
Article:
Sweetman, Jennifer orcid.org/0000-0003-1969-4586, Knapp, Peter orcid.org/0000-0001-5904-8699, McMillan, Dean orcid.org/0000-0002-2901-8410 et al. (3 more authors) (2022) Risk factors for initial appointment non-attendance at Improving Access to Psychological Therapy (IAPT) services : A retrospective analysis. Psychotherapy research. ISSN 1468-4381

https://doi.org/10.1080/10503307.2022.2140616

Psychotherapy Research

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/tpsr20

Risk factors for initial appointment non-attendance at Improving Access to Psychological Therapy (IAPT) services: A retrospective analysis

Jennifer Sweetman, Peter Knapp, Dean McMillan, Caroline Fairhurst, Jaime Delgadillo & Catherine Hewitt

To cite this article: Jennifer Sweetman, Peter Knapp, Dean McMillan, Caroline Fairhurst, Jaime Delgadillo & Catherine Hewitt (2022): Risk factors for initial appointment non-attendance at Improving Access to Psychological Therapy (IAPT) services: A retrospective analysis, Psychotherapy Research, DOI: 10.1080/10503307.2022.2140616

To link to this article: https://doi.org/10.1080/10503307.2022.2140616

Psychotherapy Research, 2022
https://doi.org/10.1080/10503307.2022.2140616

EMPIRICAL PAPER

Risk factors for initial appointment non-attendance at Improving Access to Psychological Therapy (IAPT) services: A retrospective analysis

JENNIFER SWEETMAN [1], PETER KNAPP [2], DEAN MCMILLAN [2], CAROLINE FAIRHURST[1,3], JAIME DELGADILLO [4,5], & CATHERINE HEWITT[1,3]

[1]*Department of Health Sciences, University of York, York, UK;* [2]*Hull York Medical School and Department of Health Sciences, University of York, York, UK;* [3]*York Trials Unit, University of York, York, UK;* [4]*Clinical and Applied Psychology Unit, Department of Psychology, University of Sheffield, Sheffield, UK &* [5]*Rotherham Doncaster and South Humber NHS Foundation Trust, Doncaster, UK*

(Received 15 May 2022; revised 6 October 2022; accepted 20 October 2022)

Abstract

Background Approximately 1.5 million referrals are made to Improving Access to Psychological Therapy (IAPT) services annually. However, treatment is received in less than half of cases due to ineligibility or non-attendance. The aim was to explore risk factors for non-attendance at the initial two IAPT appointments following referral.

Methods An exploratory, retrospective analysis of referral and attendance data from five IAPT services in the North of England. Participants were 97,020 referrals received 2010–2014. Main outcome was attendance at the first two offered appointments (assessment and initial treatment).

Results Based on data from two services, 66% of referrals resulted in assessment attendance. Across all five services 57% of patients who attended for assessment subsequently attended the first treatment appointment. The odds of attending an assessment appointment were more than 3 times higher for self-referrals than for GP referrals (OR 3.46, 95% CI 3.27–3.66, $p < 0.001$). Factors important to treatment appointment attendance following assessment were the service, referral source, presenting problem, and anxiety severity.

Conclusion Initial appointment non-attendance is a consistent problem for IAPT services. Specific factors that may support IAPT services to improve non-attendance rates are identified. IAPT indicators of success should take account of non-attendance at initial appointments.

Keywords: brief psychotherapy; depression; anxiety; mental health services research; outcome research

Clinical or methodological significance of this article: Referral data from a sample of UK IAPT services over 2010–2014 show that one third of people did not attend an assessment appointment and nearly half did not attend their initial treatment appointment. Assessment appointment non-attendance was associated with the referral route, while non-attendance at first treatment appointment was linked to several factors including referral route, the presenting problem and symptom severity. Non-attendance at IAPT assessment and treatment appointments is a consistent, important problem that results in many symptomatic patients not accessing treatment, and which needs to be addressed.

Introduction

In England, primary care mental health services are delivered by Improving Access to Psychological Therapy (IAPT) services which offer talking therapies for common mental health problems. Patients can self-refer or be referred by their General

Correspondence concerning this article should be addressed to Jennifer Sweetman, Department of Health Sciences, University of York, York YO10 5DD, UK. Email: Jennifer.sweetman@york.ac.uk

Practitioner (GP) or another healthcare professional, and IAPT services are provided to patients free of charge, through the National Health Service (NHS). It comprises an initial assessment appointment (usually undertaken by phone) to determine whether IAPT treatment is suitable, followed by a course of treatment appointments, usually around seven sessions according to national data (NHS Digital, 2021). IAPT services report treatment outcomes on a session-by-session basis (Clark et al., 2018) and have been shown to provide effective, evidence-based support for people with common mental health problems (Wakefield et al., 2021). Although the treatments offered by IAPT services such as guided self-help and cognitive behavioural therapy, are often beneficial (Barlow et al., 2000; Cuijpers et al., 2010, 2020; Norton & Price, 2007; Vernmark et al., 2010), and the service delivery of these is considered effective (Wakefield et al., 2021), non-attendance at early IAPT appointments is a significant problem.

In 2014, 62% of patients referred to IAPT services across England discontinued involvement prior to their first treatment appointment (Delgadillo et al., 2016). The latest annual report for IAPT services show that during the 2020/2021 12-month period, 1.46 million referrals were received by IAPT services in England, from which only 634,649 (43%) individuals attended both an assessment and an initial treatment appointment (NHS Digital, 2021): an attrition rate of 57%. Similar figures have been reported in recent IAPT annual reports (NHS Digital, 2018, 2019, 2020). A portion of these people will have been assessed and signposted elsewhere for more appropriate support (National Collaborating Centre for Mental Health, 2018); however, this level of attrition raises concerns about appropriateness of referrals, wasted service resource and unmet patient need. Key performance indicators for IAPT services focus on service delivery and treatment outcomes; however, non-attendance rates for initial appointments are not addressed.

There is a need to understand the factors associated with patient attrition from IAPT. Factors contributing to attrition may vary and there is evidence that different factors may be influential during the early and later stages of a course of treatment (Barrett et al., 2008). Previous research has already highlighted the length of time between referral, assessment appointment and first treatment appointment as important to IAPT appointment attendance (Clark et al., 2018; Davis et al., 2020) and appointment attendance at similar services offering psychological support to people with common mental health problems (Sweetman et al., 2021). To complement this previous work, we considered other factors which have been reported to be influential in mental health appointment attendance, within the context of IAPT referral data. We focussed on non-attendance at the initial two contacts with IAPT services: an assessment appointment, and the first treatment session offered.

Aims

(1) To ascertain which characteristics increase the risk of non-attendance at an assessment appointment in five IAPT services in the north of England.
(2) To ascertain which characteristics increase the risk of non-attendance at a first treatment appointment in five IAPT services in the north of England, among patients who had attended the assessment appointment.

Methods

Design and Data Sources

This was a retrospective analysis of routinely collected clinical data from psychological services. Data from five IAPT services located in the north of England were obtained through the Northern IAPT Practice Research Network, a multi-service collaboration between IAPT services and academic partners (Lucock et al., 2017). The dataset included individual patient data representing 97,020 referrals made between January 2010 and December 2014.

Measures

Variables included those routinely collected by the services to comply with national data reporting standards: method of referral, IAPT service, gender, age, and ethnicity. Each patient's home postcode was linked to the English Index of Multiple Deprivation (IMD) (Smith et al., 2015). The IMD is a measure of relative deprivation for small geographical areas in England (neighbourhoods with an average of 1,500 residents in each), referred to as Lower-layer Super Output Areas (LSOA). IMD data were available in two forms: a scale variable where higher numbers represent higher levels of deprivation, and as deciles which rank geographical areas across England (rank 1 = 10% most deprived areas, rank 10 = 10% least deprived areas). Attendance at each offered appointment was recorded and additional information was collected at each attended appointment. Following assessment, information about the presenting problem, severity of depression symptoms via PHQ-9 (Kroenke et al., 2001), anxiety symptoms via GAD-7 (Spitzer et al., 2006), employment status

and decisions about subsequent appointments were recorded.

Ethical Approvals

Data collection for this project was reviewed and approved by North East - Newcastle & North Tyneside 2 Research Ethics Committee (REC reference: 15/NE/0062) and the University of York Department of Health Sciences Research Governance Committee.

Data Preparation

All analysis was conducted in Stata v16 (StataCorp, 2019).

Analysis Plan

Patient identifiers were not included in the dataset, and it is possible that the data contain multiple referrals relating to the same patient. However, for the purposes of this analysis, referrals were considered to be independent. Separate analyses were conducted to examine attendance at an initial assessment appointment and treatment initiation after an assessment, since additional variables were available for individuals who attended the initial assessment. Data relating to all referred individuals (including those who did not attend for assessment) were only available for two of the IAPT services; these were included in the analysis of risk factors associated with non-attendance of the assessment appointment. All five IAPT services provided data on patients who attended the initial assessment, regardless of whether or not they continued to treatment. These were included in the analysis investigating risk factors associated with non-attendance at the initial treatment session. Logistic regression analyses were applied firstly using all available variables as covariates and then using backwards selection of predictors (Nathanson & Higgins, 2008; Peng et al., 2002). The latter models aimed to retain statistically significant patient-level variables as fixed effects to ascertain which factors were associated with increased odds of non-attendance. Variables considered in the analysis of attendance at assessment following referral were referral source, IAPT service, gender, age in years, ethnicity, and IMD score. Additional variables included in the analysis of treatment initiation (initial treatment appointment attendance) were employment status, primary presenting problem, and symptom severity measures (PHQ-9 and GAD-7). A significance level of $p < 0.1$ was used to determine the categories and variables to be removed from the models during backwards selection, which proceeded until the final fully-adjusted model only included predictors with a significance level of $p < 0.05$. Service was included as a fixed, rather than a random, effect due to the small number of services included; therefore, interpretations of findings will necessarily be limited to the services within this dataset (Allison, 2009). The overall effect of each categorical variable was tested using the Wald Chi-squared test; those with a p value greater than 0.05 were not considered to be a significant predictor of the outcome. The Hosmer-Lemeshow Chi-squared test was used to assess goodness of fit of the logistic regression models.

Missing Data

Patterns of missing data were explored by variable. Pearson's Chi-squared test of independence was used to ascertain whether missing data points within each variable were different to values present for the same variable when compared to the outcomes of attendance at assessment and initial treatment appointments. The number of missing data points per referral observation was also evaluated to assess whether the number of missing values within referrals was associated with different outcomes for attendance at assessment or initial treatment appointments. Thirdly, missing data were considered by service to assess differences in reporting patterns across services. Finally, after "missingness" within the original dataset had been explored, missing values were replaced through multiple imputation (MI) (Rubin, 1976) by chained equations (White et al., 2011). MI (burn-in iterations = 10, number of imputations = 10) was used to replace missing values within the explanatory variables of ethnicity, employment status, a condensed version of the presenting problem variable (phobic anxiety disorder, other anxiety disorder, obsessive compulsive disorder, stress or adjustment disorder and somatoform disorder were collapsed into one category labelled other CMH disorders), PHQ-9 and GAD-7 using the logit function, and IMD using the regress function. The presenting problem variable was collapsed to reduce the number of categories within the imputation modelling as large numbers of categories caused problems with convergence. Age and service were included in the imputation command to provide additional information which would support predictions of missing values. Ten iterations were selected to allow successful convergence of the model; variable characteristics were proportionally

the same across different imputed datasets and reflect the original data. Analyses were rerun on these multiply imputed datasets and the parameter estimates were pooled using Rubin's rules. Conclusions were compared with the complete case analyses (Graham, 2009; Rubin, 1996; Sinharay et al., 2001).

Results

Description of the Dataset

A total of 45,332 referrals were included in the examination of risk factors associated with assessment appointment non-attendance (Services A and C only), and 97,020 were included in the assessment of risk factors for non-attendance at initial treatment appointment (Services A–E) (see Table I).

Characteristics of people referred are presented in Table II, stratified as: did not attend any appointments, attended only an assessment appointment, or attended an offered treatment appointment following an assessment. The number of people considered ineligible for treatment was low (<5% of those referred) for most services with the exception of Service D where 32% of referrals were considered ineligible. In Service D, 83% of referrals were made by a GP or other professional (see Table I), indicating the potential for reducing inappropriate referrals through closer liaison with referring professionals. Among those considered eligible at assessment, treatment appointment attendance ranged between 59% and 79% across services. Overall, 50% of the referrals in this dataset resulted in an assessment and attendance at a first treatment appointment.

Non-Attendance at Assessment Appointment

In total, 29,779 (66%) referrals to services A and C were recorded as attending for an assessment appointment. Characteristics of people referred to services A and C, presented by whether or not they attended for their initial assessment are shown in Table III.

A logistic regression model was run to assess the association between all variables entered and attendance at assessment appointment, see Table IV. Based on a p-value of <0.05, this model indicated that referral source may be important to consider when assessing risk of non-attendance to assessment appointments. The odds of attending an assessment appointment were more than three times higher for people who self-referred than for those who had been referred by a GP (odds ratio (OR) 3.44, 95% CI 3.24–3.65, $p < 0.001$). No significant differences were noted in assessment attendance between people who were referred by a GP and those who were referred by another professional.

Age, ethnicity, and IMD score were also significantly associated with assessment attendance; however, the odds ratios were small indicating modest effect sizes. People who attended tended to be older than those who did not attend assessment appointments (OR 1.017, 95% CI 1.015–1.019, $p < 0.001$). When compared with White people, individuals from Mixed, Black and Other ethnic groups were significantly less likely to attend assessment appointments (OR for Mixed 0.70, 95% CI 0.60–0.83, $p < 0.001$, Asian OR 0.87, 95% CI 0.75–1.00, $p = 0.06$, Black OR 0.80, 95% CI 0.66–0.95, $p = 0.01$, Chinese OR 0.80, 95% CI 0.46–1.39, $p = 0.42$, Other OR 0.63, 95% CI 0.50–0.80, $p < 0.001$). Higher IMD scores (indicating more deprived areas) were significantly associated with assessment appointment non-attendance (OR 0.990, 95% CI 0.989–0.992, $p < 0.001$). No significant differences were observed for gender. Service was not included in this model. Univariate odds ratios for each predictor on assessment attendance are also included in the supplementary file.

Post-estimation tests indicated that the model shown in Table IV was specified correctly for the data (linktest: hat = 1.08, $p < 0.001$, hatsq = −0.03, $p = 0.32$). In line with this model, gender was not a significant predictor of assessment attendance; however, ethnicity and referral source were found to be significant predictors (Wald: Gender $Chi^2(1) = 0.16$, $p = 0.69$, Ethnicity $Chi^2(5) = 39.3$, $p < 0.001$, Referral Source $Chi^2(2) = 1803.84$, $p < 0.001$). The regression model was considered to be well callibrated (Hosmer-Lemeshow: $Chi^2(8) = 12.34$, $p = 0.14$). Collinearity was not considered to be a problem in this model (Gender VIF = 1.00, tolerance = 1.00, Age VIF = 1.01, tolerance = 0.99, Ethnicity ONS VIF = 1.01, tolerance = 0.99, IMD Score VIF = 1.02, tolerance = 0.98, Referral source VIF = 1.00, tolerance = 1.00).

Following the initial regression analysis, a stepwise regression using backwards selection was undertaken. As in the full regression model, there were 30,501 observations included in the backwards selection model of services A and C. Gender ($p = 0.69$), referral by GP or other professional ($p = 0.47$) and ethnic group of Chinese relative to White ($p = 0.41$) were removed from the model as no significant differences were found. As in the full model, the stepwise regression analysis indicated that method of referral, age, ethnicity and IMD score were important to assessment attendance. Full details can be found in the supplementary file.

Table I. Description of people included in the dataset stratified by IAPT service.

	Service A	Service B	Service C	Service D	Service E
Number of referrals received	33,562	22,993	11,770	11,560	17,135
Referral source, *n* (%)					
GP	10,626	19,308 (84)	8044 (68)	6105 (53)	4500 (26)
Self-referral	(32)	2680 (12)	1554 (13)	1945 (17)	11,733 (68)
Other professional	20,694	1005 (4)	2019 (17)	3510 (30)	832 (5)
Missing	(62)	0 (0)	153 (1)	0 (0)	0 (0)
	2242 (7)				
	0 (0)				
Gender, *n* (%)					
Male	12,520	8314 (36)	4412 (37)	3972 (34)	6305 (37)
Female	(37)	14,679 (64)	7357 (63)	7586 (66)	10,830 (63)
Missing	21,038	0 (0)	1 (0.01)	2 (0.02)	0 (0)
	(63)				
	4 (0.01)				
Age, years[a] Mean (SD)	39 (14)	42 (15)	38 (14)	40 (14)	44 (15)
Ethnicity ONS, *n* (%)					
White	22,552	17,653 (77)	5417 (46)	9114 (79)	16,915 (99)
Mixed	(67)	395 (2)	10 (0.1)	215 (2)	55 (0.3)
Asian	801 (2)	855 (4)	13 (0.1)	941 (8)	34 (0.2)
Black	1165 (3)	537 (2)	15 (0.1)	157 (1)	28 (0.2)
Chinese	687 (2)	37 (0.2)	0 (0)	14 (0.1)	0 (0)
Other	86 (0.3)	243 (1)	19 (0.2)	112 (1)	39 (0.2)
Missing	348 (1)	3273 (14)	6296 (53)	1007 (9)	64 (0.4)
	7923 (24)				
IMD decile, *n* (%)					
1 (Most deprived 10%)	8615 (26)	6200 (27)	2940 (25)	1059 (9)	2105 (12)
2	3572 (11)	3019 (13)	2032 (17)	1858 (16)	1605 (9)
3	3731 (11)	1730 (8)	1853 (16)	1597 (14)	1891 (11)
4	2435 (7)	1224 (5)	1524 (13)	1275 (11)	1765 (10)
5	2563 (8)	1856 (8)	537 (5)	1199 (10)	2045 (12)
6	2733 (8)	1837 (8)	998 (8)	953 (8)	2280 (13)
7	2988 (9)	1648 (7)	640 (5)	1116 (10)	1658 (10)
8	2386 (7)	1709 (7)	510 (4)	1358 (12)	1564 (9)
9	2166 (6)	1645 (7)	389 (3)	724 (6)	1337 (8)
10 (Least deprived 10%)	1830 (5)	1931 (8)	71 (0.6)	287 (2)	610 (4)
Missing	543 (2)	194 (0.8)	276 (2)	134 (1)	275 (2)
IMD Score Mean (SD)	29.84 (19.63)	29.59 (20.20)	32.40	24.39 (14.09)	24.08 (16.17)
			(15.92)		
Employment status, *n* (%)					
Employed	7823 (23)	8634 (38)	3760 (32)	6218 (54)	9460 (55)
Unemployed job seeker	3853 (11)	4561 (20)	345 (3)	1256 (11)	2997 (17)
Student	1795 (5)	1329 (6)	376 (3)	432 (4)	706 (4)
Long-term sick or disabled	4695 (14)	74 (0.3)	1057 (9)	1363 (12)	1071 (6)
Homemaker/carer	1412 (4)	1061 (5)	475 (4)	691 (6)	896 (5)
Unemployed, not seeking work	816 (2)	5 (0.02)	1093 (9)	28 (0.2)	34 (0.2)
Voluntary work	234 (1)	2 (0.009)	10 (0.08)	48 (0.4)	38 (0.2)
Retired	896 (3)	1374 (6)	527 (0.4)	679 (6)	1676 (10)
Missing	12,038	5953 (26)	4127 (35)	845 (7)	257 (1)
	(36)				
Problem descriptor, *n* (%)					
Depressive disorder	4670 (14)	1146 (5)	1057 (9)	1400 (12)	7008 (41)
Phobic anxiety disorder	549 (2)	397 (2)	85 (<1)	385 (3)	698 (4)
Other anxiety disorder	8362 (25)	9836 (43)	1418 (12)	7864 (68)	4042 (24)
Obsessive compulsive disorder	385 (1)	270 (1)	60 (1)	198 (2)	252 (1)
Stress or adjustment disorder	638 (2)	1036 (5)	228 (2)	228 (2)	1029 (6)
Somatoform disorder	100 (<1)	35 (<1)	8 (<1)	33 (<1)	150 (1)
Other	5290 (16)	10,266 (45)	646 (5)	40 (<1)	496 (3)
Does not meet diagnostic criteria	742 (2)	0 (0)	0 (0)	0 (0)	0 (0)
Missing	12,826	7 (<1)	8268 (70)	1412 (12)	3460 (20)
	(38)				

(*Continued*)

Table I. Continued.

	Service A	Service B	Service C	Service D	Service E
PHQ-9, *n* (%)					
Sub-threshold score (0-9)	4305 (13)	4414 (19)	1431 (12)	2250 (19)	3481 (20)
Case-level score (10-27)	17,263	15,432 (67)	6249 (53)	8547 (74)	12,734 (74)
Missing	(51)	3147 (14)	4090 (35)	763 (7)	920 (5)
	11,994				
	(36)				
GAD-7, *n* (%)					
Sub-threshold score (0-7)	3358 (10)	3666 (16)	1232 (10)	1711 (15)	2694 (16)
Case-level score (8-21)	18,189	15,930 (69)	6448 (55)	9086 (79)	13,464 (79)
Missing	(54)	3397 (15)	4090 (35)	763 (7)	977 (6)
	12,015				
	(36)				
Attended for assessment, *n* (% of service referrals)					
Attended assessment	21,910	22,993	7869 (67)	11,550	17,135
	(65)	(100)		(100)	(100)
Assessed but not offered treatment, *n* (% of service					
referrals)	854 (3)	1467 (6)	268 (2)	4359 (38)	34 (0.2)
Assessed, not eligible					
Attended for treatment, *n* (% of service referrals)					
Accessed treatment	12,940	12,474 (54)	4580 (39)	4598 (40)	12,149 (71)
	(39)				

[a]The ages of individuals ranged between 14 and 101 years.

Non-Attendance at Initial Treatment Appointments

A logistic regression model was run to assess the association between all variables entered and whether individuals attended an initial treatment appointment, see Table V. This indicated that the service people were referred to, method of referral, presenting problem and severity of anxiety may be important to consider when assessing risk of non-attendance to initial treatment appointments. Ethnicity and severity of depression were not found to be associated with initial treatment attendance.

In this model people referred to service A were significantly more likely to attend a treatment appointment following an assessment than people referred to services B or D (OR for service B vs. A 0.79, 95% CI 0.74–0.84, OR for service D vs. A 0.40, 95% CI 0.37–0.42). Individuals referred to services C and E were significantly more likely to attend treatment than those referred to service A (OR for service C vs. A 1.39, 95% CI 1.25–1.54, OR for service E vs. A 2.52, 95% CI 2.37–2.69). This indicates that the odds of attending a treatment appointment were substantially lower (60%) for people referred to service D, and 2.5 times higher for people who were referred to service E, compared to those referred to service A.

Individuals who were referred by another professional were significantly more likely to attend a treatment appointment than those referred by a GP (OR 1.63, 95% CI 1.52–1.75, $p < 0.001$). This indicates that the odds of attending a treatment appointment were 63% higher for those who had been referred by another professional compared to people who had been referred by a GP. Within this analysis, no significant difference in treatment attendance was noted between those who self-referred to IAPT service and those referred by a GP.

Individuals referred for treatment for phobic anxiety disorder, obsessive compulsive disorder or somatoform disorder were significantly more likely than those with depressive disorder to attend for treatment (OR for those with phobic anxiety disorder 1.58, 95% CI 1.40–1.78, $p < 0.001$, OR for those with obsessive compulsive disorder (OCD) 1.62, 95% CI 1.39–1.90, $p < 0.001$, and OR for somatoform disorder 1.91, 95% CI 1.38–2.64, $p < 0.001$). The odds of attending a treatment appointment were 90% higher for people with somatoform disorder, 62% for people with OCD, and 58% for people with phobic anxiety disorder, compared to people with a depressive disorder. Those with a problem classed as "other" in this analysis, and individuals who did not meet criteria for a common mental health problem were significantly less likely to attend a treatment appointment than those with a depressive disorder (OR those with another disorder 0.64, 95% CI 0.60–0.68, $p < 0.001$, OR those that did not meet criteria 0.32, 95% CI 0.27–0.38, $p < 0.001$). This suggests that for people with a problem which did not meet ICD-10 criteria for a CMHP the odds of attending a treatment appointment decreased by 68% compared to those with

Table II. Characteristics of people referred to IAPT services stratified by whether they did or did not attend for an offered treatment appointment.

Explanatory variables (% by row)	Not assessed (n = 15,555)	Assessed, not eligible (n = 5624)	Assessed only (n = 25,974)	Attended treatment (n = 48,099)	Missing (n = 1768)	Total (n = 97,020)
Service, *n* (%)						
A	11,652	661 (2)	8116 (24)	13,133 (39)	0 (0)	33,562
B	(35)	1062 (5)	9052 (39)	12,879 (56)	0 (0)	22,993
C	0 (0)	173 (1)	3021 (26)	4675 (40)	0 (0)	11,770
D	3901 (33)	3705 (32)	2593 (22)	5252 (45)	8 (<1)	11,560
E	2 (<1)	23 (<1)	3192 (19)	12,160 (71)	1760 (10)	17,135
	0 (0)					
Gender, *n* (%)						
Male	5895 (17)	2189 (6)	9656 (27)	17,060 (48)	723 (2)	35,523
Female	9658 (16)	3434 (6)	16,316	31,037 (50)	1045 (2)	61,490
Missing	2 (29)	1 (14)	(27)	2 (29)	0 (0)	7
			2 (29)			
Age Mean (SD)	37 (14)	40 (14)	40 (15)	42 (15)	47(16)	40 (15)
Min/Max	15/97	16/92	16/98	14/101	17/91	14/101
Ethnicity ONS, *n* (%)						
White	6289 (9)	4428 (6)	19,315	39,874 (56)	1745 (2)	71,651
Mixed	237 (16)	117 (8)	(27)	674 (46)	4 (<1)	1476
Asian	293 (10)	392 (13)	444 (30)	1382 (46)	3 (<1)	3008
Black	186 (13)	121 (8)	938 (31)	685 (48)	2 (<1)	1424
Chinese	19 (14)	10 (7)	430 (30)	75 (55)	0 (0)	137
Other	117 (15)	62 (8)	33 (24)	360 (47)	6 (1)	761
Missing	8414 (45)	494 (3)	216 (28)	5049 (27)	8 (<1)	18,563
			4598 (25)			
IMD decile, *n* (%)						
1 (Most deprived 10%)	4620 (22)	1021 (5)	6338 (30)	8694 (42)	246 (1)	20,919
2	2055 (17)	963 (8)	3367 (28)	5556 (46)	145 (1)	12,086
3	1962 (18)	731 (7)	2801 (26)	5119 (47)	189 (2)	10,802
4	1283 (16)	514 (6)	2143 (26)	4116 (50)	167 (2)	8223
5	983 (12)	504 (6)	2092 (26)	4402 (54)	219 (3)	8200
6	1135 (13)	376 (4)	2121 (24)	4922 (56)	247 (3)	8801
7	1047 (13)	439 (5)	1966 (24)	4417 (55)	181 (2)	8050
8	885 (12)	491 (7)	1846 (25)	4163 (55)	142 (2)	7527
9	716 (11)	336 (5)	1612 (26)	3471 (55)	126 (2)	6261
10 (Least deprived 10%)	559 (12)	169 (4)	1333 (28)	2588 (54)	80 (2)	4729
Missing	310 (21)	80 (6)	355 (25)	651 (46)	26 (2)	1422
IMD Score Mean (SD)	32.83	28.52 (17.07)	29.71	26.45 (17.79)	24.33	28.42
	(19.10)		(18.92)		(16.52)	(18.41)
Employment status, *n* (%)						
Employed	7 (0.002)	2409 (7)	10,452	22,222 (62)	805 (2)	35,895
Unemployed job seeker	2 (0.02)	797 (6)	(29)	7633 (59)	331 (3)	13,012
Student	1 (0.02)	287 (6)	4249 (33)	2715 (59)	74 (2)	4638
Long-term sick or disabled	1 (0.01)	691 (8)	1561 (34)	4437 (54)	137 (2)	8260
Homemaker/carer	2 (0.04)	340 (7)	2994 (36)	2711 (60)	66 (1)	4535
Unemployed, not seeking	2 (0.1)	56 (3)	1416 (31)	1147 (58)	2 (0.1)	1976
work	1 (0.3)	20 (6)	769 (39)	197 (59)	2 (0.6)	332
Voluntary work	2 (0.04)	304 (6)	112 (34)	3186 (62)	264 (5)	5152
Retired	15,537	720 (3)	1396 (27)	3851 (17)	87 (0.3)	23,220
Missing	(67)		3025 (13)			
Referral source, *n* (%)						
GP	8417 (17)	3790 (8)	13,138	22,895 (47)	413 (1)	48,653
Self	5187 (13)	967 (3)	(27)	20,443 (53)	1269 (3)	38,606
Other	1881 (20)	865 (9)	10,740	4719 (49)	86 (1)	9608
Missing	70 (46)	2 (1)	(28)	42 (27)	0 (0)	153
			2057 (21)			
			39 (25)			

(*Continued*)

Table II. Continued.

Explanatory variables (% by row)	Not assessed (*n* = 15,555)	Assessed, not eligible (*n* = 5624)	Assessed only (*n* = 25,974)	Attended treatment (*n* = 48,099)	Missing (*n* = 1768)	Total (*n* = 97,020)
Problem descriptor, *n* (%)						
Depressive disorder	291 (2)	589 (4)	3400 (22)	10,507 (69)	494 (3)	15,281
Phobic anxiety disorder	18 (1)	126 (6)	375 (18)	1560 (74)	35 (2)	2114
Other anxiety disorder	305 (1)	2921 (9)	8706 (28)	19,326 (61)	264 (1)	31,522
Obsessive compulsive disorder	7 (1)	72 (6)	211 (18)	862 (74)	13 (1)	1165
Stress or adjustment disorder	24 (1)	154 (5)	799 (25)	2086 (66)	96 (3)	3159
Somatoform disorder	2 (1)	7 (2)	45 (14)	268 (82)	4 (1)	326
Other	1739 (10)	784 (5)	6403 (38)	7765 (46)	47 (<1)	16,738
Does not meet diagnostic criteria	21 (2)	93 (13)	376 (51)	252 (34)	0 (0)	742
Missing	13,148 (51)	878 (3)	5659 (22)	5473 (21)	815 (3)	25,973
PHQ-9, *n* (%)						
Sub-threshold score (0–9)	6 (0.4)	842 (5)	5220 (33)	9316 (59)	497 (3)	15,881
Case-level score (9–27)	15 (0.02)	4216 (7)	18,055 (30)	36,889 (61)	1050 (2)	60,225
Missing	15,534 (74)	566 (3)	2699 (13)	1894 (9)	221 (1)	20,914
GAD-7, *n* (%)						
Sub-threshold score (0–7)	7 (0.6)	785 (6)	4489 (35)	6914 (55)	466 (4)	12,661
Case-level score (8–21)	12 (0.02)	4240 (7)	18,576 (29)	39,222 (62)	1067 (2)	63,117
Missing	15,536 (73)	599 (3)	2909 (14)	1963 (9)	235 (1)	21,242

depressive disorder. The odds of attending a treatment appointment decreased by 36% for people with a diagnosis classed as "other" compared to people with depressive disorder. Compared to individuals referred for treatment of depressive disorder, those categorised as having other anxiety disorders and stress or adjustment disorders did not differ significantly in terms of treatment attendance. People who reported more severe anxiety symptoms using the GAD-7 scale were significantly more likely to attend for treatment than those reporting less severe anxiety symptoms (OR 1.36, 95% CI 1.28–1.44, $p < 0.001$). The odds of attending a treatment appointment increased by 36% for those with case-level anxiety symptoms compared to those with mild anxiety symptoms.

Statistically significant differences in treatment attendance were also noted for gender, age, IMD and some categories of employment status; however, with odds ratios close to 1 these are unlikely to be important to treatment attendance within IAPT services. Taking account of the other variables within the model, females were more likely than males to attend treatment appointments following assessment (OR 1.09, 95% CI 1.05–1.13, $p < 0.001$). Increases in age were associated with treatment appointment attendance (OR 1.009, 95% CI 1.008–1.01, $p < 0.001$). Lower IMD scores (indicating less deprivation) were associated with treatment appointment attendance (OR for IMD score 0.992, 95% CI 0.991–0.993, $p < 0.001$). Individuals who were unemployed and seeking work, long term sick or disabled, homemakers or carers, and those who were retired were significantly less likely to attend treatment appointments than those who were employed. No significant differences were found between those who were employed, students and people engaged in voluntary work. In addition, no significant differences in treatment attendance were found between White people and those from any other ethnic group. The severity of depression symptoms reported at assessment was not associated with treatment appointment attendance. Univariate odds ratios associated with each predictor of treatment attendance are included in the supplementary file.

Post-estimation tests indicated that the model shown in Table V was specified correctly for the data (linktest: hat = 0.99, $p < 0.001$, hatsq = 0.005, $p = 0.81$). All independent variables with the exception of ethnicity and PHQ-9 were significant predictors of treatment attendance (Wald: Service $Chi^2(4) = 2312.83$, $p < 0.001$, Gender $Chi^2(1) = 19.24$, $p < 0.001$, Employment status $Chi^2(7) = 107.79$, $p < 0.001$, Referral Source $Chi^2(2) = 201.42$, $p < 0.001$, Presenting Problem $Chi^2(7) = 639.26$, $p < 0.001$, GAD-7 $Chi^2(1) = 109.12$, $p < 0.001$). The predicted outcomes from this model were different to the observed outcomes and therefore there are likely to be other variables which were not included that could improve this model (Hosmer-Lemeshow:

Table III. Characteristics of people referred to IAPT services A and C stratified by whether they did or did not attend for assessment.

Explanatory variables (% shown by row)	Attended assessment $n = 29,779$	Did not attend assessment $n = 15,553$	Total $n = 45,332$
Service, *n* (%)			
A	21,910	11,652 (35)	33,562
C	(65)	3901 (33)	11,770
	7869 (67)		
Gender, *n* (%)			
Male	11,038	5894 (35)	16,932
Female	(65)	9657 (34)	28,395
Missing	18,738	2 (40)	5
	(66)		
	3 (60)		
Age, Mean (SD)	40 (14)	37 (14)	39 (14)
Min/Max	16/97	15/97	15/97
Ethnicity ONS, *n* (%)			
White	21,681	6288 (22)	27,969
Mixed	(78)	237 (29)	811
Asian	574 (71)	292 (25)	1178
Black	886 (75)	186 (26)	702
Chinese	516 (74)	19 (22)	86
Other	67 (78)	117 (32)	367
Missing	250 (68)	8414 (59)	14,219
	5805 (41)		
IMD decile, *n* (%)			
1 (Most deprived	6936 (60)	4619 (40)	11,555
10%)	3549 (63)	2055 (37)	5604
2	3622 (65)	1962 (35)	5584
3	2676 (68)	1283 (32)	3959
4	2118 (68)	982 (32)	3100
5	2596 (70)	1135 (30)	3731
6	2581 (71)	1047 (29)	3628
7	2011 (69)	885 (31)	2896
8	1839 (72)	716 (28)	2555
9	1342 (71)	559 (29)	1901
10 (Least deprived	509 (62)	310 (38)	819
10%)			
Missing			
IMD Score Mean	29.29 (18.49)	32.83 (19.10)	30.50
(SD)			(18.77)
Employment status, *n*			
(%)	11,578	5 (<1)	11,583
Employed	(>99)	2 (<1)	4198
Unemployed job	4196 (>99)	1 (<1)	2171
seeker	2170 (>99)	1 (<1)	5752
Student	5751 (>99)	2 (<1)	1887
Long-term sick or	1885 (>99)	2 (<1)	1909
disabled	1907 (>99)	1 (<1)	244
Homemaker/carer	243 (>99)	2 (<1)	1423
Unemployed, not	1421 (>99)	15,537 (96)	16,165
seeking work	628 (4)		
Voluntary work			
Retired			
Missing			
Referral source, *n* (%)			
GP	10,253	8417 (45)	18,670
Self	(55)	5186 (23)	22,248
Other	17,062	1880 (44)	4261
Missing	(77)	70 (46)	153
	2381 (56)		
	83 (54)		

$Chi^2(8) = 17.61$, $p = 0.02$). Collinearity was not considered to be a problem for most variables in this model; VIF and tolerance for PHQ-9 and GAD-7 suggest potential collinearity issues (Service VIF = 1.13, tolerance = 0.89, Gender VIF = 1.01, tolerance = 0.99, Age VIF = 1.12, tolerance = 0.89, Ethnicity ONS VIF = 1.03, tolerance = 0.98, IMD score VIF = 1.05, tolerance = 0.95, Employment status VIF = 1.11, tolerance = 0.90, Referral source VIF = 1.02, tolerance = 0.98, Presenting Problem VIF = 1.13, tolerance = 0.88, PHQ-9 VIF = 1.33, tolerance = 0.75, GAD-7 VIF = 1.30, tolerance 0.77).

Following this, a stepwise regression using backwards selection was undertaken. As in the initial model, there were 55,159 observations included in the logistic regression model for initial treatment appointment attendance. During the backwards selection process a number of categories of the included variables were removed as no significant differences were found when comparing to the variable reference category (for example, self-referral was removed as no significant difference in attendance was found for those in this category compared with those referred by a GP).

As in the full model, the stepwise regression indicated that service, source of referral, presenting problem and severity of anxiety were important to treatment attendance. Gender, age, IMD and some categories of employment status were also found to be statistically significant. Full details can be found in the supplementary file.

Missing Data

The most common single variable in the analysis with a missing datapoint was ethnicity, affecting 18,146 cases (19%). Minimal missingness was noted for IMD, referral source and gender. Chi-square tests indicated that missing datapoints for gender were not related to attendance at assessment; however, missing data for ethnicity, IMD and referral source were related to assessment outcomes. Higher levels of missingness were noted in each of these variables for individuals who did not attend an assessment appointment. This was especially apparent for ethnicity, where 54% of those who did not attend an assessment appointment had missing data for ethnicity compared with 12% missingness for those who did attend an assessment. In relation to the initial treatment appointment, missingness within gender, IMD decile and referral source were not found to be related to attendance. Missingness within ethnicity, employment status, presenting problem, PHQ-9 and GAD-7 were related to initial treatment appointment attendance: 16% of people who did

Table IV. Full logistic regression of those who attended an assessment appointment following a referral to either IAPT service A or C.

Accessed assessment	Coefficient	Std. Err.	Odds ratio	Std. Err.	*Z*	*P*>|*z*|	[95% Conf. Interval]	
Gender (Male)								
Female	−0.0120	0.0296	0.9881	0.0293	−0.4000	0.6860	0.9324	1.0471
Age	0.0165	0.0011	1.0166	0.0011	15.3200	0.0000	1.0145	1.0188
Ethnicity ONS (White)								
Mixed	−0.3540	0.0836	0.7019	0.0587	−4.2300	0.0000	0.5958	0.8269
Asian	−0.1404	0.0735	0.8690	0.0638	−1.9100	0.0560	0.7525	1.0035
Black	−0.2282	0.0925	0.7960	0.0736	−2.4700	0.0140	0.6640	0.9541
Chinese	−0.2253	0.2818	0.7983	0.2250	−0.8000	0.4240	0.4595	1.3869
Other	−0.4593	0.1211	0.6317	0.0765	−3.7900	0.0000	0.4982	0.8010
IMD Score	−0.0100	0.0008	0.9901	0.0007	−13.2600	0.0000	0.9886	0.9916
Referral Source (GP)								
Self	1.2348	0.0308	3.4377	0.1057	40.1400	0.0000	3.2365	3.6513
Other	−0.0330	0.0452	0.9675	0.0438	−0.7300	0.4650	0.8854	1.0572
Constant	0.3447	0.0574	1.4115	0.0810	6.0000	0.0000	1.2613	1.5796

Number of observations = 30,501, Log likelihood = −15141.287, LR $chi^2(10)$ = 2477.89, Prob > chi^2 = 0.0000, Pseudo R^2 = 0.0756.

not attend for treatment had a missing value for ethnicity compared with 10% of those who did attend the initial treatment appointment; 12% of those who did not attend were missing data for employment status compared to 8% for those who attended treatment; and 21% of people who did not attend for treatment had a missing value for their presenting problem compared with 11% missingness for those who did attend the initial treatment appointment. Missingness for PHQ-9 and GAD-7 were similar with 10% (PHQ-9) and 11% (GAD-7) of people who did not attend treatment having missing data, compared to 4% missing for those who did attend (both PHQ-9 and GAD-7). Data reported by services was examined; with the exception of gender, significant between service differences in missing data were observed for each variable included in the primary and secondary analysis.

In the MI analysis, there were 45,327 observations included in the logistic regression model for assessment attendance using imputed data (Table VI). The pattern of covariates remained consistent with the complete case analysis of assessment attendance. The source of referrals was a strong predictor of assessment appointment attendance in this model; those who self-referred and those referred by other professionals had significantly higher odds of attending an assessment appointment than those referred by a GP (self-referrals OR 2.73, CI 2.61–2.85; professional referrals OR 1.11, 95% CI 1.04–1.19). All other variables were either associated with increased likelihood of attendance at assessment appointments with odds ratio values close to 1, or were not significant within the model.

There were 79,692 observations included in the model for initial treatment appointment attendance using imputed data (Table VII). Again, the pattern of covariates remained consistent with the complete case analysis of initial treatment appointment attendance; the service people were referred to, the source of the referral and the problem people were referred for were considered important to treatment attendance, while ethnicity and depression symptom severity were not considered important to treatment attendance.

Discussion

This study provides an insight into the levels of access and support for common mental health problems in the UK using a large dataset of referrals made to five IAPT services based in the North of England between 2010 and 2014. Overall, two-thirds of referrals resulted in assessment attendance (based on two services) and across all five services, just over half of those who were assessed subsequently attended a first treatment appointment. The main risk factor for non-attendance at assessment appointments was found to be referral by GP as opposed to self-referral. Risk factors associated with non-attendance at first treatment appointments were being referred by GP, having a depressive disorder or not meeting the criteria for a common mental health problem, and having lower anxiety symptoms. In addition, significant differences in assessment attendance were related to ethnicity, age and IMD score. Gender, age, IMD and some categories of employment status showed significant differences in relation to first treatment appointment attendance.

Historical data were used for this analysis; however, the level of non-attendances found in

Table V. Full logistic regression of those who attended a treatment appointment following an assessment at an IAPT service.

Accessed treatment	Coefficient	Std. Err.	Odds ratio	Std. Err.	*z*	*P*>|*z*|	[95% Conf. Interval]	
Service (A)								
B	−0.2328	0.0322	0.7923	0.0255	−7.2300	0.0000	0.7439	0.8439
C	0.3261	0.0524	1.3855	0.0726	6.2200	0.0000	1.2503	1.5354
D	−0.9272	0.0336	0.3957	0.0133	−27.6000	0.0000	0.3704	0.4226
E	0.9246	0.0324	2.5209	0.0817	28.5400	0.0000	2.3658	2.6862
Gender (Male)								
Female	0.0861	0.0196	1.0899	0.0214	4.3900	0.0000	1.0488	1.1326
Age	0.0089	0.0007	1.0089	0.0007	12.3900	0.0000	1.0075	1.0103
Ethnicity ONS (White)								
Mixed	−0.0689	0.0670	0.9334	0.0625	−1.0300	0.3030	0.8186	1.0643
Asian	−0.0177	0.0475	0.9824	0.0467	−0.3700	0.7090	0.8951	1.0783
Black	−0.0147	0.0699	0.9854	0.0689	−0.2100	0.8330	0.8592	1.1301
Chinese	0.1823	0.2403	1.2000	0.2884	0.7600	0.4480	0.7492	1.9219
Other	0.0342	0.0976	1.0348	0.1010	0.3500	0.7260	0.8547	1.2528
IMD Score	−0.0077	0.0005	0.9923	0.0005	−14.5400	0.0000	0.9913	0.9933
Employment Status (Employed)								
Unemployed job seeker	−0.1044	0.0259	0.9009	0.0233	−4.0400	0.0000	0.8563	0.9477
Student	−0.0381	0.0398	0.9626	0.0384	−0.9600	0.3390	0.8903	1.0408
Long-term sick or disabled	−0.3105	0.0321	0.7331	0.0235	−9.6700	0.0000	0.6884	0.7807
Homemaker/carer	−0.1830	0.0406	0.8328	0.0338	−4.5100	0.0000	0.7691	0.9017
Unemployed, not seeking work	−0.1016	0.0704	0.9034	0.0636	−1.4400	0.1490	0.7870	1.0369
Voluntary work	−0.0645	0.1406	0.9375	0.1318	−0.4600	0.6460	0.7117	1.2349
Retired	−0.1305	0.0419	0.8777	0.0367	−3.1200	0.0020	0.8085	0.9528
Referral Source (GP)								
Self	−0.0269	0.0271	0.9735	0.0264	−0.9900	0.3220	0.9230	1.0267
Other	0.4903	0.0361	1.6328	0.0589	13.5900	0.0000	1.5214	1.7524
Problem (Depressive disorder)								
Phobic anxiety disorder	0.4546	0.0617	1.5755	0.0972	7.3700	0.0000	1.3960	1.7780
Other anxiety disorder	0.0083	0.0266	1.0083	0.0268	0.3100	0.7550	0.9571	1.0623
Obsessive compulsive disorder	0.4850	0.0790	1.6241	0.1283	6.1400	0.0000	1.3912	1.8961
Stress or adjustment disorder	−0.0353	0.0498	0.9653	0.0480	−0.7100	0.4790	0.8756	1.0643
Somatoform disorder	0.6458	0.1663	1.9075	0.3173	3.8800	0.0000	1.3768	2.6427
Other	−0.4525	0.0325	0.6360	0.0207	−13.9300	0.0000	0.5968	0.6778
Does not meet diagnostic criteria for CMD	−1.1491	0.0863	0.3169	0.0274	−13.3100	0.0000	0.2676	0.3753
PHQ-9 (Sub-threshold score)								
Case-level	−0.0114	0.0273	0.9886	0.0270	−0.4200	0.6750	0.9372	1.0429
GAD-7 (Sub-threshold score)								
Case-level	0.3050	0.0292	1.3567	0.0396	10.4500	0.0000	1.2812	1.4366
Constant	0.3415	0.0549	1.4070	0.0772	6.2200	0.0000	1.2635	1.5668

No. of observations = 55,159, Log likelihood = −33159.061, LR $chi^2(30)$ = 5056.44, Prob > chi^2 = 0.0000, Pseudo R^2 = 0.0708.

this study are in line with national reporting figures which have remained similar during recent years in 2017–2018 of the 1.44 million referrals received, 1.01 million (approximately 70%) attended at least one appointment and 554,709 (approximately 39%) attended at least two appointments (NHS Digital, 2018), In 2018–2019 of the 1.6 million referrals received, 1.09 million (68%) attended at least one appointment and 582,556 (36%) attended at least two appointments (NHS Digital, 2019). In 2019–2020 1.69 referrals were received; 1.17 million (69%) resulted in attendance to at least one appointment, 606,192 (36%) of these referrals resulted in attendance to at least two appointments (NHS Digital, 2020). In 2020–2021 1.46 million referrals were received, 1.02 million (70%) were associated with attendance to at least one appointment and 634,649 (43%) were associated with attendance to at least two appointments (NHS Digital, 2021). This indicates that non-attendance to these initial two appointments is a consistent problem for IAPT services which requires some form of intervention to encourage improvements. IAPT annual reporting includes details of service performance relating to service delivery and treatment effectiveness. At present, none of the key performance indicators relate to initial non-attendance; emphasising the importance of attendance at these appointments may support services to address this issue.

Table VI. Logistic regression of those who attended an assessment appointment following a referral to IAPT service A or C using imputed data to replace missing values.

Accessed assessment	Coefficient	Std. Err.	Odds ratio	Std. Err.	*z*	*P*>|*z*|	[95% Conf. Interval]	
Gender (Male)								
Female	0.0306	0.0212	1.0311	0.0219	1.4400	0.1490	0.9891	1.0748
Age	0.0168	0.0008	1.0169	0.0008	22.0900	0.0000	1.0154	1.0184
Ethnicity ONS (White)								
Mixed	−0.2877	0.0780	0.7500	0.0585	−3.6900	0.0000	0.6420	0.8761
Asian	−0.1729	0.0601	0.8412	0.0505	−2.8800	0.0050	0.7469	0.9475
Black	−0.2430	0.0784	0.7842	0.0615	−3.1000	0.0020	0.6716	0.9158
Chinese	−0.2578	0.2828	0.7728	0.2185	−0.9100	0.3680	0.4352	1.3722
Other	−0.3500	0.1059	0.7047	0.0746	−3.3000	0.0010	0.5715	0.8690
IMD score	−0.0072	0.0006	0.9928	0.0006	−12.9000	0.0000	0.9917	0.9939
Referral source (GP)								
Self	1.0032	0.0219	2.7270	0.0598	45.7200	0.0000	2.6122	2.8468
Other	0.1047	0.0348	1.1104	0.0386	3.0100	0.0030	1.0372	1.1888
Constant	−0.2240	0.0406	0.7993	0.0325	−5.5200	0.0000	0.7381	0.8655

Number of Imputations = 10, Number of observations = 45,327, Average RVI = 0.2456, Largest FMI = 0.5345, F (101840.2) = 232.25, Prob > F = 0.0000.

The number of services included in this dataset was small ($n = 5$) which meant that hierarchical factors that may have influenced non-attendance were not able to be explored within this study (Greenland, 2000). This is particularly relevant to the analyses pertaining to assessment appointment attendance, where only two services were able to be included; this is an unfortunate limitation of the data available for this work. In addition, all of these services were based in the north of England; therefore, it is not known whether these findings are relevant to IAPT services in other areas. Additionally, data within this dataset were not identifiable; consequently, it was not possible to control for individuals associated with multiple referrals within the analyses. Although most of the variables included in the analysis were considered objective, the presenting problem relies on the experience of the assessing IAPT practitioner and service-specific protocols to determine appropriate support for people referred (National Collaborating Centre for Mental Health, 2018). There is some evidence to suggest that the accuracy of problem descriptors reported by IAPT services is improving (Saunders et al., 2020); however, there is a lack of research exploring the overall reliability of this variable.

This study has identified specific characteristics that are considered to affect non-attendance at these two distinct time-points. From this, services can explore appropriate strategies to reduce non-attendance. Services that identify non-attendance at assessment appointments as problematic may look to their source of referrals. With the odds of attending an assessment many times higher for people who had self-referred compared to those referred by a GP this could indicate that where people are able to self-refer, the current referral and appointment scheduling processes are acceptable. IAPT services which only accept professional referrals may wish to consider introducing self-referrals. Those services which already accept self-referrals may decide to pilot methods to promote self-referrals. Where IAPT services accept self-referrals, instances of people being referred by a GP may indicate a different approach from IAPT services is necessary to engage people. Conversations between IAPT services and GPs could help to identify whether additional strategies are required to support this group of people to attend initial appointments (Thomas et al., 2020).

In line with the data from the analysis of assessment appointment attendance, high levels of non-attendance at treatment appointments may indicate that different approaches are needed to support early appointment attendance for people referred by GPs when self-referral is an option. Further research exploring the different needs of in people who self-refer and those referred to IAPT by a GP would be advantageous. Interestingly, people who had been referred by a professional other than a GP were most likely to attend for treatment after attending an assessment appointment. Further exploration of this finding could help to determine whether the nature of the professional referral, or the processes involved in the referral from these professionals, could explain why people referred by professionals other than a GP are more likely to attend an initial treatment appointment.

Detailed comparisons between the referral pathways for services with higher and lower attendance

Table VII. Logistic regression of those who attended a treatment appointment following an assessment at an IAPT service using imputed data to replace missing values.

Accessed treatment	Coefficient	Std. Err.	Odds Ratio	Std. Err	z	$P>\|z\|$	[95% Conf. Interval]	
Service (A)								
B	−0.1824	0.0246	0.8332	0.0205	−7.4000	0.0000	0.7940	0.8745
C	−0.1475	0.0303	0.8628	0.0261	−4.8700	0.0000	0.8131	0.9156
D	−0.9275	0.0274	0.3955	0.0108	−33.8800	0.0000	0.3749	0.4173
E	0.7075	0.0260	2.0290	0.0527	27.2500	0.0000	1.9283	2.1349
Gender (Male)								
Female	0.0910	0.0157	1.0953	0.0172	5.7900	0.0000	1.0621	1.1295
Age	0.0072	0.0006	1.0072	0.0006	12.5100	0.0000	1.0061	1.0083
Ethnicity ONS (White)								
Mixed	−0.0674	0.0637	0.9348	0.0595	−1.0600	0.2920	0.8242	1.0602
Asian	−0.0803	0.0407	0.9228	0.0376	−1.9700	0.0490	0.8519	0.9997
Black	−0.0112	0.0576	0.9889	0.0570	−0.1900	0.8460	0.8832	1.1072
Chinese	0.1815	0.1926	1.1990	0.2309	0.9400	0.3460	0.8216	1.7498
Other	−0.0064	0.0823	0.9937	0.0818	−0.0800	0.9380	0.8453	1.1681
IMD Score	−0.0078	0.0004	0.9922	0.0004	−18.0800	0.0000	0.9914	0.9931
Employment Status (Employed)								
Unemployed job seeker	−0.0996	0.0226	0.9052	0.0204	−4.4100	0.0000	0.8660	0.9462
Student	−0.0568	0.0334	0.9448	0.0316	−1.7000	0.0900	0.8848	1.0089
Long-term sick or disabled	−0.2732	0.0263	0.7609	0.0200	−10.3900	0.0000	0.7227	0.8012
Homemaker/carer	−0.1334	0.0342	0.8751	0.0300	−3.9000	0.0000	0.8182	0.9359
Unemployed, not seeking work	−0.1670	0.0494	0.8462	0.0418	−3.3800	0.0010	0.7680	0.9323
Voluntary work	−0.0636	0.1164	0.9384	0.1092	−0.5500	0.5850	0.7468	1.1790
Retired	−0.1098	0.0351	0.8960	0.0314	−3.1300	0.0020	0.8364	0.9599
Referral Source (GP)								
Self	−0.0537	0.0199	0.9477	0.0188	−2.7000	0.0070	0.9115	0.9854
Other	0.3917	0.0279	1.4795	0.0413	14.0400	0.0000	1.4007	1.5626
Problem (Depressive disorder)								
Other CMH disorders	0.0179	0.0220	1.0180	0.0224	0.8100	0.4180	0.9749	1.0630
Other	−0.4191	0.0264	0.6576	0.0174	−15.8700	0.0000	0.6244	0.6926
Does not meet diagnostic criteria for CMD	−1.0844	0.0793	0.3381	0.0268	−13.6700	0.0000	0.2894	0.3950
PHQ-9 (Sub-threshold score)								
Case-level	−0.0426	0.0227	0.9583	0.0218	−1.8800	0.0610	0.9165	1.0019
GAD-7 (Sub-threshold score)								
Case-level	0.2926	0.0253	1.3398	0.0339	11.5500	0.0000	1.2748	1.4082
Constant	0.3285	0.0445	1.3889	0.0618	7.3800	0.0000	1.2729	1.5155

Number of Imputations = 10, Number of observations = 79,692, Average RVI = 0.08, Largest FMI = 0.26, F (26,37853.7) = 178.05, Prob > F = 0.0000.

rates for treatment appointments may help to identify service-level practices associated with increased early appointment attendance; for example, the odds of attending a treatment appointment at service E were much higher compared to referrals to service A. Clarifying the scope of the service prior to referral, for all referrers (people requiring support and professionals), could help to prevent inappropriate referrals. In line with this, the odds of attending treatment decreased by 66% for those who did not meet criteria for a common mental health problem, and by 44% for those with other less common problems (eating disorder, alcohol related mental or behavioural disorder, bipolar affective disorder, non-organic sleep disorder, and not specified), compared to individuals with a depressive disorder. Ensuring that IAPT service information incorporates details for other local organisations which offer support for problems outside of the IAPT remit would enable people to contact the appropriate services to meet their needs.

In the wider mental health literature, the finding of depressive disorder being associated with non-attendance to mental health appointments is in line with other research; a survey of primary care patients found that depression was associated with more perceived barriers to accessing mental health support than non-depressed patients (Mohr et al., 2006). In addition to having more perceived barriers to attending treatment, theories relating to the level and type of motivation associated with treatment appointment in people with depression may help to explain non-attendance rates for this group (Binnie & Boden, 2016; Trew, 2011). Also in line with our findings, anxiety has been associated with attendance to

mental health appointments where other diagnoses were associated with non-attendance or drop out from both mental health services (Bados et al., 2007) and also with increased healthcare use more generally (Horenstein & Heimberg, 2020). Although these studies do not specifically relate to IAPT service non-attendance, the similarities in findings suggest that the nature of the presenting problem is important to initial appointment attendance rates. Our finding that the people with more severe anxiety symptoms are more likely to attend initial appointments is also in line with previous research findings; where people consider that their mental health problems are not severe or could resolve without additional support, non-attendance is considered more likely to occur (Bados et al., 2007; Bruwer et al., 2011; Greeno et al., 1999; Sweetman et al., 2021).

Many of the other characteristics included in these analyses showed statistically significant differences in relation to attendance at assessment or initial treatment appointments. These characteristics reflect an individual's gender, age, ethnicity, whether they live in an area of social deprivation, employment status and the severity of anxiety symptoms. These findings were consistent whether missing data were excluded from the analyses or replaced using an imputed dataset. Increasing the awareness of higher attrition rates amongst certain population groups may be useful for considering adjustments to IAPT services and the patient pathway.

Other factors likely to affect initial appointment attendance include delays between a referral being made and initial appointment dates. The length of time between referral, assessment appointment and first treatment appointment has been highlighted as important specifically for IAPT services (Clark et al., 2018; Davis et al., 2020) and services offering psychological support for common mental health problems more generally (Sweetman et al., 2021); however, this was not explored within this sample. Individual reasons for non-attendance including perceptions of mental health symptoms and psychological therapies, support from network members, previous contact with similar services and logistical issues around appointment attendance were not able to be explored using this dataset but have been shown to influence attendance at initial appointments at similar primary care mental health services (Sweetman et al., 2021). Further work is needed to assess whether and how these individual factors influence non-attendance at initial appointments to IAPT services.

Based on data from two services, we showed that only 39% of referrals resulted in attendance to both assessment and first treatment. Based on data from 5 services, we showed that only 57% of people attended their first treatment appointment after attending an initial assessment. With the proportion of inappropriate referrals found to be minimal for four of the five services in this sample, this level of attrition is a significant problem.

These findings suggest a need for changes to IAPT delivery and the reporting of IAPT effectiveness: indicators of success of the service should take account of self-selected patient attrition. It may be helpful for individual IAPT services to monitor rates of non-attendance and assess the factors associated with it; interventions to increase attendance could be targeted as indicated. There is also a need for further research to (1) understand the individual reasons behind non-attendances which could inform flexibility in service policies, (2) explore the most effective and acceptable self-referral pathways to IAPT care and (3) investigate differences between services in the referral pathway which may influence initial non-attendance rates.

Acknowledgements

The authors would like to thank the Northern IAPT Practice Research Network for providing access to the dataset which was analysed in this project. This work was reviewed and approved by North East – Newcastle & North Tyneside 2 Research Ethics Committee (REC reference: 15/NE/0062) and the University of York Department of Health Sciences Research Governance Committee. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. The concept for this work was developed by JS, DM and PK. JD supported the ethical approvals and facilitated access to the dataset. JS developed the methodological approach under the supervision of CF; feedback was received from JD and CH. JS undertook all tasks relating to data preparation, analysis and interpretation under the supervision of CF. DM and PK provided supervision throughout this work. PK contributed to early drafts of this paper. All authors have reviewed and edited the final manuscript.

Funding

This study was undertaken as part of PhD research supported by Economic and Social Research Council studentship awarded to JS [grant number ES/J500215/1].

Disclosure Statement

No potential conflict of interest was reported by the author(s).

Supplemental data

Supplemental data for this article can be accessed online at https://doi.org/10.1080/10503307.2022.2140616.

ORCID

JENNIFER SWEETMAN http://orcid.org/0000-0003-1969-4586
PETER KNAPP http://orcid.org/0000-0001-5904-8699
DEAN MCMILLAN http://orcid.org/0000-0002-2901-8410
JAIME DELGADILLO http://orcid.org/0000-0001-5349-230X

References

Allison, P. D. (2009). *Fixed effects regression models*. SAGE Publications.

Bados, A., Balaguer, G., & Saldaña, C. (2007). The efficacy of cognitive–behavioral therapy and the problem of drop-out. *Journal of Clinical Psychology*, *63*(6), 585–592. https://doi.org/10.1002/jclp.20368

Barlow, D. H., Gorman, J. M., Shear, M. K., & Woods, S. W. (2000). Cognitive-behavioral therapy, imipramine, or their combination for panic disorder: A randomized controlled trial. *Jama*, *283*(19), 2529–2536. https://doi.org/10.1001/jama.283.19.2529

Barrett, M. S., Chua, W.-J., Crits-Christoph, P., Gibbons, M. B., & Thompson, D. (2008). Early withdrawal from mental health treatment: Implications for psychotherapy practice. *Psychotherapy: Theory, Research, Practice, Training*, *45*(2), 247. https://doi.org/10.1037/0033-3204.45.2.247

Binnie, J., & Boden, Z. (2016). Non-attendance at psychological therapy appointments. *Mental Health Review Journal*, *21*(3), 231–248. https://doi.org/10.1108/MHRJ-12-2015-0038

Bruwer, B., Sorsdahl, K., Harrison, J., Stein, D. J., Williams, D., & Seedat, S. (2011). Barriers to mental health care and predictors of treatment dropout in the South African Stress and Health Study. *Psychiatric Services*, *62*(7), 774–781. https://doi.org/10.1176/ps.62.7.pss6207_0774

Clark, D. M., Canvin, L., Green, J., Layard, R., Pilling, S., & Janecka, M. (2018). Transparency about the outcomes of mental health services (IAPT approach): An analysis of public data. *The Lancet*, *391*(10121), 679–686. https://doi.org/10.1016/S0140-6736(17)32133-5

Cuijpers, P., Donker, T., van Straten, A., Li, J., & Andersson, G. (2010). Is guided self-help as effective as face-to-face psychotherapy for depression and anxiety disorders? A systematic review and meta-analysis of comparative outcome studies. *Psychological Medicine*, *40*(12), 1943–1957. https://doi.org/10.1017/S0033291710000772

Cuijpers, P., Veen, S. C. V., Sijbrandij, M., Yoder, W., & Cristea, I. A. (2020). Eye movement desensitization and reprocessing for mental health problems: A systematic review and meta-analysis. *Cognitive Behaviour Therapy*, *49*(3), 165–180. https://doi.org/10.1080/16506073.2019.1703801

Davis, A., Smith, T., Talbot, J., Eldridge, C., & Betts, D. (2020). Predicting patient engagement in IAPT services: A statistical analysis of electronic health records. *Evidence-Based Mental Health*, *23*(1), 8–14. https://doi.org/10.1136/ebmental-2019-300133

Delgadillo, J., Asaria, M., Ali, S., & Gilbody, S. (2016). On poverty, politics and psychology: The socioeconomic gradient of mental healthcare utilisation and outcomes. *The British Journal of Psychiatry*, *209*(5), 429–430. https://doi.org/10.1192/bjp.bp.115.171017

Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual Review of Psychology*, *60*(1), 549–576. https://doi.org/10.1146/annurev.psych.58.110405.085530

Greenland, S. (2000). Principles of multilevel modelling. *International Journal of Epidemiology*, *29*(1), 158–167. https://doi.org/10.1093/ije/29.1.158

Greeno, C. G., Anderson, C. M., Shear, M. K., & Mike, G. (1999). Initial treatment engagement in a rural community mental health center. *Psychiatric Services*, *50*(12), 1634–1636. https://doi.org/10.1176/ps.50.12.1634

Horenstein, A., & Heimberg, R. G. (2020). Anxiety disorders and healthcare utilization: A systematic review. *Clinical Psychology Review*, *81*, 101894. https://doi.org/10.1016/j.cpr.2020.101894

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, *16*(9), 606–613. https://doi.org/10.1046/j.1525-1497.2001.016009606.x

Lucock, M., Barkham, M., Donohoe, G., Kellett, S., McMillan, D., Mullaney, S., & Delgadillo, J. (2017). The role of Practice Research Networks (PRN) in the development and implementation of evidence: The Northern improving access to psychological therapies PRN case study. *Administration and Policy in Mental Health and Mental Health Services Research*, *44*(6), 919–931. https://doi.org/10.1007/s10488-017-0810-5

Mohr, D. C., Hart, S. L., Howard, I., Julian, L., Vella, L., Catledge, C., & Feldman, M. D. (2006). Barriers to psychotherapy among depressed and nondepressed primary care patients. *Annals of Behavioral Medicine*, *32*(3), 254–258. https://doi.org/10.1207/s15324796abm3203_12

Nathanson, B. H., & Higgins, T. L. (2008). *An introduction to statistical methods used in binary outcome modeling* [Paper presentation]. Seminars in cardiothoracic and vascular anesthesia.

National Collaborating Centre for Mental Health. (2018). *The improving access to psychological therapies manual*. https://www.england.nhs.uk/publication/the-improving-access-to-psychological-therapies-manual/

NHS Digital. (2018). *Psychological therapies, annual report on the use of IAPT services – England, 2017–18*. https://digital.nhs.uk/data-and-information/publications/statistical/psychological-therapies-annual-reports-on-the-use-of-iapt-services/annual-report-2017—18

NHS Digital. (2019). *Psychological therapies, annual report on the use of IAPT services 2018–2019*. https://digital.nhs.uk/data-and-information/publications/statistical/psychological-therapies-annual-reports-on-the-use-of-iapt-services/annual-report-2018-19

NHS Digital. (2020). *Psychological therapies, annual report on the use of IAPT services 2019–2020*. https://digital.nhs.uk/data-and-information/publications/statistical/psychological-therapies-annual-reports-on-the-use-of-iapt-services/annual-report-2019-20

NHS Digital. (2021). *Psychological therapies, annual report on the use of IAPT services, 2020-2021*. https://digital.nhs.uk/data-and-information/publications/statistical/psychological-therapies-annual-reports-on-the-use-of-iapt-services/annual-report-2020-21

Norton, P. J., & Price, E. C. (2007). A meta-analytic review of adult cognitive-behavioral treatment outcome across the anxiety

disorders. *The Journal of Nervous and Mental Disease*, *195*(6), 521–531. https://doi.org/10.1097/01.nmd.0000253843.70149.9a

Peng, C.-Y. J., Lee, K. L., & Ingersoll, G. M. (2002). An introduction to logistic regression analysis and reporting. *The Journal of Educational Research*, *96*(1), 3–14. https://doi.org/10.1080/00220670209598786

Rubin, D. B. (1976). Inference and missing data. *Biometrika*, *63*(3), 581–592. https://doi.org/10.1093/biomet/63.3.581

Rubin, D. B. (1996). Multiple imputation after 18+ years. *Journal of the American Statistical Association*, *91*(434), 473–489. https://doi.org/10.1080/01621459.1996.10476908

Saunders, R., Cape, J., Leibowitz, J., Aguirre, E., Jena, R., Cirkovic, M., & Buckman, J. E. (2020). Improvement in IAPT outcomes over time: Are they driven by changes in clinical practice? *The Cognitive Behaviour Therapist*, *13*, E16. https://doi.org/10.1017/S1754470X20000173

Sinharay, S., Stern, H. S., & Russell, D. (2001). The use of multiple imputation for the analysis of missing data. *Psychological Methods*, *6*(4), 317. https://doi.org/10.1037/1082-989X.6.4.317

Smith, T., Noble, M., Noble, S., Wright, G., McLennan, D., & Plunkett, E. (2015). *The English indices of deprivation 2015*. Department for Communities and Local Government.

Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, *166*(10), 1092–1097. https://doi.org/10.1001/archinte.166.10.1092

StataCorp, L. (2019). *Stata Statistical Software: Release 16. 2019*. United States of America.

Sweetman, J., Knapp, P., Varley, D., Woodhouse, R., McMillan, D., & Coventry, P. (2021). Barriers to attending initial psychological therapy service appointments for common mental health problems: A mixed-methods systematic review. *Journal of Affective Disorders*, *284*, 44-63. https://doi.org/10.1016/j.jad.2021.01.089.

Thomas, F., Hansford, L., Ford, J., Wyatt, K., McCabe, R., & Byng, R. (2020). How accessible and acceptable are current GP referral mechanisms for IAPT for low-income patients? Lay and primary care perspectives. *Journal of Mental Health*, *29*(6), 706–711. https://doi.org/10.1080/09638237.2019.1677876.

Trew, J. L. (2011). Exploring the roles of approach and avoidance in depression: An integrative model. *Clinical Psychology Review*, *31*(7), 1156–1168. https://doi.org/10.1016/j.cpr.2011.07.007

Vernmark, K., Lenndin, J., Bjärehed, J., Carlsson, M., Karlsson, J., Öberg, J., & Andersson, G. (2010). Internet administered guided self-help versus individualized e-mail therapy: A randomized trial of two versions of CBT for major depression. *Behaviour Research and Therapy*, *48*(5), 368–376. https://doi.org/10.1016/j.brat.2010.01.005

Wakefield, S., Kellett, S., Simmonds-Buckley, M., Stockton, D., Bradbury, A., & Delgadillo, J. (2021). Improving Access to Psychological Therapies (IAPT) in the United Kingdom: A systematic review and meta-analysis of 10-years of practice-based evidence. *British Journal of Clinical Psychology*, *60*(1), 1–37. https://doi.org/10.1111/bjc.12259

White, I. R., Royston, P., & Wood, A. M. (2011). Multiple imputation using chained equations: Issues and guidance for practice. *Statistics in Medicine*, *30*(4), 377–399. https://doi.org/10.1002/sim.4067