSD Resolution clients had a planned ending (which is consistent with the findings of the HGTPRN pilot, which had 65.3% planned endings (Andrews, Twigg et al. 2011), and a little below the findings of the five-year repeat (Andrews, Wislocki et al. 2013) which had 72.7% reaching a planned ending (but 21% of that sample did not have ending type recorded)). Table 3 shows the effect of demographic factors on treatment completion, restricted to those who received at least one treatment session. Likelihood of completing treatment had a borderline significant variation between age groups, but the trend was ambiguous.

Factor	Category	No. with planned/ unplanned end	%	χ^2 value	p-value
Sex	Male	272/97	73.7	0.83	0.36
	Female	36/9	80.0		
Age	19-24	9/3	75.0	9.43	0.05
	25-34	66/37	64.1		
	35-44	93/34	73.2		
	45-54	89/20	81.7		
	55+	39/10	79.6		
Employment	Employed	141/51	73.4	5.86	0.12
	Not seeking work	40/13	75.5		
	Long-term sick	71/17	80.7		
	Seeking work	31/19	62.0		
Relationship status	Married	80/24	76.9	0.82	0.66
	Cohabiting/committed relationship	46/19	70.8		
	Casual relationship/single	76/25	75.3		
Accommodation	Partner	161/55	74.5	2.03	0.85
	Family	31/7	81.6		
	Non-family	8/3	72.7		
	Alone	86/33	72.3		
	No fixed abode	10/5	66.7		
	Prison	6/3	66.7		
Dependents	0	139/49	73.9	3.04	0.69
	1	61/18	77.2		
	2	66/22	75.0		
	3	33/16	67.4		
	4	13/5	72.2		
	5-9	4/0	100.0		
Pharmaceutical use	None	92/41	69.2	2.88	0.24
	Anti-depressant	90/30	75.0		
	Other	107/30	78.1		

Table 3 Demographic differences between those with planned and unplanned end, among those who attend at least one session of treatment

Service usage

PTSD Resolution aim to deliver counselling for around six sessions (including initial assessment). The IAPT data shows that patients who received a higher number of sessions were more likely to recover (Gyani, Shafran et al. 2013). In light of this, and in particular when considering the nature and consequences of unplanned endings to therapy, we considered it worthwhile to investigate the distribution of service usage. Figure 2 shows the overall distribution of therapy sessions for the whole sample (note that this includes assessment and completion sessions) (n=504); as can be seen, there are a large number with zero sessions, with another peak around six sessions and very few having more than 12 sessions.

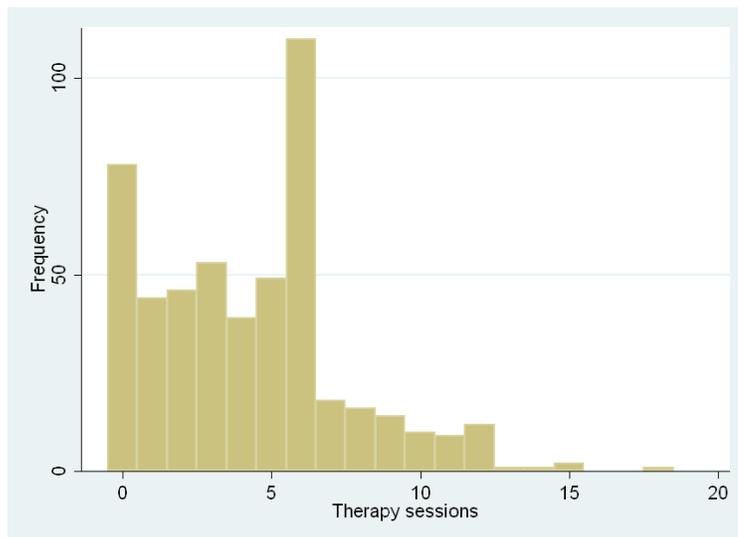


Figure 2 Distribution of therapy sessions attended (includes assessment and completion)

To further clarify how PTSD Resolution clients make use of the services provided, this data can be examined according to whether the individual completed therapy in a planned way. Figure 3 shows the number of therapy sessions for those with a planned completion; here, there are relatively few individuals with zero therapy sessions, and the peak around six sessions is more defined.

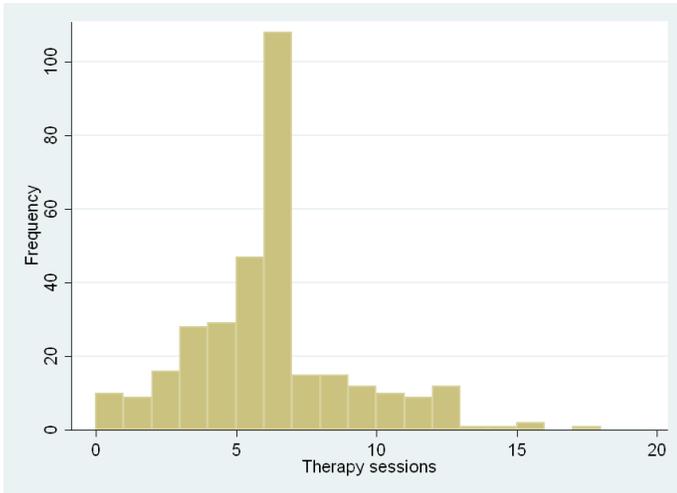


Figure 3 Distribution of therapy sessions attended (planned completion) (includes assessment and completion)

By comparison, Figure 4 shows that, for those with an unplanned ending, most received zero sessions of therapy, but a substantial proportion had one or more sessions (though very few had more than four).

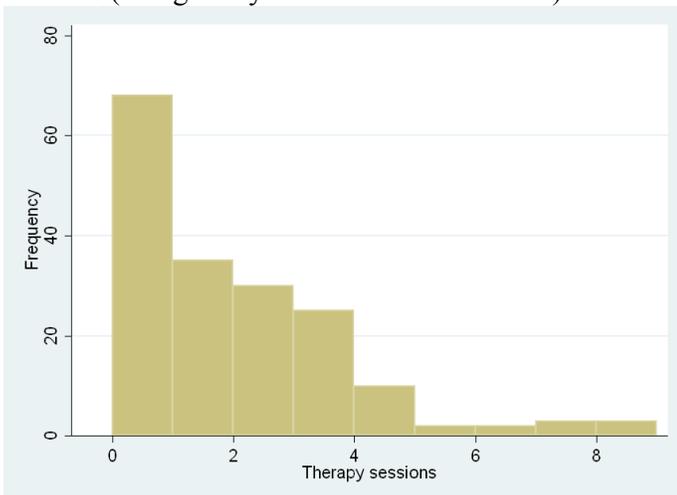


Figure 4 Distribution of therapy sessions attended (unplanned completion) (includes assessment and completion)

Overall, of those with a planned ending, 96.9% (n=315) attended at least one therapy session, while of those with an unplanned ending, 61.8% (n=110) attended at least one therapy session.

Given that we identified that demographic factors can affect whether a client received therapy and whether they completed therapy, and also that for IAPT the number of sessions is predictive of recovery, we then examined how demographic factors affected number of sessions. Table 4 compares the effects of demographic factors on number of sessions. Note that, unlike previous analyses, this table utilises linear regression; regression coefficients presented show the expected number of sessions gained (a positive coefficient)/lost (a negative coefficient) for the category, by comparison to the baseline category (designated with a regression coefficient of zero; see Appendix 2 for further explanation).

Factor	Category	Mean	Regression coefficient (95% confidence interval)	p-value
Sex	Male	4.2	0	0.452
	Female	4.6	0.36 (-0.57 to 1.29)	
Age	19-24	2.8	-1.35 (-3.16 to 0.45)	0.141
	25-34	4.0	-0.08 (-0.85 to 0.69)	0.835
	35-44	4.1	0	
	45-54	5.0	0.88 (0.13 to 1.63)	0.022*
	55+	4.0	-0.17 (-1.11 to 0.77)	0.721
Employment	Employed	4.5	0	0.226
	Not seeking work	4.0	-0.54 (-1.42 to 0.34)	
	Long-term sick	4.8	0.25 (-0.50 to 1.00)	
	Seeking work	3.2	-1.30 (-2.20 to -0.40)	
Relationship status	Married	4.2	0	0.717
	Cohabiting/committed relationship	4.3	0.16 (-0.71 to 1.03)	
	Casual relationship/single	3.9	-0.28 (-1.04 to 0.48)	
Accommodation	Partner	4.3	0	0.979
	Family	4.3	0.01 (-1.02 to 1.05)	
	Non-family	4.3	0.06 (-1.83 to 1.95)	
	Alone	4.1	-0.17 (-0.83 to 0.49)	
	No fixed abode	4.5	0.22 (-1.26 to 1.71)	
	Prison	5.0	0.72 (-1.45 to 2.89)	
Dependents	0	4.3	0	0.756
	1	4.5	0.13 (-0.67 to 0.92)	
	2	4.4	0.05 (-0.72 to 0.82)	
	3	3.9	-0.45 (-1.39 to 0.48)	
	4	3.6	-0.74 (-2.22 to 0.75)	
	5-9	4.0	-0.34 (-3.22 to 2.55)	
Pharmaceutical use	None	3.6	0	0.019*
	Anti-depressant	4.4	0.75 (0.02 to 1.49)	
	Other	4.7	1.10 (0.39 to 1.81)	
Planned end	Planned	5.8	0	<0.001*
	Unplanned	1.6	-4.20 (-4.67 to -3.73)	

Table 4 Therapy sessions attended by demographic

Again, a p-value less than 0.05 (marked with *) indicated statistical significance. Those in the 45-54 age group attended slightly more sessions (i.e. slightly less than one more session than the baseline 35-44 age group), but there were no other significant effects among other age groups. Jobseekers attended fewer sessions; this may be explained by the previous finding that jobseekers were less likely to complete treatment, as those with unplanned endings had fewer treatment sessions. The only other significant factor was pharmaceutical usage; those on courses of medicine had more sessions of therapy. Possible explanations for this observation could be that such individuals are accustomed to making more contact with medical services, or that they had greater needs hence requiring more therapy sessions.

Section 2: Analysis of CORE-10 outcomes

Outcomes: recovery and reliable change

Simple comparisons can be performed with outcomes reported by IAPT¹³. IAPT measures recovery in terms of the PHQ-9 and GAD-7 instruments (measuring depression and anxiety respectively), whereas PTSD Resolution utilise CORE-10, a single overall measure of psychological wellbeing; thus, since different instruments are being used, we cannot be wholly confident that a direct comparison of IAPT and PTSD Resolution data is valid¹⁴. Furthermore, the PTSD Resolution client basis is demographically different from the IAPT general population. Nonetheless, if we take a “caseness” cut-off of 11 for CORE-10, and a change in six points on the score as representing “reliable change”¹⁵, as recommended for this measure (Barkham, Bewick et al. 2013), we can perform a tentative analysis of recovery in terms of change in observed caseness.

We found that 42.0% of those who are defined as cases according to their first CORE-10 measure were no longer a case by their last recorded measure; this is comparable to recovery rates of 37-45% of those using IAPT services (Glover, Webb et al. 2010; Gyani, Shafran et al. 2013). Of those who had a planned ending, this recovery rate rose to 51.6%, which again is similar to IAPT users (58.7%) (Glover, Webb et al. 2010). We found that 65.1% showed a change in CORE-10 score, suggestive of reliable improvement. This rose to 66.9% for those who were cases at first measurement, comparable to the average of 63.7% in IAPT (Gyani, Shafran et al. 2013). We also found that 42.2% of cases at baseline were both no longer cases and showed reliable improvement by last measure; this compares with an average of 40.3% of IAPT users (Gyani, Shafran et al. 2013).

Thus users of PTSD Resolution services seem to experience similar rates of recovery and reliable improvement as IAPT users, with the important caveats that both demographic factors and the measures used differ between these service providers.

¹³ Note that more recent IAPT data shows similar figures as presented here; see footnote 6 above

¹⁴ No direct comparisons of CORE-10, PHQ-9 and GAD-7 exist; however, CORE-OM (on which CORE-10 is based) shows performance characteristics similar to PHQ-9 (Gilbody, S., D. Richards, et al. (2007). "Diagnosing depression in primary care using self-completed instruments: UK validation of PHQ-9 and CORE-OM." *British Journal of General Practice* 57(541): 650-652.

¹⁵ See footnote 7 above

Outcome measures by demographic covariates

The results reported in Tables 2 and 4 above show that those who are employed are more likely to receive therapy, while long-term sick clients had more therapy sessions (once the consequence of unplanned ending were taken into account) and those using pharmaceuticals attended more sessions. As would be expected, those with unplanned endings attended fewer sessions, though most had at least one and some had several sessions before terminating therapy.

Using these data we generated a number of testable hypotheses regarding initial symptomatology:

- **H1:** Employed clients were more likely to receive therapy because they had a greater need, and hence their initial CORE-10 scores will be higher. Alternative hypotheses (if **H1** is not supported) could be that those in employment were more concerned about their health due to the risk of losing their job, or had the resources to more reliably attend (e.g. had access to transport, a regular schedule, etc.); in this case, there would not be any difference in initial CORE-10 scores.
- **H2:** Clients who were off from work because of longer-term sickness and those taking pharmaceuticals utilised more sessions of therapy due to greater need as demonstrated by higher initial CORE-10 scores.
- Clients with unplanned endings terminated their treatment early and had fewer therapy sessions either because they have lower initial CORE-10 scores (implying less need for services) (**H3**) or higher CORE-10 scores (suggesting that they needed more intensive therapy than could be provided by PTSD Resolution) (**H4**).

We were able to test these hypotheses by comparing first recorded CORE-10 scores (for 89% of clients, during initial assessment sessions) between groups. As can be seen in Table 5, long-term sick patients and those using pharmaceuticals did indeed have higher initial CORE-10 scores, supporting hypothesis **H2** above. However, employed clients were not different from the other categories (i.e. job-seekers and those not seeking work), which does not support **H1** above and suggests that the higher number of therapy sessions attended was due to some alternative explanation. Similarly, those with unplanned endings did not differ significantly from those with planned endings, suggesting that they do not differ at initial presentation and hence neither **H3** nor **H4** above are supported.

<i>Factor</i>	<i>Category</i>	<i>Mean</i>	<i>Regression coefficient (95% confidence interval)</i>	<i>p-value</i>
Sex	Male	23.7	0	
	Female	21.4	-2.25 (-4.55 to 0.06)	0.056
Age	19-24	21.1	-2.43 (-6.72 to 1.85)	0.265
	25-34	23.8	0.24 (-1.69 to 2.17)	0.804
	35-44	23.5	0	
	45-54	24.3	0.74 (-1.15 to 2.64)	0.441
	55+	20.7	-2.82 (-5.25 to -0.38)	0.024*
Employment	Employed	22.6	0	
	Not seeking work	22.7	0.07 (-2.15 to 2.29)	0.950
	Long-term sick	25.3	2.68 (0.85 to 4.51)	0.004*
	Seeking work	24.0	1.36 (-0.93 to 3.64)	0.243
Accommodation	Partner	22.5	0	
	Family	22.8	0.31 (-2.12 to 2.74)	0.803
	Non-family	26.4	3.92 (-0.56 to 8.40)	0.086
	Alone	25.3	2.82 (1.12 to 4.53)	0.001*
	No fixed abode	21.5	-1.06 (-4.83 to 2.71)	0.581
	In prison	25.7	3.15 (-4.48 to 10.77)	0.418
Dependants	0	23.1	0	
	1	24.0	0.89 (-1.13 to 2.91)	0.384
	2	23.6	0.50 (-1.47 to 2.47)	0.616
	3	23.7	0.53 (-1.87 to 2.93)	0.665
	4	22.0	-1.12 (-4.76 to 2.51)	0.544
	5-9	20.5	-2.62 (-9.41 to 4.17)	0.448
Pharmaceutical use	None	22.3	0	
	Anti-depressant	24.6	2.30 (0.41 to 4.20)	0.017*
	Other	24.0	1.73 (-0.03 to 3.49)	0.055
Planned end	Planned	24.2	0	
	Unplanned	23.1	1.04 (-0.71 to 2.79)	0.242

Table 5 Initial CORE measures by demographic

Table 5 also gives rise to other observations; the oldest group presented with lower CORE-10 scores (although the mean was still well above the cut-off for caseness), those who live alone have higher CORE-10 scores than those who live with a partner.

At this stage of analysis, we have demonstrated that those seeking work attend fewer sessions (as do, unsurprisingly, those with unplanned endings), those taking medication attend more sessions, and the long-term sick have higher initial CORE-10 scores as do those on medication and those living alone. Given these observations, and our previous hypothesis testing, we can generate new hypotheses before analysing CORE-10 outcomes at the end of therapy (i.e. last recorded measure):

- **H5:** since employed clients are not worse than other categories as regards initial presentation, and attend more therapy sessions, they will receive more benefit from treatment and hence have lower final scores
- **H6:** since those with unplanned endings did not differ in initial CORE 10 score from those with planned endings and attend fewer sessions, they will receive less benefit and have higher final scores

Those who are long-term sick and/or use pharmaceuticals have higher initial scores, but also attend more therapy sessions; thus it is difficult to form hypotheses as to their final scores.

Factor	Category	Mean	Regression coefficient (95% confidence interval)	p-value	
Sex	Male	13.1	0	0.953	
	Female	13.0	-0.10 (-3.35 to 3.15)		
Age	19-24	9.9	-3.02 (-9.90 to 3.85)	0.387	
	25-34	13.3	0.45 (-2.30 to 3.20)	0.748	
	35-44	12.9	0		
	45-54	13.3	0.46 (-2.23 to 3.15)	0.736	
	55+	10.9	-1.97 (-5.49 to 1.55)	0.272	
Employment	Employed	11.0	0	0.058	
	Not seeking work	14.1	3.04 (-0.10 to 6.18)		
	Long-term sick	15.2	4.15 (1.53 to 6.77)		0.002*
	Seeking work	14.9	3.91 (0.63 to 7.19)		0.020*
Accommodation	Partner	12.1	0	0.371	
	Family	10.5	-1.60 (-5.12 to 1.92)		
	Non-family	14.9	2.82 (-3.21 to 8.86)		0.358
	Alone	15.1	3.04 (0.64 to 5.45)		0.013*
	No fixed abode	14.7	2.66 (-2.83 to 8.15)		0.341
	In prison	19.3	7.27 (-2.99 to 17.52)		0.164
Dependants	0	13.2		0.609	
	1	12.4	-0.73 (-3.56 to 2.09)		
	2	13.2	-0.02 (-2.81 to 2.78)		0.991
	3	13.6	0.45 (-2.92 to 3.81)		0.795
	4	12.9	-0.24 (-5.43 to 4.95)		0.927
	5-9	6.8	-6.42 (-15.47 to 2.64)		0.164
Pharmaceutical use	None	12.0	0	0.167	
	Anti-depressant	13.9	1.89 (-0.79 to 4.56)		
	Other	13.5	1.53 (-1.02 to 4.07)		0.239
Planned end	Planned	11.4	0	<0.001*	
	Unplanned	19.7	11.39 (10.33 to 12.46)		

Table 6 Last recorded CORE measures by demographic, for those attending at least one therapy session (excludes follow-up measures)

As Table 6 shows, those who are employed have lower final scores than those who are unemployed, supporting **H5** above. Those who were long-term sick had higher final scores than other employment status groups, despite having more therapy sessions; however, this finding was not repeated among those using pharmaceuticals. Those who have an unplanned exit do have much higher scores according to the last available measure; this supports **H6**.

Further detail can be obtained by considering the change in CORE-10 score between first and last available measures. As shown in Table 7, this analysis shows that employed clients have a larger drop between initial and final scores (albeit significant only by comparison with those not seeking work), further reinforcing **H5**; however,

neither those who are long-term sick nor pharmaceutical users showed significant difference in score change, suggesting that those in these groups do not receive greater benefit despite receiving more therapy sessions (and, since the long-term sick had higher final scores as shown above, underlines the greater need in this group). Unplanned leavers experience less benefit (supporting **H6**), though as noted above they attended many fewer sessions.

Factor	Category	Mean	Regression coefficient (95% confidence interval)	p-value
Sex	Male	-10.8	0	0.178
	Female	-8.6	2.13 (-0.98 to 5.23)	
Age	19-24	-11.0	0.34 (-6.38 to 7.05)	0.921
	25-34	-10.1	1.24 (-1.44 to 3.93)	0.364
	35-44	-11.3	0	
	45-54	-10.9	0.41 (-2.22 to 3.04)	0.757
	55+	-10.4	0.95 (-2.48 to 4.39)	0.585
Employment	Employed	-11.9	0	0.029*
	Not seeking work	-8.5	3.44 (0.36 to 6.53)	
	Long-term sick	-9.9	2.02 (-0.55 to 4.59)	
	Seeking work	-9.2	2.70 (-0.52 to 5.92)	
Accommodation	Partner	-10.6	0	0.400
	Family	-12.1	-1.47 (-4.91 to 1.97)	
	Non-family	-11.6	-0.93 (-6.83 to 4.97)	
	Alone	-10.5	0.12 (-2.23 to 2.47)	
	No fixed abode	-8.5	2.08 (-3.29 to 7.45)	
	In prison	-6.3	4.29 (-5.73 to 14.32)	
Dependants	0	-10.4	0	0.442
	1	-11.5	-1.07 (-3.79 to 1.66)	
	2	-10.9	-0.42 (-3.11 to 2.28)	
	3	-9.7	0.71 (-2.54 to 3.96)	
	4	-9.0	1.43 (-3.57 to 6.44)	
	5-9	-13.8	-3.32 (-12.05 to 5.42)	
Pharmaceutical use	None	-10.2	0	0.618
	Anti-depressant	-10.9	-0.66 (-3.25 to 1.94)	
	Other	-11.1	-0.87 (-3.33 to 1.59)	
Planned end	Planned	-12.1	0	<0.001*
	Unplanned	-4.4	7.64 (5.28 to 10.01)	

Table 7 Change in CORE measures by demographic, for those attending at least one therapy session

Prior treatment

Many personnel in the sample reported having had prior treatment (82% of the 323 who answered this question; as noted in Appendix 1, this factor had high missingness¹⁶). Furthermore, all of those reporting prior treatment rated the usefulness of the treatment they had received, as show in Figure 5. As can be seen, most

¹⁶ I.e. a substantial proportion of the sample (in this case 36%) did not provide a response for this question, making further analysis difficult as any record missing for this data point will be dropped;

respondents selected the most helpful, the average, or the least helpful response, with few selecting any response in between these categories.

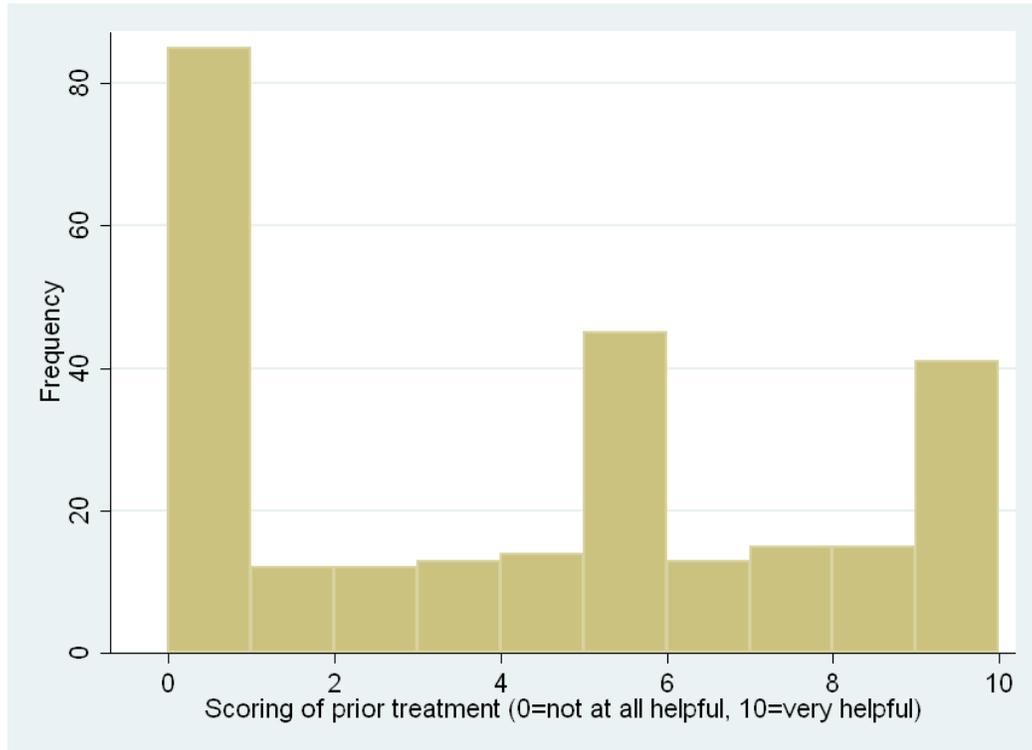


Figure 5 Usefulness of prior treatment

Only 52.2% of the sample had both received prior treatment and endorsed a response to this question, preventing its use in most analyses. However, with this limitation in mind, we analysed this variable separately to determine (a) its effect on engagement with treatment, in terms of, receiving therapy, association with dropout, and number of therapy sessions attended; (b) its association with scores at initial presentation; and (c) its effect on score change. For this analysis we will compare those rating prior treatment as zero (not at all helpful) with all other scores.

(a) Effect of prior treatment on engagement with services

Among those who reported prior treatment, there was no difference between those rating prior treatment as not at all helpful with the remainder in proportions of receiving therapy (χ^2 value 0.0021, p-value 0.963), having a planned ending (χ^2 value 1.33, p-value 0.249), or in number of therapy sessions attended (regression coefficient -0.21, 95% confidence interval -0.93 to 0.52, p-value 0.571). While we cannot say anything about the effect of prior treatment on the decision to contact PTSD Resolution in the first place, this shows that, once contact has been made, prior treatment experiences do not affect engagement with PTSD Resolution services.

(b) Association with initial CORE-10 score

Those reporting poor prior treatment experiences did not report significantly higher initial CORE-10 scores (regression coefficient 0.34, 95% confidence interval -2.04 to 2.71, p-value = 0.780) than those who did not report poor prior treatment. Thus it

appears that those with negative prior experiences were no more symptomatic when they contacted PTSD Resolution.

(c) Effect of prior treatment on score change

Among those who received some treatment, there was no significant difference in CORE-10 score change to last recorded score between those with poor prior experiences and the remainder (regression coefficient 1.76, 95% confidence interval -1.43 to 4.95, p-value 0.276). Although some individuals reported having unhelpful prior treatment experiences, while others did not, this did not impact their response to PTSD Resolution treatment.

Distress

Clients were asked how distressing their problems were for them, on a scale of 0 to 10 of increasing distress (Figure 6). Reports of distress are generally high; 40.3% selected the highest score, and 91% selected one of the highest 4 distress scores.

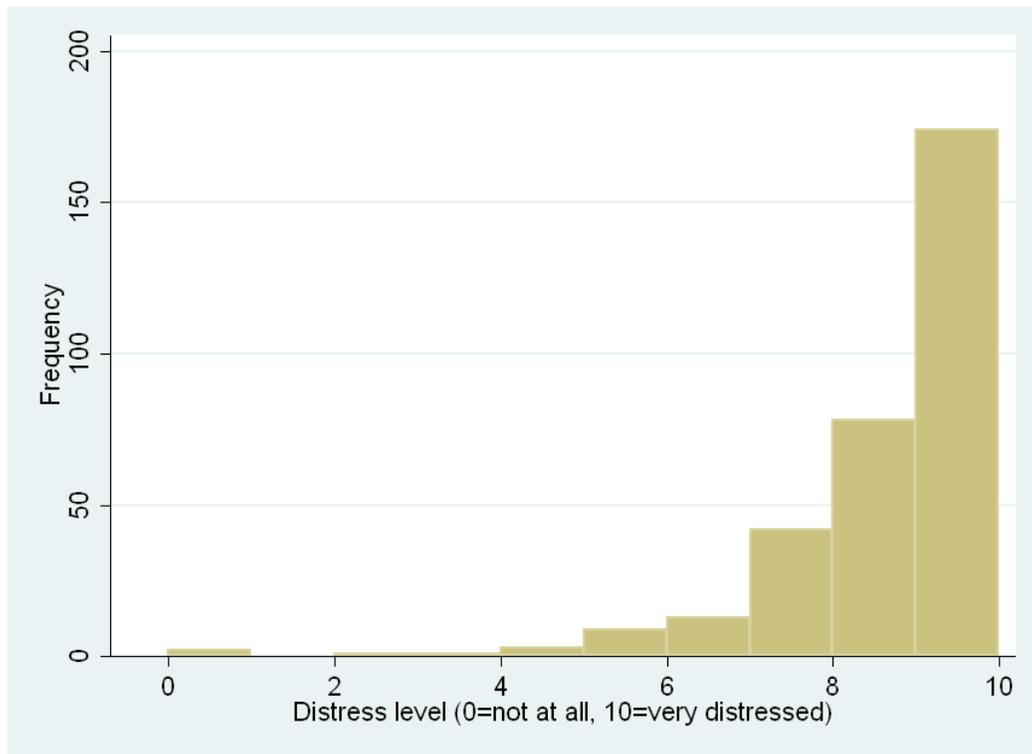


Figure 6 Distress arising from symptoms

The association between distress and the covariates was analysed using Poisson regression (see Appendix 2), by reversing the scores for distress (i.e. converting score 10 to 0, and vice versa); thus an increase in score represents a reduction in distress.

<i>Factor</i>	<i>Category</i>	<i>Mean</i>	<i>Poisson regression coefficient (95% confidence interval)</i>	<i>p-value</i>	
Sex	Male	1.5	0	0.004*	
	Female	0.8	-0.64 (-1.06 to -0.21)		
Age	19-24	1.3	-0.35 (-0.99 to 0.29)	0.284	
	25-34	1.7	-0.05 (-0.28 to 0.18)	0.651	
	35-44	1.8	0		
	45-54	1.3	-0.30 (-0.55 to -0.06)	0.013*	
	55+	1.2	-0.42 (-0.74 to -0.09)	0.012*	
Employment	Employed	1.6	0	0.166	
	Not seeking work	1.9	-0.19 (-0.46 to 0.08)		
	Long-term sick	1.0	-0.87 (-1.18 to -0.56)		<0.001*
	Seeking work	1.7	-0.07 (-0.32 to 0.19)		0.604
Accommodation	Partner	1.7	0	0.846	
	Family	1.6	-0.03 (-0.36 to 0.30)		
	Non-family	1.5	-0.13 (-0.63 to 0.38)		0.618
	Alone	1.1	-0.43 (-0.66 to -0.21)		<0.001*
	No fixed abode	1.5	-0.12 (-0.59 to 0.34)		0.602
	In prison	2.7	0.48 (-0.22 to 1.18)		0.182
Dependants	0	1.3	0	0.135	
	1	1.6	0.19 (-0.06 to 0.44)		
	2	1.7	0.24 (0.02 to 0.47)		0.036*
	3	1.5	0.11 (-0.19 to 0.40)		0.491
	4	1.4	0.07 (-0.42 to 0.57)		0.771
	5-9	1.3	0.01 (-0.98 to 1.00)		0.979
Pharmaceutical use	None	2.0	0	0.006*	
	Anti-depressant	1.4	-0.31 (-0.53 to -0.09)		
	Other	1.1	-0.59 (-0.81 to -0.37)		<0.001*
Planned end	Planned	1.5	0	0.892	
	Unplanned	1.5	-0.01 (-0.20 to 0.17)		

Table 8 Differences in distress rating by demographics

Females were more distressed by their symptoms, as were older clients, the long-term sick, those living alone, and those using pharmaceuticals. Notably though distress did not predict having an unplanned ending.

Those with higher distress score as calculated above (i.e. were less distressed) had lower initial CORE-10 scores (coefficient -0.92, 95% confidence interval -1.49 to 0.35, p-value 0.002), but the relationship with attendance at therapy sessions was borderline (coefficient -0.19, 95% confidence interval -0.39 to 0.01, p-value 0.065), score change to last recorded measure was not significantly different (coefficient -0.21, 95% confidence interval -0.96 to 0.54, p-value 0.580). Although those reporting most distress regarding their symptoms also report more CORE-10 symptoms, this does not appear to affect treatment outcome.

Change in CORE-10 over treatment

Given the findings above, particularly with reference to the consequences of unplanned ending on CORE-10 outcomes, we hypothesised that reduction in CORE-10 score was at least partly explained by length of treatment. We performed a regression analysis, considering the effects of each factor on the overall curve of CORE-10 scores over the treatment period. Note that Table 9 shows the linear part of a quadratic analysis, i.e. the size of the effect at the beginning of therapy; over time, this effect size decreases (see Appendices 2 and 4). Similar findings arise when considering the change in score over time (Table 9). To determine whether the observed change in score is due to the effects of time or the effects of treatment sessions, both factors can be included in the statistical model (Table 9). This analysis determines that it is number of sessions, as opposed to simple remission over time, which is the primary source of the decrease in CORE-10 scores; however, correlation between time and number of sessions is understandably high (correlation coefficient 0.662), limiting how sure we can be of this finding.

Factor	Category	Coefficient (95% CI)	p-value
Sessions alone			
Session ¹⁷		-4.27 (-4.77 to -3.78)	<0.001*
Time alone			
Time ¹⁷	Days	-0.14 (-0.15 to -0.13)	<0.001*
Combined model			
Time ¹⁷	days	-0.01 (-0.03 to 0.01)	0.332
Sessions ¹⁷	number	-4.07 (-4.68 to -3.46)	<0.001*

Table 9 Change in CORE-10 scores over session number (excludes follow-up)

The association between demographic factors and treatment progress (expressed as size of change in CORE score) can be examined by performing regression analyses, including analysis of the effect of sessions over time on treatment progress (Table 10). Treatment appeared to be more effective for youngest clients, and less effective for the long-term sick, those on pharmaceuticals, and those with unplanned endings.

¹⁷ Quadratic terms not shown (see Appendix 4 for an explanation), but in all cases were significant whenever the linear term was, and vice versa

Factor	Category	Regression coefficient (95% confidence interval)	p-value
Sex	Male	0	
	Female	-0.77 (-3.02 to 1.47)	0.499
Age	19-24	-4.92 (-9.16 to -0.67)	0.023*
	25-34	0.43 (-1.42 to 2.29)	0.646
	35-44	0	
	45-54	1.20 (-0.62 to 3.01)	0.197
	55+	-1.30 (-3.70 to 1.09)	0.285
Employment	Employed	0	
	Not seeking work	1.51 (-0.63 to 3.65)	0.167
	Long-term sick	4.70 (-2.96 to 6.43)	<0.001*
	Seeking work	2.12 (-0.07 to 4.31)	0.058
Accommodation	Partner	0	
	Family	-0.24 (-2.59 to 2.11)	0.842
	Non-family	2.01 (-2.35 to 6.37)	0.367
	Alone	3.04 (1.40 to 4.68)	<0.001*
	No fixed abode	0.92 (-2.83 to 4.66)	0.631
	In prison	5.95 (-1.72 to 13.63)	0.129
Dependents	0	0	
	1	0.13 (-1.80 to 2.06)	0.892
	2	0.14 (-1.75 to 2.04)	0.884
	3	0.21 (-2.13 to 2.54)	0.863
	4	-1.63 (-5.17 to 1.91)	0.367
	5-9	-8.20 (-14.81 to 1.59)	0.015*
Pharmaceutical use	None	0	
	Anti-depressant	2.33 (0.48 to 4.17)	0.014*
	Other	2.60 (0.88 to 4.32)	0.003*
Planned end	Planned	0	
	Unplanned	1.92 (0.18 to 3.67)	0.032*

Table 10 Demographic effects on change in CORE-10 score over sessions

Additional analyses revealed that the independent factors which were found to consistently affect outcome trajectory are employment (specifically the effect of being long-term sick) and having an unplanned ending.

Section 3: Findings and Recommendations

Findings

PTSD Resolution clients were broadly representative of veterans in terms of sex and ethnic origin allowing for the time elapsed since leaving service. A modest minority (45%) of clients were in employment; this figure is much lower than UK veterans in general, and somewhat lower than the IAPT population (given as 54% in the one-year IAPT report (Glover, Webb et al. 2010). Furthermore, nearly a quarter (23.7%) were unemployed due to long-term sickness and additionally, nearly two-thirds of the client group were on some form of medication. A large proportion were single (39.3%), and a much smaller proportion were married (37.2%); once again this figure is substantially lower than general veteran population (where 64% are married).

At the time of initial presentation to PTSD Resolution, most clients reported high levels of distress regarding their symptoms; this was particularly true for females, the long-term sick, those living alone, and those on medication. Whilst distress was correlated with higher CORE-10 scores at initial presentation; it did not otherwise affect treatment progression (i.e. use of services and outcomes).

We identified that more than half of the sample had received some form of prior treatment; most of those who did rated their previous treatment experiences as very poor. We did not find however, that receipt of previous treatment (regardless of how such treatment was rated) influenced the effect of treatment with PTSD Resolution.

Clients most frequently attended six sessions (21.8% of all clients attended exactly six), which falls in line with PTSD Resolution's target; however a small proportion (16.9%) attended more than this which appears to reflect the flexible approach of the HGT therapists that PTSD Resolution uses. Even among those with unplanned endings, a substantial proportion (42.1%) attended more than one session (and 4.5% attended six or more).

We found that PTSD Resolution clients had similar rates of recovery and reliable improvement of symptoms (42.2%) as IAPT patients (40.3%) (Gyani, Shafran et al. 2013). These data are similar to those found in a prior pilot study (54.6%) (Andrews, Twigg et al. 2011) and its five-year repetition (50.6%) (Andrews, Wislocki et al. 2013). Statistical modelling of the changes in CORE-10 score, considering both time and number of treatment sessions, demonstrated that improvement as therapy sessions progress was independent of (and indeed may explain) improvement over time, implying that the benefits of treatment are not merely natural remission from acute symptoms; however an important caveat is that the high correlation between time and number of sessions restricts the certainty of this finding. Furthermore, because of the limited data available to us, it was not possible to determine if there may have been other causes of the identified improvement such as changes in social or occupational status or other treatment services being accessed.

Whilst clients who had unplanned endings were less likely to experience improvement, there were no clear identifying factors for unplanned endings. We did not, for instance, find that unplanned leavers had either fewer or more symptoms at presentation which might have suggested attrition as participants either did not have a

need for treatment or that their high symptomatology was in itself a barrier to treatment. We did find that clients who were seeking employment attended fewer sessions. These findings could indicate a shortage of resources for such clients, such limited finances or limited time in which to access care, or that as job seekers they were more focused on seeking employment than attending treatment sessions. Whatever the reason, job-seekers did not receive as much benefit from therapy as other employment groups. We also found that people who were living alone were less likely to benefit from therapy; this suggests that social support provided by, for example, spouses and partners is associated with better prognosis in treatment, and/or that close social contacts encourage engagement in therapy and are protective of mental health (Hatch, Harvey et al. 2013). It may be that whilst there is little that PTSD Resolution can do to affect this factor, other charitable treatment and care provision agencies may be able to assist with this by either providing access to social support or providing housing opportunities if they are required which may facilitate more successful treatment, although this would need to be assessed in a further evaluation.

Employed clients were more likely to receive therapy although this did not appear to be because of a poorer mental health state, as determined by CORE-10 scores, at initial presentation. Instead this could be reflective of higher motivation or greater resources for this group. As they ended therapy with lower CORE-10 scores, it would appear that the higher number of sessions for this group may at least be a partial explanation of their better outcomes.

Clients on medication attended more sessions, and had higher CORE-10 scores at initial presentation suggesting greater need in this group. This group, and the long-term sick, nonetheless showed less overall benefit from treatment.

Administrative recommendations

- PTSD Resolution would benefit from using the mental health measures routinely used by IAPT services, and in various academic studies, such as the PHQ-9 (Kroenke, Spitzer et al. 2001), GAD (Spitzer, Kroenke et al. 2006), and WSAS (Mundt, Marks et al. 2002). If PTSD Resolution wish to continue to specialise in trauma-related cases, they should also consider using a PTSD-specific measure such as the widely used PCL-C (Blanchard, Jones-Alexander et al. 1996) or the new PCL-5 (Weathers, Litz et al. 2013). It might also be worthwhile including a measure of alcohol usage, given the prevalence of alcohol misuse in serving and veteran populations, such as the World Health Organization's AUDIT measure (Babor, Higgins-Biddle et al. 2001) or the shorter 3 item AUDIT-C (Bush, Kivlahan et al. 1998). If new measures are collected alongside CORE-10, this would raise the possibility of comparison and validation of CORE-10 against those measures.
- PTSD Resolution should consider utilising a missing data identifier, rather than 0, when recording data, in order to distinguish missing data points from true zeroes (e.g. code fields as -9 by default, a number which is unlikely to come up in any other context, until data is entered into them).
- PTSD Resolution should be consistent in the way they record demographic factors in in particular the marital/relationship status of clients. This is an

important factor in mental health in itself, and also because of its interactions with other demographic factors.

- While there is not yet reason to believe that PTSD Resolution services are missing minority ethnic patients (see Appendix 1), providers should maintain surveillance of this issue to ensure this proportion rises over time as would be expected.
- The scale investigating usefulness of prior treatment could be reduced to only three options, as few choose any other than maximum, minimum or average options (or alternatively, given the lack of effect of prior treatment experience, remove this question entirely).
- While the questionnaire enquires about prior treatment, it does not clarify whether clients are also currently accessing other treatment. Given that many clients are currently taking medication for mental health difficulties, it is likely that many were also receiving other treatment elsewhere; this should be clarified so that it can be taken into account during analysis.
- Given that one of the stated aims of the PTSD approach is to avoid stigma and barriers to care, it could be valuable to include a stigma scale among standard measures, e.g. adapting the methodology originally used by Britt and since used, with appropriate variations, internationally (Hoge, Castro et al. 2004).
- The website for PTSD Resolution currently advertises that 78% of clients have symptoms at sub-clinical levels after treatment. This seems to be based on older data; the website states that among 157 service users who completed the programme 78% had symptoms reduced to below clinical level, and references a conference abstract which does not seem to be available. By contrast, a peer-reviewed paper for the pilot study showed 54.6% reliable recovery rates by CORE-10 measures (Andrews, Twigg et al. 2011) and a five-year repeat study showed 50.6% reliable recovery (Andrews, Wislocki et al. 2013), similar to the findings of this report (and comparable to NHS IAPT outcomes). Extraordinary claims require extraordinary proof, or risk inviting cynicism; in the absence of strong evidence of a 78% recovery rate, PTSD Resolution should consider reporting a more rigorous and proven success rate (such as those found in this report, and/or the prior studies (Andrews, Twigg et al. 2011; Andrews, Wislocki et al. 2013)).

Recommendations for further study

Other than future analyses using some of the measures recommended above, one possibility for future study could be the effect of employment on treatment outcomes (and vice versa). PTSD Resolution already provide Trauma Awareness Training to employers; it could be worthwhile to investigate the possibility of additional gains by providing employment support to those veterans not in work, either in-house or in collaboration with a veteran employment charity. Such a project could easily be performed as a randomized controlled trial by randomly assigning new unemployed clients to an employment-support strand.

Attrition is a problem for any outpatient therapy, and this analysis did not identify any factors which strongly identified those at risk of dropping out (other than unemployment). Further research into reasons for attrition, possibly by approaching those who left to qualitatively evaluate their reasons for dropout, could be valuable.

Another factor affecting treatment is medication usage. This is a potential confounder for any talking therapy, as it may indicate that the individual is also receiving care from a separate source; it is difficult to evaluate the independent effect of PTSD Resolution-provided therapy without taking into account the effects of this external treatment. If the suggestion above for recording parallel treatment is taken on, an analysis of the effects of combined therapy could be performed.

Finally, we suggest that the HGT provided by PTSD Resolution therapists should be tested in a randomised controlled trial. Whilst it is likely to be unethical to withhold treatment from a patient in need, HGT could be compared a more conventional therapy such as CBT (cognitive behavioural therapy). As a control group comparison is not possible, the next best option might be comparison study with other data sources to determine differences in effectiveness, demographic makeup of clientele, and the differing effects of demographic factors between samples; the intention need not be to discover a single “best performing” provider, but to identify which individuals may benefit the most from the different approaches of treatment providers. Comparisons could be made with either general population NHS data (i.e. IAPT data, which identifies veterans among their users) or that of other charitable providers of therapeutic input for veterans (e.g. Combat Stress).

Summary

Key findings

- The PTSD Resolution client group appears demographically representative of the UK veteran population. However, PTSD Resolution client were more likely to be unmarried and unemployed compared to IAPT users.
- At initial presentation, clients reported being highly distressed by their symptoms, although this did not affect treatment use or outcomes.
- The long-term sick, those taking medication, and those living alone appeared to receive less benefit (as measured by CORE-10 score) from HGT therapy
- No factors were identified which reliably predicted attrition.
- Clients show comparable rates of recovery and reliable improvement to IAPT services.
- The effect of treatment appears independent of the effect of time, suggesting a specific therapeutic effect. However, time and sessions are highly correlated making interpretation of these data difficult. Furthermore, it was not possible to ascertain if other factors, such as changes in social or occupational roles or concomitant other treatment, may explain this finding.

Key limitations

- Without a control group or any other group for comparison, we cannot be confident of the effect of therapy
- Use of a measure which is not widely used in epidemiology, and not used by IAPT, limits comparisons to other treatments and services
- Missing data for some factors, e.g. distress and prior treatment, limit the usefulness of these variables in analysis
- Ambiguous use of zero (where it may also indicate missing data) similarly restricts the conclusions which can be drawn from some variables

- Lack of questioning regarding other current treatment makes it difficult to analyse the effects of long-term sickness and medication
- Sparse follow-up data prevents any analysis as to whether improvements are sustained; this is also an important limitation of IAPT services, of course.

Appendix 1: Defining the dataset

Data inclusions and exclusions

This report utilises the data provided from PTSD Resolution records, comprising the data on personnel to the end of February 2016. Data was routinely collected by the PTSD Resolution Practice Research Network, and provided in an anonymised form to King’s College London for service evaluation. Although PTSD Resolution also included data on open cases (i.e. comprising clients still undergoing therapy at the time of submission), only closed cases were analysed in this report, as open cases do not yet have a full set of measures, nor a planned/ unplanned ending which is essential to analysis.

517 closed cases were provided. Certain exclusions were made (Figure 7), after which the analysed data set comprised 504 records.

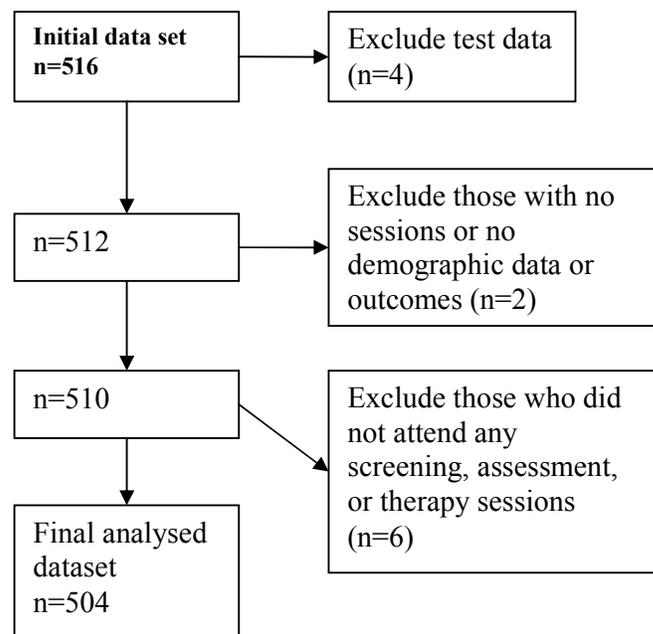


Figure 7 Flowchart of record exclusion

It should additionally be noted that, in any analysis involving CORE-10 measures, only individuals who had attended at least one session of therapy were included. Additionally, one other individual was excluded from these analyses as this individual had many measures, but a gap of around a year partway through, interrupting the pattern of therapy and measurement.

Preparation of covariate data

Simple covariates were generated directly from provided data, without further checking or manipulation (e.g. sex data). Special cases, and variables which involved further categorisation, are as follows:

Ethnicity

88.3% of PTSD Resolution clients declared being “White British” (in line with the IAPT population), but another 2% were “White Irish”, 1.2% “Other White”, and 7.1% “Not stated” (which excludes 93 individuals missing for this variable), leaving only 6 individuals (1.5%) of defined black or minority ethnicity. This number is too small for analysis, and hence this factor is not considered in subsequent analyses. By comparison, 7% of the UK Regular Forces are black, Asian and minority ethnic (Ministry of Defence 2015); however, this proportion would have been lower at the time when many of these service users left service (e.g. ethnic minorities made up 1.7% of the UK Regular Forces in 2001)(Ministry of Defence 2001), and only 1% of the veteran population are of a non-white ethnic group to 2014 (Ministry of Defence 2016), so the low percentage of ethnic minorities served by PTSD Resolution may merely be representative of the population at risk.

Length of service

Year of service was determined from text answers. Where it was possible to determine, year of leaving the regular forces was utilised; subsequent reserve service was discounted for consistency between records. Those who were not ex-Armed Forces personnel – including partners of AF personnel, former police officers, and those who had not yet left service – were coded as missing.

From year of leaving, length of service was calculated as the difference between this and the data of referral. 217 (42.6%) individuals were missing for this factor, and hence it is only used in a restricted fashion in this analysis.

Planned/unplanned ending

Planned ending data was provided, but did not match up with records of having, and attending, a completion session. Planned ending data provided was used, due to the possibility that individuals could reach a planned ending outside of booked and attended sessions (or that sessions recorded as therapy included an agreed ending). There was no missing data in this category.

Employment status

The employment status largely followed the data provided. The exception was that “homemaker”, “retired”, “student” and “voluntary work” were combined into the existing “not seeking work” category. In addition, those who were in prison (see Accommodation below) were categorised as not seeking work. There were 54 (10.6%) missing records for this variable.

Pharmaceutical usage

Due to small numbers, those taking anti-psychotics, anxiolytics, hypnotics, and mood stabilisers were recoded as “other” and added to the existing records which were categorised by PTSD Resolution as “other”, leaving three final categories (“anti-depressants”, “other” and “none”). There were 45 (8.8%) missing data for this factor.

Number of dependents

Due to low numbers, those with more than 5 dependents (the highest in the data set being 9) were combined into a single “5+” category. This variable has no missing

data, but it is likely that some of those coded as zero are, in fact, missing; the lack of a code for missing data makes it impossible to determine this or discriminate. Since we cannot determine this, data is taken at its face value i.e. it is assumed that all zero records are genuine.

Accommodation

Two fields were present in the dataset provided: one is a multiple-choice field, the other a text field. The multiple-choice field had the following choices for living arrangements:

- Partner and children
- Partner without children
- Family, without partner
- With non-family
- Alone
- No fixed abode

Responses in the text field were recategorised into the following possible responses:

- Living alone
- Living with a partner
- Living in shared accommodation
- Living with parents/guardians/other family members
- Living with a child/children
- Living with a friend
- Homeless, or living in a hostel or charitable housing
- Held at Her Majesty's pleasure

These two accommodation fields do not always concur. To generate a final variable, the multiple-choice responses were taken, combining those living with or without children into a single response. Text responses were used only to fill missing data in this variable, with the exception of those in prison where the text data was used to form a new category. The resulting variable had n=23 (4.5%) missing data.

Relationship status

Data provided had the following possible responses for relationship status:

- Married
- Cohabiting
- In a committed relationship
- In a casual relationship
- Single

“Cohabiting” and “in a committed relationship” were combined for analysis (the difference is accounted for by the accommodation variable). “In a casual relationship” and “single” were combined due to small numbers of the former. The resulting variable had n=186 (36.5%) missing data, which limited its use in the analysis.

Prior treatment

Clients were asked if they had sought help for their problems before, and if so, how helpful they found such help. 36.0% did not answer either question, limiting the value of this factor. 4 individuals claimed to not have sought prior therapy, but nonetheless provided a rating for its usefulness; in these cases the claim to not have sought prior therapy was given priority, and the rating for therapy ignored.

Distress

Clients were asked to indicate how distressing their problems were, on a 0-10 scale from not at all to very distressing. 36.0% did not provide a response, limiting the value of this factor. For those that did, no data cleaning or manipulation was performed, except that due to the distribution this factor (which skewed heavily toward the high scores) it was methodologically more appropriate to invert the scale (i.e. so that scores of 10 became 0, scores of 0 became 10, and so forth).

Missing data for other categories

31 (6.2%) individuals were missing data for age, and 12 (2.4%) for sex. These numbers were relatively small and did not affect the usage of these factors in the analysis.

CORE-10 measures

CORE-10 responses, for all questions, are included with data and session type. CORE-10 measures for each available session (of which there were up to 9 measures taken for each individual) were produced by summing individual item scores; in addition, each session measure was checked for missingness of individual item scores. There was only one case in which an item was missed from the measure, and only a single item was missed in this case; thus, following standard procedure, as only 10% of the information was missing the value was imputed by standardisation (i.e. dividing the 9-item score by 9, and multiplying by 10 to extrapolate the 10-item score).

Initial scores were taken as the first CORE-10 measure received, irrespective of session type; 37.0% did not have even an initial CORE-10 score, but half of these did not receive even a single therapy session, so would not have been included in the analysis of CORE-10 changes anyway. Final CORE-10 score was taken as being the last available measure which was not for a follow-up session (see Appendix 3 for more detail on the treatment of CORE-10 measures taken at follow-up). Additional analyses were performed looking at the curve of CORE-10 scores across sessions; see Appendices 2 and 3 for further details.

Some respondents in the sample did not have their scores recorded for individual items in the CORE-10 measure, but nonetheless have a separately recorded field for CORE-10 measure at T1. Investigation of these found that in all but 18 cases these measures were identical with the first recorded CORE-10 measure. In the exceptional 18 individuals, the CORE-10 T1 measure did not match with any of the individually-recorded CORE-10 measures; however, an unpaired two-tailed t-test showed no significant difference between these scores ($t = 0.682$, $p = 0.495$), so there is no reason to believe that the analysis presented in this report is affected by not using the CORE-10 T1 measures.

Appendix 2: Statistical methods

Analyses were performed using the statistical package Stata version 11.2 (StataCorp 2009). Basic comparisons of proportions between categories of demographic variable were performed using χ^2 tests; this test compares the proportions of a given outcome between the categories, resulting a χ^2 statistic, from which a p-value can be derived representing the probability of any observed difference between outcomes to be due to chance. For example, a p-value of 1 means that any observed differences are 100% due to chance; a p-value of 0.05 represents a 5% probability that observed differences are due to chance. This latter value is the generally-accepted cut-off for statistical significance in epidemiological analyses, and thus any analysis producing a p-value of 0.05 or lower is taken as being statistically significant and marked “*” in tables. Where statistical significance is found in a factor with two categories, this indicates that the category with the highest proportion is significantly higher than the other. However, where there are multiple categories, this is not necessarily the case; the highest proportion is not necessarily significantly higher than any other, it is merely that the overall variation within the variable is significant.

Score-based analyses primarily utilise linear regression. For any given session, CORE-10 scores are approximately normally distributed, justifying this approach. In these cases, when comparing differences between categories within a factor, one category is selected as the baseline (usually the most populous category); the regression coefficient for other categories within the factor is the average difference in score compared with this baseline (and the 95% confidence intervals given indicated the probable range of the true value, as opposed to the experimentally-determined value found in this particular sample). Unlike χ^2 tests, comparisons are done individually, so a difference in regression analysis which has a p-value less than 0.05 is statistically significantly different from the baseline. For numerical, rather than categorical categories (e.g. number of therapy sessions), the regression coefficient represents the average change per unit (e.g. effect of each session), and the p-value indicates whether the overall trend is significant. Some analyses utilise Poisson, rather than linear, regression, as the distribution of outcome values does not approximate a normal distribution but rather a Poisson distribution (i.e. having the highest value at zero, with decreasing frequency of each subsequent outcome, such that the mean outcome approximates the variance). The outcome data from Poisson regressions can be interpreted similarly to linear regression.

Change in CORE-10 scores over time or session number utilises random-effects regression (via the Stata *xtreg* command). This methodology takes into account individual differences in starting values and changes over time, discriminating “within-group” effects (differences which explain change within an individual’s scores) and “between-group” effects (differences between individuals), allowing us to determine which factors affect the trajectory of CORE-10 score taking into account individual differences. Note that change in score over both time and sessions followed a curve, and hence analysed using both a “linear term” (whereby scores decrease linearly with increasing time/sessions) and a “quadratic term” (which increases exponentially over time/sessions, until the downward trajectory flattens out and potentially curves back up again); see Appendix 4 for more details.

Appendix 3: Follow-up measures

PTSD Resolution also delivers post-therapy follow-up sessions. Figure 8 shows the distribution of the number of follow-up sessions attended by clients. Of 381 attending at least one therapy session, only 7.6% have any follow-up sessions. Of the 29 who do, 24 have a single follow-up (the remainder having 3-6). The one person with 10 follow-up sessions did not receive any therapy sessions; they have an assessment followed by 10 follow-ups. Given the small proportion of individuals receiving follow-up sessions, it is not possible to analyse follow-up data with any confidence; hence this study will not discuss follow-up outcomes.

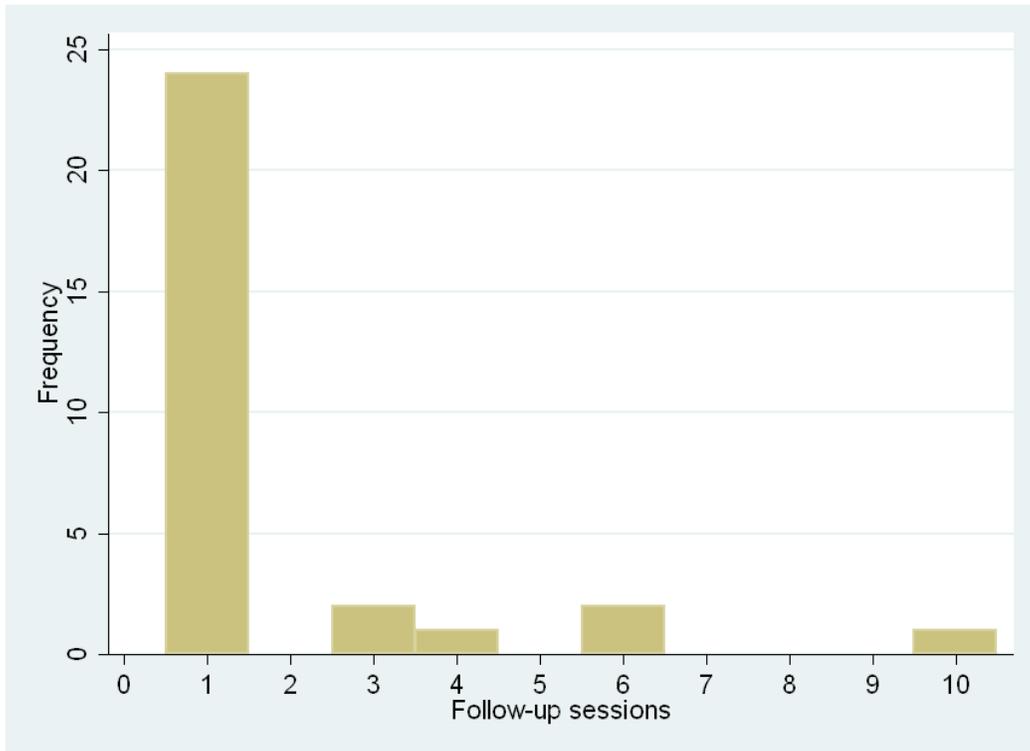


Figure 8 Distribution of follow-up sessions (excluding zero)

Appendix 4: Justifying the quadratic model

Linear regression assumes a linear change of the outcome as the prospective causative factor increases. If the change is not linear, then some method must be used to take this into account; for example, if the change in outcome follows a curve, and exponential value is introduced into the mathematical model to take into account this curve. The analyses in this document include change in score over both time and session number; the shape of the trend must be considered and corrective factors introduced as appropriate.

By session

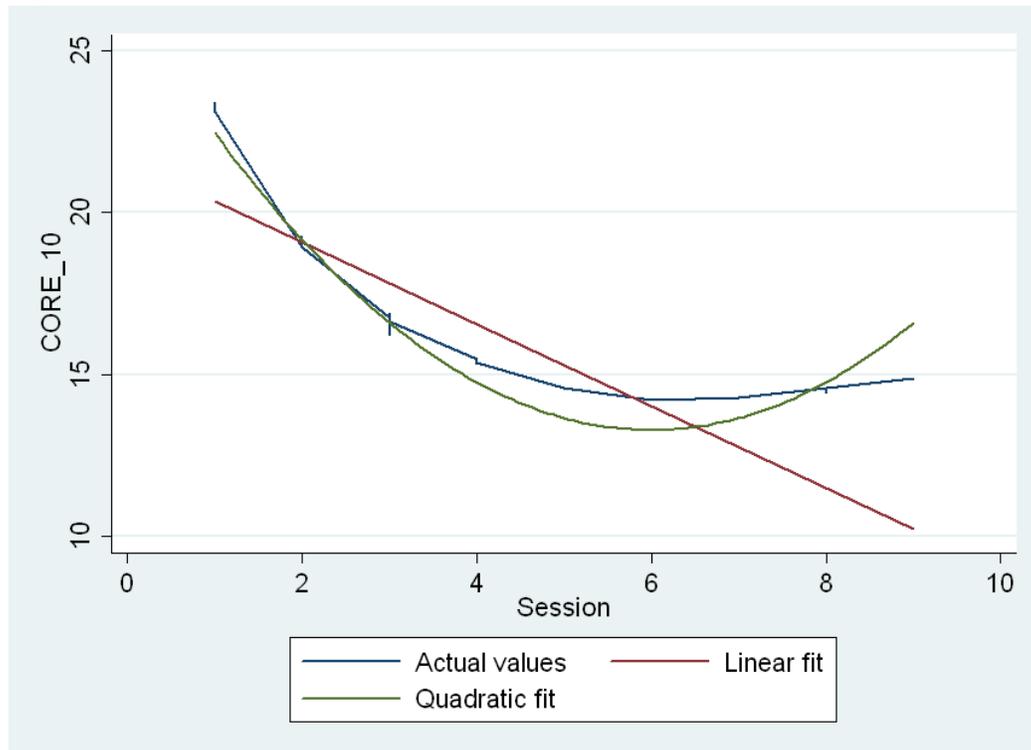


Figure 9 CORE score by number of sessions, with model fit lines (planned ending)

As Figure 9 shows, for those with a planned ending, the observed values (blue line) are more similar to the quadratic model (green line) than standard linear regression (red line). Thus a quadratic model is more appropriate. The same is observed among those with unplanned endings (Figure 10).

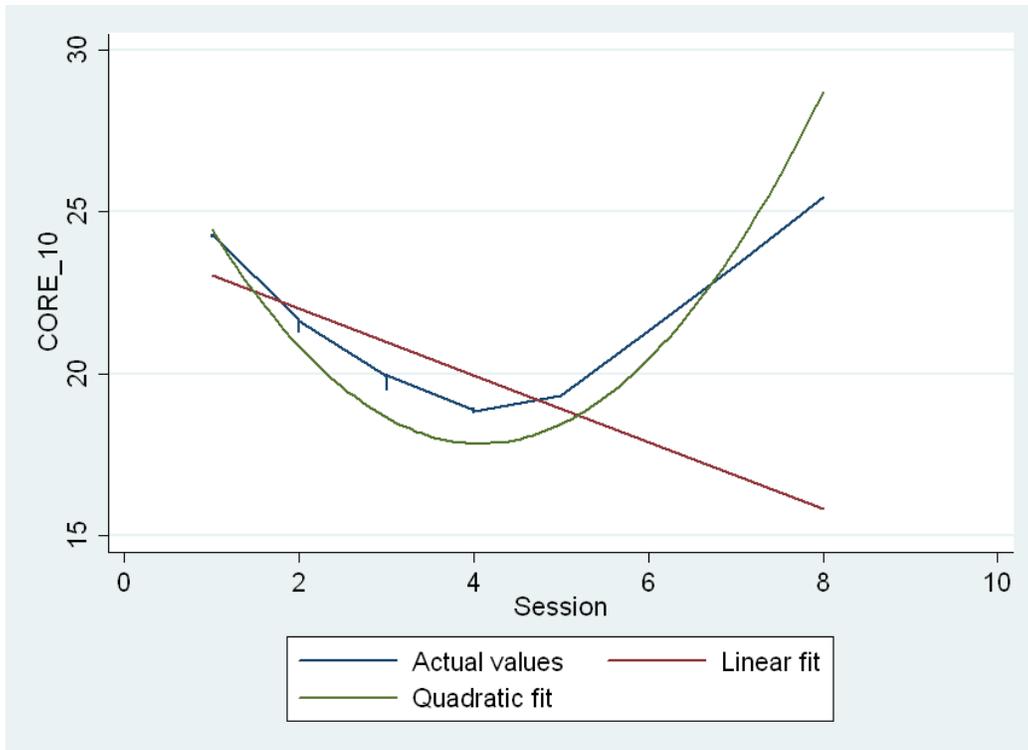


Figure 10 CORE score by number of sessions, with model fit lines (unplanned ending)

By time

The same procedure was performed to check the change in score over time. While the fit was less clear-cut as regards those with planned endings (Figure 11), the quadratic model is still a better fit for both planned and unplanned endings (Figure 12).

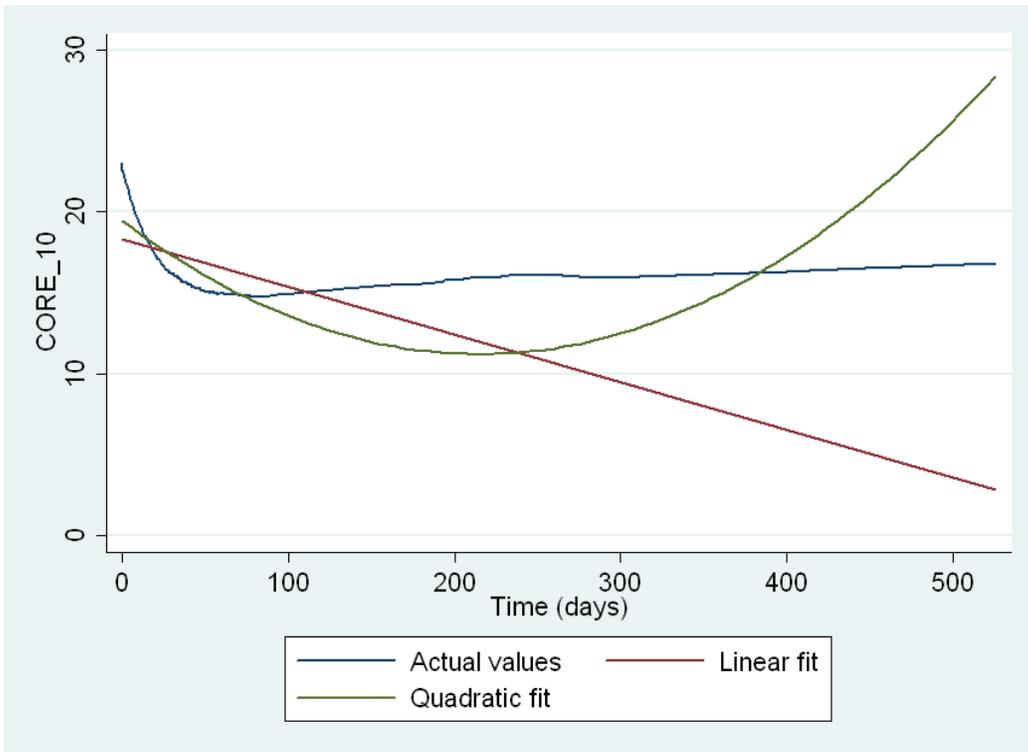


Figure 11 CORE score by time, with model fit lines (planned ending)

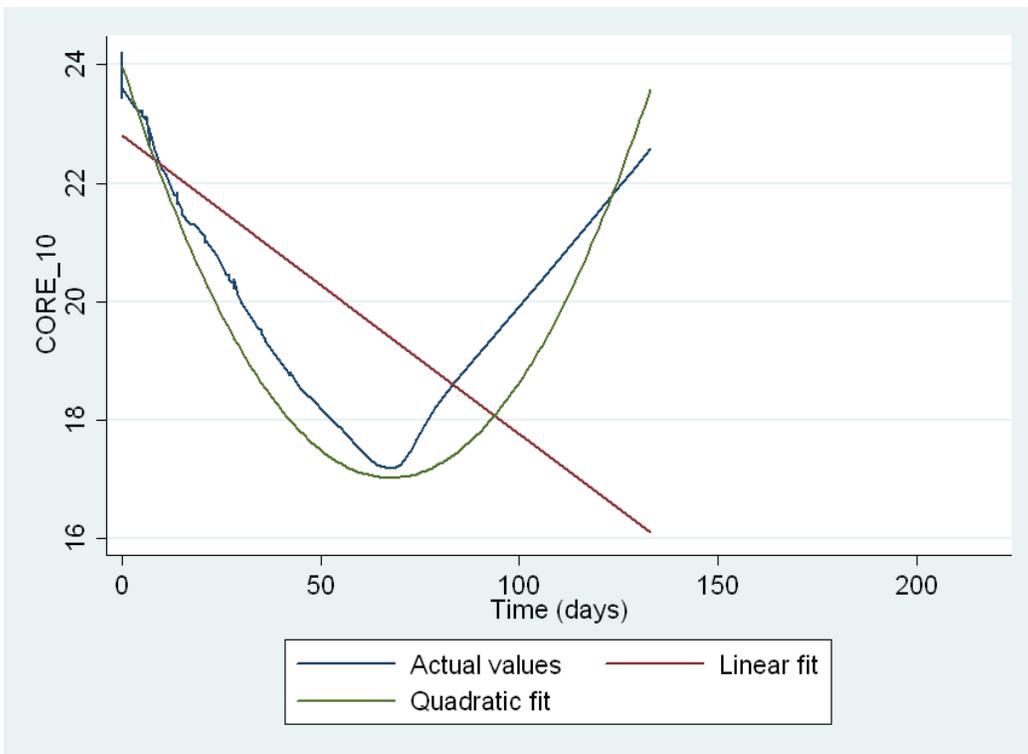


Figure 12 CORE score by time, with model fit lines (unplanned ending)

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