

When Does Premature Treatment Termination Occur? Examining Session-by-Session Dropout Among Clients with Gambling Disorder

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Abstract Premature termination challenges the successful outcomes of psychological treatments for gambling disorder. To date, research has primarily identified clients who are at particular risk for dropping out of treatment. A smaller but growing body of literature has investigated when dropout occurs. Typically, those studies have not considered improvement in psychological distress within their operationalizations of dropout and therefore may have misrepresented when dropout occurs. The current study examined when dropout occurs using an operationalization based on the criteria of attaining reliable change in a naturalistic sample of clients with gambling disorder, and the classification rates yielded from that operationalization were compared to the rates from a more common operationalization. Participants ($n = 334$) were clients meeting diagnostic criteria for gambling disorder at an outpatient private practice who completed a measure of psychological distress at baseline and prior to each subsequent treatment session. A survival analysis was conducted to determine temporal patterns of treatment dropout (i.e., clients who discontinued treatment before realizing reliable changes in psychological distress) and completion (i.e., clients who discontinued treatment after realizing reliable changes in distress) at each treatment session. Forty-nine percent of clients were classified as dropouts, and the majority of those clients did so in the first few sessions. The more common operationalization of dropout classified clients as dropouts when they had improved in their distress and clients as completers when they had not improved in their distress. Discussion centers on the implications of dropout occurring at various stages of treatment and future directions.

Keywords Premature termination · Dropout · Treatment effectiveness · Gambling disorder · Reliable change · Cognitive–behavioral therapy

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Introduction

Premature termination, or treatment dropout, poses a significant problem in the psychological treatment of gambling disorder (Melville et al. 2007). Previous investigations have focused largely on identifying the client factors associated with dropout but have reached little consensus (e.g., Dowling 2009; Melville et al. 2007; Milton et al. 2002). A smaller, but growing body of literature has examined when dropout occurs and has found that the great proportion of clients with gambling disorder discontinued psychological treatment during the early stages (Jiménez-Murcia et al. 2007). However, this research has been limited by operationalizations that reflected treatment duration rather than reduction in distress. In this study, we explored when clients with gambling disorder, referred to a private practice, discontinued treatment using an operationalization reflecting a reduction in psychological distress. We also compared the classification rates yielded by this operationalization to the classification rates yielded by an operationalization of treatment duration.

Despite the existence of efficacious psychological treatments for gambling disorder, the effects of these treatments have been hindered by high rates of dropout (Westphal 2008). Qualitative and quantitative reviews have demonstrated that psychological treatments for gambling disorder significantly reduced gambling symptom severity, financial loss from gambling, and the frequency of gambling episodes (Cowlshaw et al. 2012; Gooding and Tarrier 2009; Pallesen et al. 2005). However, approximately 31% of clients with gambling disorder drop out of psychological treatment (Melville et al. 2007), which is higher than the rate across other psychological disorders (20%; Swift and Greenberg 2012). This rate of dropout in psychological treatments of gambling disorder challenges clinicians in effectively delivering treatment (Toneatto 2005) and researchers in measuring treatment outcomes (Walker 2005).

Dropout from gambling specific treatments has been defined multiple ways across studies. The most common definition has been that dropout occurs when a client discontinues treatment prior to completing a treatment program or a prespecified number of treatment sessions (Melville et al. 2007). The less common definition has classified clients as dropping out when the client discontinues treatment and the therapist judges them as needing further treatment (e.g., Sylvain et al. 1997).

The contemporary literature has focused largely on identifying the client factors associated with increased risk for dropout among clients with gambling disorder. Some studies have found that clients with gambling disorder who were likely to drop out of psychological treatment were single (Aragay et al. 2015), had greater severity of psychological distress (Jiménez-Murcia et al. 2007), and had certain personality characteristics such as impulsivity (Álvarez-Moya et al. 2011). By contrast, other studies have found no significant associations across some of these same variables (Dowling 2009; Hodgins et al. 2004; Milton et al. 2002). Collectively, these studies have failed to converge on factors associated with increased risk for treatment dropout.

At least two explanations have been offered for these collective inconsistencies. The first explanation is that employing different operationalizations of dropout has led to different results (Melville et al. 2007). Indeed, this explanation has been borne out empirically in the broader psychotherapy literature, where disparate operationalizations have resulted in different rates of dropout (Swift et al. 2009; Swift and Greenberg 2012). The second explanation is that studies have assumed that pre-treatment and in-treatment dropout constituted similar constructs. Recent research has suggested that these two constructs may

be categorically distinct, and that the factors for dropping out at one stage of treatment may be different from the factors for dropping out at a different stage (Ronzitti et al. 2017).

Since the factors influencing clients with gambling disorder to drop out of psychological treatment may be different at various stages of treatment, it may be more fruitful to examine when dropout occurs in session-by-session intervals. A study by Jiménez-Murcia et al. (2007) examined this question in a 16-week outpatient treatment for gambling disorder by operationalizing clients as dropping out if they attended less than four treatment sessions. Their results indicated that the highest percentage of clients dropped out during the early stages of treatment. Specifically, 9% dropped out after attending the first session but before the second session. After the second session, rates of dropout remained constant around 2% until clients attended the fifth session but not the sixth.

The operationalization of dropout employed by Jiménez-Murcia et al. (2007) may misrepresent when dropout occurs among clients with gambling disorder. Their operationalization of dropout was defined as “no group attendance for more than three sessions” (p. 547). Because they did not collect session to session data on symptom improvement, they may have classified clients as dropping out when they improved in the problems that led them to seek treatment. Indeed, a study by Swift et al. (2009) demonstrated that operationalizations similar to that employed by Jiménez-Murcia et al. (2007) misclassified clients as dropouts when they achieved improvement in their psychological distress.

In the current study, we sought to address these limitations by investigating when dropout occurs using an operationalization that considers changes in psychological distress throughout treatment. This operationalization assumed that clients completed a routine, standardized outcome measure (e.g., Beck Depression Inventory-II; BDI-II; Beck et al. 1996) at intake and prior to each subsequent treatment session. Our operationalization was adopted from Swift et al. (2009), who defined dropout as occurring when a client discontinues treatment prior to achieving recovery calculated by the Reliable Change Index (RCI). The RCI reflects a change in scores on a standardized outcome measure (for a detailed discussion of reliable improvement, see Jacobson et al. 1984; Jacobson and Truax 1991).

To address the question of when dropout occurs, we conducted a discrete time survival analysis (Singer and Willet 2003) on an archival database of clients who sought treatment at a group private practice and examined session-by-session rates of dropout. Given past research on the timing of dropout, we expected that rates would be highest in the early portion of treatment. We also calculated the occurrence of dropout using the operationalization by Jiménez-Murcia et al. (2007) and compared it to the operationalization of reliable change. We hypothesized that this comparison would yield discrepancies in rates of dropout and treatment completion.

Method

Participants

Participants ($n = 334$) were drawn from an archival database of clients seeking outpatient treatment for gambling-related problems between the years of 1998 and 2008 at a group private practice specialized in treating individuals with gambling problems. The exclusion criterion was a score less than 9 on the BDI-II (Beck et al. 1996) at intake, which excluded 39 clients. Table 1 displays the demographics of this sample. The mean age of these clients was 46.48 ($SD = 11.27$). Nearly two-thirds (64%; $n = 214$) were women, and the majority were Caucasian (84%, $n = 278$). Almost half (45%) of the sample were married, 29%

Table 1 Sample demographics and symptomatology among this sample of clients with gambling disorder ($N = 334$)

Sample characteristic	
Age, M (SD)	46.22 (11.04)
Female, n (%)	214 (64.1)
Ethnicity, n (%)	
African American	8 (2.4)
Asian American	10 (3.0)
Caucasian	278 (83.7)
Hispanic American	26 (7.8)
Native American	5 (1.5)
Other/multiple ethnicities	5 (1.5)
Marital status, n (%)	
Married	148 (44.8)
Never married	87 (26.4)
Divorced/separated/widowed	95 (28.8)
Education level, n (%)	
Less than high school	15 (4.6)
High school diploma or equivalent	90 (27.6)
Some college	127 (39.0)
Baccalaureate degree	68 (20.9)
Graduate degree	26 (8.0)

Not all clients responded to all demographics questions. Percentages are calculated with non-responders coded as missing

were divorced/separated/widowed, and 26% were never married. Approximately 67% attended college in some capacity, 28% attained a high school diploma or equivalent degree, and 5% did not complete high school. The mean number of sessions attended by the sample was 7.43 ($SD = 9.00$).

Materials

BDI-II (Beck et al. 1996)

The BDI-II was used as an indicator of general improvement in psychological distress. This measure is comprised of 21 items with total scores ranging from 0 to 63, with greater scores indicating greater severity of psychological distress. For this sample, reliable change was determined by a change in score of 8.46 points.

Significant positive associations have been found between the BDI-II and gambling symptomatology (e.g., Poirier-Arbour et al. 2014; Pfund et al. 2017). Psychological distress has also been identified as one of the most common reasons for individuals experiencing gambling-related problems to seek treatment (Pulford et al. 2009). Among outpatient populations, the BDI-II has demonstrated substantial evidence of its validity, internal consistency ($\alpha = .91$), and one-week test re-test reliability ($r = .93$; Beck et al. 1996). The BDI-II has also demonstrated convergent validity ($r = .62$ to $.80$) with total scores on the Outcome Questionnaire-45.2, which is one of the most commonly administered session-by-session outcome measures of psychological distress (Lambert et al. 1996).

DSM-5 Criteria for Gambling Disorder (American Psychiatric Association 2013)

The DSM-5 criteria served to indicate a diagnosis of gambling disorder. The treating psychologist administered a 10-item structured diagnostic interview to assess the DSM-IV criteria for pathological gambling (American Psychiatric Association 1994). Respondents were asked to indicate, in a question format, the presence or absence of DSM-IV diagnostic symptoms during the past 12 months. In order to accurately reflect the most recent diagnostic criterion, we recoded clients' scores on the DSM-IV criteria for pathological gambling to meet the DSM-5 criteria for gambling disorder. To recode clients' scores, the item on the DSM-IV criteria related to committing illegal acts to finance gambling was collapsed into the item related to relying on others to relieve desperate financial situations caused by gambling. The threshold for number of items needed for a diagnosis was then reduced to a score of 4 or greater. A similar recoding technique demonstrated adequate internal consistency ($\alpha = .71$; Stinchfield et al. 2016).

Demographics Questionnaire

This questionnaire assessed age, gender, ethnicity, marital status, and level of education.

Procedure

All clients were referred by a jurisdiction's problem gambling hotline to an outpatient, group private practice located in the southwest U.S. They were seen by one of four doctoral-level, licensed psychologists whose theoretical orientation was predominately cognitive-behavioral. All clients were treated in accordance with the American Psychological Association's (APA) Ethical Principles of Psychologists and Code of Conduct (APA 2002). This study was approved by the university's Institutional Review Board as the study only involved secondary analysis of a de-identified database.

Upon retirement, the lead psychologist in this practice eliminated all identifiable information from the clinical files and made them available to our research team. At the onset of treatment, each of the four treating psychologists informed their clients that treatment was not time limited. Clients expected to attend 50-min sessions until the therapist and client mutually agreed to terminate. During the assessment session, the psychologist conducted a structured diagnostic interview to indicate the presence of each gambling disorder diagnostic symptom and asked clients to complete the BDI-II as part of a battery of other pencil and paper measures. Clients were given the option to choose either a moderation or abstinence goal. Throughout the course of treatment, the BDI-II was administered prior to each treatment session. Gambling symptomatology was not collected on a session-by-session basis following the first session.

The treatment followed a cognitive-behavioral model and consisted of an initial assessment session and treatment sessions. During the initial appointment, the assessment session, clients provided a thorough personal/social history and were guided in a functional analysis of their gambling behavior. In the following sessions, the treatment sessions, clients identified antecedents and consequences of their gambling as well as healthy alternatives. They engaged in planning for high-risk situations following a relapse prevention model. Given that the treatment setting was private practice, these elements guided the content of treatment but not the content of any one treatment session (K. Wilson, personal communication, October 23, 2017).

Using the BDI-II, clients were classified as treatment dropouts or completers using reliable change in psychological distress (Jacobson et al. 1984; Jacobson and Truax 1991). Specifically, clients were classified as dropouts if they discontinued treatment prior to improving their BDI-II score by at least 8.46 points. Clients were classified as a treatment completer if they discontinued treatment and achieved an improvement in their BDI-II score by at least 8.46 points. This criterion was adopted from the BDI-II population-based cutoff score proposed by Seggar et al. (2002). Therapists did not use the tracking of psychological distress when making decisions about termination.

It was common for clients who reached criteria for reliable change at one point to deteriorate so that they no longer met criteria for reliable change. In these cases, we considered clients as reliably changed only when they met change criteria at every subsequent treatment session. For example, if a client met the reliable improvement criteria at session 5 but deteriorated during sessions 6 through 8, and then met reliable change criteria again at session 9 through termination, then that client was considered to have reached reliable change at session 9.

Data Analysis Plan

Descriptive statistics were calculated for the number of sessions attended, gambling disorder symptom severity, and psychological distress severity. Rates of dropout over the course of treatment were examined by performing a discrete-time survival analysis (Singer and Willet 2003). For each client, the time origin was defined as the point immediately prior to their first therapy session. We determined the passage of time as the number of therapy sessions received rather than time on a calendar (i.e., two weekly sessions was considered equivalent to two biweekly sessions). Those clients who failed to achieve reliable change in distress were considered treatment dropouts at the final observation point. Clients who achieved and maintained reliable change by their final observation point were classified as treatment completers. We also calculated descriptive statistics for the occurrence of dropout classified by the operationalization used by Jiménez-Murcia et al. (2007). Finally, kappa analyses were performed to compare the agreement between the Jiménez-Murcia operationalization to the reliable change operationalization.

Results

Treatment Attendance and Symptomatology

On average, clients attended 7.43 ($SD = 9.29$) sessions. The number of sessions for the entire sample ranged from 1 to 68. Virtually all clients (97%; $n = 323$) met DSM-5 criteria for gambling disorder. The mean number of DSM-5 criteria endorsed was 7.53 ($SD = 1.56$). The average score of the BDI-II at intake was 26.50 ($SD = 10.95$).

Rates of Dropout and Completion

Forty-nine percent ($n = 165$) of clients dropped out and 51% ($n = 169$) completed treatment. Table 2 displays differences in client factors between clients classified as dropouts and treatment completers. Overall, there were no significant differences in demographic factors or the number of DSM-5 gambling disorder criteria endorsed (all

Table 2 Sample characteristics of clients dropping out ($n = 165$) versus completing treatment ($n = 169$) for gambling disorder

Characteristic	Treatment group		Statistic (<i>df</i>)	<i>p</i> value
	Dropout	Completer		
Age, <i>M</i> (<i>SD</i>)	45.14 (11.35)	47.28 (10.66)	$t(332) = 1.78$.08
Gender, <i>n</i> (%)			$\chi^2 (1) = .72$.34
Male	63 (38)	57 (34)		
Female	102 (62)	112 (66)		
Ethnicity, <i>n</i> (%)			$\chi^2 (1) = 1.93$.16
White/Caucasian	142 (87)	136 (81)		
Other	22 (13)	32 (19)		
Marital status, <i>n</i> (%)			$\chi^2 (2) = 2.32$.31
Married	75 (46)	73 (44)		
Never married	47 (29)	40 (24)		
Divorced/separated/widowed	41 (25)	54 (32)		
Education, <i>n</i> (%)			$\chi^2 (1) = 2.59$.11
High school or less	58 (36)	47 (28)		
Some college or more	101 (64)	120 (72)		
DSM-5 criteria for gambling disorder, <i>M</i> (<i>SD</i>)	7.54 (1.52)	7.52 (1.61)	$t(332) = .11$.91
Baseline BDI-II score, <i>M</i> (<i>SD</i>)	28.64 (10.65)	24.32 (10.85)	$t(332) = 3.67$	< .001

We collapsed our original ethnicity category to represent differences between White and other participants. We also collapsed our original education category to high school or less or some college or more

p 's > .05). Treatment completers ($M = 28.64$, $SD = 10.65$) had a significantly higher severity of psychological distress at baseline than treatment dropouts ($M = 24.32$, $SD = 10.85$) ($p < .001$). However, we suspect that difference was an artifact because clients who entered treatment with a lower severity BDI-II score had less room to improve their score.

We constructed a life table presenting the number and proportion (survival) of clients remaining in treatment, the number, proportion (hazard), cumulative number, and cumulative proportion dropping out, and the number, proportion, and cumulative number and proportion completing treatment across the assessment and treatment sessions (Table 3). Plots of the hazard and survival proportions across the assessment and treatment sessions are presented in Fig. 1. Figure 2 compares the number of clients in treatment alongside the cumulative frequencies of clients who dropped out and completed treatment.

The median survival time was 8.53 sessions. The greatest proportion of dropout occurred following completion of the assessment session but before attending the first treatment session (15%; $n = 50$). The second greatest proportion of dropout occurred after completing the first treatment session but before attending the second treatment session (12%; $n = 34$) (see Fig. 2). Approximately 89% of the clients ($n = 147$) who would ultimately drop out of treatment had already done so after the completion of treatment session 8. About five percent of the entire sample ($n = 18$) dropped out after attending more than nine treatment sessions.

Table 3 Life table indicating the number and proportion of clients remaining in treatment, the number, proportion, cumulative number, and cumulative proportion dropping out, and the number, proportion, and cumulative number and proportion completing treatment at various session intervals ($n = 334$)

Session interval	# in treatment	Proportion remaining in treatment (survival)	# dropping out	Proportion dropping out (hazard)	Cum. # dropping out	Cum. proportion dropping out	# completing	Proportion completing	Cum. # completing	Cum. proportion completing
Baseline	334	1.00	–	–	–	–	–	–	–	–
Assessment-T1	284	.85	50	.15	50	.15	0	0	0	0
T1–T2	230	.88	34	.12	84	.25	20	.07	20	.06
T2–T3	199	.93	15	.07	99	.30	16	.07	36	.11
T3–T4	161	.91	17	.09	116	.35	21	.11	57	.17
T4–T5	137	.94	10	.06	126	.38	14	.09	71	.21
T5–T6	115	.95	6	.05	132	.40	16	.12	87	.26
T6–T7	94	.91	10	.09	142	.42	11	.10	98	.29
T7–T8	83	.96	4	.04	146	.44	7	.07	105	.31
T8–T9	73	.99	1	.01	147	.44	9	.11	114	.33
T9–T10	64	.99	1	.01	148	.44	8	.11	122	.34
T10–T11	57	.97	2	.03	150	.45	5	.08	127	.38
T11–T12	48	.96	2	.04	152	.46	7	.14	134	.40
T12–T13	43	.96	2	.04	154	.46	3	.06	137	.41
T13–T14	39	.93	3	.07	157	.47	1	.02	138	.41
T14–T15	36	.97	1	.03	158	.47	2	.05	140	.42
T15–T16	34	1.00	0	0	158	.47	2	.06	142	.43
T16–T17	33	1.00	0	0	158	.47	1	.03	143	.43
T17–T18	32	1.00	0	0	158	.47	1	.03	144	.43
T18–T19	32	1.00	0	0	158	.47	0	0	144	.43
T19–T20	30	1.00	0	0	158	.47	2	.06	146	.44
T20–T67	0	1.00	7	0	165	.49	23	.77	169	.51

T treatment, Cum. cumulative

Figure 2 shows a linear increase in the cumulative number of clients dropping out of treatment between the assessment session to treatment session interval 7 and 8. Rates of dropout during that time ranged from 4 to 15% (Table 3 and Fig. 1). These rates plateaued by treatment session interval 8 and 9, when the proportion of clients dropping out fell to 1%.

The cumulative proportion of clients who completed treatment was linear across all treatment sessions. Eleven percent of clients ($n = 36$) were considered treatment completers following the assessment session but before attending the third treatment session. After the completion of treatment session 19, 86% of clients ($n = 146$) who would ultimately complete treatment had done so.

Comparison of Dropout Operationalizations

When applying the Jiménez-Murcia operationalization (i.e., clients who attended fewer than four sessions) to clients in this study, 40% ($n = 135$) were classified as dropouts and 60% ($n = 199$) as completers. The kappa coefficient between the two operationalizations was .39, $p < .001$. Table 4 presents a comparison of the number of clients classified as dropouts and treatment completers by the Jiménez-Murcia operationalization to the number of clients classified as dropouts and treatment completers by reliable change operationalization. The Jiménez-Murcia operationalization classified approximately 11% ($n = 36$) of clients in the sample as dropouts when reliable improvement in psychological distress had occurred and approximately 20% ($n = 66$) as completers when reliable improvement in psychological distress had not occurred.

Discussion

This study examined the rates of dropout relative to rates of reliable change over the course of a naturalistic treatment for gambling disorder. Overall, approximately half of the clients dropped out of treatment and the other half completed treatment/reliably improved. The greatest number of clients dropped out following the assessment session ($n = 50$), and rates of drop out plateaued after completing treatment session 8 but before attending treatment session 9. By contrast, rates of treatment completion were linear. Collectively, these results were consistent with other studies on the timing of dropout (Jiménez-Murcia et al. 2007), the client factors associated with dropout (e.g., Dowling 2009), and the dose–response relationship in general psychotherapy outcome (Howard et al. 1986). More specifically, these previous studies found that the largest proportion of dropout occurs early in treatment and that about 50% of clients will complete treatment by 8 sessions.

In this study, we found that the early portion of treatment was a critical time for the occurrence of dropout. Prior to attending the second treatment session, 84 clients dropped out and 20 clients completed treatment, respectively. Those numbers translate to 51% of all dropout and 12% of all treatment completion occurring during that time. For clinicians, these findings underscore the need to carefully attend to clients during the early stages of treatment as they may drop out without making reliable improvements. For the researcher, these findings underscore the need to further explore the reasons why clients drop out during the early stages of treatment.

The reasons why clients with gambling disorder dropped out of this psychological treatment may be dependent upon specific time points. This study demonstrated that the

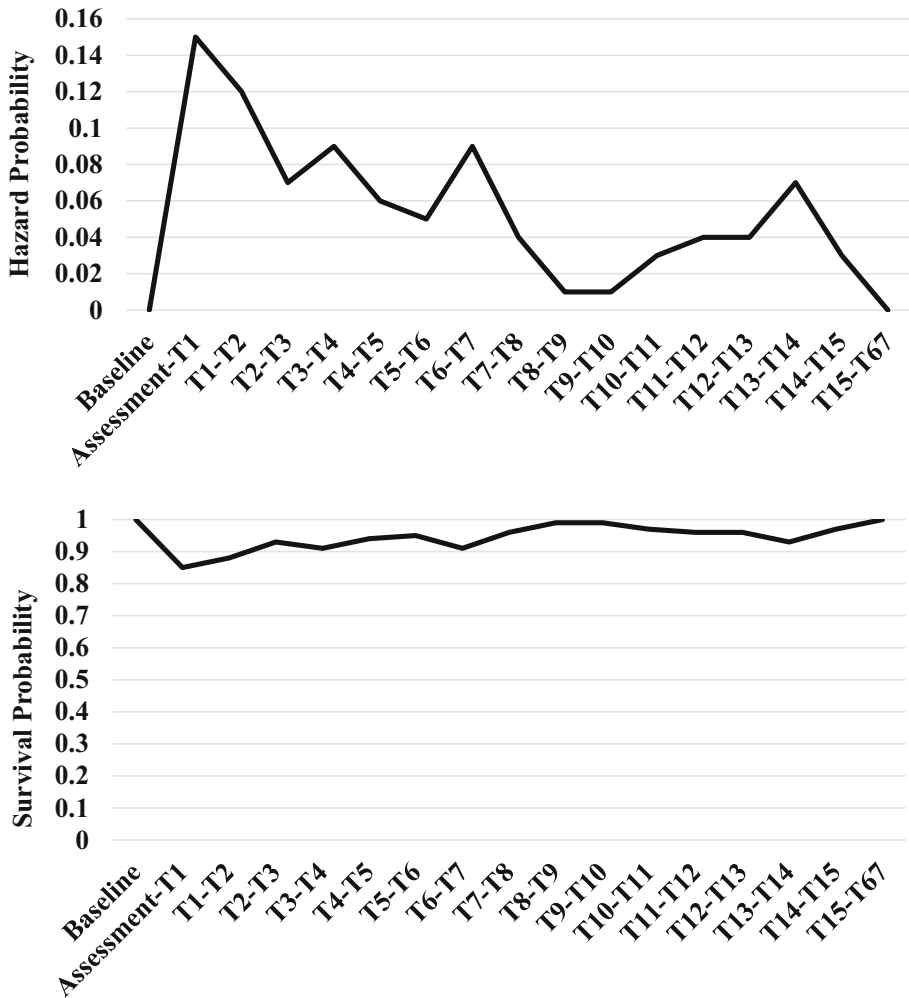


Fig. 1 Hazard function indicating the proportion of clients dropping out of gambling disorder treatment and survival function indicating the proportion of clients remaining in treatment at various session intervals

reason many clients may leave treatment during the early stages was that they achieved reliable improvement in their psychological distress. Other recent research from Ronzitti et al. (2017) found that pre-treatment dropout was significantly associated with younger age and use of drugs, whereas in-treatment dropout was significantly associated with a family history of gambling disorder, lower gambling symptom severity, and smoking. Although Ronzitti et al. (2017) distinguished between pre-treatment and in-treatment dropouts, further differences in the reasons for dropout may exist at different time points during treatment. In our study, it may have been important to understand the reasons for dropping out during the transition from the assessment session to the treatment sessions. Unfortunately, the archival nature of this dataset prevented us from investigating these questions. Future studies may wish to consider these comparisons.

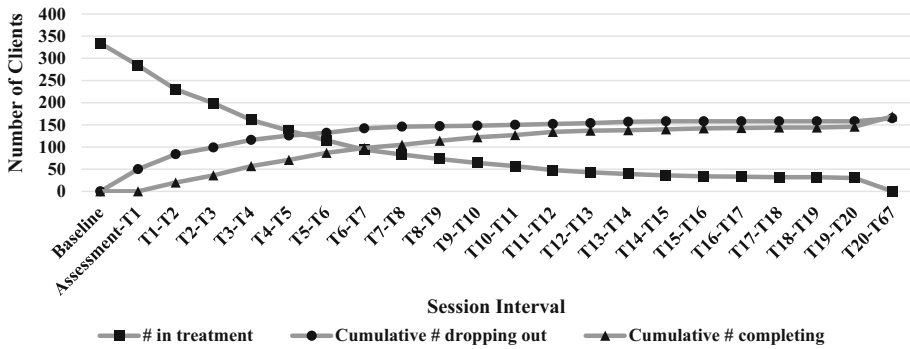


Fig. 2 Cumulative frequencies of the number of clients dropping out and completing treatment at various session intervals. *Note* Session numbers do not perfectly correspond to the number of consecutive weeks in treatment

In the present study, there were generally no significant differences in client factors between treatment dropouts and completers. These results are consistent with previous studies that failed to find client factors associated with treatment dropout (Dowling 2009; Melville et al. 2007). We did find that treatment completers had significantly higher psychological distress at baseline than dropouts. However, we believe that this finding was an artifact because clients presenting to treatment with lower distress had less room for improvement than clients in higher distress. In other words, clients who entered treatment with low severity of psychological distress were likely unable to eliminate their psychological distress. The difficulty for these clients to improve their distress may also reflect a high estimate of dropout.

Rates of dropout vary greatly as a product of the operationalization (Swift et al. 2009), which likely explains why previous gambling treatment studies have found wide variation in dropout rates (i.e., 14–50%; Melville et al. 2007). In the present study, nearly half of the clients dropped out of treatment using an operationalization based on reliable improvement in psychological distress over time. This number may have been at the high end of the range of dropout rates because previous studies utilized samples from randomized controlled trials with resources to track and retain clients. Indeed, research has found that rates of dropout were higher in studies employing naturalistic designs (Swift and Greenberg 2012). Our study may represent a more ecologically valid rate of dropout, in that clients were choosing to attend treatment without a monetary incentive.

Table 4 Comparisons of two dropout operationalizations

Dropout classified by Jiménez-Murcia et al. (2007)	Dropout by reliable change	
	Yes	No
Yes	99	36 ^a
No	66 ^b	133

^aRepresents a classification of dropout when clients had reliably improved in psychological distress

^bRepresents a classification of completion when reliable improvement in psychological distress had not occurred

This study raised important questions about the multifaceted construct of dropout and what specific circumstances constitute dropout from gambling treatment. When comparing our operationalization of dropout to that of Jiménez-Murcia et al. (2007), we found that about 11% of clients in the sample were classified as dropouts when reliable improvement in psychological distress had occurred and about 20% were classified as completers when reliable improvement in psychological distress had not occurred. These results would suggest that current unidimensional definitions of dropout, such as discontinuing prior to a predetermined number of sessions and therapist judgment, may not completely capture the construct of dropout because they do not consider a client's symptom improvement. Instead, future studies may want to combine multiple operationalizations, including one of symptom improvement, to fully capture the construct of dropout.

A small percentage (5%) of the entire sample attended more than nine treatment sessions but never evidenced reliable improvement in their symptoms. This finding was not surprising given that 50% of clients require 13–18 treatment sessions to recover or show clinically significant change in their psychological symptoms (Hansen et al. 2002). These findings substantiate concerns over the competing goals of managed care's reimbursement restrictions and treatment duration required for client improvement (Baldwin et al. 2009).

Perhaps the most apparent limitation in this study was that the BDI-II (Beck et al. 1996) was used to track reliable improvement in psychological distress and classify clients with gambling disorder as dropouts rather than a measure of gambling disorder symptoms or another measure of psychological distress (e.g., OQ-45.2; Lambert et al. 1996). Although this assessment may not be ideal for tracking reliable improvement in a treatment for gambling disorder, we believe that it was sufficient because the BDI-II is significantly correlated with gambling disorder symptoms (Pfund et al. 2017) and total scores on other routine outcome assessments of psychological distress (Lambert et al. 1996). In the absence of a diagnostic interview of depressive disorders, the BDI-II has long been thought of assessing general psychological distress (Coyne 1994). This measure of psychological distress was also justified in that one of the most common reasons for seeking treatment with a gambling-related problem is psychological distress and emotional problems (Pulford et al. 2009). It seems likely that clients in this sample discontinued treatment because they reduced their generalized psychological distress by improving in their gambling specific symptoms (e.g., gambling frequency, cognitive distortions).

This limitation does not allow us to determine whether clients discontinued treatment because they improved in gambling-specific symptoms, and it was unfortunate that these private practice psychologists did not routinely monitor gambling specific outcomes beyond the assessment session. (At the same time, they are commended for their regular monitoring of their clients). For that reason, we recommend future studies track gambling specific outcomes using reliable and valid assessment instruments, such as the Gambling Symptom Assessment Scale (G-SAS; Kim et al. 2009). The G-SAS was developed to assess gambling symptom severity and change throughout treatment and to broadly capture different dimensions of gambling disorder such as urges, thoughts, and behaviors. Tracking symptoms using a measure like the G-SAS would allow for the investigation of session-by-session improvement in gambling-specific symptoms and time course of treatment dropout.

Despite these limitations, the findings of this study highlighted the importance of the assessment session and early treatment sessions in their relation to dropout when treating clients with gambling disorder. Although some clients reliably improved in their psychological distress during these sessions, a greater number dropped out of treatment. A strength of this study was that we used a sample of clients in private practice. Few investigators have published studies on the rates of dropout outside the context of

randomized controlled trials where methods may often incentivize clients to continue treatment. Furthermore, we used a session-by-session assessment of client functioning rather than treatment duration that allowed us to more accurately identify when clients drop out of treatment. Future investigations should consider operationalizations of dropout incorporating reliable change as well as factors that motivate clients to discontinue treatment. It will also be important for future studies to examine differences in client characteristics for those who dropout in various stages of treatment.

Compliance with Ethical Standards

Conflict of interest All authors declare that they have no conflicts of interest.

Human and Animal Rights All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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