Predictors of treatment attrition of cognitive health interventions in first episode psychosis

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Abstract

Aim
Dropping out of psychological interventions is estimated to occur in up to a third of individuals with psychosis. Given the high degree of attrition in this population, identifying predictors of attrition is important to develop strategies to retain individuals in treatment. We observed a particularly high degree of attrition (48%) in a recent randomized controlled study assessing cognitive health interventions for first-episode psychosis participants with comorbid social anxiety. Due to the importance of developing interventions for social anxiety in first episode psychosis, the aim of the present study was to identify putative predictors of attrition through a secondary analysis of data.

Methods
Participants (*n* = 96) with first episode psychosis and comorbid social anxiety were randomized to receive cognitive behavioral therapy for social anxiety or cognitive remediation. Differences between completers and non-completers (<50% intervention completed) were compared using t-tests or chi-square analyses; statistically significant variables were entered into a multivariate logistic regression model.

Results
Non-completers tended to be younger, had fewer years of education and had lower levels of social anxiety compared to completers. Lower baseline social anxiety and younger age were statistically significant predictors of non-completion in the logistic regression model.

Conclusions
Age and social anxiety were predictors of attrition in cognitive health interventions in first episode psychosis populations with comorbid social anxiety. In the ongoing development of social anxiety interventions for this population, future studies should investigate specific engagement strategies, intervention formats and outcome monitoring to improve participant retention in treatment.

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Background

Early intervention for first-episode psychosis (FEP) is key to improving symptoms, reducing relapse risk, and improving long-term social, functional, and occupational outcomes (Bird et al., 2010; Norman et al., 2011). Premature treatment termination (i.e., attrition), ranging between 15 and 30% in early intervention services (Doyle et al., 2014; Kreyenbuhl et al., 2009) and higher in some cases (53%) (Mascayano et al., 2021), is a significant issue that can impact the course of illness. Due to the high frequency and implications on patient trajectories, identifying factors associated with attrition in FEP services has been an ongoing and important area of research.

A framework to conceptualize factors related to treatment attrition is the Andersen Behavioural Model of Health Service Use which has been used widely to understand individual and contextual factors impacting health service usage (Andersen, 1995; Babitsch et al., 2012). This framework includes three levels of factors that impact health service use: predisposing, enabling and need. Predisposing factors represent demographic characteristics (e.g., age, sex), social factors (e.g. education), and mental factors in terms of health beliefs (e.g., attitudes, values, and knowledge related to health and health services). Enabling factors include personal, familial and community features relating to an individual's use of healthcare services, such as family support. It also considers financing (e.g., health insurance) and characteristics of the health service itself, such as the quality, variety, location, structure and distribution of services facilities and personnel. Finally, need factors describe an individual's needs for health services and encompass an individual's perceived need for health services (e.g., personal views and experiences related to one's health, functioning and symptoms) and evaluated need (e.g., professional assessments and objective measures of an individual's health status and need for care). In a recent review using the Andersen Behavioural Model framework, Mascayano and colleagues (2021) found consistent associations between disengagement from early intervention psychosis services and several enabling and need factors.

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Early intervention services consist of tailored individualized programs that combine evidence based pharmacological and psychological interventions. Although numerous studies have investigated attrition factors in early intervention services for FEP, most do not formulate findings using the Andersen model, despite its relevancy. For example, reviews of studies assessing FEP early intervention services have consistently identified enabling factors including lack of family support or involvement (Doyle et al., 2014; Mascayano et al., 2021) and substance use or abuse to be linked with attrition (Doyle et al., 2014; Mascayano et al., 2021). There are mixed findings regarding commonly reported predisposing factors, which include age, sex, and racial/ethnic minority group (Mascayano et al., 2021), as well as commonly reported need factors, which include duration of untreated psychosis, baseline symptom severity, and insight (Doyle et al., 2014). Factors related to attrition from psychological intervention for FEP often provided in the context of early intervention services, have also been identified in literature reviews. One predisposing factor relating to attrition in early intervention services is age, although the directionality of this relationship is unclear. One meta-analysis found that older age was associated with dropouts (Villeneuve et al., 2010), while another review found that older age was associated with improved adherence (Sedgwick et al., 2021). Male sex has also been a predisposing factor associated with attrition (Villeneuve et al., 2010). Need factors relating to attrition included longer illness duration (Villeneuve et al., 2010). Finally, enabling factors related to the treatment itself were identified in these reviews, with a greater number of intervention sessions associated with attrition (Szymczynska et al., 2017; Villeneuve et al., 2010), and receiving incentives linked with greater adherence (Sedgwick et al., 2021).

Although predictors of attrition have been investigated in early intervention services and FEP psychological interventions, with several emerging trends, little is known about attrition factors in the context of cognitive health interventions. We investigate a recent randomized controlled trial where we observed a high attrition rate (48%) in FEP participants who received either cognitive behavioral therapy for social anxiety or cognitive remediation. In addition, the participants in this study had comorbid social anxiety (SA) disorder, a condition that affects a third of FEP individuals (Michail & Birchwood, 2009). Studying the predictors of attrition in this subgroup is much needed due to the prevalence of this comorbidity in FEP and the limited understanding of the role SA severity plays in treatment engagement. In non-psychotic psychological populations experiencing social phobias or anxiety, findings on the role of SA on attrition have been mixed. Social anxiety has been linked with higher (Mersch et al., 1989) and lower attrition rates (Issakidis & Andrews, 2004; Rosser et al., 2003), while others have found no relationship at all (Hofmann & Suvak, 2006; Marie Lincoln et al., 2005).

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Accordingly, this exploratory study aimed to identify baseline factors that predict intervention attrition and completion from a RCT assessing cognitive behavioral therapy and cognitive remediation in outpatients with FEP and comorbid SA (Lepage et al., 2022). This analysis will allow us to better understand factors associated with attrition in FEP, with a special emphasis on those experiencing comorbid SA.

Methods

Participants

Participants were recruited based on the following criteria: less than two years of psychotic disorder onset, aged between 18-35, able to read English or French, scored above predetermined cut-offs on three measures of SA, and met criteria for SA disorder. Participants were excluded if they were clinically unstable, IQ<70, were hospitalized at the time of recruitment, had a current diagnosis of substance dependence, or had a lifetime history of a neurological condition. Participants were assessed at baseline, post-treatment and follow-ups (three and six months). All participants provided informed consent. More information on the study is reported in Lepage et al., 2022 (ClinicalTrials.gov identifier: NCT02294409).

Design

Data from this study came from an RCT, parallel-group study comparing Cognitive Behavioural Therapy adapted for Social Anxiety (CBT-SA; n= 51), with an active control group receiving Cognitive Remediation Therapy (CRT; n= 45), with the SA as the primary outcome. Both CBT-SA and CRT groups continued to receive standard FEP clinical care. The study took place from November 2014 to June 2019.

The 13-week cognitive interventions comprised of weekly 1.5-hour group sessions with 4-8 participants. Both interventions targeted cognitive processes, with differences in the exact processes targeted. CRT targeted processing speed, attention, memory, and executive function. CRT was not specifically adapted to target social anxiety as it served as an active control. CBT-SA included five modules covering psychoeducation, cognitive restructuring, social skills training, exposure component, and relapse prevention, and maintenance. CBT-SA was delivered according to the group manual outlined by Montreuil et al. (2016). The CRT intervention consisted of supervised individual computer cognitive training activities (delivered on Brain Training Pro software), documenting and attempting new strategies for solving problems, ‘strategic monitoring’, and therapist-led ‘transfer activities’. The intervention was developed by Bowie et al., (2012).

Efforts to reduce attrition were implemented. A co-therapist called participants to remind them of every session, and to follow up if they did not show up. Participants’ clinical teams were contacted if they missed three consecutive sessions.

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Measures

A subset of variables assessed in the RCT representing predisposing, need and enabling factors relating to health care service use were analyzed.

Predisposing factors

Predisposing factors assessed were age, biological sex (male, female) and years of education.

Need Factors

Need factors were assessed in terms of severity of illness, clinical symptoms, internalized stigma, and functioning. Measures of illness severity were number of hospitalizations due to mental health reasons and duration of illness (in years). Clinical symptoms were assessed prior to the start of the intervention, and these assessments were completed on average two weeks prior to the start of the intervention. The clinical measures assessed SA, positive and negative symptoms, and depression. SA was assessed using three complementary measures: the Social Interaction Anxiety Scale (Mattick & Clarke, 1998), Social Phobia Inventory (Connor et al., 2000), and Brief Social Phobia Scale (Davidson et al., 1991). Severity of positive symptoms was assessed using the Scale for Assessment of Positive Symptoms (Andreasen, 1984), negative symptoms were assessed using the Scale for Assessment of Negative Symptoms (Andreasen, 1984) and depression was assessed using the Calgary Depression Scale for Schizophrenia (Addington et al., 1990). Internalized stigma was assessed using the Internalized Stigma of Mental Illness scale (Ritsher et al., 2003). Overall level of functioning was assessed using the Social and Occupational Functioning Assessment Scale (Morosini et al., 2000).

Enabling factors

Enabling factors included finance related variables and characteristics of the intervention. Financial factors were assessed using socioeconomic status (SES) category which was calculated using ratings from the Hollingshead two-factor index of social position (Hollingshead, 1957), combining the participants' education and occupation with modification of the education scale for Quebec. Enabling factors relating to characteristics of the health service were assessed. This included whether the participant was randomized to the intervention they expressed a preference for (prior to randomization). We also assessed whether the participant was randomized to receive the intervention at the same institution where they were referred (i.e., where they received their mental healthcare services).

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Analytic Plan

We completed secondary exploratory analyses on predictors of attrition by comparing patients who completed the interventions with non-completers (non-completers were classified as individuals who completed <50% of intervention sessions).

Descriptive statistics were used to characterize the sample. Completers and non-completers were compared on baseline measures using t-tests (continuous predictors) or chi-square analyses (categorical predictors). If significant differences were observed, the predictors (standardized to Z-scores) were entered into a multivariate binary logistic regression with bootstrapping (2,000 re-samples) as a post-hoc analysis to understand the relative contribution of each predictor on non-completion status. These statistical analyses were performed using SPSS version 27 with an alpha level of 0.05.

Data from both intervention groups were aggregated as there was no statistically significant difference in completion status (non-completer or completer) between the two intervention groups (X^2 = 1.96, p = 0.159).

Results

Participants

Ninety-six participants were recruited to be randomized in the study from five first-episode psychosis clinics affiliated with either McGill University or Université de Montréal; PEPP-Montréal, Douglas Institute; the First Episode Psychosis Program from the Jewish General Hospital (JGH); the First Episode Psychosis Program from the McGill University Health Centre (MUHC) from the McGill network; the Clinique Jeunes Adultes Psychotiques from the Centre hospitalier de l'Université de Montréal (CHUM); and the Clinique Connec-T from the Institut Universitaire de Santé Mentale de Montréal. 44 % (*n*=20) of participants randomized to CRT completed the intervention, while 59% (*n*=30) of participants randomized to CBT-SA completed the intervention. Across both interventions 48% were non-completers (*n*=46). See Table 1 and Figure 1 for information on completers and non-completers (non-completers were those who completed less than 50% of the intervention).

Figure 1.

Table 1.

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Qualitative Attrition Motives

Participants who were considered non-completers were invited by the research team and their clinical care team to share their reasons for ceasing their participation. Fifteen participants provided a reason. Attrition motives that participants disclosed were scheduling conflicts (*n*= 5), hospitalization (*n*=2), entered drug rehabilitation (*n*=1), didn't want to attend the group anymore (*n*=2), too anxious due to the group setting (*n*=1), too anxious (*n*=1), left the country (*n*=1), didn't like the group they were randomized to (*n*=1) and multiple reasons (*n*=1).

Group Differences

Non-completers tended to be younger (t(92.42)=2.84, *p*=0.006), had fewer years of education (t(94)=2.652 , *p*=0.009) and lower SA scores (t(90)=2.177, *p*=0.032). No statistically significant differences between completers and non-completers were found for all other predictors.

Results from the post-hoc logistic regression analysis were in line with the previous results. Overall, the model significantly predicted completion status. Age, followed by SA, had the greatest relative contribution in predicting non-completion; adjusted odds ratio age 0.88 [95% CI 0.79, 0.99], adjusted odds ratio SA 0.96 [95% CI 0.93, 0.99]. Years of education was no longer a significant predictor of non-completer status when added in the model. See Table 3.

An analysis of differences between non-completers at different treatment stages was also assessed, see supplementary materials.

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Discussion

The present study is novel in investigating baseline factors associated with attrition in cognitive health interventions among a FEP cohort with comorbid SA. Attrition predictors were investigated from this FEP cohort where only 52% of randomized participants completed the intervention. Furthermore, we investigated differences between individuals who dropped out at different points of the intervention.

Our findings show that participants who dropped out tended to be younger, had fewer years of education, and had lower SA scores. In terms of prior findings in the literature, our age difference corroborates findings from reviews examining disengagement from group interventions in schizophrenia (Mattick & Clarke, 1998), disengagement and attendance of mental healthcare services in schizophrenia (Daniels et al., 2014; Kreyenbuhl et al., 2009) and treatment program adherence in psychosis (Nosé et al., 2003). However, one review examining adherence to psychosocial treatments in schizophrenia spectrum disorder found the opposite trend, where older age was associated with attrition (Villeneuve et al., 2010). It has been hypothesized that the effect of age on intervention attrition could be in part due to the lack of perceived need for intervention and tendencies to engage in independent mental-health related problem solving, commonly endorsed by younger patients with severe mental illnesses (Kessler et al., 2001).

Our finding on years of education was not confirmed following the logistic regression analysis and is not independent of other possible factors. However, this finding aligns with previous studies, which have found that, in psychosis, fewer years of education is associated with treatment non-adherence in community psychiatric services (Nosé et al., 2003) and mental health treatment programs (Kreyenbuhl et al., 2009).This trend has also been identified in populations with FEP engaging in early intervention services (Turner et al., 2009; Zheng et al., 2013). The effect of education on the likelihood of non-completion has been hypothesized to be due to the link between lower educational attainment and difficulty managing one's life, which has been suggested to translate to challenges in managing and complying with a treatment regimen (Dalgard et al., 2007; Zheng et al., 2013).

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Finally, we found those with greater SA were more likely to complete treatment. This finding is in accordance with other studies which found that those with greater SA and general anxiety were more likely to remain in treatment. These specific findings were found for CBT treatments for social phobia and for individuals receiving treatment for anxiety disorders (Issakidis & Andrews, 2004; Rosser et al., 2003). In their study, Issakidis and Andrews (2004) found that those with major anxiety disorder with greater anxiety were more likely to remain in their outpatient treatment clinic. Rosser and colleagues (2003) found similar results when investigating CBT for social phobia; those with higher social anxiety were more likely to remain in the treatment. However, a study by Mersch and colleageus (1989) had contrasting findings; those receiving psychological treatment for social phobia were more likely to drop out if they had greater social anxiety. To address these disparate findings, future studies should collect qualitative information on attrition. These differing findings could also suggest that treatment engagement strategies of those with social anxiety in first episode psychosis could differ from other anxiety disorders. Our qualitative findings do suggest that some individuals who dropped out found the group setting to be too anxiety provoking, thus for such individuals, it will be important to provide alternative intervention options. Alternative options could include combining some individual sessions prior to a group intervention or novel individual interventions such as emerging virtual reality SA interventions where individuals are exposed to social settings in a non-threatening virtual environment (Emmelkamp et al., 2020; Horigome et al., 2020). However, our findings indicate that most individuals with social anxiety were still able to engage in a group intervention despite their SA. Given the limited treatment options available for SA in FEP, our findings indicate that group setting of treatment can continue be explored for SA in FEP as it is not a barrier in engaging in the treatment for most individuals.

We hypothesize that those with lower initial symptom severity experienced could have improved more quickly and experienced meaningful improvements within fewer sessions, leading to their dropout. Thus, future research should also explore symptom improvement trajectories throughout the course of treatment so that treatments can be personalized to those with lower baseline symptom severity. Finally, further research needs to be done on engagement strategies for participants with these characteristics. It seems that participants need factors, indicated by their initial SA severity, and the predisposing factor of age, which may also be related to their perceived need as those who are younger may perceive less need for treatment, predicts whether they complete treatment or not. To decrease attrition, it would be important to understand and address participants who have a lower perceived need for treatment through specific engagement strategies for patients with these characteristics.

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There are several limitations to note from the present study. First, we assessed attrition from the intervention within a RCT setting. Certain factors, such as randomization, intervention location being different compared to where primary care is received and additional assessment measures required within the research context, are likely to increase attrition rates in RCT settings compared to those provided within a naturalistic setting. Although we took special care to assess predictors that were hypothesized to contribute to the differences in attrition between a RCT and naturalistic setting, there are still additional contributors to attrition in an RCT that were not assessed due to the limitations in the variables collected at baseline. Second, we were not able to obtain information from all participants regarding their motives for ceasing the intervention, even though all participants were invited to provide a reason. Although we reported the qualitative reasons for attrition, these reasons may not be representative since only 33% of non-completer participants responded. Other factors which could impact attrition were not assessed, such as therapeutic alliance, additional enabling factors and factors like participant's motivation to engage in treatment, which has already been demonstrated to be influential in treatment outcomes in schizophrenia (Lecomte et al., 2008; Medalia & Saperstein, 2011). We also excluded patients with substance use disorders from this study; however, those with high SA are at higher risk of developing problems with substance use. In addition, those with alcohol use disorders are associated with higher dropout rates for psychological treatment services (Buckman et al., 2018; Wenzel & Jager-Hyman, 2014). Further studies should include patients with this triple comorbidity. The relatively small sample size limits the generalizability of the findings. Finally, although there were no statistically significant differences in completion status between both intervention groups, reasons for dropping out of the interventions could differ based on the intervention provided. For instance, participants seeking SA treatments could be more likely to drop out from CRT as there were no components of the treatment which directly addressed SA symptoms.

Understanding factors related to attrition will allow us to better tailor and adapt group psychosocial interventions for the FEP population to achieve a higher treatment retention rate, thus, improving patient outcomes and our ability to study efficacy of psychosocial interventions.

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Tables and Figures

Table 1. Completer and Non-completer participant characteristics at baseline

	Non-completers (n = 46)		Completers (n = 50)		Total Sample (n = 96)	
	M	**SD**	**M**	**SD**	**M**	**SD**
Age	23.35	3.78	25.80	4.68	24.63	4.42
Years of education	11.35	2.28	12.50	1.97	11.95	2.19
Number of hospitalizations	1.30	1.53	.72	.86	1.00	1.26
Duration of illness†	1.66	1.63	1.36	1.32	1.51	1.48
Socioeconomic status Category	3.05	1.09	2.81	1.33	2.92	1.22
Social anxiety	48.33	15.26	55.55	16.30	52.25	16.15

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Positive symptoms	13.56	12.93	11.60	11.95	12.51	12.38
Negative symptoms	25.19	10.30	24.02	10.78	24.56	10.52
Depression severity	5.93	3.42	5.68	3.96	5.79	3.71
Internalized stigma	2.21	.46	2.23	.46	2.22	.46
Functioning	51.21	10.40	51.52	12.11	51.38	11.30
	N	**%**	**N**	**%**	**N**	%
Sex (Male/Female)	27/19	59/41	36/14	72/28	63/33	66/34
Intervention Preference (Y/N)	26/9	57/20	29/10	58/20	55/19	57/20
Intervention at Referral Hospital (Y/N)	29/17	63/37	27/23	54/46	56/40	58/42

† 0.5 = 6 months.

‡ Not all participants completed all measures

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Table 2. *Logistic Regression (2000 resamples) of Baseline Predictors of Attrition (Completers or Dropouts)*

	Beta	*SE*	*p*	*Exp(B)*	*95% CI for Exp(B)*
Attrition Predictors					
Years of education	-0.20	0.12	0.14	0.82	[0.65, 1.04]
Age	-0.13	0.058	0.018*	0.88	[0.79, 0.99]
Social anxiety	-0.04	0.016	0.005*	0.96	[0.93, 0.99]

* $p < .05$

Figure 1. *Number of completers and dropouts in Cognitive Remediation Therapy (CRT) and Cognitive Behavioural Therapy (CBT)*

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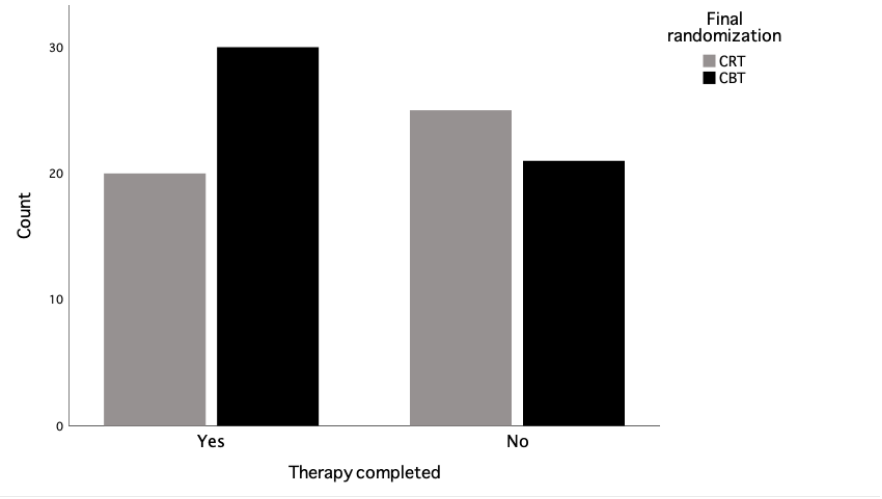

Clinical Trial Registration

ClinicalTrials.gov identifier: NCT02294409

Data Availability Statement

Anonymized data that support the findings of this study are available on reasonable request from the CRISP group (martin.lepage@mcgill.ca), subject to approval by the Steering Committee.

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Conflict of Interest Disclosure

Au-Yeung, C., Bowie, C. R., Montreuil, T., Baer, L. H., Lecomte, T., Joober, R., Abdel-Baki, A., Jarvis, G. E., Margolese, H. C., De Benedictis, L., Schmitz, N., Thai, H., Malla, A. K., & Lepage, M. (2023). Predictors of treatment attrition of cognitive health interventions in first episode psychosis. *Early Intervention in Psychiatry*, *17*(10), 984–991. https://doi.org/10.1111/eip.13391

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Ethical standards

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.

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